BID IDENTIFICATION NO.:

ODISHA STATE AGRICULTURAL MARKETING BOARD, BHUBANESWAR

COVER – I

TECHNICAL BID DOCUMENTS / DETAILED TENDER CALL NOTICE FORTHE WORK:

Construction of 12 Nos. 5000MT Godowns (Tora, Sarsara, Katapalli, Govindpur, Adagaon, Jhilimunda, Attabira, Paharsrigida, Lahanda, Laramba, Tamparsara & Bheden) and 6Nos. 2500MT Godowns (Sankrida, Remunda, Rusuda, Sialkhandahatha, Barpali & Narayan) with ancillary works at **BARAGODA.**
(Composite Tender)

Estimated Cost Put to Tender: ₹ 80,78,19,044.02

GENERAL MANAGER, OSAM BOARD, BHUBANESWAR

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OFFICE OF THE ODISHA STATE AGRICULTIRAL MARKETING BOARD, BHUBANESWAR
AT-BARAMUNDA, KHANDAGIRI, BHUBANESWAR -751030

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INVITATIONS FOR BIDS THROUGH e-Procurement

Bid Identification no. 11 e – Procurement notice no. 03 of 2026-2027

TENDER CALL NOTICE NO 3667 **/ OSAMB Dated: -** 03.10.2026

The General Manager, O.S.A.M Board invites percentage rate bids in **Double Cover System in online mode** for the works in the table below from **the eligible contractors** registered with Govt. of Odisha / Govt. of India / C.P.W.D. /central undertaking / Railway / M.E.S. The proof of registration from the appropriate authority shall be enclosed along with the bid. If successful, the bidder who has not registered under State Government has to register under the appropriate register authority of the State Government of Odisha in appropriate class of eligibility before award of the work as per prevalent registration norm of the State.

1. The bidder may submit bids for the following works existing

Sl. No	Name of work	Apprx. Value of work (in Rs)	Security (In Rs) (On-line)	Cost of bid document (In Rs) (On-line)	Class of Contractor	Period of completion
1	2	3	4	5	6	7
1	"Construction of 12 Nos. 5000MT Godowns (Tora, Sarsara, Katapalli, Govindpur, Adagaon, Jhilimunda, Attabira, Paharsrigida, Lahanda, Laramba, Tamparsara & Bheden) and 6 Nos 2500MT Godowns (Sankrida, Remunda, Rusuda, Sialkhandahatha, Barpali & Narayan) with ancillary works at **BARAGODA**"	**80,78,19,044.42**	80,78,190.00	10,000.00	"Super Class"	18 (Eighteen) calendar months

2. Bid documents consisting of specifications, the schedule of quantities and the set of terms and conditions of contract and other necessary documents can be seen in the website: www.tendersorissa.gov.in.
3. The Earnest Money Deposit / Bid security of the amount specified for the work in Col. 04 above, the bidder shall make electronic payment using his / her Internet banking enabled account with designated Bank or their aggregator Bank such as SBI / ICICI / HDFC or the bidder having account in other bank can make payment using NEFT / RTGS facilities of designated banks. Bidders desirous to hire machineries or equipment from outside the State or owned but deployed outside the state are required to furnish **1 %** of the amount put to tender as **Bid security**.
4. The Bid documents will be available in the website: www.tendersorissa.gov.in from 10.00 AM of Dt. 06.10.2026 up to 5.00 PM of Dt. 19.11.2026 for online bidding.

5. The bidder must possess compatible Digital Signature Certificate (DSC) of Class-II or Class-III.
6. Bids shall be received only “on line” on or before Dt. 19.11.2026 up to 5.00 PM.
7. Pre-Bid meeting will be held on 23.10.2026 at 12.00 PM at Conference Hall, OSAM Board
8. Bids received on line shall be opened at 11.30 AM of 20.11.2026 in the office of the OSAM Board Bhubaneswar, in the presence of the bidders who wish to attend. Bidders who participated in the bid can witness the opening of bids after logging on to the site through their DSC. If the office happens to be closed on the last date of opening of the bids as specified, the bids will be opened on the next working day at the same time and venue.
9. The cost of bid documents as mentioned in Column 05, the bidder shall make electronic payment using his / her Internet banking enabled account with designated Bank or their aggregator Banks such as SBI / ICICI / HDFC or the bidder having account in other Bank can make payment using NEFT / RTGS facilities of designated Banks .
10. Other details can be seen in the bidding documents.
11. The authority will not be held responsible for any technical snag or network failure during on-line bidding.
12. The bidders shall have to produce an affidavit in support of authenticity of documents / credentials. Other details can be seen in the bid documents available in above website.
13. The authority reserves the right to cancel any or all bids without assigning any reason.

03/10/2026

General Manager,
OSAM Board. Bhubaneswar

MemoNo. 3668 /Date. 03.10.2026

Copy submitted to Registrar Co-operative Societies, Odisha, Bhubaneswar for favour of information.

03/10/2026

General Manager,
OSAM Board. Bhubaneswar

MemoNo. 3669 /Date. 03.10.2026

Copy submitted to the Chief Manager (Technical) State e-procurement Cell, Odisha, Bhubaneswar for favour of kind information and necessary action.

03/10/2026

General Manager,
OSAM Board. Bhubaneswar

CHECKLIST TO BE ENSURED BY THE BIDDER

Sl. No	Particulars	Reference to DTCN Clause No.	Whether furnished		Reference to Page no.
			Yes	No	
01.	Cost of tender paper **₹.10,000.00 (Online)**	**No.4**			
02.	E.M.D at the @1% of ₹ 80,78,190.00 in form of Bank Guarantee.	**No. 20**			
03	Additional Performance Security in case the bid price/rate is less than the estimated cost put to tender	**No.62.1**			
04.	Copy of valid Contractor Registration Certificate	**No.5 (i) & 21**			
05.	Copy of valid GSTIN	**No.5 (i) & 21**			
06.	Copy of PAN Card	**No.5 (i) & 21**			
07.	No Relationship Certificate in Schedule – A	**No.35**			
08.	Works Experience : List of projects under execution / executed that are similar in nature to the work	**Schedule-B & Schedule -D**			
09. (A)	Information regarding current litigation, debarring / expelling of the tender or abandonment of the work by the tenderer (Schedule-E)	**No.49**			
(B)	Affidavit (Schedule-F)	**No.49**			
10.	a) M.O.U. (Memorandum of Understanding duly notarized) with eligible registered electrical contractor having valid H.T. / L.T. license; b) M.O.U. (Memorandum of Understanding duly notarized) for fire fighting work.	**No. 8 & Schedule - J**			
11.	Assessed Available Bid Capacity.	**No. 116 (h)**			
12.	Similar nature of work.	**No. 116 (g)**			
13.	Qualification of Key personnel engaged. (Schedule (G)	(Schedule (G)			
14.	Work Programme.				
15.	Tools & Plants and machineries as per the requirement in Schedule-C (Minimum **80%** marks to be obtained). (Proof of ownership of Tools & Plants and machineries is to be furnished in shape of copy of invoices / required sale deed in case of 2nd purchase / required lease deed with owner ship documents of the leaser duly attested. In case of centering & shuttering materials certificate of the Executive Engineer Or equivalent and higher rank officer of Govt. / Govt. under taking / PSU within **90** days of last date of receipt of tender is allowed.	**No.7 & 116(e) & Schedule-C**			
	List of plants and equipments	**Requirement**			
(i)	Water Tanker of 3000 litre capacity mounted with Truck / Tractor	**2 Nos.**			
(ii)	Truck / Tipper	**4 Nos.**			
(iii)	Welding machine	**2 No.**			
(iv)	Generator of 40 KVA Capacity	**1 No.**			
(v)	Concrete Batching plant of Capacity 15 cum/hr	**1 No.**			
(vi)	Concrete mixer	**2 Nos.**			
(vii)	Concrete vibrator				
(a)	Concrete vibrator : Needle 40mm	**4 Nos.**			
(b)	Concrete vibrator : Needle 25mm	**4 Nos.**			
(c)	Concrete vibrator : Screed type	**2 Nos.**			
(d)	Concrete vibrator : Plate type	**2 Nos.**			
(viii)	Complete staging, shuttering, centering arrangement a. For steel shuttering – Not older than 5 years b. For wooden/Ply shuttering – Not older than 2 years (No marks will be awarded if the shuttering material area is less than 2000 sqm)	**4000 Sqm.**			

(ix)	5 Ton Capacity Winch Machine (Mechanical/Power)	**2 Nos.**			
(x)	Water Pump – 5 HP Capacity- 1No. 1 HP Capacity- 1No.	**2 Nos.**			
(xi)	Hydraulic Excavator with Bucket capacity not less than 0.5 cum	**1 No.**			
16.	e-mail ID &				
	Contact no.				

CONTRACT DATA

A. GENERAL INFORMATIONS

Sl No	Item	Details
1	Name of the Work	Construction of 12 Nos. 5000MT Godowns (Tora, Sarsara, Katapalli, Govindpur, Adagaon, Jhilimunda, Attabira, Paharsrigida, Lahanda, Laramba, Tamparsara & Bheden) and 6 Nos 2500MT Godowns (Sankrida, Remunda, Rusuda, Sialkhandahatha, Barpali & Narayan) with ancillary works at BARAGODA. (**work is at one location**)
2.	Employer	General Manager, Odisha State Agricultural Marketing Board, Bhubaneswar.
3.	Employer's Representative	Executive Engineer, Odisha State Agricultural Marketing Board, Bhubaneswar
4	**Estimated Cost (Excluding GST) (In ₹.)** Civil Works EI Works **Total =**	 **₹. 80,21,79,077.00** **₹. 56,39,967.00** **₹. 80,78,19,044.00**

B. BID INFORMATION

7	Intended completion period/Time period assigned for Completion		18 (Eighteen) Calendar Months
8	Last Date & time of submission of Bid		**Date:.19.11.2026** **Time 17.00 hours**
9	Cost of Bid Document		
	i	Amount as per DTCN, Clause-4	₹.10,000/- To be remitted Online
	Bid Security/Earnest Money Deposit (EMD)		1% of the estimated amount put to tender in shape of BG. (As per Format attached with this document)
10	Details of Bid Security/Earnest Money Deposit.		
	i	Amount as per DTCN, Clause-20	₹.80,78,190/- To be submitted in shape of Bank Guarantee. (As per Format attached with this document)
	ii	In favour of	General Manager, Odisha State Agricultural Marketing Board, Bhubaneswar.
	iii	Type of instrument	As specified in the bid document.
11	Additional Performance Security		
	i	Amount	As specified in the bid document. (In shape of BG as per Format attached with this document)
	ii	In favour of	General Manager, Odisha State Agricultural Marketing Board, Bhubaneswar.
	iii	Type of instrument	As specified in the bid document.
11	The Financial years of last five years		2021-22 to 2025-26.
12	Bid validity period		**90 days**
13	Currency of Contract		Indian Rupee
14	Language of Contract		English

Procedure to participate in online bidding e-procurement:

1. PARTICIPATING IN THE BID IN THE E-PROCUREMENT PORTAL: The Contractor / Bidder intending to participate in the bid is required to register in the Portal using his /her active personal/ official e-mail ID as his Login ID and attach his/her valid Digital Signature Certificate (DSC) to his/her unique Login ID. The DSC used must be of appropriate class (Class II or Class III) issued from a registered Certifying Authority such as n-Code, Sify, TCS, MTNL etc. He/ She has to submit the relevant information as asked for about the firm/ contractor. The portal registration of the bidder/ firm is to be authenticated by the State Procurement Cell after verification of original valid certificates/ documents such as (i) PAN and (II) Registration Certificate (RC)/ GST Registration Certificate and GSTIN (for procurement of goods) of the concerned bidder. The time period of validity in the portal is at par with validity of RC/ GST Registration Certificate and GSTIN. Any change of information by the bidder is to be re-authenticated by the State Procurement Cell. After successful authentication bidder can participate in the online bidding process.

   Contractor not registered with Government of Odisha, can participate in the e-procurement after necessary enrolment in the portal but have to subsequently register themselves with the appropriate registering authority of the State Government before award of the work as per prevalent registration norms of the State.

   a. To log on to the portal the Contractor/Bidder is required to type his/her *username* and password. *The* system *will again ask to* select the DSC and confirm it with the password of DSC. For each login, a user's DSC will be validated against its date of validity and also against the Certificate Revocation List (CRL) of respective CAs stored in system database. The system checks the unique ID, password and DSC combination and authenticates the login process for use of portal.
   b. The tender documents uploaded by the Tender Inviting Officer in the website https://tendersodisha.gov.in will appear in the section of "Upcoming Tender" before the due date of tender sale. Once the due date has arrived, the tender will move to "Active Tender" Section of the *homepage*. Only a small notification will be published in the newspaper specifying the work details along with *mention* of the specific website for details. The publication of the tender will be for specific period of time till the last date of submission of bids as mentioned in the 'Invitation for Bid' after which the same will be removed from the list of Active tenders. Any bidder can view or download the bid documents from the web site.
   c. Engineering Contractor exempted from payment of EMD will be able to participate in the tender directly by uploading an affidavit to the effect that he has not availed the facility / participated in the tender for more than two works (excluding this work) during the current financial year, mentioning the name of work(s) for which participated and the authority to whom the tender was submitted, failing which the tender will be rejected.
   d. The *software* application has the provision of payment of cost of tender document through payment gateways of *authorized* bankers by directly debiting the account of the bidders.

1.1. Furnishing scanned copy of such documents is mandatory along with the tender documents otherwise his/her bid shall be declared as non-responsive and thus liable for rejection. It is mandatory that the DSC issued in the name of the authorized signatory is used in the portal.

1.2. In the case of any failure, malfunction, or breakdown of the electronic system used during the e-procurement process, the tender inviting officer shall not accept any responsibility for failures or breakdowns other than in those systems strictly within their own control.

1.3. Any third party/company/person under a service contract for operation of e-procurement system in the State or his/their subsidiaries or their parent companies shall be ineligible to participate in the procurement processes that are undertaken through the e-procurement system irrespective of who operates the system.

1.4. For submission of Bids through the E-Procurement Portal, the bidder shall upload the scanned copy/copies of document in prescribed format wherever warranted in support of eligibility criteria and qualification information. The online bidder shall have to produce the original documents in support of the scanned copies and statements uploaded in the portal before the specified date as per DTCN.

1.5. Each bidder shall submit only one bid for one package. A bid is said to be complete if accompanied by cost of bid document and appropriate bid security/Earnest Money Deposit.. The system shall consider only the last bid submitted through the E-Procurement portal.

1.6. The bidder may ask question related to tender online in the e-procurement portal using his/her DSC, provided the questions are raised within the period of seeking clarification as mentioned in tender call notice/Bid. The Officer inviting the Bid/ Procurement Officer-Publisher will clarify quarries related to the tender.

1.7. The details of drawings and documents pertaining to the works available with the officer inviting the Bid as well as in the office of Executive Engineer, OSAM Board as mentioned in the Contract Data will be open for inspection by the bidders. The bidder is required to download all the documents for preparation of his bid. It is not necessary for the part of the Bidder to upload other Bid documents (after signing) while up-loading his bid. He is required to upload documents related to his eligibility criteria and qualification information and Bill of Quantities duly filled in. It is assumed that while participating in the bid, the bidder has referred to all the drawings and documents. Seeking any revision of rates or backing out of the bid claiming for not having referred to any or all documents provided in the Bid by the Officer Inviting the Bid will be construed as plea to disrupt the bidding process and in such cases the bid security/Earnest Money Deposit shall be forfeited.

1.8. Any addendum/corrigendum/ cancellation of tender shall be published in the website https://tendersodisha.gov.in, and notice board and such notice shall form part of the bidding documents.

1.8.1. The system generates a mail to those bidders who have already uploaded their tenders and those bidders if they wish can modify their tenders. The bidders are required to visit the website till last date and time of bid submission for any addendum/ corrigendum/ cancellation thereof. Tender inviting authority is not responsible for communication failure of system generated mail.

All the volumes/ documents shall be uploaded / provided in the portal by the Officer inviting the bid. The bidder shall carefully go through the document and prepare the required documents and upload the scanned documents in Portable Document Format to the portal in the designated locations of Technical Bid. He will fill up the

rates of items or percentage in the BOQ downloaded for the work in designated Cell and up loads the same in designated locations of Financial Bid. Bidders are to submit only the original BoQ uploaded by publisher after entering the relevant fields without any alteration/deletion/modification. Multiple BoQ submission shall lead to cancellation of bid. In case of item rate tender, bidders shall fill in their rates other than Zero value in the specified cells. In the percentage rate tender, the bidder quoting Zero value is valid and will be taken as Schedule of Rates. Submission of document shall be effected by using DSC of appropriate class.

2. PAYMENT OF EMD/ BID SECURITY AND COST OF BID DOCUMENTS: The Bidder shall furnish, as part of his Bid, a Bid security for the amount mentioned under NIT/Contract Data in online mode (Scanned Copy of Bank Guarantee). Non-submission of bid security within the designated period shall debar the bidder from participating in the on-line bidding system and his portal registration shall be cancelled. His name shall also be informed to the registering authority for cancellation of his registration.

2.1 The EMD or Bid Security payable along with the bid is 1% of the estimated contract value (ECV) or as mentioned in the bid document.

2.2 Deleted.

2.3 The tender accepting authority will verify the originals of all the scanned documents of the successful lowest bidder only within 5 days of opening of the tender (price bid). In the eventuality of failure on the part of the lowest successful bidder to produce the original documents, he will be debarred in future from participating in tender for 3 years and will be blacklisted by the competent authority. In such a situation, successful L-2 bidder will be required to produce his original documents for consideration of his tender at the negotiated rate equal to L1 bidder.

2.4 Engineering Contractor exempted from payment of EMD will be able to participate in the tender directly by uploading an affidavit to the effect that he has not availed the facility / participated in the tender for more than two works (excluding this work) during the current financial year, mentioning the name of work(s) for which participated and the authority to whom the tender was submitted, failing which the tender will be rejected.

2.5 Government of Odisha has introduced e-payment gateway into the portal for payment of cost of Bid and Bid Security/ Earnest Money Deposit. The process of using e-payment gateway is mentioned in the "*Procedure for Electronic receipt, accounting and reporting of Cost of Tender Paper and Earnest Money Deposit on submission of bids*"..

3. FORMAT AND SIGNING OF BID: (Logging to the Portal)-The Contractor/ Bidder is required to type his/her Login ID and Password. The system will again ask to select the DSC and confirm it with the password of DSC as a second stage authentication. For each login, a user's DSC will be validated against its date of validity and also against the Certificate Revocation List (CRL) of respective CAs stored in system database. The system checks the unique Login ID, Password and DSC combination and authenticates the login process for use of portal.

The bidder can download the tender of his choice and save it in his system and undertake the

necessary preparatory work off-line and upload the completed tender at his convenience within the final date and time of submission. The bidder shall only submit single copy of the required documents and Price Bid in the portal. In the Financial bid, the bidder cannot leave any figure blank. He has to only write the figures; the words will be self-generated. The Bidders are advised to upload the completed Bid document well ahead of the last date & time of receipt to avoid any last moment problem of power failures etc.

3.1. The Bidder shall go through the Bid carefully and list the documents that are asked for submission. He shall prepare all documents including Declaration form, price bid etc. and store in the system.

3.2. The bidder shall log on to the portal with his DSC and move to the desired tender for uploading the documents in appropriate place one by one simultaneously checking the documents. Once the Bidder makes sure that all the documents have been uploaded in appropriate place, he clicks the submit button to submit the bid to the portal.

3.2.1. The bids once submitted cannot be retrieved or corrected. Tender cannot be pre-opened and cannot be submitted after due date and time. Therefore, only after satisfying that all the documents have been uploaded, the Bidder should activate submit button.

3.2.2. In the e-procurement process each process are time stamped. The system can identify each individual who has entered into the portal for any bid and the time of entering in to the portal.

3.2.3. The Bidder should ensure clarity of the document uploaded by him to the portal especially the scanned documents by taking out sample printing. Non-submission of legible documents may render the bid non-responsive. However, the Officer inviting the Bid if so, desires can ask for legible copies or original copies for verification with in a stipulated period provided such document in no way alters the Bidder's price bid. If the Bidder fails to submit the original documents within the stipulated date, his bid security shall be forfeited.

SUBMISSION OF BIDS:-

3.3. The bidder shall carefully go through the tender and prepare the required documents. The bid shall have a **Technical Bid and a Financial Bid**. The **Technical Bid** generally consists of GSTIN, PAN, Registration Certificate, Affidavits, Profit Loss statement, List of similar nature of works, work in hand, list of machinery, any other information required by OIT, and **Bid Security/Earnest Money Deposit in form of Bank Guarantee.** The **Financial Bid** shall consist of the Bill of Quantities (BOQ) and any other price related information/ undertaking including rebates.

3.4. Bidders are to submit only the original BOQ (in .xls format) uploaded by Procurement Officer Publisher (Officer Inviting Tender) after entering the relevant fields without any alteration/ deletion/ modification. Multiple BOQ submission by bidder shall lead to cancellation of bid. In case of items rate tender, bidders shall fill in their rates other than zero value in the specified cells without keeping it blank. **In the percentage rate tender the bidder quoting zero percentage is valid and will be taken at par with the estimated rate of the work put to tender.**

3.5. The bidder shall upload the scanned copy/ copies of document in support of eligibility criteria and qualification information in prescribed format in Portable Document Format (PDF) to the portal in the designated locations of Technical Bid.

3.6. The bidder shall write his name in the space provided in the specified location in the Protected Bill of Quantities (BOQ) published by the Officer Inviting Tender. The bidder shall type rates in figure only in the rate column of respective items(s) without any blank cell in the rate column in case of item rate tender and **type percentage excess or less up to two decimal places only in case of percentage rate tender.**

3.7. The bidder shall log to the portal with his/ her DSC and move to the desired tender for uploading the documents in appropriate places one by one simultaneously checking the documents.

3.8. Bids cannot be submitted after due date and time. The bids once submitted cannot be viewed, retrieved or corrected. The Bidder should ensure correctness of the Bid prior to uploading and take print out of the system generated summary of submission to confirm successful uploading of bid. The bids cannot be opened even by the OIT or the Procurement Officer Publisher/ opener before the due date and time of opening.

3.9. Each process in the e-procurement is time stamped and the system can defect the time of logging in of each user including the Bidder.

3.10. The Bidder should ensure clarity/ legibility of the document uploaded by him to the portal.

3.11. The system shall require all the mandatory forms and fields filled up by the contractor during the process of submission of the bid/ tender.

3.12. The bidder should check the system generated confirmation statement on the status of the submission.

3.13. The bidder should upload sufficiently ahead of the bid closure time to avoid traffic rush and failure in the network.

3.14. The Tender Inviting Officer is not responsible for any failure, malfunction or breakdown of the electronic system used during the e-procurement process.

3.15. The Bidder is required to upload documents related to his eligibility criteria and qualification information and Bill of Quantity duly filled in. It is not necessary for the part of the bidder to upload the drawing and the other Bid documents (after signing) while uploading his bid. It is assumed that the bidder has referred all the drawings and documents uploaded by the Officer Inviting the Bid.

3.16. The Bidder will not be able to submit his bid after expiry of the date and time of submission of bid (server time). The date and time of bid submission shall remain unaltered even if the specified date for the submission of bids is declared as a holiday for the Officer Inviting the Bid.

3.17. The 'Online bidder' shall digitally sign on all statement's documents, certificates uploaded by him, owning responsibility for their correctness/ authenticity as per IT ACT 2000. If any of the information furnished by the bidder is found to be false/ fabricated/ bogus, his EMD/BID Security shall stand forfeited and his registration in the portal shall be blocked and the bidder is liable to be blacklisted.

4. SECURITY OF BID SUBMISSION:

4.1. All bid data uploaded by the Bidder to the portal will be encrypted by the DSC of the opener(s). The system shall require all the mandatory forms and fields filled up by the contractor during the process of submission of the bid/tender.

4.2. The Bid shall be received in encrypted format by the system which can only be decrypted / opened by the authorized openers only on or after the due date and time.

5. DEADLINE FOR SUBMISSION OF THE BIDS:

5.1. The online bidding will remain active till the last date and time of the bid submission. Once the date and time (Server date and time) is over, the bidder will not be able to submit the bid. The date & time of bid submission shall remain unaltered even if the specified date for the submission of bids is declared as a holiday for the Officer inviting the Bid.

RESUBMISSION AND WITHDRAWAL OF BIDS:

5.2. Resubmission of bid by the Bidders for any number of times before the final date and time of submission is allowed.

5.3. Resubmission of bid shall require uploading of all documents including price bid afresh.

5.4. If the bidder fails to submit his modified bids within the pre-defined time of receipt, the system shall consider only the last bid submitted.

6. LATE BIDS:

6.1. The system shall reject submission of any bid through portal after closure of the receipt time. For all purposes the server time displayed in the e-procurement portal shall be the time to be followed by the bidder and concerned officers.

7. MODIFICATION AND WITHDRAWAL OF BIDS:

7.1. In the E-Procurement Portal, it is allowed to modify the bid any number of times before the final date and time of submission. The bidder shall have to log on to the system and resubmit the documents as asked for by the system including the price bid. In doing so, the bids already submitted by the bidder will be removed automatically from the system and the latest bid only will be admitted. But the bidder should avoid modification of bid at the last moment to avoid system failure or malfunction of internet or traffic jam or power failure. If the bidder fails to submit his modified bids within the designated time of receipt, the bid already in the system shall be taken for evaluation.

7.2. In the E-Procurement Portal, withdrawal of bid is allowed. But in such case, he has to write a letter with appropriate reasons for his withdrawal addressed to the Officer inviting the bid and up load the scanned document to portal in the respective bid before the closure date and time of receipt of the bid. The system shall not allow any withdrawal after expiry of the closure time of the bid.

8. OPENING OF THE BID:

8.1. Bid opening date is specified during tender creation or can be extended with corrigendum. This date is available in IFB, tender document as well as the home page of portal. Bid opening can be done by the authorized users which are defined during the tender publication / approval stage. The bids are encrypted using their public keys and can be decrypted only on or after the Bid Opening due date and time. The bid openers private key will be required to open the bids, and all the openers must log on to the portal during that time.

8.1.1. The bidders who participated in the online bidding can witness opening of the bid from any system logging on to the portal with the DSC away from opening place. Contractors are not required to be present during the bid opening at the opening location if they so desire.

8.1.2. Each activity is date and time stamped with user details. For time stamping, server time is taken as the reference.

8.2. In the event of the specified date of bid opening being declared a holiday for the Officer inviting the Bid/Engineer-in-Charge, the bids will be opened at the appointed time on the next working day.

8.3. In case bids are invited for more than one package, the order for opening of the "Bid" shall be that in which they appear in the "Invitation for Bid".

8.4. The Bid openers; who are pre-defined, shall log on to the portal with their respective DSC. Unless all the Officers who have been declared as Opening Officers log on to the portal with their DSC the Tender cannot be opened.

8.5. In case of non-responsive tender, the officer Inviting tender should complete the e-Procurement process by uploading the official letter for cancellation/ re-tender.

EVALUATION OF BIDS:-

All the open bids shall be downloaded and printed for taking up evaluation. The officer authorized to open the tender shall sign and number on each page of the documents downloaded and furnish a certificate that "the documents as available in the portal containing nos. of pages".

8.5.1. After opening of technical bid, the bidder may be asked in writing/ online (in their registered e-mail ID) to clarify on the uploaded documents provided in the Technical Bid, if necessary, with respect to any doubts or illegible documents required for Technical Evaluation. The Officer Inviting Tender may ask for any other document of historical nature during Technical Evaluation of the tender. Provided in all such cases, furnishing of any document in no way alters the bidder's price bid. Non submission of legible documents may render the bid non-responsive. The authority inviting bid may reserve the right to accept any additional document.

8.5.2. The bidders will respond in not more than 7 days of issue of the clarification letter, failing which the bid of the bidder will be evaluated on its own merit

8.5.3. Immediately, on receipt of these clarifications, the Evaluating Officers; predefined in the system for the bid, will finalize the list of responsive bidders. They will log on to the site with their DSC and record their comments on the technical evaluation page in the system. The Officer Inviting the Bid, if also the accepting authority, shall log on to the system with his digital signature and check the technical evaluation. He can either accept or pass on to the evaluating officers for re-evaluation. Upon acceptance of technical evaluation by the Accepting authority in the system, the system shall automatically generate letter to all the responsive bidders and the system shall forward the letter to all the responsive bidder that their technical bid has been evaluated responsive with respect to the data/information furnished by him and the letter shall also intimate him the date & time of opening of financial bid. The system shall also inform the non-responsive bidders in their e-mail ID that their bid has been found non-responsive.

8.6. The Technical evaluation of all the bids shall be carried out as per the information furnished by the Bidders. But evaluation of the bid does not exonerate the bidders from checking their original documents and if later the bidder is found to have misled the evaluation through wrong information, action as per relevant clause of DTCN shall be taken against the bidder/contractor.

8.7 The Procurement Officer-Evaluators will evaluate bid and finalized list of responsive bidders. Opening of price bid and evaluation of lowest bidder is subject to satisfaction of other qualification information.

8.7.1 The financial bids of the technically responsive bidders shall be opened on the due date of opening. The Procurement Officer-Openers shall log on to the system in sequence and open the financial bids.

8.7.2 The Financial Bid will be opened on the notified date & time in the presence of bidders or their authorised representative who wish to be present.

8.7.3 At the time of opening of "Financial Bid", the names of the bidders whose technical bids were found responsive will be announced and the bids of only those bidders will be opened. The remaining bids will be rejected.

8.7.4 The responsive bidders' name, the bid prices, the item wise rates, the total amount of each item in case the item rate is tender and percentage above or less in case of percentage rate tenders will be announced. Any discounts and withdrawals, and such other details as the officer inviting the tender may consider appropriate, will be announced by him or his authorized representatives at the time of opening.

8.7.5 Rebate/discount offer if any uploaded to the system shall be declared and recorded first.

8.7.6 The Financial bid of the bidders shall be opened one by one by the designated officers. The system shall auto-generate the Comparative statement.

8.7.7 The Bidder can witness the principal activities and view the documents/summary reports for that work by logging on to the portal with his DSC from anywhere.

8.7.8 Procurement Officer-Openers shall sign on each page of the download BOQ and the Comparative Statement and furnish a certificate in that respect.

8.7.9 System provides an option to Procurement Officer Publisher for reconsidering the rejected bid with the approval of concern Authority/ Head of Department.

9. CLARIFICATION AND NEGOTIATION OF BIDS:

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

9.2. On opening of the price bid the system shall arrange the financial bids in order of their value (L1 first, followed by L2, L3 ….) for subsequent evaluation. The evaluation status (Sheet) will be visible to all the participating bidders after opening on their respective logins. Each activity is recorded in the system with date and time stamping.

10. NOTIFICATION OF AWARD AND SIGNING OF AGREEMENT:

10.1. In the E-Procurement Portal, the system shall generate the template of award letter, **and the Officer Inviting the Bid shall mention the amount of Performance Security and additional security required to be furnished in the letter and intimate the bidders in his e-mail ID.**

10.2. The Employer/ Engineer-in-Charge shall notify acceptance of the work prior to expiry of the validity period by cable, telex or facsimile or e-mail confirmed by registered letter. **This letter of Acceptance will state the sum that the Employer/ Engineer-in-Charge will pay the contractor in consideration of execution and completion of the works by the contractor as prescribed by the contract and the amount of performance security and Additional Performance Security required to be furnished. The issue of the letter of Acceptance shall be treated as closure of the Bid process and commencement of the contract.**

10.3. The Contractor after furnishing the required acceptable Performance Security and Additional Performance Security, “Letter of Proceed” or “Work Order” shall be issued by the Employer/ Engineer-in-Charge with copy thereof to the Procurement Officer-Publisher. The Procurement Officer-Publisher shall upload the summery and declare the process as complete.

10.4. If the L1 bidder does not turn up for agreement after finalisation of the tender, then he shall be debarred from participation in bidding for three years and action will be taken to blacklist the contractor. Besides the consortium/ JV/firm where such an agency/ firm already happens to be or is going to be a partner/ member/ proprietor, he/ they shall neither be allowed for participation in bidding for three years nor his/ their application will be considered for registration and action will be initiated to blacklist him/ them. In that case, the L2 bidder, if fulfils other required criteria, would be called for drawing agreement for execution of work subject to condition that the L2 bidder negotiates at par with the rate quoted by the L1 bidder, otherwise the tender will be cancelled.

11. BLOCKING OF PORTAL REGISTRATION

11.1 If the registration Certificate of the contractor is cancelled/ suspended by the registering authority/ blacklisted by the competent authority his portal registration shall be blocked automatically on receipt of information to that effect.

11.2 The portal registration blocked in the ground mentioned in the above Para- 11.1 shall be unblocked automatically in receipt of revocation order of cancellation/ suspension/ blacklisting from the concerned authority.

11.3 The Officer Inviting Tender shall make, due inquiry and issue show cause notice to the concerned contractor who in turn shall furnish his reply, if any, within a fortnight from the date of issue of show cause notice. Thereafter, the Officer Inviting Tender is required to issue an intimation to the defaulting bidder about his unsatisfactory reply and recommend to the Chief Manager (Tech) for blocking of portal registration within 10 days of intimation to the defaulting bidder regarding his unsatisfactory reply with intimation to the Registering Authority and concerned Chief Engineer/ Heads of Office if any of the following provisions are violated.

11.3.1 Fails to furnish original Technical Documents before the designated officer within the stipulated date and time.

11.3.2 Backs out from the bid on any day after the last date of receipt of tender till expiry of the bid validity period (including till the extended bid validity period)

11.3.3 Fails to execute the agreement within the stipulated date.

11.3.4 If any of the information furnished by the bidder is found to be false/ fabricated/ bogus. Accordingly, the officer Inviting Tender shall recommended to the Chief Manager (Tech) State Procurement Cell, Odisha for blocking of portal registration of bidder and simultaneously action shall also be initiated by OFFICER INVITING TENDER for blacklisting as per Appendix-XXXIV of OPWD code Volume-II.

The minimum period of blocking of Portal Registration shall in no case be less than 180 days.

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 receipts of cost of tender paper has been successfully tested through SBI payment gateway. Now it has been decided to introduce electronic receipt of **Cost of Tender Paper and Earnest Money Deposit on submission of bids** through payment gateway of designated banks such as SBI/ICICI Bank/HDFC Bank for all Government Departments, State PSUs. Statutory Corporations, Autonomous Bodies and Local Bodies etc. in phases (ANNEXURE-I). The process outlines 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/ICICI Bank/HDFC Bank) payment gateway are being integrated with e-Procurement portal of Government of Odisha (https://tendersodisha.gov.in)

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

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 Pre-qualification/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 (Puri) as a deposit of the Division.

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

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) 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 suomoto or on being brought to its notice, the State Procurement Cell, Odisha, National Informatics Centre, Odisha unit, Cyber Treasury and the bank will promptly take steps for rectification. The e-Focal Point Branch of the participating Banks, National Informatics Centre, Odisha and the State Procurement Cell, Odisha will notify the contact number and address of the Help Desk for resolution of any dispute regarding e-Receipt.

14. Applicability and modification of existing rules / orders:

The modalities prescribed in this Office Memorandum for downloading 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.

ANNXURE-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 (tender period + I 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. Earnest Money shall be deposited in shape of Bank Guarantee, and it should come with Bid document. II. In case of forfeiture of Earnest Money Deposit on submission of bids, it will be directed to the Bank concerned to transfer the EMD value to the Account of OSAM Board.(This is not operating procedure in case the Earnest Money Deposit in the form of Bank Guarantee.)
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 the bid. III.	I. Earnest Money shall be deposited in shape of Bank Guarantee, and it should come with Bid document. II. Forfeiture as applicable in case of Bank Guarantee.

Instructions to Bidders
(ITB) e-procurement

1. NOTICE INVITING BID AND OBTAINING BID DOCUMENTS:

1.1. The General Manager, OSAM Board, Bhubaneswar is competent to invite this tender of composite bids. He/ She will also nominate the Executive Engineer who will deal with all matters relating to the bids in the invitation of bids.

1.2. For composite tender, estimated cost of each component should be clearly indicated in addition to combined estimated cost put to tender. The eligibility of bidders will correspond to the combined estimated cost of different components put to tender.

1.3. The contractor shall comply with the provisions of the Apprentices Act 1961, and the rules / amendments issued there under from time to time. If he fails to do so, it will be considered a breach of the contract and the General Manager, OSAM Board may at his/her discretion, without prejudice to any other right or remedy available under law, cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation of the provisions of the said Act by him.

1.4. The contractor shall be deemed to have satisfied himself as to the correctness and sufficiency of the Tender and of the rates and prices quoted in the Bill of Quantities, all of which shall, except in so far as it is otherwise provided in the Contract, cover all his obligations under the Contract (including those in respect of the supply of goods, materials, plant & services or of contingencies for which there is a Provisional Sum) and all matters and things necessary for the proper execution and completion of the work and the remedying of any defects therein.

1.5. The successful bidder shall complete the works by the intended completion date specified in the Contract data.

1.6. Throughout these bidding documents, the terms'' bid and tender'' EMD and Bid Security and their derivatives (bidder/ tenderer, bidding/ tendering, etc.) are synonymous.

1.7. In case the tender for composite work includes in addition to main work/ building work all other ancillary works such as sanitary and water supply installations, drainage installation, electrical work, Firefighting installation, horticulture work, roads and paths etc., the bidder apart from being a registered civil Contractor of appropriate class must associate himself with agencies of appropriate class those who is eligible to tender for sanitary and water supply drainage, **electrical**, Fire fighting installation and horticulture works in the composite tender. Intending purchasers are not required to produce any documents viz. copy of Registration, GST Registration certificate & GSTIN etc, at the time of purchase of tender documents but will be required for verification purpose at later stage. **Furnishing copy of such documents is mandatory along with the tender documents otherwise his/her bid shall be declared as non-responsive and thus liable for rejection. The L1 Bidder is required to attend the officer inviting the bid for verification of original documents within five days of opening the Price bid. In this case the stipulation points to Electrical work.**

1.8. PARTICIPATING IN THE BID IN THE E-PROCUREMENT PORTAL: The Contractor/ Bidder intending to participate in the bid is required to register in the Portal with some information about the firm/Contractor. This is onetime activity for registering in Portal. During registration, the contractor has to attach a Digital Signature Certificate (DSC) to his/ her unique user ID. The DSC used must be of appropriate class (Class II or Class III) issued from a registered Certifying Authority such as n-Code, Sify, TCS, MTNL e-Mudra etc.

1.8.1. To log on to the portal, the Contractor/Bidder is required to type his/her *username* and password. *The* system *will again ask to* select the DSC and confirm it with the password of DSC. For each login, a user's DSC will be validated against its date of validity and also against the Certificate Revocation List (CRL) of respective CAs stored in system database. The system checks the unique ID, password and DSC combination and authenticates the login process for use of portal.

1.8.2. The tender documents uploaded by the Tender Inviting Officer in the website **www.tendersOdisha.gov.in** will appear in the section of "Upcoming Tender" before the due date of tender sale. Once the due date has arrived, the tender will move to "Active Tender" Section of the *homepage*. **Only a small notification will be published in the newspaper specifying the work details along with mention of the specific website for details.** The publication of the tender will be for specific period of time till the last date of submission of bids as mentioned in the 'Invitation for Bid' after which the same will be removed from the list of Active tenders. Any bidder can view or down load the bid documents from the web site.

1.8.3. Engineering Contractor exempted from payment of EMD will be able to participate in the tender directly by uploading an affidavit to the effect that he has not availed the facility / participated in the tender for more than two works (excluding this work) during the current financial year, mentioning the name of work(s) for which participated and the authority to whom the tender was submitted, failing which the tender will be rejected.

1.8.4. If the software application has the provision of payment of cost of tender document through payment gateways of *authorized* bankers by directly debiting the account of the bidders, bidders will be required to avail on-line payment.

1.9. The bidders are to participate in the bid online.

1.10. ***DELETED.***

1.11. In the case of any failure, malfunction, or breakdown of the electronic system used during the e-procurement process, the tender inviting officer shall not accept any responsibility for failures or breakdowns other than in those systems strictly within their own control.

1.12. Any third party/company/person under a service contract for operation of e-procurement system in the State or his/their subsidiaries or their parent companies shall be ineligible to participate in the procurement processes that are undertaken through the e-procurement system irrespective of who operates the system.

2. ELIGIBLE BIDDERS:

2.1. This Bid is open to **all** Contractors of the class mentioned in the *Invitation for Bids* registered with the State Governments and Contractors of Equivalent Grade/ Class Registered with Central Government/ MES/ Railways for execution of civil works. The Bidders are required to enclose the proof of registration from the registering authority along with the Bid subject only to the registration in the portal using his/her DSC for on-line bids.

Contractors not registered with Govt. of Odisha can participate in the e-procurement after necessary enrolment in the portal but have to subsequently register themselves with the appropriate registering authority of the State Govt. before award of the work as per prevalent registration norms of the state.

2.2. All bidders *shall* provide a statement that the bidder is neither associated, nor has been associated, directly or indirectly, with the Consultant or any other entity that has prepared the design, specifications, and other documents for the Project or being proposed as Project Manager for the Contract. A firm that has been engaged by the Engineer-in-Charge to provide consulting services for the preparation or supervision of the works, and any of its affiliates shall not be eligible to bid.

2.3. If the bidder has a relative employed as an Officer in the rank of an Assistant Engineer/Under Secretary and above in the Government of Odisha in the concerned Department, he shall inform the same in **Schedule-I** of the bid document mentioning the exact details in a covering letter along with the tender, failing which his bid will not be considered. Also, if the fact of relationship subsequently comes to light, his contract will be rescinded. The bid security or the performance security will be forfeited, and he shall be liable to make good any loss or damage resulting from such cancellation. In case the bidder has no relationship with any of the officers mentioned above he shall have to furnish with his bid an undertaking to that effect.

2.4. He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any gazetted officer in the Department concerned. Any breach of this condition by the contractor would render him liable for penal action for suppression of facts.

2.5. No Engineer of gazetted rank or other gazetted officer employed in Engineering or Administrative duties in an Engineering Department of the Government of Odisha is allowed to work for contractor for a period of two years after his retirement from Government service, without prior permission of the Government of Odisha in writing. Such a contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of Odisha as aforesaid before submission of the tender for engagement in the contractor's service.

3. QUALIFICATION CRITERIA:

3.1. For submission of Bids through the E-Procurement Portal, the bidder shall upload the scanned copy/copies of documents listed under clause 3.2 in prescribed format wherever warranted in support of eligibility criteria and qualification information. **The L-1 bidder shall have to produce the original documents in support of the scanned copies and statements uploaded in the portal within 5 days of opening of price bid.** ***The Bids from Joint ventures are not acceptable.***

3.2. The bid shall include following information and documents.

(a) Copy of valid contractor's registration certificate, PAN card, GST Registration certificate & GSTIN should accompany the technical bid.

(b) Copies of original documents defining the constitution or legal status, place of registration, and principal place of business; written power of attorney of the signatory.

(c) Major construction equipment to be deployed to carry out the Contract. The contractors are required to furnish evidence of ownership of principal machineries / equipments for only those machineries / equipments asked for in the tender documents.

(d) In case if contractor executing several works, he is required to furnish a time schedule for movement of equipment/machinery from different sites to this work site when work is to be executed.

(e) The contractor shall furnish ownership documents for those machineries which he is planning to deploy for the tendered work.

(f) 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/Bid security.

(g) The contractor intending to use/lease equipments/machineries are required to furnish proof of ownership from the company/persons providing equipment/ lease deed and duration of such contract.

(h) **Copy of sub-contract agreement with eligible Registered Electrical Contractors having valid L.T. / H.T. license (Associated with the sub-contractor).**

(i) Details of work under progress as per tender documents.

(j) Details of works executed during the last five years and works in hand (list of on-going works as per bid documents).

(k) The bidder is required to furnish MOU with professional Firm or body having experience in handling Fire safety services for design, construction and commissioning High rise/ Old age home/ Buildings/ Hospitals / Apartments.

3.3. ***DELETED***

3.4. *The Bidders are subject to be disqualified if they have:*

a. Made misleading or false representations in the forms, statements and attachments submitted in proof of the qualification requirements; and/or

b. Record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures etc.; and/or

c. Participated in the previous bidding for the same work and had quoted unreasonable prices and could not furnish rational justification to the Engineer-in-Charge.

d. Indulged in unlawful & corrupt means in obtaining bids.

e. Been blacklisted/ their registrations by the competent authority.

4. ONE BID PER BIDDER:

4.1. Each bidder shall submit only one bid for one package. A bid is said to be responsive if accompanied by cost of bid document and **appropriate bid security**. The system shall consider only the last bid submitted through the E-Procurement portal.

5. COST OF BIDDING:

5.1. The bidder shall bear all costs associated with the preparation and submission of his bid, and the Engineer-in-Charge will in no case be responsible and liable for those costs.

5.2. **All the rates and prices in the bid shall cover all taxes, GST Registration certificate & GSTIN, ferry, tollage charges and royalties and any other charges except GST.**

5.3. **The rate of royalties and taxes prevailing on the date of measurement shall be considered while making deductions in the bills.**

5.4. The successful bidder shall make his own arrangement for all materials unless otherwise specified in the conditions of contract.

6. SITE VISIT:

6.1. Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders as to the nature of the ground and sub-soil (so far as practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A Bidder shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charges consequent to any misunderstanding or otherwise shall be allowed. The Bidder shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of work.

6.2. The bidder, in preparing the bid, shall rely on site Investigation Reports referred to in the Contract Data, supplemented by any information available to the bidder.

6.3. **The Officer inviting the bid / Engineer-in-Charge will clarify queries on the Contract Data on requisition by the intending Bidder. The bidder may ask questions in the e-procurement portal using his DSC; provided the questions are raised before the date mentioned in the home page under critical dates.**

B. BIDDING DOCUMENTS

7. GENERAL INSTRUCTIONS:

7.1. The description of the work is as mentioned under Invitation for Bid.

7.2. The bids uploaded by the Tender Inviting Officer may consist of general arrangements, drawings or typical sections of the project. Bidder may download these drawings and take out the print for detail study. Any other drawings and documents pertaining to the works available with the officer inviting the Bid as well as in the office of the Executive Engineer as mentioned in the contract data will be open for inspection during working hours on all working days by the bidders. The bidder is required to download all the documents including the drawings for preparation of his bid. It is not necessary on the part of the Bidder to up-load the drawings other Bid documents (after signing) while up-loading his bid. He is required to upload documents related to his qualification information and Bill of Quantities duly filled in. It is assumed that while participating in the bid, the bidder has referred to all the drawings and documents uploaded by the Officer Inviting the Bids. Seeking any revision of rates or backing out of the bid claiming for not having referred to any or all documents provided in the Bid document by the Officer Inviting the Bids will be construed as plea to disrupt the bidding process and in such cases the bid security shall be forfeited.

7.3. The bidder is expected to examine carefully all instructions, conditions of contract, contract data, forms, terms, and technical specifications, bill of quantities, forms, Annexes and drawings in the Bid Document. Failure to comply with the requirements of Bid Documents shall be at the bidder's own risk.

8. CLARIFICATION OF BIDDING DOCUMENTS:

8.1. Bid documents consisting of drawings, plans, specifications, the schedule of quantities of the various items of work to be done and the set of terms & conditions of contract to be complied with by the contractor who intends to bid and other necessary Documents can be seen in the office of the officer inviting the Bid during office hours every day except on Sundays & Public Holidays till last date of sale of tender paper.

8.2. **No paper** copy **of** the **bid shall be sold.**

8.3. The Contract Data to bid shall be filled and completed in the office of Officer inviting bid before issue of bid documents. If the documents are issued to the intending bidder without having been so filled in & completed, he shall request the officer inviting the bid to have this done before he completes and delivers his bid.

8.4. **The bidder can** seek **clarification on the bids** which he received earlier than 15 days prior to the deadline for submission of bids. The Employer's response will be forwarded through the e-mail ID of the enquirer.

8.5. PRE-BID MEETING: There will be pre-bid meeting for this work. The date and venue of the same are mentioned in this document.

9. AMENDMENT OF BIDDING DOCUMENTS:

9.1. Before **the** deadline for submission of bids, the officer inviting the Bid may modify the bidding documents by issuing addenda.

9.2. **Any addendum thus issued shall be part of the bidding documents and shall be notified in the website www.tendersOdisha.gov.in / notice board and through paper publication.**

9.3. To give **prospective** bidders reasonable time in which to take an addendum into account in preparing their bids, the Officer inviting the Bid(General Manager OSAM Board), at his/her discretion, extend as necessary the deadline for submission of bids.

C. PREPARATION OF BIDS

10. LANGUAGE OF THE BID:

10.1. All documents relating to the Bid shall be in the English / Odia language. Bids submitted in any other language shall be summarily rejected.

11. DOCUMENTS COMPRISING THE BID:

11.1. Following documents will be deemed to be part of the bid even if not submitted with the bid.

(i) Invitation for Bids (IFB)

(ii) Instructions to bidders (ITB)

(iii) Conditions of Contract

(iv) Contract Data

(v) Specifications

(vi) Drawings

11.2. All the volumes/documents shall be provided in the portal by the Officer inviting the bid. The bidder shall carefully go through the document and prepare the required documents and upload the scanned documents in Portable Document Format to the portal in the designated locations of Technical Bid. He will fill up the percentage rate in the BOQ downloaded for the work in designated Cell and upload the same in designated locations of Financial Bid. Submission of documents shall be effected by using DSC of appropriate class.

A. **Cost** of **"Bid document"** shall be remitted online using e-procurement Gateway and Bid Security/Earnest Money Deposit in form of Bank Guarantee shall be deposited.

B. **"Technical Bid"** shall comprise.

(i) Declaration under the Official Secret Act, 1923

(ii) Qualification Information and supporting documents,

(iii) Certificates, undertakings, affidavits,

(iv) Bid Security/Earnest Money Deposit.(In form of Bank Guarantee)

C. **"Financial Bid "**shall comprise.

(i) Priced Bill of Quantities

12. PROPOSAL BY THE BIDDER:

12.1. **In the E-Procurement Portal,** an intelligent Bill of Quantity in Microsoft Excel format shall be made available to the bidder.

12.2. For **Item rate** tenders, the bidder shall fill in rates in figures and should not leave any cell blank. The line-item total in words and the total amount shall be calculated by the system and shall be visible to the bidder.

12.3. In case of **percentage rate** tender, the bidder will only fill in the designated cell and activate "less" or "excess" to indicate how much his price offer is excess or less **(Up to two decimal Place)** than the estimated amount.

12.4. The **bidder** shall bid for the whole works as described in the Bill of Quantities.

12.5. Bidders shall submit offers that fully comply with the requirements of the bidding documents, including the Conditions of Contract basic technical design as indicated in the drawing and specification. **Conditional offer or alternative offers will not be considered** in the process of bid evaluation.

12.6. **All duties, taxes, excluding GST including Building and other Construction Workers Welfare Cess @ 1% payable by the contractor under the contract, or for any other cause shall be included in the rates and prices submitted by the bidder. Taxes on material in respect of this contract shall be payable by the Contractor and OSAMB/Government will not entertain any claim whatsoever in respect of the same except GST payable for works contract.**

12.7. In the case of any bid where unit rate of any item/items appears unrealistic, such bid will be considered as unbalanced and if the bidder is unable to provide satisfactory explanation such a tender is liable to be disqualified and rejected.

12.8. Bidders while quoting their offers shall consider the following as regards price adjustment towards **Cement, Steel** & **Bitumen** and escalation of **all components** of work **as per Sub-Clause 31 of Condition of P-1 Contract.**

12.9. **Deleted.**

12.10. **Deleted.**

12.11. **Deleted.**

12.12. **Deleted**

12.13. The contractor shall be deemed to have satisfied himself as to the correctness and sufficiency of the Tender and of the rates and prices stated in the Bill of Quantities, all of which shall, except in so far as it is otherwise provided in the Contract, cover all his obligations under the Contract (including those in respect of the supply of goods, materials, plant & services or of contingencies for which there is a **Provisional** Sum) and all matters and things necessary for the proper execution and completion of the work and the remedying of any defects therein.

12.14. The **contractor shall** conform in all respects, by giving all notices and paying all fees, with the provisions of:

i) Any national or State Statue, Ordinance, other Law, or any regulation, or bye-law of any local or other duly constituted authority in relation to the execution and completion of the works and remedying of any defects therein, and

ii) The rules and regulations of all public bodies and companies whose property rights

are affected or may be affected in any way by the works.

12.15. **DELETED.**

CURRENCIES OF BID AND PAYMENT:

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

13. VALIDITY:

13.1. Bids shall remain valid for a period not less than **90 days** or the period mentioned in the Contract Data, after the deadline date for submission of bid as specified in the notice inviting the Bids. A Bid valid for a shorter period shall be rejected by the Engineer-in-charge as non-responsive.

13.2. **In exceptional circumstances, prior to expiry of the original time limit, the Officer inviting the Bid may request the bidders to extend the period of validity for a specified additional period. The request and the bidders' responses shall be made in writing or by cable or by e-mail.**

13.3. **DELETED.**

14. BID SECURITY:

14.1. The Bidder shall remit a bid security for the amount mentioned under Contract Data.

The successful lowest bidder will produce the original of all scanned documents for verification within 5 days of opening of the tender (Price Bid). In the eventuality of failure on the part of the lowest successful bidder to produce the original documents, he will be debarred in future from participating in tender for three years and will be blacklisted by the competent authority. In such a situation, successful L-2 bidder will be required to produce his original documents for consideration of his/her tender at the negotiated rate equal to L-1 bidder.

14.1.1. **DELETED**

14.1.2. **DELETED.**

14.1.3. **DELETED**

14.2. The Bid shall be declared non-responsive and shall be rejected if submitted without an acceptable Bid Security and not secured as indicated in Sub-Clauses 15.1.

14.3. Combined bid security for more than one work is not acceptable.

14.4. In the case of Government Undertakings, Co-operatives Societies, Diploma or Degree holders in Engineering who are registered with the Government of Odisha, the rules framed by government from time to time about Cost of Bid documents, Bid security, performance security will apply.

14.5. The bid Security of unsuccessful bidders will be returned within 28 days of the end of the validity period specified in Sub-Clause 13.1.

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

14.7. The Bid Security may be forfeited

14.7.1. If the bidder withdraws the bid after opening of the bid but within the period of validity.

14.7.2. If the Bidder seeks any revision of rates or backs out of the bid claiming for not having referred to any or all documents provided in the Bid by the Officer Inviting the Bids.

14.7.3. **DELETED.**

14.7.4. The bid will be cancelled, if the bidder fails within the specified time limit to

14.7.4.1. Sign the Agreement; or

14.7.4.2. Furnish the required Performance Security including additional performance security if any.

15. FORMAT AND SIGNING OF BID:

15.1. The bidder can download the tender of his choice and save it in his system and undertake the necessary preparatory work off-line and upload the completed tender at his convenience within the final date and time of submission. The bidder shall only submit single copy of the required documents and Price Bid in the portal. In the Financial bid, the bidder cannot leave any figure blank. He has to only write the figures; the words will be self-generated. The Bidders are advised to upload the completed Bid document well ahead of the last date & time of receipt to avoid any last moment problem of power failures etc.

15.2. The Bidder shall go through the Bid carefully and list the documents that are asked for submission. He shall prepare all documents including cost of Bid Document, Bid Security, Declaration form, price bid etc. and store it in the system.

15.3. The bidder shall log on to the portal with his DSC and move to the desired tender for up-loading the documents in appropriate place one by one simultaneously checking the documents. Once the Bidder makes sure that all the documents have been uploaded in appropriate place, he clicks the submit button to submit the bid to the portal.

15.3.1. Tender cannot be pre-opened and cannot be submitted after due date and time. Therefore, only after satisfying that all the documents have been uploaded, the Bidder should activate submit button.

15.3.2. In the e-procurement process, each process is time stamped. The system can identify each individual who has entered into the portal for any bid and the time of entering into the portal.

15.3.3. The Bidder should ensure clarity of the document up-loaded by him to the portal, especially the scanned documents by taking out sample printing. Non-submission of legible documents may render the bid non-responsive. However, the Officer inviting the Bids if so desires, **can ask for legible copies for clarification within a stipulated period of 7 days**, provided such document in no way alters the Bidder's price bid. **If the Bidder fails to submit Such documents within the stipulated date, his bid shall be evaluated on it's own merit**.

D. SUBMISSION OF BIDS

16. SECURITY OF BID SUBMISSION:

16.1. All bid data uploaded by the Bidder to the portal will be encrypted by the DSC of the opener(s). The system shall require all the mandatory forms and fields filled up by the contractor during the process of submission of the bid/tender.

16.2. The Bid shall be received in encrypted format by the system which can only be decrypted / opened by the authorized openers only on or after the due date and time.

17. DEADLINE FOR SUBMISSION OF THE BIDS:

17.1. The online bidding will remain active till the last date and time of the bid submission. Once the date and time (Server date and time) is over, the bidder will not be able to submit the bid. The date & time of bid submission shall remain unaltered even if the specified date for the submission of bids declared a holiday for the Officer inviting the Bid.

17.2. The officer inviting the bid may extend the deadline for submission of bids by issuing an amendment in accordance with Sub-Clause 9.3, in which case all rights and obligations of the officer inviting the bid & Engineer-in-Charge and the bidders previously subject to the original deadline will then be subject to the new deadline.

18. LATE BIDS:

18.1. The system shall reject submission of any bid through portal after closure of the receipt time. For all purposes the server time displayed in the e-procurement portal shall be the time to be followed by the bidder and concerned officers.

19. MODIFICATION AND WITHDRAWAL OF BIDS:

19.1. In the E-Procurement Portal, it is allowed to modify the bid any number of times before the final date and time of submission. The bidder shall have to log on to the system and resubmit the documents as asked for by the system including the price bid. In doing so, the

bids already submitted by the bidder will be removed automatically from the system and the latest bid only will be admitted. But the bidder should avoid modification of bid at the last moment to avoid system failure or malfunction of internet or traffic jam or power failure. If the bidder fails to submit his modified bids within the designated time of receipt, the bid already in the system shall be taken for evaluation.

19.2. In the E-Procurement Portal, withdrawal of bid is allowed. But in such case he has to write a letter with appropriate reasons for his withdrawal addressed to the Officer inviting the bid and upload the scanned document to portal in the respective bid before the closure of receipt of the bid. The system shall not allow any withdrawal after expiry of the closure time of the bid.

E. OPENING AND EVALUATION

20. OPENING OF THE BID:

20.1. Bid opening dates are specified during tender creation or can be extended vide corrigendum. These dates are available in IFB, tender document as well as the home page of portal. Bid opening can be done by the authorized users which are defined during the tender publication / approval stage. The bids are encrypted using their public keys and can be decrypted only on or after the Bid Opening due date. The bid openers private key will be required to open the bids, and all the openers have to log on to the portal during that time.

20.1.1. The bidders who participated in the online bidding can witness opening of the bid from any system logging on to the portal with the DSC away from opening place. Contractors are not required to be present during the bid opening at the opening location if they so desire.

20.1.2. Each activity is date and time stamped with **user** details. For time stamping, server time is taken as the reference.

20.2. In the event of the specified date of bid opening being declared a holiday for the Officer inviting the Bid/Engineer-in-Charge, the bids will be opened at the appointed time on the **next working day.**

20.3. In case bids are invited for more than one package, the order for opening of the “Bid” shall be that in which they appear in the “Invitation for Bid”.

20.4. The Bid openers; who have been pre-defined shall log on to the portal with their respective DSC. Unless all the Officers who have been declared as Opening officers log on the portal with their DSC the Tender cannot be opened.

20.4.1. **After receiving confirmation of the bid security**, the bidder will be asked in writing to clarify his technical bid, if necessary.

20.4.2. The bidders will respond in **not more than 7 days** of issue of the clarification letter, which will also indicate the date, time and venue of opening of the Financial Bid.

20.4.3. Immediately on receipt of these clarifications, the Evaluating Officers; predefined in the system for the bid, will finalize the list of responsive bidders. They will log on to the site with their DSC and record their comments on the Technical evaluation page in the system. The Officer Inviting the Bid, if also the accepting authority, shall log on to the system with his digital signature and check the technical evaluation. He can either accept or pass on to the evaluating officers for re-evaluation. Upon acceptance of technical evaluation by the Accepting authority in the system, the system shall automatically generate letter to all the responsive bidders and the system shall forward the letter to all the responsive bidder that their technical bid has been evaluated responsive with respect to the data/information furnished by him and the letter shall also intimate him the date & time of opening of financial bid. The system shall also inform the non-responsive bidders in their email ID that their bid has been found non-responsive.

20.5. The Technical evaluation of all the bids will be taken up as per the information furnished by the Bidders. **If any of the information/ statements/documents/certificates furnished by the bidder is found to be false/fabricated/bogus, his EMD/Bid Security shall stand forfeited and his registration in the portal shall be blocked and the bidder is liable to**

be blacklisted.

20.6. After **technical** evaluation of the bidders and selection of the qualified bidders, the financial bids of the technically qualified bidders shall be opened on the due date of opening. Members of the bid opening committee log on to the system in sequence and open the financial bids for the technically qualified bidders. The opening of financial bid by the opening officer using their DSC shall decrypt the financial bids.

20.6.1. Opening of price bid and evaluation of lowest bidder is subject to satisfaction of other qualification information asked for in the bid pursuant to Clause-3.

20.6.2. The Officer inviting Bid shall ensure that all the Bidders are individually intimated about the date, time & venue of opening of the financial bid along with the responsiveness of the Technical Bid.

20.6.3. The Financial Bid will be opened on the notified date & time in the presence of bidders or their authorized representative who wish to be present.

20.6.4. At the time of opening of "Financial Bid", the names of the bidders whose bids were found responsive in accordance with Sub-Clause 24.1 will be announced. The bids of only those bidders will be opened. The remaining bids will be rejected.

20.6.5. The responsive bidders' names, the bid prices, the item wise rates the total amount of each item, any discounts and withdrawals, and such other details as the officer inviting the tender may consider appropriate, will be announced by him or his authorized representatives at the opening.

20.6.6. Special conditions and/or rebate/discount offer if any uploaded to the system shall be declared and recorded first.

20.6.7. The Financial bid of the bidders shall be opened one by one by the designated officers. **The system shall auto-generate the Comparative statement**.

20.6.8. The Bidder can witness the principal activities and view the documents/summary reports for that particular work by logging on to the portal with his DSC from anywhere.

21. PROCESS TO BE CONFIDENTIAL:

21.1. Information relating to the examination, clarification, evaluation, and comparison of bids and recommendations for the award of a contract shall not be disclosed to bidders or any other persons not officially concerned with such process until the award to the successful bidder has been announced. Any effort by a bidder to influence the officer inviting the bid, processing of bids or award decisions may result in the rejection of his bid.

22. CLARIFICATION OF BIDS:

22.1. To assist in the examination, evaluation, and comparison of bids, the officer inviting the bid may, at his discretion, ask any bidder for clarification of his rates including breakdowns of unit rates. The request for clarification and the response shall be in writing or by cable or by e-mail, but no change in the bid price or substance of the bid shall be sought, offered.

22.2. Subject to sub-clause 23.1, no bidder shall contact the officer inviting the bid on any matter relating to his bid from the time of the opening to the time the contract is awarded. If the bidder wishes to bring additional information to the notice of the officer inviting the bid, it should do so in writing.

23. EXAMINATION OF BIDS AND DETERMINATION OF RESPONSIVENESS:

23.1. During the detailed evaluation of "Technical Bids", the officer inviting the bid will determine whether each bid: -

23.1.1. Whether the Bid security is confirmed by issuing institution/bank.

23.1.2. Has submitted legible documents for evaluation

23.1.3. Meets the eligibility criteria defined in *Clause 3* and;

23.1.4. Is substantially responsive to the requirements of the bidding documents.

23.2. During the detailed evaluation of the "Financial Bid", the responsiveness of the bids will be

further determined with respect to the remaining bid conditions, i.e., priced bill of quantities, technical specifications and drawings.

23.3. A substantially responsive "Financial Bids" is one, which conforms to all the terms, conditions, and specifications of the bidding documents, without material deviation or reservation. A material deviation or reservation is one

23.3.1. Which affects in any substantial way the scope, quality, or performance of the works?

23.3.2. Which limits in any substantial way, inconsistent with the bidding documents, the right of the officer inviting the bid or the bidder's obligations under the contract or

23.3.3. Whose rectification would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

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

23.5. On opening of the price bid the system shall arrange the financial bids in order of their value (L1 first, followed by L2, L3 ….) for subsequent evaluation. The evaluation status (Sheet) will be visible to all the participating bidders after opening on their respective logins. Each activity is recorded in the system with date and time stamping.

24. EVALUATION OF BIDS: DELETED

24.1. If the officer **inviting** the Bid in his opinion judges that the price quoted by the lowest qualified bidder is high or a special condition imposed by the bidder is to be withdrawn, the bidder shall be invited for negotiation by the officer inviting the Bid or by an officer authorised by him in writing. **Negotiations** of financial bid with **only the lowest bidder** shall be carried out, if necessary. Negotiation of bid will be carried out in a manual way.

24.2. **DELETED.**

24.3. **DELETED**

24.4. **DELETED.**

24.5. **DELETED.**

F. AWARD OF CONTRACT

25. AWARD CRITERIA:

25.1. The officer inviting the bid will award the contract to the bidder whose bid has been determined to be substantially responsive to the bidding documents and who has offered the lowest evaluated price.

25.2. On acceptance of the tender, the Contractor shall name in writing his accredited representative(s) who would be responsible for taking instructions from the Engineer-in-Charge.

25.3. Competent Authority, on behalf of Governor of Odisha reserves to himself the right to accept the whole or any part of the bid and the bidder shall be bound to perform the same at the rate quoted.

25.4. The successful bidder registered under other State Government / MES / Railways / CPWD in equivalent rank must register under state PWD before signing the agreement.

26. OPTIONS IF THE BIDDER BACKS OUT FROM BIDDING PROCESS:

26.1. In case the 1st lowest Bidder or even the next lowest Bidder withdraw in series one by one, thereby facilitating a particular Bidder for award, then they shall be penalized with adequate disincentives with forfeiture of EMD/Bid Security unless adequate justification for such back out is furnished. Appropriate action for blacklisting the bidder shall also be taken apart from dis-incentivising the bidder.

26.2. The bidding process shall be deemed to be complete till the date of issue of letter of acceptance. If the bidder fails to sign the agreement within the stipulated period mentioned under clause 29.2, his bid security shall be forfeited.

27. RIGHT TO ACCEPT OR REJECT ANY OR ALL BIDS:

27.1. The competent authority on behalf of the Governor of Odisha does not bind him to accept the lowest or any other tender and reserves the authority to reject any or all the tenders received without assigning any reason.

27.2. All bids in which any of the prescribed conditions are not fulfilled or any condition including that of conditional rebate is put forth by the bidder shall be summarily rejected.

28. NOTIFICATION OF AWARD AND SIGNING OF AGREEMENT:

28.1. In the E-Procurement Portal, the system shall generate the template of award letter, and the Officer Inviting the Bid shall mention the amount of Performance Security and additional security required to be furnished in the letter and intimate the bidders in his e-mail ID. The issue of the letter of acceptance shall be treated as closure of the Bid process and commencement of the contract.

28.2. The bidder shall within 15 days of issue of letter of acceptance, furnish the Performance security & additional Performance security (if any) in the prescribed form & the work program & shall sign the agreement in prescribed format, failing which the Engineer-in-Charge shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the Bid Security absolutely**.** The agreement will incorporate all agreements between the officer inviting the bid and the successful bidder.

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 blacklisted, it will be widely published and intimated to all departments of Government and also to Govt. of India agencies working in the state.

(Amendment to Para-3.5.14 Note-I of OPWD Code Vol.-I by inclusion).

28.2.1. Following documents shall form part of the agreement.

28.2.1.1. The notice inviting bid, all the documents including additional conditions, specifications and drawings, if any, forming the bid as issued at the time of invitation of bid and acceptance thereof together with any correspondence & documents leading thereto & required amount of performance security including additional performance security as per sub clause 29.2 hereof.

28.2.1.2. Standard Bid Document P.W.D. Form **P-1**

28.3. The letter to proceed with the work shall be issued by Engineer-in-charge only after signing of the agreement. The notification of award will constitute the formation of the contract subject only to the furnishing of performance security and additional performance security in accordance with the provisions of the agreement.

28.4. On acceptance of the composite bids by the competent authority the letter of award will be issued by the General Manager of OSAM Board.

28.5. Upon signing the agreement by the successful bidder, the General Manager, OSAM Board will promptly notify the other bidders that their bids have been unsuccessful.

29. CORRUPT OR FRAUDULENT PRACTICES:

29.1. The Engineer-in-Charge will reject a proposal for award if he determines that the bidder recommended for award has been engaged in corrupt or fraudulent practices in competing for the contract in question. He will report to the Officer Inviting Bid / next higher authority.

29.2. Canvassing whether directly or indirectly, in connection with tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable for rejection.

DETAILED TENDER CALL NOTICE

1. **Percentage rate** bids are invited **online in double cover system** from the Class of eligible contractors registered with the State Government and contractors of equivalent Grade / class registered with Central Government / MES / Railways having registration for Civil, Electrical and P.H. works for execution of Civil / E.I. / P.H. works on production of definite proof from the appropriate authority in prescribed firm to be eventually drawn in P.W.D. FORM P-1 for the work **"** Construction of 12 Nos. 5000MT Godowns (Tora, Sarsara, Katapalli, Govindpur, Adagaon, Jhilimunda, Attabira, Paharsrigida, Lahanda, Laramba, Tamparsara & Bheden) and 6 Nos 2500MT Godowns (Sankrida, Remunda, Rusuda, Sialkhandahatha, Barpali & Narayan) with ancillary works at BARAGODA**"** at an estimated cost of **₹.80,78,19,044/-** (Rupees Eighty crore seventy eight lakh nineteen thousand forty four) only. Contractors not registered with Govt. of Odisha can participate in the e-procurement after necessary enrolment in the portal but have to subsequently register themselves with the appropriate registering authority of the state Govt. before award of the work as per prevalent registration norms of the state.

a) This tender is of composite nature and consists of Civil works, Electrical and PH works.

b) This detailed Tender Call Notice along with the clauses mentioned herein shall form a part of the contract and agreement.

2. The Bid documents are available on official website of Government: *https://www.tendersodisha.gov.in* from Dt. 06.10.2026 to 17:00 Hours of Dt. 19.11.2026. The last date and time of submission of Bid is as per contract data.+

3. Pre-Bid meeting will be held on 23.10.2026 at 12.00 PM at Conference Hall, OSAM Board

4. The Technical Bid documents **(Cover–I)** will be opened by the assigned officer in the office of the OSAM Board, Odisha, Bhubaneswar at **11.30 AM on Dt.20.11.2026** in the presence of the bidders or their authorized representatives who wish to attend. After evaluation of the documents contained in Cover-I, the Cover-II containing price bid/s of the technically responsive bidder/s will be opened. The date, time and place of opening the price bid will be intimated to the eligible qualified bidders through system generated E-mails.

5. The cost of Bid documents is to be remitted online through e-payment gateway for **₹.10,000/-** towards the paper cost of each bid respectively.

6. The bid is to be submitted in two covers.

i) **Cover-I** is to contain scanned copy of Contractor Registration Certificate, GST Registration Certificate, GSTIN, PAN, Profit Loss statement, M.O.U. (Memorandum of Understanding duly notarized) with eligible registered electrical contractor having valid H.T. / L.T. license, List of similar nature of works, work in hand, list of machineries, affidavit, and all other documents required as per the relevant clauses of this DTCN. The contractor belonging to outside state of Odisha and not started business should submit an undertaking in the form of an Affidavit indicating therein that they are not registered under Odisha GSTIN as they have not started any business in the state and they have no liability under the Act. But before award of final contract, such bidders will have to produce the Odisha GSTIN. This cover shall contain Bid Security/Earnest Money Deposit in the form of Bank Guarantee.

ii) **Cover-II** is to contain the **PRICE BID** duly filled in and signed by the bidder as per the relevant clauses of this DTCN.

7. Furnishing scanned legible copy of Original Contractor Registration certificate, valid GSTIN, PAN card along with the Technical Bid is mandatory otherwise his/her bid

shall be declared as non-responsive and thus liable for rejection.

8. **(i)** The Contractors are required to furnish scanned copy of evidence of ownership showing the possession of principal machineries/ equipments as per Annexure-I in Schedule-C for which contractor shall have to secure minimum 80% of marks failing which the tender shall be liable for rejection.

(ii) 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 / Bid Security. The entire bid security including the additional bid security shall stand forfeited in case the contractor fails to mobilize the machineries within a period as to be able to execute an item of work as per original programme which will be part of the agreement.

(iii) The contractor intending to hire/lease equipments/machineries are required to furnish proof of ownership from the company/ person providing equipments/ machineries on hire/lease along with contracts/ agreements/lease deed and duration of such contract. The contracts/agreements/lease deed should be on long term basis for a minimum period of 27 (Twenty-seven) months as mentioned in contract data from the last date of receipt of Bid documents.

9. A) The Civil contractor in order to take part in the composite tender should enter into an M.O.U (Memorandum of Understanding duly notarized) with eligible registered electrical contractor having valid H.T. / L.T. license; for execution of electrical installation and other electrical works and a copy of such M.O.U. should be attached with the tender as per the proforma at Schedule- J which shall form a part of tender. A copy of electrical license should also be enclosed with the tender papers, the original of which need to be furnished during verification. The above M.O.U. is not required in case of the civil contractor having valid registration in H.T. / L.T. electrical license with the same name & style.

10. (i) The contract will be drawn in P.W.D. **P-1** contract form and will constitute 3 parts as follows.

a. Part – I : For Civil items of works

b. Part – II : For Electrical items of works

The contract shall be drawn & signed by E.E., OSAMB on behalf of the General Manager, Odisha State Agricultural Marketing Board, Bhubaneswar.

(ii) The Civil items of works as per Part-I of Schedule of quantities, Electrical items of works (both internal & external) as per part-II of Schedules of quantities shall be supervised, measured and check measured by the E.E, Odisha State Agricultural Marketing Board, Bhubaneswar.

The contractor shall be bound to receive and act as well according to the direction of the Engineer-in-Charge.

11. If an individual makes the application, the individual should sign (with DSC) above his full type written name and current address.

12. If the application is made by proprietary firm, it shall be signed (with DSC) by the proprietor & furnish full type written name and the full name of his firm with its current address in a forwarding letter.

13. If the application is made by a firm in partnership, it shall be signed (with DSC) by a partner holding power of attorney for the firm in which case a certified copy of the power of attorney shall accompany the application. A certified copy of the partnership deed and current address of all partners of the firm shall also accompany the application.

14. If the application is made by a limited company or a corporation, it shall be signed (with DSC) by a duly authorized person holding power of attorney for signing the application in which case a certified copy of the power of attorney shall accompany the application. Such limited company or corporation will be required to furnish satisfactory evidence of its existence along with the technical bid.

15. The tender should be strictly in accordance with the provisions mentioned in the tender schedule. Any change in the wordings will not be accepted.

16. The work is to be completed in all respects within eighteen **(18)** calendar months from the date of issue of work order. Before acceptance of tender, the successful bidder will be required to submit a work program 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

(Amendment to Para-3.5.18 Note-VIII of OPWD Code Vol.-I).

17. All tenders received will remain valid for a period of **90 days** from the last date prescribed for receipt of tenders and validity of tenders can also be extended if agreed by the tenderers and the Department.

18. The tenderer shall carefully study the tentative drawings and specifications applicable to the contract and all the documents which will form a part of the agreement to be entered in to, by the accepted tenderer and detailed specifications for Odisha, and other relevant specifications and drawings, which are available. Complaint at a future date that the tenderers have not seen plans and specifications cannot be entertained.

19. The drawings furnished with the tender are tentative and subject to revision or modification as tendered during the execution as per actual necessity and detail test conducted. But the tendered rates quoted by the tenderer will hold good in case of such modification of drawings during the time of execution and shall in no way invalidate the contract and no extra monetary compensation will be entertained. The work shall however be executed as per final approved drawing to be issued by the Engineer-in-Charge as and when required.

20. By admission of a tender for the work, a tenderer will be deemed to have satisfied himself by actual inspection of the site and locality of the work, about the quality and availability of the required quantity of material including the wheat/ rice referred to above, medical aid, labour and food stuff etc., and that rates quoted by him in the tender will be adequate to complete the work according to the specifications attached there to and that he had taken in to account all conditions and difficulties that may be encountered during its progress and to have quoted rates including labour and materials with taxes except GST, octroi, other duties, lead, lifts, loading and unloading, freight for all materials and all other charges necessary for the completion of the work, to the entire satisfaction of the Engineer-in Charge of the work and his authorized subordinates. After acceptance of the contract rate. Government will not pay any extra charges for any reason in case the contractor claims later on to have misjudged as regard availability of materials, labour and other factors.

Engineers in charge would be responsible for ensuring the quality of the materials supplied. The contractors would, however, be responsible for procurement of material from authorized 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.

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

21. The bidders shall remit the EMD/ Bid Security amount @ 1% (One percent) of the estimated cost put to tender of **₹.80,78,190/-** only through **Bank Guarantee** as part of the bid. Bidders desirous to hire machineries or equipments from outside the state or owned but deployed outside the state are required to **remit offline** additional one percent (1%) EMD / Bid Security.

22. The tender should be accompanied with the *Scanned copies of the valid Contractor Registration certificate, GST Registration Certificate*, *GSTIN and PAN card* which are mandatory, otherwise his/her bid shall be declared non-responsive and thus liable for rejection. The contractor belonging to outside state of Odisha and not started

business should submit an undertaking in the form of an Affidavit indicating therein that they are not registered under Odisha GSTIN as they have not started any business in the state and they have no liability under the Act. But before award of final contract, such bidders will have to produce the Odisha GSTIN.

23. The tender containing extraneous conditions not covered by the tender notice are liable for rejection and quotations should be strictly in accordance with the items mentioned in the Tender Call Notices. Any change in the wording will not be accepted.

24. The department reserves the right of authority to reject any or all tenders received without assigning any reason whatsoever.

25. The earnest money of the L-1 bidder will be retained and will be dealt with as per terms and condition of O.P.W.D. Code. The retention of E.M.D. with the Department will carry no interest.

26. The General Manager, OSAM Board will notify the bidder/ tenderer whose bid has been accepted of the award prior to expiration of the validity period by cable, telex or facsimile confirmed by registered letter. This letter (hereinafter and in the conditions of Contract called the "Letter of Acceptance") will state the sum that the Engineer-in-charge will pay the contractor in consideration of the execution, completion and maintenance of the Works by the contractor as prescribed by the contract (Hereinafter and in the contract called the "Contract Price").

The Notification of award will constitute the formation of the contract, subject only to the furnishing of a performance security (Initial Security Deposit) in the form of BG amounting to 1% of the tendered amount from the Schedule Banks as per the Format attached and in no other form (excluding 1% deposited towards hiring of equipments/ machineries from outside the state if any) and sign the agreement in the office of the **General Manager, Odisha State Agricultural Marketing Board, Bhubaneswar** and payable at **Bhubaneswar** or as directed. The security deposit and the amount withheld according to the provision of P-1 agreement shall be retained as security for the due fulfillment of this contract and additional performance security in accordance with the provisions of the agreement.

The agreement will incorporate all agreements between the officer inviting the bid/ Engineer-in Charge and the successful bidder within 15 days following the notification of award along with the Letter of Acceptance. The successful bidder will sign the agreement and deliver it to the Engineer-in Charge. Following documents shall form part of the agreement.

a) The notice-inviting bid, all the documents including additional conditions, specifications and drawings, if any, forming the bid as issued at the time of invitation of bid and acceptance
thereof together with any correspondence leading thereto & required amount of performance security including additional performance security.

b) Standard **P.W.D. Form P-1 with latest amendments.** Failure to enter into the required agreement and to make the security deposit as above shall entail forfeiture of the Bid Security (earnest money). No contract (tender) shall be finally accepted until the required amount of initial security money is deposited. The security will be refunded after **12 (Twelve) months** of completion of the work and payment of the final bill and will not carry any interest. As concurred by Law Department & Finance Department In their U.O.R. No 848, dt.21.05.97 J.O.R.No.202 W.F.D. dtd.06.03.98 respectively the E.M.D. will be forfeited in case, where tenderers back out from the offer before acceptance of tender by the competent authority.

27. The contractor should be liable to fully indemnify the Department for payment of compensation under workmen compensation act. VIII of 1923 on account of the workmen employed by the contractor and full amount of compensation paid will be recovered from the contractor.

28. Tenderers are required to liable by fair wages clause as introduced by Govt. of Odisha, Works Department letter No.VII (R&B) 5225, dt.26.2.55 and No.II, M-56/61-

28842 (5), dt.27.9.61.

29. The contractor shall bear cost of various incidentals, sundries and contingencies necessitated by work in full within the following or similar category.

a) Rent, royalties, cess and other charges of materials and all other taxes except GST from time to time, Ferry tolls, conveyance charges and other cost on account of land buildings including temporary building required by the tenderer for collection of materials, storage, housing of staff or other purpose of the work are to be borne by the contractor at his own cost. No rent will be payable to Govt. for temporary occupation of land owned by govt. at the site of the work for bonafide use of the land for work and all such construction of temporary nature by the contractor shall be done after obtaining written permission from the Engineer-in-Charge of the work and all such construction shall have to be demolished and debris removed and ground made good and cleared after completion of the work at no extra cost.

b) Royalty will be recovered from each bill as notified by Govt. from time to time unless K Forms are enclosed. Refund of royalty at later date after passing of the bills cannot be entertained as the recovery of royalty is being credited to revenue.

c) Labour camps or huts necessary to a suitable scale including conservancy and sanitary arrangements therein to the satisfaction of the local labour laws and health authorities shall have to be provided by the Contractor.

d) Arrangement of suitable water supply including pipe water supply where available for the staff and labour as well as for the execution of the work is sole responsibility of the Contractor and no extra cost for carriage of water will be entertained. e) All fees and dues levied by Municipal, Canal or Water Supply Authorities are to be borne by the Contractor.

f) Suitable safety equipments and dresses, gloves, life belts etc. for the labour engaged in risky operations are to be supplied by the contractor at his own cost.

g) Suitable fencing barriers, signals including paraffin and electric signals where necessary at work and approaches in order in project the public and employees from accident has to be provided by the Contractor at his own cost.

h) Compensation including cost of any legal suit for injury to persons or property arising out of execution of the work and also any sum, which may become payable due to operation of the workmen compensation act, shall have to be borne by the contractor.

i) The contractor has to arrange adequate lighting arrangements for the work wherever necessary at his own cost.

30. No payment will be made for layout, benchmark, level pillars, profiles and benching and **levelling the ground required**, which has to be carried out by the contractor at his own cost. The rates to be quoted should be for finished items of work inclusive of carriage of all materials and all incidental items of work.

31. After the work is finished all surplus materials should be removed from the site of work, preliminary work such as vats, mixing platforms, etc. should be dismantled and all materials removed from the site and premises left neat and his should be inclusive in the rates. No extra payment will be made to the Contractor in this account.

32. **It should be understood clearly that no claim what-so-ever will be entertained to extra items of works quantity of any item besides estimate amount unless written order is obtained from the competent authority and rate settled before the extra items of work or extra quantity of any items of work is taken up.**

33. The tenderers shall have to abide by the C.P.W.D. safety code rules introduced by the Govt.of India, Ministry of Works and Housing & Supply in their standing order No.44150, dt.25.11.57.

34. No part of the contract shall be sublet without written permission of the employer or transfer to be made by the power of attorney authorizing others to receive payment on

contractor's behalf.

35. DELETED

36. No Relation certificate.

The contractor shall furnish a certificate along with the tender to the effect that he is not related to any officer in the rank of an Assistant Engineer & above in the state P.W.D. and OSAM Board or Assistant/Under Secretary & above in the Works Department and OSAM Board. If the fact subsequently proved to be false, the contract is liable to be rescinded. The earnest money & the total security will be forfeited & he shall be liable to make good to damages the loss or damages resulting for such cancellations. The proforma for no relationship certificate is contained in a separate sheet vide **Schedule-A**.

37. Price Adjustment in works contract :

Price Adjustment clauses due to increase or decrease in rate and price of labour, materials, fuels & lubricants and Plant & machineries spare component in accordance with the following principles and procedures as per formula Vide Works Department Memorandum No-15847 /W dt.19.11.2019, as subsequently amended by Works Department O.M. No.8189/W dt.07.06.2021 (giving retrospective effect to this Price Adjustment clause for the period from 07.07.2012 to 18.11.2019, subject to the conditions at Clause 31.3 below) and Works Department O.M. No.1739/W dt.03.02.2023 (revising the procedure for the Schedule of Adjustment Data on revision of the technically sanctioned estimate, as reflected in the Appendix to Bid below), as given below:

ANNEXURE-A

Clause 31(OPWD) :- 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

31.3 : The above Price Adjustment clause, originally issued vide Works Department O.M. No.15847/W dt.19.11.2019, has been given retrospective effect for the period from 07.07.2012 to 18.11.2019 vide Works Department O.M. No.8189/W dt.07.06.2021, subject to the following stipulations: (i) the Administrative Department shall have complete proof, including documentary proof, of cost escalation in terms of actual work done; (ii) a certificate has to be signed by the competent authority certifying that the delay is not due to the actions of the contractor concerned; and (iii) where there are avoidable administrative delays, responsibility has to be fixed on the Government servants concerned for the cost escalation, and a consolidated Action Taken Report in this regard shall be submitted to the Finance

Department.

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:

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

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_o = 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.

M1 = 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.

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

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:

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

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

C_o = 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.

C1 = 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

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

$V_S = 0.85 \times P_s/100 \times R \times (S_1 - So)/So$

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

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

S_1 = The all India wholesale price index for steel (Mild Steel long products) for the month under

consideration as published by the Ministry of Commerce and Industry, Government of India, New Delhi.

P_s = Percentage of steel component of the work

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

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

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

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

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

B_o = 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:

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

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

31(b):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

$VL = 0.85 \times P_l/100 \times R \times (L_1 - L_o)/L_o$

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

Lo= The minimum wages for unskilled labour as Notified by Government of Odisha as prevailed on the

last stipulated date of receipt of tender including extension, if any.

$L_{1=}$The minimum wages for unskilled labour as Notified by Government of Odisha as prevailed on the last date of the

Month previous to the one under consideration.

$P_{l=}$ Percentage of labour component of the work.

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

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

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

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.

Fo = 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*

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:

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

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_o = 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**	**Item in WPI 2004-**	**Item in WPI 2011-12**

	series	05 series	series
1	Cement	Grey Cement	Ordinary Port land cement
2	Bars & rods	Rebars	Mild steel long products
3	Heavy Machinery and parts	Construction Machinery	Manufacture of machinery for mining quarrying and construction.

31(e): APPLICATION OF ESCALATION CLAUSE:

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

Percentage Table

S.I. No.	Category of works		% Component (Cost wise)		
			Labour (Pl)	POL (Pf)	Steel (Ps) + Cement (Pc) + Bitumen (Pb) + Pipes (Ppi) + Plant & Machinery Spare & Component (Pp) + Other Materials *
1	R&B works (%) of Component)	Road Works	5	5	90
		Bridge Works	5	5	90
		Building Works	5	5	90
2	Irrigation works (%) of Component)	Structural work	5	5	90
		Earth, Canal & Embankment work	5	5	90
3	P.H Work	Structural Work	5	5	90
		Pipeline Work	5	5	Pipe – 70% Machinery + Other Material – 20%

		Sewer Line	5	5	Pipe – 70% Machinery + Other Material – 20%

**** Note : -*** *Further 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)*

Appendix to Bid
Schedule of Adjustment Data

[For all works, adjustment factor for Labour and POL shall be considered at the rate of 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. The cases where the original technically sanctioned estimate gets revised, the technical sanction to the revised estimate will be obtained from the competent authority as provided under Para 3.11.2(b) of OPWD Code, Volume-I. Based on the revised technically sanctioned estimate, the Labour & the POL component shall be given the weightage of 5% each as provided in O.M No.15847/W dated 19.11.2019 of Works Department and the weightage of 90% on steel, cement, bitumen, pipes, other materials and plant and machinery spare component shall be given as per the technically sanctioned revised estimate excluding the extra items. The revised weightage of "Schedule of Adjustment Data" based on revised technically sanctioned estimate shall be included as an Addendum to the agreement. The technical sanctioning authority shall be the competent authority for this purpose.] (Works Department O.M. No.1739/W dt.03.02.2023)

Cl. No- 31 of F2/P1 Contracts Sl No.	Index description	Source of index	Base value*	Base Date*	Weight age 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.			35.47%
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.			36.26%
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			16.93%

		Industry.			
31(a) (iv)	Bitumen(VG -30)	Official retail price of bulk bitumen at the nearest IOC/ HPCL depot			0.00%
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.			0.03%
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			1.31%
				Total	100 %

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

**Values to be filled up in the bid document

38. If any advance / Secured advance is granted by the OSAMB/Department the same will bear interest at the rate of 18% P.A.

39. All items of work as per schedule of quantities of this tender should confirm to Odisha Detailed Standard Specification. I.R.C. & **BIS Codes** & Bridge code section I,II,III,IV&VII & latest design criteria for pre-stressed concrete bridge specially for Roads & Bridges issued by MoRT&H., Government of India, Compacting shall have to be carried out with help of mechanical vibrators from the range of I.S.:2505, I.S.:2006, I.S.:2514. I.S.:4656.

40. Deleted.

41. Form work including complete false work shall be designed by the Contractor without any extra cost to employer and the Department will have the right to inspect the scaffolding, centering and shuttering made for the work and can reject partly of fully such structures, if found defective in their opinion. Any eventually such as loss of lives or properly due to failure of centering and shuttering shall be the responsibility of the Contractor regarding compensation of all claims thereof.

42. Cement shall be used by bags and weight of one bag of Cement should be 50 (fifty) Kg. net & the Engineer-in-Charge or his representative shall have the right to test the weight & quality from time to time.

43. The tenderers shall make all arrangements for proper storage of materials but no cost for raising shed for store and pay of security guard etc. will be borne by the Department. The department is not responsible for any theft or loss of materials at site. It is contractor's risk. Under any such plea, if the tenderer stops the work he shall have to pay the full penalty as per clauses of the contract.

44. Approach road to site of work for transport of materials to site of work is sole responsibility of the Contractor. Statutory traffic restriction in the town area for Transport of construction material to site of work is to be taken into consideration before tendering and no consideration for extra time or compensation thereof shall be considered.

45. The contractor should at his own cost arrange necessary tools and plants required for efficient execution of work and the rates quoted should be inclusive of transportation, hire and running charges of such plant and cost of consumables.

46. The contractor shall properly co-ordinate with the execution of P.H. and Electrical works and take care of the safety of workers.

47. The machineries if available, with the department may be supplied on hire as per charges noted in the enclosed statement and may be changed from time to time subject to the condition that the contractor will execute in advance an agreement with the Engineer-in-Charge.

48. No claim whatsoever will be entertained for supply of machineries. No extension of time will be granted to the contractor under this ground under any circumstances

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49. The tenderer should furnish along with their tender a list of works executed during the last five years duly certified by the concerned Engineer-in-charge indicating the satisfactory completion for Civil,

& Electrical works as per the proforma enclosed in a separate sheet of **Schedule-D.**

50. The tenderer or any of its constituent partners of whose contract for any work has been rescinded or who has abandoned any work in the last five years prior to the date of Bid shall be debarred from qualification. The tenderer is to furnish an affidavit at the time of submission of tender paper about the authentication of tender documents. An affidavit to this effect is to be furnished in **Schedule-F** and information in **Schedule-E**

51. It should be clearly understood that:

a) The joints of the bars are to be provided with lapping, welds or bolts nuts as well be directed by the Engineer-in-charge.

b) Concrete test specimens 150mm × 150mm × 150mm in size (whether plain or reinforced concrete) for the testing shall be taken for each structural member by a representative of the contractor in the presence of responsible officer of the rank not lower than that of an Assistant Engineer or sub-Divisional Officer. The contractor shall bear the cost involved in testing. The test specimen in cube should be carried out as per relevant I.S.Code in the Laboratory as approved by the employer.

c) Test specimens shall be formed carefully in accordance with the standard method of taking test specimen and no plea shall be entertained later on the grounds that the casting of the test specimen was faulty and that the result of the specimen did not give a correct indication of the actual quality of concrete.

d) Plain concrete and reinforced concrete specimens will be tested in ***Quality Control and Research Laboratory as per direction of Engineer-in-charge.*** Cost of testing of all specimens and samples will be borne by the Contractor.

52. The rates quoted should be inclusive of carriage of water required in connection with execution of the work. No claim for carriage of water whatsoever will be entertained.

53. The contractor should employ one or more Engineering Graduate or Diploma holders as applicable. The fair wage to be paid and should not be less than the emolument of

personnel of equivalent qualification employed under Government.

54. List of tool & plants in running condition in possession of contractor is to be furnished in a separate sheet of **Schedule-C**.

55. It is the responsibility of the contractor to procure and store explosives required for blasting operation if required. Department may render necessary possible help for procuring license.

56. For submission of a tender for the work, the tenderer will be deemed to have satisfied himself by actual inspection of the site and locality of the work about the quality and availability of the required quantity of materials, Medical aid, labor and Flood stuff etc. and that the rates quoted by him in the tender will be adequate to complete the work according to the specifications attached thereto and that he had taken in to account all conditions and difficulties that may be encountered during its progress and to have quoted labor rates and materials with taxes, Octroi and other duties lead, lifts, loading and unloading freight for materials and all other charges necessary for the completion of the work to the entire satisfaction of the Engineer-in-charge of the work and his authorized subordinates except GST. After acceptance of the contract rates Government will not pay any extra charges for any reason in case the contractor finds later to have misjudged the conditions as regards the availability of materials, labor and other factors. The contractor will be responsible for any misuse, loss or damages due to any reasons whatsoever of any departmental material during the execution of work. In case of loss, damage or misuse, recovery at the rate at 5 times the cost of the materials will be deducted from the bills or his other dues.

57. **The prevailing percentage of I.T. of the gross amount of the bill towards income tax will be deducted from the contractor's bill.**

58. Deleted.

59. **Prevailing rate of Cess @ 1% as per the Building and Other Constructed Workers (RE&CS) Act. 1996 and Buildings and Other Construction Workers Welfare Cess Act. 1996 (vide resolution No.-12653, dt.15.12.2008 of Labour and Employment Department, Govt. of Odisha) will be deducted from each running bill of the contractor.**

60. It must be clearly understood that under no circumstances any interest is chargeable for the dues or additional dues if any payable for the work executed and final bill pending disposal due to any reason whatsoever.

61. No extra payment will be made for removing spreading and consolidating salvaged metals and materials.

62. **Under section 12 of contractors' labour (Regulation and Abolition) Act. 1970 the contractor who undertakes execution of work through labour should produce valid license from licensing authorities of labour Department.**

63. **Additional Performance Security :**

62.1 The financial bid of the technically qualified bidders will be opened for evaluation of the price bid. As per letter no.173/W dated 03.01.2026 of Works Department, the 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 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.

The applicable Additional Performance Security (APS) shall have to be furnished by the successful bidder in shape of BG from any Nationalised/ Schedule Bank in India counter guaranteed by its local Branch at Bhubaneswar within seven days of issue of Letter of Acceptance (LoA) by the General Manager, Odisha State Agricultural Marketing Board, Bhubaneswar.

62.2. The security will be refunded after lapse of defect liability period on completion of the work in all respect provided the final bill is passed and the security deposit shall not carry any interest. Any defect noticed during the defect liability period after the actual date of completion of the work shall be rectified by the contractor at his own cost. Failure to comply such rectification, the defective work shall be rectified by the employer and cost involved thereof shall be recovered from the contractor from his dues. (Ref. works Deptt order No. 17823/WE dt. 11.10.2006).

64. a) The bidder will be suspended for the time specific in the tender documents in the following cases.

If the bidder backs out his offer before acceptance of tender by the competent authority, as concurred by Law and Finance Department in their UOR No.848/L dt.31.05.1997 and UOR No.202/FD dt.06.03.1998 respectively.

(b) In the case of a successful bidder, if the bidder fails within the specified time limit to

(i) Furnish the required performance and additional performance security.

(ii) enter into the agreement

(iii) If any of the statements, documents, certificates uploaded by the bidder through e-procurement portal, is found to be false / fabricated / bogus;

the bidder will be blacklisted in this case.

65. In case of discrepancy revealed between P1/F2 form and Detailed Tender Call Notice, condition in P1/F2 form shall prevail over the Detailed Tender Call Notice.

66. The clause of printed form of P1/F2 contract with latest addition/ deletion/ corrections/ substitution etc. shall also prevail

67. No claim for idle labour, machineries etc. will be entertained by the Department whatsoever the reason may be.

68. **Sample of all material -** The contractor shall supply sample of all materials fully before procurement for the work for testing and acceptance as may be requiring by the concerned Executive Engineer.

69. Super class contractor shall employ under himself two Graduate Engineer and two Diploma holders belonging to the State of Odisha. Special class contractor shall employ under him one graduate Engineer and two Diploma Holders belonging to the state of Odisha. Likewise 'A' class contractor shall employ under him one Graduate Engineer or two Diploma Holders belonging to state of Odisha. The contractor shall pay to the Engineering personnel monthly emoluments, which shall not be less than the emoluments of the personnel of equivalent qualification employed under the State Govt. of Odisha. The Engineer-in Chief (Civil), Odisha may however assist the contractor with names of such unemployed Graduate engineers and Diploma Holders if such help is sought for by the contractor. The names of such Engineering personnel appointed by the Contractors should be intimated to the tender receiving authority along with the tender as to who would be supervising the work. Each bill of the Super Class, Special Class or 'A' Class Contractor shall be accompanied by an employment Roll of the Engineering personnel together with a Certificate of the Graduate Engineer or Diploma Holder so employed by the contractor to the effect that the work executed as per the bill has been supervised by him. (Vide Works Department No. Codes M-22/91-15384 dated 9.7.91). The required certificate is to be furnished in the tender documents vide **Schedule-G**.

70. An engineering personnel of the executing agency should be present at work site at the time of visit of High level Inspecting officers.

71. All reinforced cement work should conform to Odisha Detailed specification and should be of proportion as per Contract Agreement having desired compressive strength (in work test) in 15 Cm cubes at 28days, after mixing and test conducted in accordance with IS 456 and IS 516.

72. Bailing out of water from the foundation, pipeline trenches S. Tanks/ Soak pits/ Sumps/ M.H. etc. either rainwater or sub-soil water if necessary, should be borne by the contractor. No payment will be made for benchmarks. Level pillars, profiles and benching and levelling the ground wherever required. The rates quoted should be for finished items of work inclusive of these incidental items of work. It should be understood clearly that no claims whatsoever would be entertained.

73. The tenderer shall have to abide by the C.P.W.D. safety code rules introduced by the Government of India, Ministry of work Housing and Supply in their standing order No-44150 dtd.25.11.57.

74. The Contractor will have to submit to the Executive Engineer, OSAM Board, Bhubaneswar, monthly return of labour both skilled and unskilled employed by him on the work.

75. All fittings for doors and windows, P.H. & Electrical works as supplied by the Contractor should be of best quality and conform to relevant I.S. specifications and should be got approved by the Engineer-in-charge of the respective wing before they are used on the work.

76. After completion of the work the contractor shall arrange at his own cost all requisite equipment for testing buildings, if found necessary**, and bear the entire cost of such test, including the inspection of Electrical Inspectorate.**

77. The Tenderer should furnish along with their tender **1**. A list of works, which are at present in their hand (**Schedule-B**) **2**. List of T&P (**Schedule-C**) and **3**. List of work executed (**Schedule-D**) in the prescribed proforma(s) enclosed herewith in

appropriate place of bid document.

78. All reinforced cement concrete work should be finished smooth.

79. The tenderer may at his option quote reasonable rate for each item of work carefully so that the rate for one item should not be unworkable low and for others too high.

80. The contractor has to arrange the samples of materials required for execution to be tested and approved by the Engineer-in-charge before taking up the work and during course of execution required from time to time. All such samples will be tested at the ***Laboratories as per direction of the Engineer-in-Charge***, at the cost of the Contractor. No extra cost will be borne by the OSAMB/ the Department.

81. If there is any damage to the work due to natural calamities like flood or cyclone or any other cause during the course of execution of work or up to 12 months after completion of work or if any, imperfection becomes apparent to the work within 12 months from the date of final certificate of completion of work the contractor shall make good of all such damages at his own cost with no extra cost to the OSAMB/Department. No claims whatsoever, in this regard will be entertained.

82. The Fly Ash Bricks should be of good quality. The bricks should be approved by the Engineer-in-Charge before use in the work and should be confirmed to the minimum strength and other criteria as per National Building Code/BIS Code.

83. **Under Section 1 of contract labor Regulation and Abolition Act 1970 the contractor who undertakes execution of work through labor should produce valid license from the licensing authority of labor Department.**

84. Standard co-efficient for linear measurement will be adopted while calculating consumption of steel and no claim whatsoever regarding difference in co-efficient of steel will be entertained. The rates quoted shall be inclusive of any eventuality of difference for co-efficient for linear measurements.

85. Engineer Contractor desirous to avail the facility of exemption of E.M.D is required to submit an affidavit to the effect that he has not yet availed the facility / participated in the tender for more than two works (Excluding this work) during the current financial year. The name of work for which participated and the authority to whom the tender was submitted must be mentioned in the affidavit, failing which the tender will be rejected.

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

87. SPECIAL CONDITIONS (PART OF THE CONTRACT)

(I) All materials before they are being used in the items of works as per this Schedule of quantities and also the finished items of work where tests are applicable shall have to be tested at appropriate Laboratories as per direction of the Engineer-in-charge according to the relevant I.S. specifications of the materials and the said items of works and the cost of all such tests shall have to be borne by the Contractor and quoted rate for the work should be inclusive of cost of such tests.

(II) The tests have to be planned & carried out such that the progress of work is not hampered

(III) The tests are mandatory as per the prescribed frequencies and I.S. specifications. However, these are not exhaustive, and the Engineer-in-charge has the right to prescribe other required test if any as will be considered from time to time.

88. In case of ambiguity between clauses of this D.T.C.N. and the **P-1** contract form, the relevant Clauses of the **P-1** contract form shall prevail over the D.T.C.N. The clauses not covered under **P-1** contract form shall be governed by the clauses of the D.T.C.N.

89. It must be understood that the OSAMB/Government does not accept any responsibility for the correctness and completeness of the trial borings shown in the Cross Section.

90. Schedule of quantities is accompanied in **Cover-II (Price Bid)**. It shall be definitely understood that the OSAMB/Government does not accept any responsibility for the correctness or completeness of this schedule and that this schedule is liable for alternation or omissions, deductions or alternations set forth in the conditions of the contract and such omissions, deductions, additions or alternations shall no way invalidate the contract and no extra monetary compensation, will be entertained.

91. In case of any complaint by the labor working about the non-payment or less payment of his wages as per latest minimum Wages Act, the employer will have the right to investigate and if the contractor is found to be in default, he may recover such amount due from the contractor and pay such amount to the labor directly under intimation to the local labor office of the Govt. The contractor shall not employ child labor. The decision of the Executive Engineer/employer is final and binding on the contractor.

92. The contractor should arrange the materials like Steel, Cement, paint and bitumen etc. of approved quality and specification at his own cost for completion of the work with the time schedule. No extension of time will be granted on the application of the contractor due to delay in procurement of materials.

93. The bidder will be responsible for the loss or damage of any departmental/OSAMB materials during transit and in the execution of the work due to reasons what-so-ever and the cost of such materials will be recovered from the bills at stock issue rates or market rates whichever is higher.

94. If the contractor removes Government/OSAMB materials supplied to him from the site of work with a view to dispose of the same dishonesty, he shall be in addition to any other liability civil or criminal arising out of his contract be liable to pay a penalty equivalent to five times of the price of the materials according to the stock issue rate or market rate whichever is higher. The penalty so imposed shall be recovered at any time from any sum that may then or at any time thereafter become due to the contractor or from his security deposit or from the proceeds of sale thereof.

95. The selected contractor may take delivery of departmental supply according to his need for the work issued by the **Engineer-*in-charge*** subject to the availability of the materials. The tenderer shall make all arrangements for proper storage of materials but no cost for raising shed for storage, pay of security guard etc. will be borne by the Department. The Department/OSAMB is not responsible for considering the theft of materials at site. It is the contractor's risk. Under any such plea if the tenderer stops the work, he shall have to pay the full penalty as per clause of **F2** agreement time.

96. The Department/OSAMB will have the right to supply at any time in the interest of work any departmental materials to be used in the work and the contractor shall use such materials without any controversy or dispute on that account. The rate of issue of such materials will be at the stock issue rates inclusive of storage charges or rates fixed by the Department or current market rate whichever is higher.

97. All the materials which are to be supplied from P.W.D./OSAMB store will be as per availability of stock and the contractor will have to bear the charges of straightening, cutting, jointing, welding etc. to required sizes in case of M.S. Rods or TOR Steel / M.S Angles, Tees and Joists etc. After the issue of the P.W.D./OSAMB store, the materials may be under the custody of the contractor and the contractor will be responsible for its safety and storage. Cut pieces of steel more than one meter in length will be returned by the contractor at the issuing stores without conveyance charges.

98. Though Departmental/OSAMB issue of cement and steel has been indicated, it may not be taken as binding. The contractor must arrange by themselves cement, steel,

bitumen and every sort of material from approved manufacturer, get it tested in the Laboratory approved by the Engineer-in-Charge/Employer before use. No extension of time or escalation of price on such account shall be entertained in future. **It is to be noted that OSAMB has no store and does not supply any material. This is the governing stipulation as regard to the supply of material by OSAMB.**

99. TOR rods, plates and structural members will be supplied in quantity, length and size if available in stock. For payment of reinforcement, the steel including plates etc. shall be measured in length of different diameter, size and specification as actually used (including hooks and cranks) in the work correct to an inch or cm. And their weight calculated as per sectional weight prescribed by the Indian Standard Specification or as directed by the Engineer-in-Charge (Wastage of bars and unnecessary lapping will not be considered for measurement and payment).

100. **Odisha Bridge & Construction Corporation** Ltd. will be allowed price preference up to 3% over the lowest quotation or tender as laid down in Works and Transport Department Resolution No-285 date-17.04.1974. The **Odisha Construction Corporation** will be allowed a price preference to the extent of up to 3% over the lowest tender amount (Where their tender is not the lowest) provided they express willingness to execute the work after reduction of rates by negotiation.

101. The contractor is required to pay royalty to Govt. as fixed from time of time. Royalties of different materials as utilised in the work will be recovered from their bills and deposited in the revenue of the department concerned.

102. **Trial Boring - The foundation level as indicated in the body of the departmental/OSAMB drawing is purely tentative and for general guidance only. The Department/OSAMB has no responsibility for the suitability of actual strata at the foundation level. The contractor has to conduct his own boring before starting the work and get the samples tested at his own cost to ascertain the S.B.C. and credibility of the strata at founding level while quoting his rates for tender the contractor shall take into account of the above aspects.**

103. Any defects, shrinkage or other faults which may be noticed within **12 (Twelve) months from the completion of the work** arising out of defective or improper materials or workmanship timing are upon the direction of the Engineer-in-Charge to be amended and made good by the contractor at his own cost unless the Engineer for reasons to be recorded in writing shall be decided that they ought to be paid for and in case of default Department/OSAMB may recover from the contractor the cost of making good the works. The contractor is also required to maintain the road/ building for **12 (Twelve) months** from the date of successful completion of the work.

104. From the commencement of the works to the completion of the same, they are to be under the contractors' charge. The contractor is to be held responsible to make good all injuries, damage and repairs occasioned or rendered necessary to the same by fire or other causes and they hold the OSAM Board/Govt. of Odisha harmless for any claims for injuries to person or structural damage to property happening from any neglect, default, want of proper care or misconduct on the part of the contractor or anyone in his employment during the execution of the work. Also, no claim shall be entertained for loss due to earthquake, flood, cyclone, epidemic, riot or any other calamity whether natural or incidental damages so caused will have to be made good by the contractor at his own cost.

105. **Gradation of ingredients**: The coarse and fine aggregate shall meet the grade requirement as per the latest provision of relevant. I.S. Code / I.R.C. code / MoRT&H specifications.

106. **Where it is found necessary by the Department/OSAMB, the Officer-in-Charge of the work shall issue an order book to the contractor to be kept at the site of the work with pages serially numbered. Orders regarding the work whenever necessary are to be entered into this book by the Officer-in-Charge with their**

dated signatures and duly noted by the contractor or his authorized agents with their dated signature. Orders entered in this book and noted by the contractor's agent shall be considered to have been duly given to the contractor for following the instructions of the Department/OSAMB. The order Book shall be the property of the Department/OSAMB and shall not be removed from the site of work without written permission of the Engineer (Executive Engineer) and to be submitted to the Engineer-in charge every month.

107. The contractor should attach the certificate in token of payment deposit with the registration authority as per recent circular of the Government relating to his registration.

108. In case of any discrepancy in printing or omissions of statutory specifications or any other part or portion of the approved document during download of the bid document, the decision of the officer inviting the bid will be binding on the bidder.

109. The rates quoted by the contractor shall cover the latest approved rates of Labours, Materials, P.O.L. and Royalties. Arrangement of borrow areas i.e. Land, Approach Road to the building site etc. are the responsibility of the contractor.

110. The rate for each work of concrete items wherever dewatering is imperatively necessary the term dewatering shall mean the execution or operation of the items due to standing water as well as due to percolation of water. The quoted rates will be inclusive of this.

111. **The contractor shall make requisition of claim book from the date of commencement of the work from the Department/OSAMB** and shall maintain in proper P.W.D. form with pages serially numbered in order to record items of work that are not covered by his contract and claimable as extra. Claims shall be entered regularly in this book under the dated signature of the contractor or his duly authorized agents at the end of each month. A certificate should be furnished along with the claim to the effect that he has no other claim beyond this claim up to date. If in any month there are no claims to record, a certificate to that effect should be furnished by the contractor in the claim book. Each claim must be defined and should be given as far as possible regarding the quantities as well as the total amount claimed. The claim book must be submitted by the contractor regularly by 10th and 16th days of each month for orders from the Engineer-in-Charge or competent authority. Claims not made in this manner or the claim book not maintained from the commencement of the work is liable to be summarily rejected. The claim book is the property of the P.W.D./OSAMB and shall be surrendered by the contractor to the Engineer-in-charge after completion of the work or before recession of the contract by the Department/OSAMB whichever is earlier for record.

112. Number of tests as specified in I.R.C. / MoRT&H / BIS specification required for the construction of roads / bridges / buildings or any other structural works will be conducted in any Govt. Test House/Departmental laboratories/reputed material testing laboratory as to be decided by the Engineer-in-charge. Testing charges, including expenditure for collection / transportation of samples /specimens etc. will be borne by the contractor. The collection of samples and testing are to be conducted both prior to execution and during execution as may be directed by the Engineer-in-charge and on both accounts the cost shall be borne by the contractor.

113. Even qualified criteria are met, the bidders can be disqualified for the following reasons, if enquired by the Department/OSAMB

(a) Making a false statement or declaration.

(b) Past record of poor performance.

(c) Past record of abandoning work halfway/ recession of contract.

(d) Past record of in-ordinate delay in completion of the work.

(e) History of Litigation.

114. In case the 1st lowest tenderer or even the next lowest tenderers withdraw in series one by one, thereby facilitating a particular tender for award, then they shall be penalized with adequate disincentives with forfeiture of EMD unless adequate justification for such back out is furnished. Appropriate action for blacklisting the tenderers shall also be taken apart from disincentives against the tenderer.

115. The following documents which are submitted with the Bid, will be deemed to be part of the Bid:

Sl. No	Particulars
1	Notice Inviting tender
2	Instruction to the Bidders
3	Conditions of Contract.
4	Contract data
5	Specifications
6	Drawings

116. DELETED

117. ELIGIBILITY CRITERIA:

To be eligible for qualification, applicants shall furnish the following. Non-furnishing of the following particulars shall be treated as ineligible.

a. Required E.M.D (Bid Security) as per Clause No.20 of DTCN

b. Cost of bid document towards Cost of tender paper as per Clause No.4 of DTCN.

c. Scanned copy of valid Contractor Registration Certificate, GST Registration Certificate, GSTIN, PAN card along with the tender documents and the L-I bidder has to furnish the Original Registration certificate, GSTIN and Pan card for verification within (5) Five days of opening of Cover-II of the tender before Chief Engineer, (Buildings), Odisha, Bhubaneswar as per Clause No-1, 5(i) and 21 of DTCN. The contractor belonging to outside state of Odisha and not started business should submit an undertaking in the form of an Affidavit indicating therein that they are not registered under Odisha GST as they have not started any business in the state and they have no liability under the Act. But before award of final contract, such bidders will have to produce the GST Registration certificate.

d. i) License criteria as per Clause No.8 of DTCN and Schedule-J need to be furnished.

e. Evidence of ownerships of machineries/ equipments as per Clause No.7 of DTCN and need to be furnished by the bidder in Schedule-C.

f. Joint Ventures are accepted.

g. Technical capacity of the bidder shall be assessed on the following criteria, based on performance during the last five financial years, i.e. from FY 2022-23 to FY 2026-27:

(i) Satisfactory completion of similar major items of work: The bidder should have satisfactorily executed the following minimum quantities of important and critical major items of work during the last five financial years, i.e. from FY 2022-23 to FY 2026-27:

Sl. No.	Major Item of Work	Minimum Qualifying Quantity
1	M-25 RCC	2,741 Cum
2	PCC in 1:3:6	3,794 Cum
3	Brickwork	3,808.00 Cum
4	Galvalume Sheet Roofing	14,802 Sq.m
5	Reinforcement Steel	3,347 Quintal

The quantities of similar major items executed in different works during one financial year may be aggregated. Different major items may be considered from different

financial years within the above five financial years. The bidder shall submit self-attested copies of certificates issued by the concerned Executive Engineer/Competent Officer in charge of execution in support of the quantities executed. Failure to submit the required proof shall result in non-consideration of the tender.

(ii) Availability of Plant & Machinery: The bidder shall produce documentary evidence regarding the availability of the key plant, machinery and equipment in working condition required for execution of the work, either owned in the bidder's name, obtained on hire-purchase scheme, or proposed to be hired from reputed firms/contractors. Where plant, machinery and equipment are proposed to be hired for the specific period of completion of the work on lease/rental basis, a copy of the MoU/Affidavit with the owner shall be furnished. The bidder shall also submit an affidavit declaring that the plant, machinery and equipment proposed for the work are free and will be available during execution of the work. The detailed list of plant, machinery and equipment required for execution of the work shall be as specified in the DTCN.

h. Financial capacity of the bidder shall be assessed on the following criteria:

(Note: The estimated cost put to tender for this work is ₹.80,78,19,044/-. For the sake of simplicity and transparency, this has been rounded off to ₹.81.00 Crore for the purpose of the financial eligibility criteria at (i) to (iii) below.)

(i) Annual Turnover: The bidder, in its own name, should have achieved a minimum annual turnover of **₹.81.00 Crore** in any one financial year during the last five financial years, i.e. from FY 2021-22 to FY 2025-26, in all classes of Civil Engineering construction works, at FY 2026-27 price level. For the annual turnover of previous financial years, 10% weightage per year shall be given to bring the same to FY 2026-27 price level. The bidder shall submit an attested copy of the certificate of annual turnover issued by the appropriate authority.

(ii) Credit Facility: The bidder must possess credit facilities of not less than **₹.16.20 Crore** from any Scheduled Commercial Bank and shall furnish the Bank Certificate in the following prescribed format, mentioning the name of the work and Tender Identification Number:

BANK CERTIFICATE

This is to certify that M/s. _____ is a reputed company with a good financial standing.

If the contract for the work, namely "_____" is awarded to the above firm, we shall be able to provide overdraft/credit facilities to the extent of Rs. _____ (in words _____) to meet their working capital requirements for executing the above work.

Signature & Seal of Bank Manager
Name & Address of Bank

(iii) Bid Capacity – (Vide Works Department Office Memorandum No.6300 dtd.16.6.2011): The bidder shall have an Assessed Available Bid Capacity of more than **₹.81.00 Crore** at the time of bidding. The Assessed Available Bid Capacity shall be calculated as follows:

Assessed Available Bid Capacity = (A × N × 2) – B

Where:

A = Maximum value of works executed in any one financial year during the last five financial years, i.e. from FY 2021-22 to FY 2025-26, updated to the current price level. The rate of inflation shall be taken as 10% per year.

B = Value at current price level of the existing commitments and on-going works to be completed during the next 18 months.

N = Number of years prescribed for completion of the work for which the Bids are invited.

For this work, N = 18/12 = 1.5 years. Therefore, Assessed Available Bid Capacity = (A × 1.5 × 2) – B, or Assessed Available Bid Capacity = 3A – B.

The bidder shall submit a statement showing the value of existing commitments and ongoing works as well as the stipulated period of completion remaining for each of the works listed. The Statement shall be countersigned by the Engineer-in-Charge, not below the rank of an

Executive Engineer.

The information on Bid Capacity as on the date of this bid is to be furnished as per the format in

Schedule-B.

Total value of Civil Engineering construction work performed in the **last five years** is to be furnished for which **certificate from Chartered Accountant is to be furnished.**

2021-2022 ---------- 2023-2024 ---------- 2025-2026 ----------

2022-2023 ---------- 2024-2025 ----------

I. Non-submission of required information in schedule B, D, E and F shall be treated as non-responsive, and the bid shall be summarily rejected.

118. Time Control: - (Vide Works Department Office Memorandum No.24716 dtd.24.12.2005 and No.8310 dtd.17.05.2006)

a) Progress of work and Re-scheduling program.

i) The General Manager, OSAM Board issue a 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.

ii) Within 15 days of issue of the letter of acceptance, the contractor shall submit to the Executive Engineer, OSAM Board for approval of Program showing the general methods, arrangements, and timing for all the activities in the Works along with monthly cash flow forecast.

iii) To ensure good progress during the execution of the work, the contractors shall be bound in all cases in which the time allowed for any work exceeds one month to complete, 1/4th of the whole time allowed under the contract has elapsed, ½ of the whole of the work before ½ of the whole time allowed under the contract has elapsed, 3/4th of the whole of the work before 3/4th of the whole time allowed under the contract has elapsed.

iv) If at any time it should appear to the Engineer-in-Charge that the actual progress of the work does not conform to the program to which consent has been given the Contractor shall produce, at the request of the Engineer-in-Charge, a revised program showing the modifications to such program necessary to ensure completion of the works within the time for completion. If the contractor does not submit an updated Program 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 overdue Program has been submitted.

v) An update of the Program shall be a program 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.

vi) Approval of the Program by Executive Engineer, OSAM Board shall not alter the Contractor's obligations. The Contractor may revise the Program and submit it again at any time. A revised Program is to show the effect of Variations and Compensation Events.

b) Extension of the Completion Date.

i) The time allowed for execution of the works as specified in the Contract data shall be the essence of the Contract. The execution of the works shall commence from the 15th day of such time-period as mentioned in letter of Award after the date on which the General Manager issues 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 & performance guarantee/ Security deposit absolutely.

ii) The Contractor shall submit the Time & Progress Chart for each milestone Quarter wise indicating each month and get it approved by the OSAMB. The Chart shall be prepared in direct relation to the time stated in the Contract documents for completion of the work. It shall indicate the forecast of the dates of commencement and completion of various sections of the work and may be amended as necessary by agreement between the Executive Engineer, OSAM Board and the Contractor within the limitations 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 program has been agreed upon) complete the work as per milestone given in contract data.

iii) In case of delay occurred due to any of the reasons mentioned below, the Contractor shall immediately give notice thereof 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.

(1) Force majeure, or

(2) Abnormally bad weather, or

(3) Serious loss or damage by fire, or

(4) Civil commotion, local commotion of workmen, strike or lockout affecting any of the trades employed on the work, or.

(5) Delay on the part of other contractors or tradesmen engaged by Engineer-in-Charge in executing work not forming part of the Contract.

(6) In case a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work and which would cause the Contractor to incur additional cost, or

(7) Any other cause, which, in the absolute discretion of the authority mentioned, in Contract data is beyond the Contractors control.

iv) Request for reschedule and extension of time, to be eligible for consideration, shall be made by the Contractor in writing within fourteen (14) 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.

v) 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.

c) Compensation for Delay.

If the contractor fails to maintain the required progress in terms of clause-2 of P-1 Contract 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 **General Manager, OSAM Board (whose decision in writing shall be final and binding)** may decide on the amount of tendered value of the work for every completed day / month (as applicable) that the progress remains below that specified in Clause-2 of P-1 Contract 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 completed on per Day basis. Provided that the total amount of compensation for delay to be paid under this condition shall not exceed 10% of the Tendered Value of work or to the Tendered Value of the item or group of items of work for which a separate period of completion is originally given. The amount of compensation may be adjusted or set off against any sum payable to the Contractor under this or any other contract with the Government. In case the contractor does not achieve a particular milestone mentioned in contract data, 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 contractor. 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 each milestone missed subsequently also shall be withheld. However, no interest whatsoever shall be payable on such withheld amount.

d) Bonus for early completion

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 General Manager & the Administrative Department. The incentive for timely completion should be on a graduated scale of one percent to 05 percent of the contract value. Assessment of incentives may be worked out for earlier

completion of work in all respect in the following scale.
Before 30 % of contract period = 5 % of Contract Value Before
20 to 30 % of contract period = 4 % of Contract Value
Before 10 to 20 % of contract period = 3 % of Contract Value
Before 5 to 10 % of contract period = 2 % of Contract Value
Before 5% of contract period = 1 % of Contract Value
(Amendment to Para-3.5.5 (V) of Note-III of OPWD Code Vol.-I by inclusion vide O.M. No.5288 dt.04.05.2016)

e) Management Meetings

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

ii) 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 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.

Rescission of Contract (Amendment as per letter No.10639 dt.27.05.2005 of Works Department, Odisha):- To rescind the contract (of which rescission notice in writing to the contractor under the hand of the Executive Engineer shall be conclusive evidence), 20% of the value of left over work will be realized from the contractor as penalty.

119. Building and other Construction Workers Welfare Cess @ 1% of the estimated cost as per tender notification read with latest corrigendum if any will be proportionately deducted from the contractor's bill at the time of making payment of each bill.

120. The tenderers are required to go through each clause of P.W.D. Form **P-1** carefully in addition to the clauses mentioned here in before tendering.

121. A Contractor may be blacklisted as per amendment made to Appendix XXXIV to OPWD Code Vol.II on rules for blacklisting of Contractors vide letter No.3365 dt.01.03.2007 of Works Department, Odisha.

As per said amendment a Contractor may be blacklisted

a) Misbehavior/threatening to 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 a tender.

122. The safety certificate of the E.I. work will be furnished by the agencies after getting necessary verification from the electrical inspector/ equally competent authority responsible for the work prior to Energisation of the building.

123. Percentage rate contract (vide Works Department letter no.8310 dt.17.05.2006) In case of percentage rate tender:-

ii) The Contractor has to mention percentage excess or less over the estimated cost (In figures as well as words) in the prescribed format appended to the tender document.

iii) Contractors participated in the tender for more than one work may offer conditional rebate. Rebate offer submitted in separate sealed envelope shall be opened, declared and recorded first. The rebate so offered shall be considered after opening of all packages called in the same Tender Notice. The Contractors who wish to tender for two or more works shall submit separate tender for each. Each tender shall have the Bid Identification No., Name & Sl. No. of the work (as per IFB) to which they refer, written on the envelope.

iv) 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.

(1) 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

(2) If any discrepancy is found in the percentage quoted in percentage excess/ less and the total amount quoted by the Contractor, then percentage will be taken as correct.

(3) The percentage quoted in the tender without mentioning excess or less and not supported with the corresponding amount will be treated as excess.

(4) The percentage quoted in the tender without mentioning excess / less supported with corresponding amount does not tally with either to percentage excess or less then it will be treated as percentage excess.

(5) The percentage quoted in the tender without mentioning excess / less supported with corresponding amount if tallied with the percentage then it will be treated as to which side the amount tallies.

(6) The Contractor will write percentage excess/ less up to **two decimal point** only.

(7) The tender shall be written legibly and free from erasures, overwriting or corrections of figures. Corrections, over writings & interpolations where unavoidable should be made by making out, initialing, dating and rewriting.

v) In the contract P1 time is the essence. The contractor is required to maintain a certain rate of progress specified in the contract.

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

vii) The period of completion is fixed and cannot be altered except in case of exceptional circumstances with due approval of next higher authority.

viii) 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.

(Total 118 Clauses)

APPROVED

Sd/-

General Manager,
Odisha State Agricultural Marketing Board,
Bhubaneswar

CONDITIONS OF CONTRACT

Clause-1: All compensation or other sums of money payable by the contractor to Government under the terms of this contract may be deducted from or paid by the sale of a sufficient part of his security deposit or from the interest arising there from or from any sums which may be due or may become due to the contractor by Government on any account whatsoever and in the event of his security deposit being reduced by reason of any such deduction of 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 deducted from or raised by sale of the security deposit or any part thereof.

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(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 essence of the contract on the part of the contractor) and the contractor shall pay as compensation, an amount equal to ½ 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 un-finished 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 satisfaction of the E.E. 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 in the events of the contractor failing to comply with the condition, he shall be liable to pay as compensation an amount equal to one third percent on the said estimated cost of the whole work for every day that the due quantity of work remains incomplete. Provided always that the entire amount of compensation to be paid under the provisions of this clause shall not exceed 10 percent on the estimated cost of the work as shown in the tender.

Action when whole security deposit is forfeited.

Clause - 2(b) To rescind the contract of which rescission notice in writing to the contactor under the hand of the Superintending Engineer shall be conclusive evidence,20% of the value of left-over work will be realized from the contactor as penalty (Work department Memo No.13396 dated 01.07.2005)

i) To rescind the contract (of which rescission notice in writing to the contractor under the hand of the E.E. shall be conclusive evidence) and in which case, the security deposit of the contractor shall stand forfeited, and be absolutely at the disposal of Government.

ii) To employ labour paid by the Public Works Deptt. and to supply materials to carry out the work or any part of the work, debiting the contractor with the cost of the labour and the price of the materials (of the amount of which the cost and price certificate of the Superintending Engineer shall be final and conclusive against the contractor) and crediting him with the value 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 or 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 purchases or procured any material, of entered into any engagements, or made any advances on 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 rescinded under the provision aforesaid, the contractor shall not be entitled to recover or be paid any sum of any work thereto for actually performed under this contract, 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 after **one year** of the date of completion of the work provided that the final bill has been paid and defects, if any, rectified.

Contractor remains liable to pay compensation if action not taken under clause- 5

Clause-3 : In any case in which any of the powers, conferred upon the Superintending Engineer by clause-3 hereof shall have become exercisable and the same shall not constitute a waiver of any of the condition hereof and such powers shall not withstanding to be exercisable in the event of any future case of default by the contract 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 desires, take possession of all or any tools, plants, materials and stores, in or upon the works or the site there of or belonging to the contractor or procured by him and intended to be used for the execution of the work or any part thereof, paying or allowing for the same in the account at the contract rates or in case of these not being applicable, at current market rates to be certified by the Executive Engineer whose certificate thereof shall be final,

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

otherwise the Superintending Engineer may notice in writing to the contractor or his clerks of the works, foreman or other authorized agent required by him to remove such tools, plants, materials, or stores from the premises within time to be specified in such notice, and in the event of the contractor failing to comply with any such requisition, the Superintending Engineer may remove them by the contractor's expense or sell them by suction or private sale on account of the contractor and at his risk in all respects, and the certificate of the Superintending Engineer as to the

expense of any such removal and the amount of the proceeds and expense, if any such sale shall be final and conclusive against the contractor.

Extension of time

Clause-4 : If the contractor shall desire an extension of the time for completion of the work on the ground of his having been unavoidably hindered in its execution or any other ground he shall apply in writing to the Superintending Engineer within 30 days of the date of the hindrance on account of which he desires such extension 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. In P1 contract time is the essence. The contactor is required to maintain a certain rate of progress specified in the contract. The contract can also be terminated with penalty when the progress of the work is not as per the condition of the contact.

Final certificate

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 completed 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 cleaned of the dirt from all wood work, doors, windows, walls, floor or other parts of any building in upon or about which the work is 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 against the contractor. If the contractor shall fail to comply with the requirements of this clause as to removal scaffolding, surplus materials and rubbish and cleaning off dirt on or before the date fixed for the completion of the Engineer-in-Charge may at the expense of the contractor remove such scaffolding, surplus materials and rubbish, and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall forthwith pay the amount of all expenses incurred, and shall have no claim in respect of any such scaffolding or surplus material as aforesaid, except for any sum actually realized by the sale thereof.

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

Clause-6 : A bill shall be submitted by the contractor each month on or before the date fixed by the Engineer-in-charge or his subordinate shall take the requisite measurement for the purpose of having the same verified and the claim, as far 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 prepare all bill from such list which shall be binding on the contractor in all respects.

Provided that, if any balance of the 10% 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 and imperfect or unskillful work to be removed and taken away and reconstructed or re-erected, or be considered as an admission of the due performance of the contractor, 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 officer of the Public Works Department in accordance with the rules of the department in presence of the contractor within one month of the date fixed for completion of the work.

Stores supplied by Government

Clause-8 : If the specification or estimate of the work provides for the use of any special description of material to be supplied from the Engineer-in-Charge's store, or it is required that the contractor shall use certain stores to be provided by the Engineer-in-Charge under the conditions of the contract such materials and stores; to and the prices be charged thereof as hereinafter mentioned being so far practicable or the convenience of the contractor, but not so as in any way to control the meaning or effect of this contract are specified in the schedule or memorandum hereto annexed the contractor shall be supplied with such materials and stores noted in the annexed schedule as are required from time to time to be used by him for the 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 set off or deducted from any sums then due or thereafter to become due to the contractor under the contract or otherwise or against or from the security deposit or the proceeds of sale thereof if the same is held in Government securities the same or sufficient portion thereof being in this case sold of the purpose. All materials supplied to the contractor shall remain the absolute property or Government and shall not on any account be removed from the site of the work and shall at all times be open to inspection by the Engineer-in-charge.

Any such material unused and in perfectly good condition at the time of the completion or termination of the contract shall be returned to the Engineer-in-Charge's store, at the prevailing market rate or at the issue rate whichever is less if by a notice writing under his hand he shall so require but the contractor shall not be entitled to return any such material unless with such contract and shall have no claim for compensation on account of any such materials so supplied to him as aforesaid being unused by him or for any wastage in or damage to any such materials.

Clause-8(a): If contractor removes any material or stock supplied to him from the site of the work in contravention of the provision of this clause with a view to dispose of the same dishonestly, he shall in addition to any other liability civil or criminal, arising out of this contract be liable to pay a penalty equivalent to five times the price of the said materials or stock, according to the stipulated rate. The penalty so imposed shall be recoverable from any sum that may be then or at any time thereafter may become due to the contractor or from his security deposit or the proceeds of sale thereof.

Clause-8(b): Owing to difficulty in obtaining certain materials in the open market the Government has under taken to supply materials specified in the schedule hereto annexed. There may be delay in obtaining materials by the Department and the contractor is therefore required to keep himself in touch with the day to day position regarding the supply of materials from the Engineer-in-charge and to so adjust the progress of the work that their labour may not remain idle not 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.

Work to be executed in accordance with specification drawing and orders etc.

Clause-9 : The contractor shall execute the whole and every part of the work in the most substantial and workman like manner and both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also confirm exactly fully and faithfully to the designs, drawing 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 the inspection during office hour and the contractor shall, if the so require be entitled at his own expense to make or cause to be made copies of the specification , and of all such designs, drawings and instructions as aforesaid.

Do not invalidate contracts.

Extension of time and consequence of alterations

Clause-10 : The Engineer-in-charge shall have power to make any alterations in or additions to the original specifications, drawings designs and instructions that may appear to him necessary and advisable during the progress of work and the contractor shall be bound to carry out the work in accordance with any instructions which may be given to him in writing signed by the Engineer-in-charge and such alteration shall not invalidate the contract, and any additional work the contractor may be directed to do in the manner above specified as part of the work shall be carried out by the contractor on the same conditions in all respects on which he agreed to do the main work, and at the same rates as are specified in the tender for the main work.

Rates of work not in estimate or schedule of rates of the district.

The time for the completion of the work shall be extended in the proportion that the additional work bears 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 or work for which no rate is specified in this contract then such class of work shall be carried out at the rates entered in the sanctioned schedule of rates of the locality during the period when the work is being carried on and if such last mentioned class of work is not entered in the schedule of rates of the district then the contractor shall within seven days of the date of his receipt 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 his rate he shall by notices in writing be at liberty to cancel his order carry out such class or work and arrange to carry it out in such manner as he may consider advisable.

No deviation from the specification stipulated in the contract nor additional items of work shall ordinarily be carried out by the contractor nor shall any altered, additional or substituted work be carried out by him, unless the rates of the substituted, altered or additional items have been approved and fixed in writing by the Engineer-in-charge. The contractor shall be bound to submit his claim for any additional work done during any month on or before the 15th day of the following month accompanied by a copy of the order in writing of the Engineer-in-charge for the additional work if he fails to submit his claim within the aforesaid period.

Provide 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 rate or rates as shall be fixed by the Engineer-in-charge. In the event of a dispute, the decision of the Chief Engineer of the Project will be final.

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

Clause-11 : If any time after the commencement of the work the Government of Orissa shall for any reason whatsoever not 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 alternation having been made in the original specification drawing, design and instruction which shall involve any curtailment of the work as originally contemplated.

Action and compensation payable in case of bad work.

Clause-12 : If it shall appear to the Engineer-in-charge or his sub-ordinate-in-charge of the work, that any work has been executed with unsound, imperfect or unskillful workmanship or with materials of any inferior description or that any materials or articles provided by him for the execution of the work are unsound or of a quality inferior to that contracted for or otherwise not in accordance with the contract, the contractor shall on demand in writing from the Engineer-in-charge specifying the work materials or articles complained of notwithstanding that the same may have been inadvertently passed certified and paid for, forthwith rectify or remove or reconstruct the work so specified in whole or in part, as the case may require or as the case may be remove the materials or articles so specified and provide other proper and suitable materials or articles at his own proper charge and cost and in the event of his failing to do so within a period to be specified by the Engineer-in-charge in his demand aforesaid, then the contractor shall be liable to pay compensation at the rate of one percent on the amount of the estimate for every day not exceeding ten days, while his failure the Engineer-in-charge may rectify or remove and replace with others, the materials or articles complained of as the case may be at the risk and expense in all respects of the contractor.

Work to be opened to inspection Contractor or responsible agents to be present.

Clause- 13: All work under or in course of execution or executed in pursuance of the contract shall at all times be opened to the inspection and supervisions 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 inspection of the Engineer-in-charge or his subordinates to visit the works shall have been given to the contractor either himself be present to receive orders and instruction or have a responsible eager to duly accredited in writing present for that purposes. Order given the contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.

Notice to be given before work is covered up

Clause-14 : The contractor shall give not less than five day's notice in writing to 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 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 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 contractor's expense, or in default thereof on payment or allowance shall be made for such work or the materials with which the same was executed.

Contractor liable for damage done and or imperfection for 3 months after certificates.

Clause-15 : If the contractor or his work people, or servants shall break, deface, injure or destroy any part of a building, in which they may be working or any building, road, fence, enclosure, or grass land, or cultivated ground contagious 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 cause whatever or any imperfection became apparent in it within three months from the date of final certificate of its completions shall have been given by the Engineer-in-charge, as aforesaid, the contractor shall make the same good at his own expense, or in default, the Engineer-in-charge may cause the same to be made good by other workmen, and deducted the expense (of which the certificate of the Engineer-in-charge shall be final) from any sums that may be then, or any time thereafter may become due to the contractor, or from his security deposit or the proceeds of sale thereof, or of a sufficient portion thereof and the contractor shall be liable to pay any part of the expenses not so recovered by the Engineer-in-charge.

Contractor to supply plant, ladders, scaffoldings etc.

Clause-16 : The contractor shall supply at his own cost all materials (except such special, if any, as may in accordance with contract, be supplied from the Engineer-in-charge's stores) plants, tools &appliances, implements, ladders, cordage, tackle, scaffolding and temporary works requisite for the proper execution of the work, whether original, altered or substituted, and whether included in the specification or other documents forming part of the contract or referred to in these conditions or not or which may be necessary of the purpose of satisfying or complying with the requirement of the Engineer-in-charge as to any matter as to which under these conditions he is entitled to be satisfied which he is entitled to require together with carriage therefore to and from the work. The contractor shall also supply without charge the requisite number of persons with the means & materials necessary for the purpose of setting out works, and counting, weighing and assisting in the measurement or examination at anytime and from time to time of the work or materials. Falling his so doing the same may be provided by the Engineer-in-charge at the expense of the contractor and the expenses may be deducted from any money due to the contractor under the contract, or from his security deposit or the proceeds of sale thereof, or of a sufficient portion thereof. The contract shall also provide all necessary fencing and light required to protect the public from accident and shall be bound to bear the expenses of defense of every suit, action or other proceedings at law that may be brought 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 or proceeding to any such person or which may with the consent of the contractor be paid to compromise any claim by any such person.

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

Clause-17(b) The contractor shall employ one or more Engineering Graduates or Diploma holders as apprentices at his own cost if the work as shown in the tender exceeds Rs.25,00,000/- . The apprentices will be selected by the Chief Construction Engineer. The period of employment will commence within one month after the date of work order and would last till the date when 90% of the work is completed. The fair wage to be paid to the apprentices should be not less than the emolument of personnel or equivalent qualification employed under Government. The number of apprentices to be employed should be fixed by the Chief Construction Engineer in a manner so that the totalexpenditure does not exceed one percent of the tendered cost of the work.

Clause-17(c) AMENDMENT MADE IN WORKS DEPT. NO. CODES M-22/91-15384/9.7.93

Super Class/ Special Class contractor shall employ under him one Graduate Engineer and two Diploma Holders belonging to the State of Orissa like-wise 'A' class contractor shall employ under him one Graduate Engineer or two Diploma Holders belonging to State of Orissa.

The contractor shall pay to the Engineering personnel monthly emoluments of the personnel of equivalent qualification employed under the State Government of Orissa. The Engineer-in-Chief, R&B, Orissa may however, assist the contractor with names of such unemployed Graduate Engineers and Diploma Holders. If such engineer personnel appointed by the contractors should be intimated to the tender receiving authority along with the tender.

Each bill of the Super Class/Special Class and 'A' class contractor shall be accompanied by an employment roll of the engineering personnel together with a certificate of the graduate engineer or diploma holder as employed by the contractor to the effect that the work executed as per the bill has been supervised by him.

Work not to be sublet

Contractor may be rescinded and security deposit forfeited for subletting

Clause- 18: The contractor shall not be assigned or sublet without the written approval of the Superintending Engineer. And if the contractor shall assign or sublet his contract, or attempt to do so or become insolvent or commence any insolvency proceeding or make any composition with his creditor, or attempts to do so, 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 Government in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Superintending Engineer may thereupon by notice in writing rescind the contract and

bribing or if contractor becomes insolvent.

the security deposit of the contractor shall thereupon stand forfeited and be absolutely at the disposal of Government and the same consequences shall ensue as if the contract had been rescinded under clause- 2(b) hereof, and in addition the contractor shall not be entitled to recover or be paid for any work therefore actually performed under the contract.

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

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

Changes in constitution of firm

Clause-20: In the case of tender by partners, any change in the constitution of the firm shall be forthwith notified by the contractor to the Engineer-in-charge for his information.

In case of failure to notify the charge in the constitution within fifteen days, the Engineer-in-charge may by notice in writing rescind the contracts and the security deposit of the contractor shall thereupon stand forfeited and be absolutely at the disposal of Government and the same consequences shall ensue as if the contract had been rescinded under clause-2(b) hereof and in addition the contractor shall not be entitled to recover or be paid for any works thereof actually performed under the contract.

Clause-21: All work to be executed under the contract shall be executed under the direction and subject to the approval in all respects of the Chief Construction Engineer of the Project 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.

Lump sums in estimates

Clause-23: When the estimate on which a tender is made include 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.

Action where no specification.

Clause-24: In the case of any class of work for which there is no such specification as is mentioned in rule-1 such work shall be carried out in accordance with the circle specification and in the event of there being no circle specification, then in such case the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-charge.

Definition of works

Clause-25: The expression “works” or “work” used in these conditions shall unless there be something either in the subject or context repugnant to such construction, be constructed and taken to mean the works by or by virtue of the contract contracted to be executed, whether temporary or permanent, and whether original, altered, substituted or additional.

Clause-26: Government shall be entitled to recover in full from the contractor any amount that the Government may be liable to pay under Workmen’s Compensation Act VIII of 1923 to any workman 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 nor 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: Sanitary arrangements will be made by the contractor at his own cost for his labour camp.

Clause- 30: The contractor shall bear all taxes including income tax, fair-weather charges and tollage, where necessary.

Clause 31:Price Adjustment Attached separately as ANNEXURE-A, As Per Office Memorandum No. 0755690024019 / 15847/W, dated 19.11.2019 of Commissioner-cum-Secy. to Govt., Govt. of Odisha, Works Department.

Clause – 32 After the work is finished all surplus material 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. The ground up to 100'-0" wide from the building should be cleared and dressed.

FAIR WAGE CLAUSE

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

Explanation: "Fair wages" means wages, whether for time or price work prescribed by the State Public works Department provided that where higher rates have been prescribed under the Minimum Wages Act. 1948 wages at such higher rates would constitute "Fair wages" (W.D. No.22059 dt.16.8.77)

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

(c) In respect of all labour directly or indirectly employed in the works for the performance of the contractor's part of this agreement, the contractor shall comply with or cause to be complied with all regulation made by Government in regard to payment of wages, wage period deductions from wages, recovery of wages not paid and deductions unauthorizedly made, maintenance of wages register, wage cards, publication of scale of wages and other terms of employment, inspection and submission of periodical returns and all other matters of a like nature.

(d) The Engineer or Sub-Divisional Officer concerned shall have the right to deduct, from the money due to 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 workers non payment of wages or of deductions 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-à-vis the Government of Odisha, the contractor shall be primarily liable for all payments to be made under and for the observance of the regulations aforesaid without prejudice to his right to claim indemnity from his sub contractor.

(f) The regulations aforesaid shall be deemed to be part of this contract and any breach there of shall be breach of this contract.

(g) Under the provision of the Minimum Wages Act, 1948 & minimum wages (Central Rules, 1950) the contractor is bound to allow or cause, to allow to the labourers directly or indirectly employed in the works one day rest for six days continuous work and pay wages at the same rate as for duty, in the event of default. The Engineer or Sub-Divisional Officer concerned shall have the right to deduct the sum not paid on account of wages for weekly holiday to labourers and pay the same to the persons entitled there to from any money due to the contractor.

(h) The contractor shall at his own expense provide or arrange for the provision of foot wear for any labour doing cement mixing work and black topping of roads

(The contractor has undertaken to execute under this contract) to the satisfaction of the Engineer-in-charge and on his failure to do so Government shall be entitled to provide the same and recover the cost from the contractor.

(i) The contractor shall submit by the 4th & 10th of every month, to the Engineer-in- charge a true statement showing in respect of the Second half of the preceding month and the first half to the current month respectively (1) the number of labours employed by him on the work (2) their working hours (3) the wages paid to them (4) the accident that occurred during the said fortnight showing the circumstances under which they happened and the contend of damage and injure caused by them and (5) the number of female workers who have been allowed maternity benefit according the clause [K] and the amount paid to the Government a sum not exceeding Rs.70.00 for each default of materially incorrect statement. The amount levied as fine as per decision of the Engineer shall be final in deducting from any bill due to contractor.

(j) In respect of all labour directly employed in the works for the performance of the contractor's part of this agreement, the contractor shall comply with a cause to be complied with all the rules framed by Government from time to time for the protection of health and sanitary arrangement for workers employed by the Odisha Public Works Department and its contractor. This will apply to work places having 50 or more workers.

(k) Maternity benefit rules for female worker employed by contractor, Leave and pay during leave shall be regulated as follows.

TECHNICAL SPECIFICATIONS OF CIVIL WORKS

SECTION I: CIVIL WORKS STANDARD SPECIFICATION
TECHNICAL SPECIFICATION OF MATERIALS

1. Materials shall be of the approved quality best obtainable. A list of materials of approved brand and manufacturer is indicated in this document.. Testing of all materials of approved brand may have to be done at the discretion of Engineer-in-Charge/OSAMB.

2. In case, some reason or other materials are required to be obtained from any manufacturer other than those listed, then prior approval from Engineer-in-Charge/OSAMB will be necessary supported by relevant test certificates qualifying the required standard. Further tests as directed by the Engineer-in-Charge shall also be carried out by the Contractor at their own cost, if required.
3. Samples of all materials shall be got approved before placing order & the approved sample shall be carefully preserved in an appropriate manner at the site office for verification from time to time.

4. For standard bought out items, the sizes manufactured by the firms listed shall prevail when there is discrepancy in the size mentioned in the schedule without any financial adjustment.

5. Materials shall be tested in Testing Laboratory (approved by the Engineer-in-Charge) conforming to the requirements and frequency indicated in the list of "Mandatory Tests" CPWD / MORTH / BIS code. The test certificate in original shall be submitted to the Engineer-in-Charge and entire charges connected with testing including charges for repeated tests if ordered shall be borne by the Contractor.

6. It shall be obligatory for the Contractor to furnish certificate, if demanded by the Engineer-in-Charge/OSAMB from manufacturer or the material supplier that the work has been carried out by using their material and as per their recommendations.

7. All materials supplied by the specialist firms shall be properly stored and the Contractor shall be responsible for its safe custody until they are required on the works and till the completion of work.

8. All equipment & facilities for carrying out field tests on materials shall be provided by the Contractor without any extra cost.

9. Unless otherwise shown on the drawings or mentioned in the Schedule of quantities of special specifications the quality of materials, workmanship, dimensions etc. shall be specified hereunder and as per BIS specification.

9.1. EARTH FILLING:

Shall be selected earth suitable for filling as approved by the Engineer-in-Charge/OSAMB and preferably free from building rubbish or organic decomposed

materials. They shall be obtained either from excavation or brought from outside, as specified in the schedule of items. Black Cotton soil shall not be used for filling.

9.2 CEMENT :

Cement shall comply in every respect with the requirements of the latest publication of codes. **The use of cement other than ordinary Portland cement may be allowed with prior approval of Engineer-in-Charge/OSAMB.** If except P.P.C. *(Not less than 43 grade and equivalent of approved make) The weight of cement shall be taken as 1440 kg per cum (90 lbs per cft). Cement shall be measured by weight and in whole bags, and each undisturbed and sealed 50 kg. bag being considered equivalent to 35 litres (1.2 cft.) in volume. Care should be taken to see that each bag contain full quantity of cement. When part bag is required cement shall be taken by weight or measured in measuring boxes.

No other makes of cement but that approved by the Engineer-in-Charge will be allowed on works and the source of supply shall not be changed without approval of the Engineer-in-Charge/OSAMB in writing. Test certificates show that cement is fully complying the specifications shall be submitted by the Contractor to the Engineer-in-Charge/OSAMB. **Notwithstanding this cement brought on site shall be re-tested in an approved testing laboratory every 30 MT or part thereof to ensure quality of materials used.** In case manufacturers test certificate is not submitted the frequency of test shall be reduced to 30 MT or part thereof. Cement ordered for retesting shall not be used for any work pending results of retest.

Cement shall be restored in order to prevent deterioration by dampness or intrusion of foreign matters. It shall be stored in such a way as to allow the removal & use of cement in chronological order of receipt i.e., first received being first used. Cement deteriorated & or clodded shall not be used on work but shall be removed at once from the site. However, allowing use of warehouse set cement shall be determined by the Engineer-in-Charge/OSAMB whose decision in this regard shall be final and binding.

Weekly report of cement received and consumed shall be maintained by the Contractor at site and submitted to Engineer-in-Charge/OSAMB if called for. Theoretical consideration vis-a-vis materials brought at site by the Contractor shall also be submitted with proper documents with entry bill for verification. Cement Consumption shall be in accordance with the "CEMENT CONSUMPTION STATEMENT" - booklet issued for the work.

9.3 FINE AGGREGATE:

Sand shall be from natural source or crushed stone screenings, if allowed chemically inert, clean, sharp, hard, durable and well graded and free from excessive deleterious materials. The silt content shall be within 8%. If it excess washing shall be done in an approved manner to bring it within allowable limit.

The fine aggregate for concrete shall be graded and the fineness modulus may range between 2.60 to 3.20.

The fineness modulus of fine aggregate may range between 1.80 to 2.60 for plaster

work.

The fine aggregate shall be stacked carefully on a clean hard dry surface so that it will not get mixed up with deleterious foreign materials. If such a surface is not available a platform of planks or corrugated Iron sheets or brick floor or a thin layer of lean concrete shall be prepared.

9.4 COARSE AGGREGATE:

Shall consist of crushed or broken stone 95% of which shall be retained on 4.75 mm IS test Sieve. It shall be obtained from crushing Granite, Trap, Basalt or similar approved stones. Coarse aggregate shall be chemically inert when mixed with cement and shall be roughly cubical in shape and free from soft friable, thin laminated or flaky pieces.

9.5 STEEL REINFORCEMENT : HYSD BARS/TMT(Fe 415/Fe 500/Fe 550/ Fe500D/ Fe 550D) &

9.6

HIGH STRENGTH DEFORMED BARS :

Where of deformed high strength reinforcement bars conforming to IS: 1786-1956 shall be Used for a total requirement of less than 10 MT steel may be obtained from recognised dealers with prior approval of Engineer-in-Charge/OSAMB. It will be the sole responsibility of the Contractor to obtain steel from recognised manufacturer. The Contractor shall try to obtain test certificate from the manufacturers. Over and above the Contractor at his own cost shall arrange to get materials tested from any recognised Govt. approved Laboratory to ensure & satisfy the Engineer-in-Charge/OSAMB regarding compliance of the materials to relevant Indian Standard Codes. Sources of supply once approved by the Engineer-in-Charge/OSAMB shall not be changed without their prior consent.

Testing frequency shall be either one for 20.00 MT or part thereof/one for each individual sizes in a lot as per direction of the Engineer-in-Charge.

9.7 Fly Ash BRICKS:

The Fly Ash Bricks should be of regular and uniform size, shape and colour, free from cracks or other flaws. They shall show a fine grained, uniform homogenous and dense texture on facture and be free from cracks, air holes, or other defects which may in any way impair their strength, durability, appearance usefulness for the purpose intended. The overall quality of the Fly Ash Brick shall comply the requirements as per I,SCode 12894(2002) & as amended there to.

The brick shall have a minimum compressive strength of 75 kg per sq.cm. as specified in the nomenclature of the item. The bricks to be used for the work shall be approved by the Engineer-in-Charge.

9.8 WATER:

Water for mixing Cement mortar or concrete shall not be salty or brackish and shall be clean, reasonably clean and free from objectionable quantities of slit traces of oil, acid and injurious alkali, salts, organic matter and other deleterious materials which will either

weaken the mortar or concrete or cause effloresce or attack the steel in reinforced cement concrete. Water shall be obtained from sources approved by the Engineer-in-Charge/OSAMB. Potable water is generally considered satisfactory for mixing and curing concrete, mortar, masonry etc. Where water other than Municipal source is used this shall be tested in an approved testing laboratory to establish its suitability. All charges connected herewith shall be borne by the Contractor.The quality of water has to satisfy the stipulation of IS:456(Latest). The water shall be tested before use.

9.9 TIMBER:

Unless otherwise specified, timber for carpentry /joinery works of all description shall be Sal/Peasal or equivalent hard wood, seasoned naturally or artificially as indicated in Schedule. These shall be free from knots, shakes, fissure, flaws, sub-cracks and other defects to a reasonable extent. The moisture content for timber normally should not exceed the following limits -

	Kiln seasoned	Air seasoned
i) Timber for frames:	14%	16%
ii) Timber for Planking/Shutters etc.:	12%	14%

In measuring cross-sectional dimensions of timber for the frames/shutters styles, rails or panel members, tolerances upto 1.5 mm shall be allowed for each planed surface.

All fully fabricated timber shall be air seasoned at site of work for a period of not less than two months to allow for any shrinkage that may take place unless it is kiln seasoned. The decision regarding acceptance/rejection of material on the basis of aforesaid norms lies with the Engineer-in-Charge/OSAMB which is final and binding on the Contractor.

9.10 FLUSH DOORS / PANEL DOORS:

All flush doors shall be I.S.I. stamped and obtained from approved manufacturer as listed shall be solid core exterior grade unless otherwise specified.

9.11 STEEL WORK:

Steel Doors shall be fabricated out of steel sections conforming to I.S.226. They shall conform to I.S.: 1038. They shall be obtained from approved manufacturers as listed and the products.

9.12 UPVC WINDOWS AND VENTILATOR

UPVC windows & Ventilators shall be obtained from approved manufacturer.

9.13 FLOOR TILES :

Plain cement tiles, checkered tiles, mosaic tiles, terrazzo tiles shall be compacted by mechanical vibrator and hydraulically pressed and shall be obtained from approved manufacturer listed. It shall be of choice shade & shall have desired pattern of chip distribution. The size and thickness of tiles shall be as approved by the Engineer-in-Charge/OSAMB. For neutral shade tiles, grey cement shall be used.

9.14 VITRIFIED TILES :

White or coloured glazed premium quality tiles shall be obtained of an approved manufacturer and shall be flat and true to shape. They shall be free from cracks, crazing, spots, chipped edges and liners. The glazing and colour shall be uniform shade and unless otherwise specified the tile shall be as per manufacturer's specification.

9.15 MARBLE/GRANITE :

Marble slabs for flooring, dado, veneering, etc., shall be of the kind specified in the item such as white / pink Makrana, Chittor black, Bhansalana black, Jaisalmer yellow, Baroda Green, Patiala(Pepsu) grey, etc. Marble from which the slants are made shall be of selected quality, hard, sound, dense and homogeneous in texture, free from cracks, decay, weathering and flaws. Before starting the work the Contractor shall get the sample of marble slab approved by the Engineer-in-Charge.

The slabs shall be machine cut and machine polished.

9.16 KOTA STONE:

Shall be of selected quality, hard, sound, dense and homogenous texture, free from cracks, decay, weathering and flaw stone slabs shall be approved by the Engineer-in-Charge. They shall be machine polished where specified and shall conform to the required sizes. Thickness shall be as specified in the respective items.

9.17 PAINTS:

Distemper and oil bound distemper, cement primer, oil paint, enamel paint, plastic emulsion paint, anti-corrosive primer, red lead, water proof cement paint shall be of an approved manufacturer as listed. Ready mixed paint shall be of an approved manufacturer without any admixture shall be used, except for addition of thinner, if recommended by the manufacturer.

9.18 CEMENT ADMIXTURES:

Cement admixture are to be obtained from approved manufacturer / supplier with the explicit approval of the Engineer-in-Charge/OSAMB. The use of admixture containing calcium chloride, fluorides, nitrates and suplhates is prohibited.

9.19 HARDWARE FITTINGS:

The hardware fittings, iron or Aluminum / Brass / anodized shall be of approved manufacturer and invariably is stamped. The MS iron fittings are to be oxidised & aluminum fittings anodised in natural colour mat satin finish even if not otherwise specified.

9.20 POLYSULPHIDE SEALANT :

Polysulphide sealant should be obtained from approved manufacturer.

9.21 CEMENT MORTAR :

Cement mortar shall be of proportions specified for each type of work in the schedule. It shall be composed of approved cement and sand. The ingredients shall be accurately gauged by measure and shall be well & evenly mixed preferably in a mechanical mixture. Care being taken not to add more water than is required. No mortar that has begun to set shall be used.

If hand mixing is approved, then it shall be done on pucca water proof platform. The gauged materials shall be put on the platform and mixed dry. Water will then be added and the whole mixed again until it is homogenous and of uniform colour.

A. SITE CLEARANCE & EARTH WORK

1.0 SCOPE:

This specification covers site clearance, excavation in all kinds of soils, soft and decomposed rock not requiring blasting, dewatering, filling around foundations to grade, compaction of fills and approaches, protective fencing, lighting etc. relevant to structures and locations covered under the scope of this contract.

1.1 GENERAL:

The excavation will generally refer to open excavation of foundation area wet or dry in all sorts of soils at any depth, unless otherwise specified except hard rocks for which separate provisions are made.

1.2 EXAMINE THE SITE :

The Contractor shall visit and ascertain the nature of the ground to be excavated and the work to be done and shall accept all responsibility for the cost of the work involved.

1.3 SETTING OUT:

The Contractor shall clear the entire site of jungles, bushes, grass, vegetation growth & trees & generally level the site and set out the centre line of the building or other involved works & get the same approved from Engineer-in-Charge/OSAMB. It shall be the responsibility of the Contractor to install substantial references marks, bench marks etc., and maintain them as long as required by the Engineer-in-Charge. The Contractor shall assume full responsibility for proper setting out, alignment, elevation and dimension of each and all parts of the works.

1.4 GROUND LEVEL AND SITE LEVEL:

Before starting the excavation, the existing ground level of the entire plot shall be taken by the Contractor in consultation with the Engineer-in-Charge/OSAMB and a proper record of these levels kept, which shall be jointly signed by the Contractor & the Engineer-in-Charge/OSAMB.

1.5 CLEARING AND GRUBBING:

The area to be excavated or filled shall be cleared out of fences, trees, logs, stumps, bush, vegetation, rubbish, slush, etc. and levelled up. Trees upto 300 mm girth shall be uprooted. Trees above 300 mm girth to be cut, shall be approved by the Engineer and then marked. Felling of trees shall include taking out roots upto 600 mm. below ground level or 150 mm below formation level whichever is lower. After the tree is cut and roots taken out the pot-holes formed shall be filled with good earth in 250 mm layers and consolidated unless directed by the Engineer otherwise. The trees shall be cut in suitable pieces as instructed by the Engineer.

Before earthwork is started, all the soils and unserviceable materials and rubbish shall be burned or removed from the site to approved disposal areas as may be specified. Ash shall be spread or removed. Useful materials, saleable timber, firewood, etc. shall be the property of the Owner and shall be stacked properly at the worksite in a manner

as directed by the Engineer.

1.6 EXCAVATION OF FOUNDATION AND TRENCHES:

1.6.1 GENERAL:

Excavation shall include removal of all materials of whatever nature, including moorum, soft rock, boulders, old foundations, concrete, asphalt or paved surfaces etc. at all depths & whether wet or dry as necessary the construction of foundation mass excavation for basement floor, septic tanks etc. where applicable exactly in accordance with lines, levels, grades and curves shown in the drawings or as directed by the Engineer. **Should the Contractor excavate to a greater depth or width than shown on the drawings, he shall at his own expensed fill the extra depth or width in cement concrete in proportion as directed by the Engineer but in no case with concrete of mix leaner than 1:5:10 cement concrete.**

The Contractor shall report to the Engineer-in-charge when the excavations are ready to receive concrete. **No concrete shall be placed in foundations until the Contractor has obtained Owner/Engineer's approval.** In case, the excavation is done through different strata of soil and if the same is payable as per provision in the Schedule of Quantities the Contractor shall get the dimensions of the strata decided by the Engineer for payment. If no specific provisions is made in the Schedule of Quantities it will be presumed that excavation shall be in all types of strata & the Contractor's rate shall cover for the same which are treated as a single entity.

After the excavation is passed by the Engineer-in-Charge & before laying the concrete, the Contractor shall get the depth & dimensions of excavation levels, and nature of strata (As applicable as per Schedule of Quantities) like hard rock, soft rock etc.) measurement recorded from the Engineer-in-charge.

1.6.2 ORDINARY SOIL, HARD SOIL, LATERITE ROCK ,SOFT/DECOMPOSED ROCK:

The excavation in ordinary soil, hard soil, soft and decomposed rock will be carried out as per the approved proposal, modified and corrected where necessary by the Engineer. The work will be carried out in a workmanlike manner without endangering the safety of nearby structures / services or works and without causing hindrance to other activities in the area. As the excavation reaches the required dimensions, lines, levels and grades, the work will be checked by the Engineer thoroughly and the balance work will be carried out carefully to avoid any over-excavation. On completion, the work Earth work will be finally checked and approved by the Engineer. In certain cases, where deterioration of the ground, upheaval, slips, etc. are expected, the Engineer may order to suspend the work at any stage and instruct the Contractor to carry out the balance work just before the foundation work of the structure can be started. No extra will be paid to the Contractor for such unavoidable temporary suspension of work.

1.6.3 HARD ROCK & LATERITE ROCK:

Rock which is in solid beds, which can only be removed whether by blasting or by wedging or chiseling shall be treated as hard rock. A boulder or detached rock measuring one cubic metre or more shall also be treated as hard rock. If the same cannot be removed with blasting, wedging or chiseling, Jack hammer with compressor shall be used.

Where blasting is not practicable or prohibited, excavation shall be done by wedging or chiseling and it shall be restricted to the quantity required to enable the necessary foundations etc., to be put in. **In case the dimension of trenches, exceed those shown in drawings, the excess quantity shall not be paid for.** The item also covers bailing out sub-soil or rainwater, including pumping at any stage of the work, shoring, strutting etc.

1.7 STACKING OF EXCAVATED MATERIALS:

All materials excavated will remain the property of the owner. The excavated materials, at first instance shall be sorted as directed by the Engineer-in-Charge and stacked appropriately at site in conformity with standard safety codes before they are disposed off and leveled within the site at locations directed by the Engineer-in-Charge.

Materials suitable and useful for back filling or leveling of the plot or other use shall be stacked in convenient places in such a way so as not to obstruct free movement of man, animals & vehicles encroach on the area required for constructional purposes. The cost on account of disposal within the site will not be additionally paid for.

All excavated material shall not be deposited within 1.5m from the top edge of the excavation.

1.8 DISPOSAL OF SURPLUS EXCAVATED MATERIALS:

All surplus material from excavation shall be carried away from the excavation site to designated disposal area selected by the Engineer.

All good and sound rock excavated from the pits and all assorted materials of dismantled structures shall be the property of the Owner and if the Contractor wants to use it, he shall have to obtain it from the Engineer at a mutually agreed rate for the same.

All sound rock and other assorted materials like excavated bricks etc. shall be stacked separately and shall be measured in stacks deducting 30% volumetric measure for voids.

All excavated materials certified as surplus and not useful shall be removed by the Contractor conforming to local civic regulations from the site in an approved manner at locations to be arranged by him and shall be paid as a separate item as in schedule of quantities.

The item of removal of surplus excavated materials shall only be undertaken by the Contractor when specific instruction in this regard has been obtained from the owner / Engineer-in-Charge.

1.9 PROTECTION:

The Engineer shall be notified by the Contractor as soon as the excavation is expected to be completed within a day so that it may be inspected by him at the earliest. Immediately after approval of the Engineer, the excavation must be covered up in the shortest possible time. But, in no case the excavation shall be covered up or worked on before approval and measurement by the Engineer.

Excavated material shall be placed beyond 1.5 metres from the edge of the pit or trench or half the depth of the pit or trench whichever is more or further away if directed by the Engineer.

If instructed by the Engineer-in-Charge all foundation pits and similar excavations shall be strong fenced and marked with red lights at night in charge of watchman to avoid accidents, adequate protective measures shall be taken to see that the excavation does not affect or damage adjoining structures.

All measures required for the safety of the excavations, the people working in and near the foundation trenches, and people in the vicinity shall be taken by the Contractor at his own cost. The Contractor will be entirely responsible for any injury or damage to property caused by his negligence or accident due to his constructional operations.

1.10 DEWATERING:

Rate for excavation shall include bailing or pumping out water which may accumulate in the excavation during the progress of work wither from seepage, springs, rain or any other cases and diverting surface flow if any by bunds or other means. Pumping out water shall be done in such approved manner as to preclude the possibility of any damage to the foundation trench concrete or masonry or any adjacent structure. When water is met in foundation trenches of in tank excavations, pumping out water shall be from auxiliary pit of adequate size dug slightly outside the building excavations. The depth of auxiliary pit shall be more than the working foundation trench levels. The auxiliary pit shall be refilled with approved excavated materials after the dewatering is over.

The excavation shall be kept free from water, during inspection and measurement/ Pouring of concrete/ masonry work.

When concrete and/or masonry are in progress and till they come above the natural water level and Till the Owner/ Engineer-in-Charge consider that the concrete mortar is sufficiently set.

1.11 SHORING:

The sides of the excavations, if required, should be protected by shoring in such a way as is necessary to secure them from falling in and the shoring shall be maintained in position as long as necessary. The Contractor shall be responsible for the proper design of the shoring to hold the sides of the excavation in position and ensuring safety and injury to persons and properties etc. The shoring shall be removed as directed after the items for which it is required are completed.

1.12 BACKFILLING:

1.12.1 General:

The material used for backfilling shall consist of material, approved by the Engineer obtained directly from nearby areas where excavation work by the same agency is in progress, from temporary stacks of excavated soils or from borrow pits from selected areas designated by the Engineer. The material shall be free from lumps and clods, roots and vegetation, harmful salts and chemicals, organic materials, etc.

1.12.2 Filling and compaction in Pits and Trenches around structure:

All shoring and form work shall be removed after their necessity ceases & trash of any sorts shall be cleaned out from the excavation. All space between foundation masonry or concrete and the sides of excavation shall be refilled to the original surface with approved excavated materials in layers 15.00 cm. in thickness watered & rammed with iron and wooden rammers weighing 7-8 kg. with a base of 20 cm. square or 20 cm. diameter. The filling shall be done after concrete or masonry is fully set and done in such a way as not to cause undue thrust on any part of the structure where suitable excavated materials is to be used for refilling it shall be brought from the place where it is temporarily stacked and used in refilling.

No excavation of foundation shall be filled in or covered up until all measurements of excavations, masonry concrete and other works below ground level are jointly recorded. Black cotton soil shall not be used for backfilling or in plinth filling.

No extra payment will be made for shoring, dewatering, safety and protection during execution.

1.13 CODES AND STANDARDS

All works under this specification, unless specified otherwise, shall confirm to the latest revision and/or replacement of the following or any other Indian Standard Specification and Codes of practice. In case any particular aspect of work is not covered specifically by Indian Standard Specifications any other standard practice as may be specified by the Engineer shall be followed:

IS: 3764	:	Indian Standard for Safety Code for Excavation work.
IS: 1200	:	Indian Standard Method of Measurement of Building and Civil Engineering work, Part-I, Earth work

B. ANTI-TERMITE TREATMENT:

1.0 SCOPE:

The scope of work is to set up a chemical barrier against attack by subterranean termites while the building is under construction.

1.1 GENERAL:

All work shall in general be executed as specified in IS: 6313 Part II-1981 and as per approved specification of the agency.

All necessary work to ensure uniform distribution and proper penetration of treatment of treating solution shall be done according to the instruction of the Engineer.

Soil treatment shall not be done when it is raining or when the soil is wet with rain or subsoil water. Once formed, the treated soil barrier shall not be disturbed.

1.2 CHEMICALS AND RATE OF APPLICATION:

Any of the following chemicals (conforming to relevant Indian Standards) in water emulsion shall be applied by pressure pumps, uniformly over the area to be treated.The tender shall clearly indicate along with the quotation the chemical he proposed to use. A daunt record shall be maintained by the Contractor indicating the amount of work done and the quantity of chemical consumed for the work. This record shall be the property of the Management.

1.3 SAFETY PRECAUTIONS:

Chemical used for anti-termite treatment are insecticides with a persistent action and

are highly poisonous. This chemical can have an adverse effect upon health when absorbed through the skin, inhaled as vapours or spray mists or swallowed.

The containers having emulsifiable concentrates shall be clearly labelled and kept securely closed in stores so that children or pet cannot get at them. Storage and mixing of concentrates shall not be done near any fire source or flame. Persons using these chemical shall be warned that absorption though skin is the most likely source of accidental poisoning. Particular care shall be taken to prevent skin contact with concentrates and prolonged exposure to dilute emulsion shall also be avoided. After handling the concentrates or dilute emulsion, Workers shall wash themselves with soap and water and wear clean clothing, especially before eating. In the event of severe contamination, clothing shall be removed at once and the skin washed with soap and water. If chemical has splashed into the eyes, they shall be flushed with plenty of soap and water and immediate medical attention shall be sought.

Care should be taken in the application of chemicals to see that they are not allowed to contaminate wells or springs which serve as source of drinking water.

1.4 METHOD OF APPLICATION

1.4.1 TREATMENT FOR MASONARY FOUNDATION AND BASEMENT

The bottom surface and sides (Up to a height of 30cm from the bottom) of the excavations made for masonry foundations and basements shall be treated with the chemical emulsion mentioned above at 5 Litres per sqm of surface area.

1.4.2 TREATMENT TO BACKFILL EARTH:

After the masonry foundation and retaining walls of the basement come up the backfill in immediate contact with the foundation structure shall be treated with the chemical emulsion at the rate of 7.5 Litres per sqm of the vertical surface of the sub-structure for each side. The earth is usually returned in layers & the treatment shall be carried out in similar stages.

1.4.3 TREATMENT FOR R.C.C. FOUNDATION & BASEMENT:

In the case of R.C.C. foundation (1:2:4) mix or richer, the treatment shall start at a depth of 50cm below the ground level except when ground level is raised or lowered by filling or cutting after the foundations have been cast. In such case the depth of 50cms shall be determined from the new soil level resulting from filling or cutting mentioned above and soil in immediate contract with the vertical surface of R.C.C. foundations. From this depth the backfill around the columns, beams and R.C.C. basement walls shall be treated at the rate of 7.5 Litres per sqm.

1.4.4 TREATMENT OF TOP SURFACE OF PLINTH FILLING

The top surface of the consolidated earth within the walls shall be treated with the chemical emulsion at the rate of 5 Litres, per sqm, of the surface before the sand bed or sub grade is laid. If the filled earth bas been well rammed and the surface does not allow the emulsion to seep through, holes up to 50 to 75 mm deep at 150mm centre as both ways may be made with 12mm di a M.S. rod on the surface facilitate absorption of the emulsion.

1.4.5 TREATMENT AT JUNCTION OF WALLS & FLOOR:

A small channel 3x3 cm., shall be made at all the junctions of walls and columns with

the floor (Before laying the sub grade) & rod holes made in the channel up to ground level 15 cm apart the rod moved backward and forward to break up the earth & chemical emulsion poured along the channel at the rate of 7.5 liters, per sqm of the vertical wall or column surface of the sub-structure so as to soak the soil right to the bottom.

1.4.6 TREATMENT OF SOIL ALONG EXTERNAL PERIMETER OF BUILDING:

After the building is complete the earth along the external perimeter of the building should be redden at intervals of 15 cm & to a depth of 300 cm. The rods should be moved backward and forward parallel to the wall to break up the earth and chemical emulsion poured along the wall at the rate of 7.5 Liters per sqm of vertical surfaces. After the treatment the earth should be tamped back into place.

1.4.7 TREATMENT OF SOIL SURROUNDING PIPES WASTES AND CONDUITS:

When pipes, wastes and conduits enter the soil inside the area of the foundation, the soil surrounding the point of entry must be loosened around each such pipe waste or conduits for a distance of 15cm and up to a depth of 7.5 mm before the treatment is commenced. When they enter the soil external to the foundations, they shall be similarly treated unless they stand clear of the walls of the building by about 7.5cm for a distance of over 30cm.

1.4.8 SPRAYING EQUIPMENT:

A pressure pump shall be used to carry out spraying operations to facilitate proper penetration of chemicals into the earth.

1.4.9 GUARANTEE: 10 YEARS

Any treatment becoming necessary subsequently during the guarantee period, required inspection and treatment shall be carried out free of cost.

1.4.10 INSTRUCTIONS TO CONTRACTOR FOR QUOTING RATES:

The tenderer should include in his rates given in schedule of Quantities in sq. meter area all the stages of treatment to bottom foundation, sides of trenches, underside of the floor, underside/ damp proof course, in the outer face of external wall up to window sill level, door and window frames to ground floor area, which comes in with contact the brick wall and finally the trench treatment all-round the buildings as per detailed specifications mentioned above. Payment will be made on the plinth area measurement and the rates for the same should include all the stages of work as mentioned above and no extra on this account will be entertained.

1.4.11 CODES AND STANDARDS:

Relevant code applicable for this Specification.

IS: 6313 (Part-II) 1981: Code of Practice of Anti-Termite Measures in Buildings

C. PLAIN AND REINFORCED CEMENT CONCRETE

1.0 GENERAL:

The provisions for Indian Standards for Plain and Reinforced concrete, mild steel, hot rolled deformed bars, cold twisted bars etc., to be used as reinforcement, cement of different qualities, coarse and fine aggregates, water to be used in concrete and other Indian Standards specifications should be generally applicable except where they are varied by the requirements of these specifications. It shall be the intent of

these specifications to ensure that all concrete placed at various locations of the job should be durable, should wear well and practically impervious to water. It should free from defects like cracking, honey combing etc.

All concrete work shall be carried out by the Contractor under the supervision of an experience civil Engineer sufficiently experienced in this type of work.

I.S. code under reference should mean the latest codes together with amendments in circulation at the time of awards of the contract.

I.S. 456 shall form a part of this specification and shall be complied with unless permitted otherwise. For any particular aspect not covered by this code, appropriate IS code, **CPWD specifications** code & MORTH and/or replacement by any International Code of practice as may be specified by the Engineer shall be followed. All Codes and Standards shall conform to its latest revisions.

1.1 SCOPE:

This specification covers the general requirements for concrete to be used on jobs using on-site production facilities including requirements in regard to the quality, quantity, handling, storage of ingredients, proportioning, batching, mixing, and testing of concrete and also requirements in regard to the quality, storage, cutting, bending and fixing of reinforcement in position. This also covers the transportation of concrete from mixer to the place of final deposit and placing, curing, protecting, repairing and finishing of concrete.

1.2 CONCRETE:

1.2.1 MATERIALS:

1.2.1.1 CEMENT:

Cement used in any concrete work shall be Portland slag cement conforming to IS 455 but having crushing strength of 43 Mpa in cement mortal 1:3 on 28 days strength and may be measured by weight or in a standard bag to weight 50 Kg. having a volume of 0.04 cum. It shall have the adhesive and cohesive properties necessary strength and durability. Reference to cement in the following paragraph shall mean Portland slag cement. In case the engineer or his representative directed use of cement like rapid hardening Portland cement as per IS 8041-1990 or any other grade of Portland cement the same shall be used at any stage of the work as directed. Cement of approved (by engineer-in-charge) manufacturer is only to be used in the work.

The cement shall be stored in such a manner as to permit easy access for proper inspection handling and identification of each shipment and in suitable water tight and well-ventilated building that will protect the cement from dampness. It should be kept on wooden platform of at least 300mm high.

Only one brand of cement may be used in the contract except by written permission of the Engineer. Different types of cement shall be stored separately and shall not be mixed. Only such cement, manufacturers of which approved by the Engineer shall be used in the work. Works executed by the cement of unapproved manufacturers shall not be accepted.

The cement shall be protected from moisture and damage in transit and shall be stored on the site in a store provided with a wooden floor raised not less than 300mm above the ground.

Batches of cement shall be used for the work in the order in which they are delivered to the site.

Notwithstanding any previous acceptance any bag of cement containing materials, which has hardened or otherwise deteriorated shall be rejected for any cause shall be removed from the site immediately.

Cement, which has been stored at site for more than two months from the date of manufacture, (as printed over the container by manufacturer) shall not be used for the work and removed from the site immediately.

The contractor shall deliver the samples of cement collected for the work to the engineer in charge for his approval after necessary tests in a reputed material testing laboratory of the state. After getting the approval from the engineer in charge, the contractor shall use the cement in construction works. In the event of any s sample being found to be not in accordance with relevant Indian Standard, he whole consignment from which the samples come shall be rejected and removed from the site immediately notwithstanding any previous acceptance on the strength of the manufacturer's certificate.

Use of re-bagged cement will not be allowed.

1.2.1.2 FINE AGGREGATE:

The fine aggregate shall be sand or any other inert materials having similar characteristics and shall consist of hard, strong uncoated particles free from injurious amounts of organic or other deleterious substances. To obtain such an aggregates, screening or washing or both as may be directed by the Engineer shall be employed shall be employed. It shall be uniformly graded from fine to coarse with the following limits as least or specification by the Engineer.

Sl. No.	IS Sieve No.	Percentage (%) passing by Weight
1	10mm	100
2	4.75mm	90-100
3	2.36mm	85-100
4	1.18mm	75-100
5	600 micron	60-79
6	300 micron	12-40
7	150 micron	10

Fine aggregate from different sources of supply shall not mixed or stored in the same pit and not used alternately in the same class of construction without permission from the Engineer.

Fine aggregate shall not contain silt or other fine materials exceeding 5% by volume

when tested according to the standard method shall neither contain organic material in sufficient quantity to show a darker colour than the standard depth of colour no.3 when tested according to the method in British standard 812, clause 28: "Organic Impurities". The grading of the fine aggregate shall be at least within the limits of grading zones II to III as defined in IS 383 table IV. The sand shall be completely free from chloride acidic or any other deleterious constituent.

A sample of the sand to be used in the work shall be submitted to the engineer for the prior approval in accordance with clause stated above.

Fine aggregate shall be stored at the site in such a manner that it is not contaminated by coarse aggregate, earth or other foreign materials.

The moisture content of the fine aggregate on the site shall be determined daily before concrete mixing is commenced. The amount of water to be added to each batch shall be adjusted on the direction of the engineer to allow for the moisture content of the fine aggregate. This test shall be repeated whenever there is reason to believe that the moisture content of the fine aggregate has changed since the previous test was made.

1.2.1.3 COARSE AGGREGATE:

Coarse aggregate may consist of 20mm down grade-crushed stone chips carefully and properly graded shown in the table below. All coarse aggregate shall be screened and washed and shall consist of clear well shaped cubical practices free from splintered or flaky particles soil organic matter or any detritus materials. A representative shall be produced for approval and the materials used in the works shall not be inferior to the approved. The grading of coarse aggregate shall be within the following limits and also within the limits of the relative grading in IS 383, table II.

IS Sieve	**Percentage passing for single sized aggregate of nominal size**					
	63mm	**40mm**	**20mm**	**16mm**	**12.5mm**	**10mm**
80mm	100	-	-	-	-	-
63mm	85-100	100	-	-	-	-
40mm	0-30	85-100	100	-	-	-
20mm	0-5	0-20	85-100	100	-	-
16mm	-	-	-	85-100	100	-
12.5mm	-	-	-	-	85-100	100
10mm	0-5	0-5	0-20	0-30	0-45	85-100

IS Sieve	**Percentage passing for graded aggregate of nominal size**			
	63mm	**40mm**	**20mm**	**16mm**
80mm	100	-	-	-
63mm	-	-	-	-
40mm	95-100	100	-	-
20mm	30-70	95-100	100	100

16mm	-	-	90-100	-
12.5mm	-	-	-	90-100
10mm	10-35	25-55	30-70	40-85
4.75mm	0-5	0-10	0-10	0-10

Coarse aggregate shall be stored at site in such a manner that is not contaminated by fine aggregate, earth or other foreign materials. Adequate precautions shall be taken to prevent segregation of the coarse aggregate while it is being transported and stacked.

1.2.1.4 WATER:

Water used for both mixing and curing shall be clean and free from injurious amounts of deleterious materials which are likely to affect the strength or durability of concrete. Water containing any sugar shall not be allowed for use. Water is to be tested in accordance with I.S. 456 of latest edition. The pH values of water shall generally be not less than 6.

1.2.1.5 ADMIXTURE:

When required, Admixtures of approved quality shall be mixed with concrete with prior approval of Engineer-in-Charge. The admixture used in concrete shall confirm to IS: 9103.

1.2.2 MIX PROPORTION :

The mix proportions shall be selected to ensure that the workability of the fresh concrete is suitable for the conditions of handling and placing, so that after compaction it surrounds all reinforcements and completely fills the form work.

1.2.3 NOMINAL MIX CONCRETE:

Nominal mix concrete may be used for concrete of grades M5, M7.5, M10, M15 & M20. The proportions of materials for nominal mix concrete shall be in accordance with IS Specification /as per direction of Engineer-in-Charge . The proportions of fine to coarse aggregates should be adjusted from upper limit to lower limit progressively as the grading of the Fine aggregates become finer and the maximum size of coarse aggregates becomes larger. Graded coarse aggregate shall be used.

The cement content in the mix for any nominal mix be proportionately increased as per mix design to overcome the difficulties of placement & compaction, so that the water cement ratio as specified is not changed.

In the case of vibrated concrete, the limit of water cement ratio & aggregate cement proportion may be suitably reduced to avoid segregation.

The quantity of water used in the reinforced concrete work should be sufficient, but not more than sufficient to produce a dense concrete of adequate workability for it purpose, which will surround and properly grip all the reinforcement. Workability of concrete should be controlled by maintaining a water content that is found to give a concrete which is just sufficiently wet to be placed and compacted without difficulty with the means available.

1.2.4 PRODUCTION AND CONTROL OF CONCRETE:

In proportioning concrete the quantity of cement should be determined by mass. Where mass of cement is determined on the basis of mass of cement per bag, a reasonable number of bags should be weighed periodically to check the net mass. Where the cement is weighed on the site & not in bags it should be weighed separately from the aggregates. Water should be either measured by volume in calibrated tanks or weighed. All measuring equipment should be maintained in a clean serviceable condition and their accuracy periodically checked.

Except where it can be shown to the satisfaction of Engineer-in-Charge that supply of properly graded aggregate of uniform quality can be maintained over the period of work, the grading of aggregate should be controlled by obtaining the coarse aggregate in different sizes & blending them in right prop. When required, the different sizes being stocked in separate stockpiles. The grading of coarse and fine aggregate should be checked as frequently as possible to ensure that the specified grading being maintained. The quantities of coarse and fine aggregate will be proposed as required in design mix. No changes in proportions or substitutions in materials shall be made without additional tests to show the quality and strength of materials satisfactory.

To maintain water cement ratio constant determination of moisture content of both coarse and fine aggregates shall be made as frequently as possible. Frequency being decided by the Engineer-in-Charge depending on the weather conditions. The amount of added water should be adjusted to compensate for the observed variation of the moisture content. I.S. 2386 should be referred for the aggregate.

1.2.5 MIXING:

Concrete shall always be mixed in mechanical mixer unless specifically approved by the Engineer for concrete to be used in unimportant out of the way locations in small quantities. Water shall not normally be charged into the drum of the mixer until all the cement and aggregates constituting the batch are already in the drum and mixed for at least one minute. Mixing of each batch shall be continued until there is a uniform distribution of the materials and the mass is uniform in colour and consistency, but in no case shall mixing be done for less than 2 (two) minutes and at least 40 (forty) revolutions after all the materials and water are in the drum. When absorbent aggregates are used or when the mix is very dry, the mixing time shall be extended as may be directed by the Engineer. Mixers shall not be loaded above their rated capacity as this prevents thorough mixing.

The entire contents of the drum shall be discharged before the ingredients for the next batch are fed into the drum. No partly set or remixed or excessively wet concrete shall be used. Such concrete shall be immediately removed from site. Each time the work stops, the mixer shall be thoroughly cleaned and when the next mixing commences, the first batch shall have 10% additional cement at no extra cost to the Owner to allow for loss in the drum. Regular checks on mixer efficiency shall be carried out as directed by the Engineer as per IS:4634 on all mixers employed at site.

Only those mixers whose efficiencies are within the tolerances specified in IS: 1791 will be allowed to be employed.

Ingredients for design mix concrete shall be measured by weight. For small jobs portable Swing weigh Batchers conforming to IS: 2722 may be used.

Batching plant conforming to IS: 4925 shall be used for large jobs. The accuracy of the measuring equipment shall be within q 2% of the quantity of cement, water or total aggregates being measured and within q 5% of the quantity of any admixture being used. The batching equipment shall be fitted with an accurate mechanism for weighing separately the cement, fine aggregate and coarse aggregate. Water may be measured by volume or by weight. All measuring equipment should be maintained in a clean serviceable condition and their accuracy shall be checked periodically.

Mechanical/Electrical control shall be provided on the mixing equipment to ensure the batch cannot be discharged until approved mixing time has elapsed and the entire batch shall be discharged before the mixer is recharged.

Where admixtures are employed, separate containers and measuring devices shall be used.

For minor concreting works, batching by volume according to specific weight may be permitted by the Engineer. In that case the whole bags of cement shall be used and gauge boxes used for measuring aggregates.

When hand mixing is permitted by the Engineer, it shall be carried out on a water-tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. In case of hand-mixing, 10% extra cement shall be added to each batch at no extra cost to the Owner.

Workability of concrete should be controlled by direct measurement of water content, and it should be checked at frequent intervals, for nominal mix workability measured by slump test may have the values given in Table below :-

Placing Conditions	**Degree of workability**	**Slump (mm)**
(1)	**(2)**	**(3)**
Blinding concrete ; Shallow sections ; Pavements using pavers	Very low	See 7.1.1
Mass Concrete ; Lightly reinforced sections in slabs, beams, walls, columns; Floors; Hand placed pavements; Canal lining; strip footings Heavily	Low	25-75
reinforced sections in slabs, beams, walls, columns; Slip form work; Pumped concrete	Medium	50-100 75-100

Trench fill; In-situ piling	High	100-150
Tremie concrete	Very High	See 7.1.2

NOTE : For most of the placing conditions, internal vibrators (needle vibrators) are suitable. The diameter of the needle shall be determined based on the density and spacing of reinforcement bars and thickness of sections. For tremix concrete, vibrators are not required to be used.

1.2.6 CASTING

1.2.6.1 TRANSPORTING:

Concrete shall be handled and conveyed from the place of mixing to the place of laying as rapidly as practicable by approved means and placed and compacted in the final position before the initial setting of the cement starts. Concrete should be conveyed in such a way as will prevent segregation or loss of any of the ingredients. For long distance haulage, agitator cars of approved design will be used. If, inspite of all precautions, segregation does occur during transport, the concrete shall be properly remixed before placement. During very hot or cold weather, if directed by the Engineer, concrete shall be transported in deep containers which will reduce the rate of loss of water by evaporation or loss of heat. If necessary, the container may have to be covered and insulated. Conveying equipments for concrete shall be well maintained and thoroughly cleaned before commencement of concrete mixing. Such equipments shall be kept free from set concrete.

1.2.6.2 PLACING:

The concrete shall be deposited as nearly as practicable in its final position to avoid re-handling. The concrete shall be placed and compacted before setting commences and should not be subsequently disturbed. Methods of placing should be such as to preclude segregation. Care should be taken to avoid displacement of reinforcement or movement of form work. Concrete shall not be dropped into position from a height greater than 2.0 metre. Incase of concreting work in multistoried buildings cranes, hoists & lifts with concrete pumps may be utilized for placing of concrete as per direction of Engineer-in-charge.

1.2.6.3 COMPACTION :

Concrete should be thoroughly compacted and fully worked around the reinforcement embedded, fixtures into corners of the form work. Mechanical vibrators should generally be used as per I.S.2505, I.S.2514, and I.S.4656. Over vibration of very wet mixes is harmful and should be avoided, under vibration is harmful.

Whenever vibration is to be applied externally the design of form work and the disposition of vibrators should receive special consideration to ensure efficient compaction, and to avoid surface blemishes.

Beams and columns shall be vibrated using immersion vibrators. Then sections like walls of water tanks, chajjas, aprons etc. should be vibrated using surface vibrators. It is better to vibrate in smaller intervals for short period of time, rather than at wider intervals for longer periods of time. The vibrator shall be used only to aid compaction and not to push concrete laterally in the forms.

1.2.6.4 CONSTRUCTION JOINTS:

Concrete shall be placed without interruption until completion of the part of the work between predetermined construction joints as specified therein after. Time laps between the pouring of adjoining units shall be as specified in the drawings or as directed by the Engineer-In-Charge.

Joints shall be either vertical or horizontal unless otherwise shown on drawing. In case of an inclined or curved member the joints shall be at right angles to the axis of the member. Vertical joints in walls shall be kept to a minimum.

Vertical joints shall be formed against a stop board and horizontal joints shall be level and wherever possible arranged so that the joint lines coincide with the architectural features of the finished work.

Batten shall be nailed to the form work to ensure a horizontal line and if directed shall also be used to form a grooved joint. For tank walls and similar work joints shall be formed as per I.S. 3370.

Horizontal and vertical joints and shear keys shall be located and shall confirm in details to the requirements of the plans unless otherwise directed by the Engineer-In-Charge.

Column Joints: In a column joints shall be formed 75 mm below the lowest soffit of the beam including haunches if any. In flat slab construction the joint shall be 75 mm below the soffit of column capital. At least 2 hours shall elapse after depositing concrete in columns, piers or walls before depositing in beams, girders or slabs supported thereon.

Beam and Slab Joints: Concrete in beam shall be placed throughout without a joint but if the joint is unavoidable the same shall be vertical and at the centre or within the middle third of the span unless otherwise shown on drawings. Where a beam intersects a girder the joints in the girder shall be offset a distance equal to twice the width of the beam and additional reinforcement provided for shear. The joint shall be vertical throughout the full thickness of the concrete member. A joint in a slab shall be vertical and parallel to the principal reinforcement. Where it is unavoidably at right angles to the principal reinforcement the joint shall be vertical and at the middle of the span.

Vertical construction joints in water tight construction will not be permitted unless indicated on the drawings. Where a horizontal construction joint is required to resist water pressure special care shall be taken in all phases of its construction to ensure maximum water tightness.

Mass foundation: Mass foundation shall be poured in lifts not exceeding 1.5 m in height unless otherwise indicated on the drawings or approved by Engineer-In-Charge.

1.2.6.5 TREATMENT OF CONSTRUCTION JOINTS ON RESUMING CONCRETE:

A dryer mix shall be used for the top lift of horizontal pours to avoid laitance. All laitance and loose stones shall be thoroughly and carefully removed by wire brushing/ hacking and surface wash.

Just before concreting is resumed the roughened joint surface shall be thoroughly cleaned and loose matter removed and then treated with a thin layer of cement grout of proportion specified by Engineer-In-Charge and worked will into the surface. The new concrete shall be well worked against the prepared face before the grout mortar sets. Special care shall be taken to obtained thorough compaction and to avoid segregation of the concrete along the joint plane.

1.2.6.6 CURING :

Exposed surfaces of concrete shall be kept continuously in a damp or wet condition by ponding or by covering with a layer of sacking, canvas, hessian or similar materials and kept constantly wet for at least 7 seven days from the date of placing of concrete. Mere sprinkling of water on vertical surface shall not be allowed.

Approved curing compounds may be used in lieu of moist curing with the permission of the Engineer-in-Charge such compound shall be applied to all exposed surfaces of the concrete as soon as possible after the concrete has set.

1.2.7 SAMPLES, TESTING AND ACCEPTANCE OF CONCRETE:

Samples from fresh concrete shall be taken as per I.S. 1199 and cubes shall be made cured and tested at 28 days in accordance with I.S.516.

Tests shall be conducted for compressive strength on 15 cm x 15 cm x 15 cm cubes of concrete. Specimen shall be cast from a single batch of concrete & shall be of the same age at the time of testing. In order to get a relatively quicker idea of the quality of concrete optional tests on beams for modules of rupture at 72 + or - two hours or seven days compressive strength tests may be carried out in addition to 28 days compressive strength tests. Table "E" may be consulted for general guidance for ordinary Portland cement. In all cases, 28 days compressive strength specified in BIS shall alone be the criterion for acceptance or rejection of the concrete.

TABLE "E" OPTIONAL TEST REQUIREMENT OF CONCRETE:

Grade of Concrete	Compressive strength of 15 cm cubes Min. at 7 days.	Modulus of Rupture by Beam test Min	
		at 72 +/-2 h N/mm^2	at 7 days N/mm^2

M - 10(1:3:6)	7.0	1.2	1.7
M - 15(1:2:4)	10.0	1.5	2.1
M - 20(1:1.5:3)	13.5	1.7	2.4

1.2.7.1 FREQUENCY OF SAMPLING:

A random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested that is the sampling should be spread over the entire period of concreting and over all mixing units.

There test specimen shall be made from each sample for testing at 28 days. Additional cubes may be required for various purposes such as to determine the strength of concrete at seven days or at the time of striking the form work or to determine the duration of curing, or to check the testing error. Additional cubes may also be required for testing cubes cured by accelerated methods as described in I.S.9013. The specimen shall be tested as per I.S.516. The samples may be tested at site laboratory generally but should be tested in any other Government test house Govt. approved test house of approved laboratory whenever asked for by the Engineer-in-Charge.

The concrete shall be deemed to comply with the strength requirement if.

a. Every sample has a test strength not less than the characteristic value or:

b. The strength of one or more samples though less than the characteristic value, is in each case not less than the greater of:

The characteristic strength minus 1.35 times the standard deviation 2) 0.80 times the characteristic strength and the average strength of all the samples is not less than the characteristic strength plus:

[1.65 – 1.65] times the standard deviation. The value of Standard Deviation may be adopted from table given below as guideline.

Grade of Concrete		Assumed	Standard Deviation N/mm2
M -	10(1:3:6)	3	.5
M -	15(1:2:4)		
M -	20(1:1.5:3)	4	.6
M-	25	5	.3

The concrete shall be deemed not to comply with the strength requirements if :-

a. The strength of any sample is less than greater of:
   1. The characteristic strength minus 1.35 times the standard deviation
   2. 80 times the characteristic strength of,

b. The average strength of all the samples is less than the characteristic strength plus [1.65 - 3.00] times the standard deviation.

Concrete which does not meet with the strength requirements as specified in 1.5.3 but has strength greater than that required by 1.5.4 may at the direction of the designer; be accepted as being structurally adequate without testing.

If the concrete is deemed not to comply pursuant to 1.5.4 the structural adequacy of the parts affected shall be investigated and any consequential action as needed shall be taken.

Concrete of each grade shall be assessed separately and shall be assessed daily for compliance. Concrete is liable to be rejected if it is porous or honey-combed, its placing has been interrupted without providing a proper construction joint, the reinforcement has been displaced beyond the tolerances specified, or construction tolerances have not been met. However, the hardened concrete may be accepted after carrying out suitable remedial measures to the satisfaction of the Engineer-in-Charge.

For controlled concrete, the Engineer-in-Charge may permit concrete of strength less than that specified to remain in the structure, but in that case the quantity of concrete thus found deficient in strength shall be paid at a reduced rate of the 80% of relevant item rate. The quantity so deficient, as assessed by the Engineer-in-Charge on the basis of the records shall be final and binding. Engineer-in-Charge

If the deficiency in the opinion of the Engineer-in-Charge is such as to necessitate removal of the concrete from the structure, then on being so directed by the Engineer-in-Charge the Contractor at his own expenses shall remove the portion of the concrete certified as deficient and replace by the concrete of specified strength.

However when the strength is so deficient as to call for removal, Engineer-in-Charge before ordering removal, provided the Contractor agrees may direct for "Load tests" or "Other standard tests" which shall be carried out by the Contractor at his own cost in the manner as will be directed by the Engineer-in-Charge and if the result is such that on all considerations the concrete can be retained then it may be accepted at a reduced rate 50%.

1.2.8 CONCRETING UNDER SPECIAL CONDITIONS:

The specifications and references given in I.S.456 for concrete in extreme weather condition, under water concreting, concrete in aggressive soil and water should be adhered to.

1.3 REINFORCEMENT STEEL:

1.3.1 GENERAL

The steel for normal reinforced concrete shall be high yield strength deformed round bars conforming to IS 1786 and IS 1139. Corrosion resistance rod shall be exclusively used in piles provided in the foundation. Mild steel rod conforming to IS 432 shall be used wherever required by the engineer. The engineer shall perform tests to be made on samples of steel reinforcement stored at the site before use. . In the event of any sample not meeting the requirement of Bureau of Indian standard, the whole consignment of bars from which the samples were taken will be rejected by the

engineer not withstanding any previous acceptance on the strength of the manufacturer's certificate. Any reinforcement rejected by the engineer shall be removed from the site.

The steel shall be kept clean and shall be free from mill scales, loose dust oil earth or other harmful materials before being placed in the forms. The steel at site shall be stored under roof with non-porous enclosure around.

The steel shall only be procured from the authorized outlets of the manufacturer approved by the engineer.

1.3.2 CLEANING OF REINFORCEMENT:

Before steel reinforcement is placed in position, the surface of the reinforcement shall be cleaned of loose rust or scaling, dust, grease and any other objectionable substances (PVC/Nylon Blocks) as required and directed.

1.3.3 HANDLING:

The coated bars shall be carefully handled in order not to drop them, not to rub them on hard surface or against another coated bar while conveying, stacking, placing or stacking of fabricated bars and that for this purpose, wooden packing batons shall be used at. spacing of not more than 60 cms.

The coated bars shall be tied to make bundles with PVC binding material to avoid damages to coating.

The coated bars shall be stacked with separation gap between ground and bars with wooden batons between rows of bars or bundles of such tied bars. Such wooden or padded contact shall be at spacing of not more than 60 cms.

The cut ends of bars shall be touched up with special touch up materials of specifications as provided by coating agency. There shall be minimum time gap to repair the cut ends and damaged portions with touch up materials and that failure to do so may cause complete rejection of the coated bars. The cut ends and damaged portions shall be touched up with repair patch-up material within four hours time gap. All damages to coating in handling etc. shall be repaired irrespective of their size.

No payment will be made for coated bars which are not used in the work and that if they were paid either on account of coating of the rejectable part of bars or doing extra fabrication etc., the amount paid will be recovered from contractor. The contractor will be paid for the same quantity of steel bars used in the work and paid under relevant item.

While bending the bars, the pins of workbenches shall be provided with PVC or plastic sleeves. It is preferable that contractor install bar bending machines suitable for FBE coated bars and that each bending operation is done in a time of not less than 90 secs.

The coated steel shall not be directly exposed to sun rays and rains and shall be protected with opaque polythene sheets or such other approved materials.

While doing concreting, the workmen or trolleys shall not directly move on coated bars but can move on wooden planks placed on the bars by contractor.

In spite of all test certificates, if the coated bars are roughly handled by contractor either during transport, fabrication, stacking, placing and concreting etc. or handled in such a manner as to damage the coating for area or portion more than reasonable the Engineer-in-charge reserve the right to reject the FBE coated bars and that if rejected then such rejected bars shall be removed by contractor from work site within three days. The decision of Engineer-in-charge will be: final as to reject the bars with damage coating or to allow repairing the coating, or to get it recoated entirely at contractor's cost.

1.3.4 BAR BENDING SCHEDULE OF REINFORCEMENT:

On receipt of structural drawing Contractor shall prepare bar bending schedule of reinforcement and shall be got approved by the Engineer-in-Charge, in advance before starting the work.

1.3.5 CUTTING OF REINFORCEMENT:

Before Steel reinforcement bars are cut, the Contractor shall study the lengths of bars required as per drawing and shall carry out cutting only to suit the sizes required as per drawings so that the wastage is minimum.

1.3.6 PLACING AND SECURITY:

Reinforcement bars shall be accurately placed & adequately secured in position and firmly supported or wedged by precast concrete blocks / chairs of suitable thickness, at sufficiently close intervals so that they will not sag between the supports or get displaced during the placing of concrete or any other operation of the work. It is most important to maintain reinforcement in its correct position without displacement and to maintain the correct specified cover. The Contractor shall be responsible for all costs for rectification required in case the bars are displaced out of their correct position.

1.3.7 BINDING WIRE:

The reinforcement shall be securely bound where ever bars cross or whenever required for with 18 gauge soft annealed steel wire. Welding of bars shall not be carried out unless specifically authorized in writing by the Engineer-in-Charge as per relevant

I.S. code of practice in place of splicing. How ever no extra payment shall be allowed for the same.

1.3.8 BENDING OF REINFORCEMENT:

Reinforcement shall be bent as stipulated in I.S. 2505. Bends, cranks etc., in steel reinforcement shall be carefully formed, care being taken to keep bends out of winding. Otherwise all rods shall be truly straight. If any bend shows signs of cracking the rod shall be removed immediately from the site. Minimum length of nine times diameter of the bar shall be used unless otherwise specified in the drawings. However in respect of standard hooks the radius of bend shall be two times the diameter of bar. Heating of reinforcement of bars to facilitate bending will not be

permitted. The bars shall always be bend cold. In case of mild steel reinforcement bars of larger sizes where cold bending is not possible they may be bend by heating with written permission of the Engineer-in-Charge. Bar when bent shall not be heated beyond cherry red colour and after bending shall be allowed to cool slowly without quenching. The bars damaged or weakened in any way in bending shall not be used on the work. High strength deformed bars shall in no case be heated to facilitate bending cranking.

1.3.9 INSPECTION OF REINFORCEMENT:

No concreting shall be commenced until the Engineer-in-Charge have inspected the reinforcement in position and until their approval have been obtained. A notice of at least 24 hours shall be given to the Engineer-in-Charge by the Contractor for inspection of reinforcement. If in the opinion of the Engineer-in-Charge any materials is not in accordance with the specification or the reinforcement is incorrectly spaced, bend or otherwise defective. The Contractor shall immediately remove such materials from the site and replace with new and rectify any other defects in accordance with the instruction of the Engineer-in-Charge and to their entire satisfaction.

1.3.10 STOCK PILING OF STEEL:

Reinforcement steel required shall be stock pilled well in advance of need in the work. Bars should be stacked off the ground so that they do not get covered with mud.

1.3.11 COVER FOR REINFORCEMENT (As per IS - 456):

Unless otherwise specified in drawings, cover shall be measured from outer surface of the main reinforcement as follows:

a) For beams and lintels: 25mm or dia of the bar whichever is higher from the longitudinal bars. For ends less than 25mm dia, 25mm or twice dia of bars whichever is more.

b) For slab, chajja, canopy, pardi - 20mm or dia of the bar whichever is higher.

c) Columns - For longitudinal bars - not less than 40mm nor less than the diameter of the bar whichever is higher. For columns of 200mm minimum dimension or where reinforcement size is 13mm or less -25mm.

d) Footings - 50mm.

e) Cover blocks of 1:1.5:3 P.C.C. with thickness not less than the cover specified.

TYPICAL FORMAT FOR RECORDING MIX DESIGN RESULTS :

Concrete mix design for M.....(Grade of Mix)
proposed to be used in .....

(designation & levels of structural members) weight in Kg. of

Cement	Coarse Aggregate	Fine aggregate	Aggregate Cement Ratio	Water/Cement ratio
1	2		4	5

Compacting factors for I.S.: 1199 strength at	Result of preliminary tests cubes 7 days/ 28 days	Gradation of		Fines modules for	
		Coarse Aggregate (C.A)	Fine Aggregate (F.A)	Fine	Coarse Fine (F.A)
6	7	8	9	10	11

Specific gravity of			Absolute Volume by water displacement method	Density of conc.
Coarse Aggregate	Fine Aggregate	Cement		
12	13	14	15	16

Representative of Engineer-in-Charge

Signature of the Contractor

1.4 FORM WORK:-

1.4.1 MATERIALS AND DESIGN:-

The form work shall be of timber or plywood or steel. If any particular material or materials be specified in the Schedule of quantities for form work such particularly specified material or materials shall be used in work. The form work shall be so constructed as to remain sufficiently rigid during placing of the concrete and shall be sufficiently tight to prevent, loss of liquid from the concrete. The forms shall have sufficient strength and rigidity to hold concrete and withstand the pressure of ramming and vibration without excessive deflection of the prescribed lines and more so when the concrete is vibrated. The surface of the forms in contact with concrete shall be clean, rigid, watertight and smooth. Suitable devices shall be used to hold corners, adjacent ends and edges of panels of other forms together in accurate alignment.

If steel form work is used the slab shuttering to be done with steel plates made out of 2mm sheets with pressed flanges and stiffener with standard shuttering made in 60mm width and 115, 100, 90, 80cm lengths with adjusters made in 40, 25 cm widths and 115, 90, 80, 60cm lengths.

If tubular telescopic steel props are used then all steel scaffold tubes are to be of 40mm nominal bore mild steel continuous weld. Props must be braced in both directions by tube and right angle couplers at approximately 250mm above prop nut when extended beyond 3.6m. All scaffolds fittings conform to I.S.2750:1968.

The form work shall conform to the shape, lines and dimensions as shown on the plans and be so constructed as to remain sufficiently rigid during the placing and compacting of the concrete and shall be sufficiently water tight to prevent loss of cement slurry from the concrete. If directed by the Engineer-in-Charge, Water proof paper or polythene sheets shall be used by the Contractor to ensure water tightness without additional costs. Form work or centering shall not be constructed on wet concrete and labours without deflection and retain its form during laying, ramming and setting of concrete. Timber used shall be properly seasoned so as to prevent wrapping when wetted.

All props either timber or steel shall be straight and of full height and no joints shall be allowed. Props shall be braced with wooden battens and where additional staging is necessary extra care should be taken to use bigger diameter props with bracing at 4 or 5 levels. All props shall be supported on sole plates and double wedges. At the time of removing props, wedges shall be gently cased off and not knocked out –

All rubbish, chipping, shavings and saw dust shall be removed from the interior of the forms before the concrete shall be cleaned and thoroughly wetted or treated if considered necessary, with non-sticking mineral oil or any other approved materials. Care shall be taken that oil or such approved materials are kept out of contact with the reinforcement.

All form work shall be removed without shock or vibration and shall be ceased off carefully in order to allow the structure to take up its load gradually. Forms shall not be disturbed until concrete has adequately hardened to take the superimposed load.

1.4.2 WATER TIGHTNESS:

It is the contractor's responsibility to ensure that the forms are checked for water tightness just before concreting operation starts and to make good any deficiencies.

1.4.3 CLEANING AND TREATMENT OF FORMS:

All rubbish, particularly chippings, shavings and sawdust shall be removed from the interior of the forms before the concrete is placed and the form work in contact with the concrete shall be cleaned and thoroughly wetted or treated with an approved composition. Care shall be taken that such approved composition is kept out of contract with the reinforcement.

1.4.4 STRIPPING:-

Forms shall left in place until their removal is authorized by the site Engineer and shall then be removed with care so as to avoid injury to concrete. In no circumstances shall forms be struck until the concrete reaches strength of at least twice the stress to which concrete may be subjected at the time of striking. The strength referred to shall be that of concrete using the same cement and aggregates with the same proportions, and cured under conditions of temperature and moisture similar to those existing on the work where possible, the form work shall be left longer, as it would assist the curing.

1.4.5 STRIPPING TIME:-

In normal circumstances (generally where temperatures are above 20 C) and where ordinary cement is used, forms shall be struck after expiry of the following periods given in table below.

LOCATION	**Stripping time in days for Ordinary Portland cement**
a. Vertical sides of walls, slabs, beams and columns	1
b. Bottoms of slabs up to 4.5m span	7-14
c. Bottoms of slabs above 4.5m span, bottoms of beams up to 6m span rib bottoms up to 6m span	14-21
d. Bottoms of beams over 6m span and arch rib bottoms above 6m span	21-30

Note 1: In case the shuttering for the part of the structure is supported or suspended from the shuttering of the concrete member already cast then the shuttering of the concrete member (already cast) supporting the new shuttering shall not be removed until the concrete of the supported /suspended member is matured.

Note 2: Special care shall be taken while striking of the shuttering for (i) canopies (ii) chajja (ii) cantilever slabs and beams and (iv) retaining walls, so as to ensure stability of these structural elements. Relevant notes given in the structural drawings in this connection shall be strictly followed.

1.4.6 FORM WORK IN LIFTS FOR CONTINUOUS SURFACES:

Where forms for continuous surface are placed in successive units (as for example in columns or walls), the forms shall fit tightly over the completed surfaces so as to prevent leakage of mortar from the concrete and do maintain accurate alignment of the surface.

1.4.7 PROCEDURE FOR REMOVING THE FORM WORK:

All form work shall be removed without such shock or vibration as would damage the reinforced concrete. Before the soffit and struts are removed, the concrete surface shall be exposed where necessary in order to ascertain that the concrete has sufficiently hardened. Proper precautions shall be taken to allow for the decrease in the rate of hardening that occurs with all cement in the cold weather. For cantilevers, props shall be removed from the tip towards support. Special notes given in relevant structural drawing shall be strictly adhered to in order of avoid mishaps.

1.4.8 TOLERANCES:

The following shall be the maximum permissible tolerances:-

a. On general setting out dimensions up to 4m length, a tolerance up to 3mm will be allowed.

b. On lengths or more than 4m tolerance of not more than 5mm will be allowed.

c. On the cross sectional dimensions of columns, beams, slabs, facia, chajja, mullions, grills, fins, louvers and such other members tolerance of more than 2mm will not be allowed.

d. The top surface of concrete floor slab shall be within 4mm of the level and line shown on the drawings.

e. Column and walls and other vertical members shall not be more than 3mm out of plumb in storey height and not more than 6mm out of plumb in full height.

If the work is not carried out within the tolerances set out above in (a) to (e), the cost of all rectification measures or dismantling and reconstructing as decided by the Site Engineer shall be borne by the contractor. In case work is dismantled, the same shall not be measured and paid for.

D. BRICK MASONRY WORK:

1.0 SCOPE:

This specification covers furnishing, installation, repairing, finishing, curing, protection, maintenance and handling of masonry and allied works for use in structures and locations covered under the scope of the contract.

1.1 GENERAL

All brick work should be carried out as shown on the drawings with set backs, projections, curvatures, cuttings, footings etc. No additional cost for use of cut bricks shall be allowed. Wherever the proportion of cement mortar has not been specifically mentioned, cement mortar proportion of 1:6 shall be used. Flat brick shall be provided wherever required without any extra cost. Brick work shall be kept wet while in

progress till mortar has properly set. On holidays or when work is stopped the top of all unfinished masonry shall be kept wet.

1.2 FLY-ASH BRICKS:

Fly ash bricks (cement bonded) shall be locally made. Bricks shall have smooth rectangular faces with sharp and square corners. Bricks shall be hand or machine moulded and shall be made from the admixture of suitable good quality of fly ash, sand and cement as per the composition mentioned below:

Fly-Ash	:	50-60%
Sand	:	32-40%
Cement	:	8-12%

The fly ash bricks will be as per latest relevant IS code. The bricks will be of dimension as per standard clay brick, suitable for making 230mm thick full brick wall, 115mm thick half brick wall and 75mm thick minor partition walls, as applicable, as per drawing/specification/BOQ. A maximum tolerance of (+/-) 2mm shall be allowed as the manufacturing tolerance. The bricks shall have frog of 100 mm in length 40 mm in width and 10 to 20 mm deep of one of its flat sides.

The bricks when tested in accordance with the procedure laid down in IS 3495 (part 2) : 1992 after immersion in cold water for 24 hrs., water absorption shall be within 13-15% by weight. Similarly, the porosity of the Masonry Page 4 of 8 fly ash bricks shall be within 12-20%. The bricks shall have a minimum crushing strength of 50 Kg/CmSq.

1.3 CONSTRUCTION DETAILS:

a. SOAKING

All bricks shall be immersed in water for twenty four hours before being put into work so that they will be saturated and will not absorb water from the mortar.

b. BATS

No bats or cut bricks shall be used in the work unless absolutely necessary around irregular openings or for adjusting the dimensions of different course and for closures, in which case full bricks shall be laid at corners, the bats being placed on the middle of the courses.

c. LAYING

The bricks shall be laid in mortar to line, level & shape shown on the drawing, tightly pressed and thoroughly bedded in mortar and all joints shall be properly flushed and packed with mortar and no hollows left anywhere. Brick shall be handed carefully so as not to damage their edges. They should not also be thrown from any height to the ground but should be put down gently. All courses shall be laid gently horizontal and all vertical joints made truly vertical. Vertical joints on one course and the next below should not come over one another and shall not normally be nearer than quarter of a brick length. For battered faces binding shall be at right angles to the face. Fixtures, frames etc. if any shall be built in at place shown in the plans while laying the courses only and not later by removal of bricks already laid. Care shall be taken during construction to see that edges of bricks at quoins, sills, heads etc., are not damaged. The verticality of

the walls and horizontality of the courses shall be checked very often with plumb bob and spirit level respectively.

d. JOINTS

Joints shall not exceed 10mm. (About 3/8") in thickness & this thickness shall be uniform throughout. The joints shall be raked but not less than 10mm (3/8") deep when the mortar is green where pointing is to be done. When the brick surfaces are to be plastered, the joints shall be raked to a depth of 5mm when the mortar is green so as to provide good key to plaster.

e. UNIFORM RAISING

Brick work shall be carried up regularly in all courses where the nature of work will admit, not leaving any part 60 cm. lower than another but where building at different levels is necessary the bricks shall be stepped so as to give later at uniform level & effective bond. Horizontal courses should be to line and level, and face plumb. The rate of laying masonry may be upto a height of 80 cm. (About 32") per day if cement mortar is used.

1.4 SCAFFOLDING

The scaffolding must be strong and rigid, stiffened with necessary cross braces and always checked to prevent any injury to persons or materials. The Contractor shall have to allow other trades to make reasonable use of his scaffolding as directed by the Engineer-in-Charge, if for the interest of work the Contractor have to erect scaffolding in the other properties including local bodies. Corporation, the arrangement for the same including the cost of licensing fees etc., shall to be borne by the Contractor and the Employer should be kept free form any liability on this account. Put log holes shall be made good by bricks to match the face work when put logs are removed after ensuring that the holes behind are solidly filled in with 1:4:8 cement concrete upto face of walls. All brick works shall be kept well watered for 14 days after laying.

1.5 CURING:

All brick works shall be kept well watered for l4 days after laying. While pozzalana cement is used for mortar the curing shall be extended by one week at contractors expense.

1.6 HALF BRICK WORK:

The mortar mix for half brick work shall be as specified. Half brick walls, shall be provided with 6 mm dia reinforcements. For half brick thick wall 2 nos of 6mm dia reinforcement bars shall be provided every 5^{th} course according to standard practice with galvanized staples.

1.7 BRICK FLAT SOLING

The bricks shall be laid on flat (Unless otherwise specified) touching each other. Brick shall be laid in parallel rows breaking bond or in herring bond pattern as directed and firmly embedded true to line and filled with local sand.

For soling, the bricks shall be sound, hard, durable, dense and free from soft spots, cracks, decay and other defects. All the interstices fillings shall be watered & compacted to get maximum consolidation. All necessary trimming or filling for laying of the soling in line and required grade shall be done. The sub-grade shall be marked by stacking and strings for required depth for laying of soling. The cushioning as well as filling of joints shall be done with local sand.

1.8 IS CODES

IS: 2212 : Code of practice for Brickwork

IS: 2250 : Code of practice for preparation and use of masonry mortar

D. CEMENT PLASTER (INTERNAL & EXTERNAL)

1.0 SCOPE:

The Cement Plaster shall be 6mm(1:4),12mm(1:4),12mm(1:6) & 16mm(1:6) thick as specified in items.The work covered under these specifications consists of supplying all materials and rendering all types of plaster/pointing finishes strictly in accordance with these specifications, applicable drawings etc.

1.1 SCAFFOLDING:

For all exposed brick work or tile work double scaffolding independent of the work having two sets of vertical supports shall be provided. The supports shall be sound and strong, tied together with horizontal pieces over which scaffolding planks shall be fixed.

For all other work in buildings, single scaffolding shall be permitted. In such cases the inner end of the horizontal scaffolding pole shall rest in a hole provided only in the header course for the purpose. Only one header for each pole shall be left out. Such holes for scaffolding shall, however, not be allowed in pillars/columns less than one metre in width or immediately near the skew backs of arches. The holes left in masonry works for scaffolding purposes shall be filled and made good before plastering.

In case of special type of brick work, scaffolding shall be got approved from Engineer-in-charge in advance.

1.2 PROPORTION OF MORTAR:

The plaster in walls, lintels, columns, ceiling, ceiling beams, projected slabs, rails, chajja, marquise, domes etc. shall be done with sand cement mortar in the proportion as described in the Schedule of Quantities. No more cement mortar shall be prepared than that can be used within half an hours.

1.3 PREPARATION OF SURFACE:

All putlog holes in brick work and junction between concrete & brick work shall be properly filled in advance. Joints in brick work shall be racked about 10/5mm and

concrete surface hacked to provide the grip to the plaster. Projecting burns of mortar formed due to gaps at joints in shuttering shall be removed.

The surface shall be scrubbed clean with wire brush, coir brush to remove dirt, dust etc. and the surface thoroughly washed with clean water to remove efflorescence grease and oil etc., and shall be kept wet for a minimum of six hours before application of plaster.

1.4 APPLICATION OF PLASTER:

1.4.1 ORDINARY CEMENT PLASTER (SINGLE COAT):

The specification for scaffolding, proportion of mortar and preparation of surfaces shall be as stated above. The thickness and proportion of plaster shall be as specified in the schedule of Quantities.

The mortar shall be applied evenly with force on the surface to be plastered. The mortar surface shall be finished at once by being rubbed over with a trowel till the cement appears on the surface. All corners, angles and junctions shall be truly vertical and horizontal as the case may be, carefully and neatly finished. Rounding of corners and junctions where required shall be done without extra charge. The mortar shall adhere to the surface intimately when set and there should be no hollow sound when struck.

1.4.2 ROUGH CAST PLASTER:

The specification for scaffolding, proportion of mortar and preparation of surfaces shall be as stated above. The thickness and proportion of plaster shall be as specified in the schedule of Quantities.

The first coat of cement mortar in proportion of 1:4 or as specified shall be applied uniformly all over the surface to the specified thickness and finished true to level and line and keys shall be formed on the surface. The surface shall be kept moist till the finishing coat is applied.

The finishing coat mortar shall be proportioned with one part of cement and one part of specially selected and graded sand and one part of gravel of 3 to 6 mm size. It shall be flung upon the base coat with large trowel to form an even and decorative surface. The work shall generally conform to clause 16.5 of I.S.1661 - 1960. The thickness of the coat shall be about 12mm (1/2").

1.5 CURING:

Curing shall be started as soon as the plaster has hardened sufficiently not to be damaged when watered.

The plaster shall be kept wet for a period of at least 7 days. During this period, it shall be suitably protected from all damages at the contractor’s expense by such means as the Engineer-in-Charge may approve. The dates on which the plastering is done shall

be legibly marked on the various sections plastered so that curing for the specified period thereafter can be watched.

1.6 METHOD OF MEASUREMENT

(a) All surface finish shall be measured on actual area laid. No deductions shall be made for openings, pipes and sleeves etc. upto 0.1 sqm in area.

(b) Unless separate item is provided for special corner or edge finish, drip coarse, grooves, mouldings, curbs etc these shall not be measured separately.

(c) No separate payment shall be made for finishing round openings, sleeves, pipes etc. No separate payment shall be made for form work, templates etc. required for achieving true lines and profiles as shown on drawing.

(d) Finishes applied integrally with walls, floors, steps and ceilings shall be measured and paid separately under relevant items.

(e) Any reinforcement incorporated in the finish shall be measured and paid separately under relevant items.

(f) Unless otherwise mentioned in the schedule of items, hangers, supports shall be measured and paid separately under relevant items.

1.7 IS CODES AND STANDARDS:

I.S: 1200 (Part-12)	: Method of measurements of building and civil engineering works. (Plastering and Pointing).
I.S: 1661	: Code of practice for cement and cement lime plaster finish on walls and ceilings
I.S: 4101	: Code of practice for external facing and veneers.

E. FLOOR FINISHING:

1. SCOPE:

This specification covers providing, laying, finishing, polishing, grinding, moulding, nosing, curing, testing, etc. till handing over various types of floor finishes and allied items of work as stated below;

a. Artificial Stone Flooring
b. Granite Stone Flooring
c. Kota Stone Cladding
d. Vitrified Tile Flooring
e. Ceramic Tile Flooring
f. Hardener Topping
g. Wooden Flooring

1.1 ARTIFICIAL STONE FLOORING:

1.1.1 GENERAL:

The selection of materials, grading, mixing, placing shall generally conform to the specification under plain and reinforced cement concrete described earlier. A stiff mix consistent with workability shall be used.

1.1.2 PREPARATION OF SURFACE:

The base concrete surface shall be thoroughly chipped to remove laitance, caked mortar, loose sand, dirt etc. cleaned with wire brush and washed clean and watered until no more water is absorbed. Where the base concrete has hardened so much that roughening the surface by wire brushes is not possible, the same shall be roughened by chipping or hacking at close intervals. The surface shall be soaked with water for at least

12 hours and surface water removed and dried before laying the topping. Before laying the concrete, cement slurry at 2.75 kg./ sqm of surface shall be applied for better bond.

Concrete flooring shall then be laid in alternate bays in pattern and joints, wide/ flush as per drawing. The edge of each panel into which the floor is divided shall be supported by wooden or metal strips duly oiled to prevent sticking. The panels shall be of uniform size and, unless otherwise specified, no dimension of panel shall exceed 2 m. and the area of a panel shall not be more than 2 sqm. However, the exact size of panel shall be decided by the Engineer-in-Charge to suit the size of the room.

The joints in the floor finish shall extend through the borders and skirting/dado. The border shall have mitred joints at the corners of the room. Where glass/ aluminium dividing strips are proposed to be provided, the same shall be fixed in cement mortar 1:2 @ 600 mm. centres or as specified in the schedule of quantities for full depth of the finished floor.

The depth of dividing strips shall be the thickness as proposed for the finished floor in the item. In the case of flush joins, alternate panels only may be cast on same day. At least 48 hours shall elapse before the concreting of adjacent bay is commenced.

Before the operation for laying topping is started the surface of base concrete shall be thoroughly cleaned of all dirt, loose particles, caked mortar, droppings and laitance of any by scrubbing with coir or steel wire brush where the concrete has hardened so much that roughening of surface by wire brush is not possible, the surface shall be roughened by chipping or racking at close intervals. The surface shall then be cleaned with water & kept for 12 hours and surplus water shall be removed by mopping before the topping is laid.

1.1.3 LAYING:

The free water on the surface of the base shall be removed and a coat of cement slurry to the consistency of thick cream shall be brushed on the surface. On this fresh grouted base, the prepared cement concrete shall be laid immediately after mixing. The concrete shall be spread evenly and laid immediately after mixing. The concrete shall be spread and levelled carefully. The concrete shall be completed and brought to the specified levels by means of a heavy straight edge resting on the side forms and down ahead with a sawing motion in combination with a series of lifts and drops alternatively with small lateral shifts, either mechanically or manually as directed by the Engineer-in-Charge.

While concreting the adjacent bays, care shall be taken to ensure that the edges of the previously laid bays are not broken by carelessness or hand tamping. Immediately after laying the concrete, the surface shall be inspected for high or low spots and any needed correction made up by adding or removing the concrete and whole surface is again levelled. When the layer is made even, the surface shall be completed by ramming or beating and then screed to a uniform line and level. Before the initial set commences, the surface shall be trowelled to smooth and even surface free from defects and blemishes and tested with straight edges. No dry cement or mixture of dry cement and sand shall be sprinkled directly or empty gunny bags spread over the surface of the concrete to absorb excess water coming on top due to floating.

1.1.4 FINISHING THE SURFACE:

After the concrete has been fully compacted, it shall be finished by trowelling or floating. Finishing operations shall start shortly after the compaction of concrete and shall be spread over a period of one to six hours depending upon the temperature and atmospheric conditions. The surface shall be trowelled intermittently at intervals for several times so as to produce a uniform and hard surface. The satisfactory resistance of floor to wear depends largely upon the care with which trowelling is carried out. The object of trowelling is to produce as hard and close knit a surface as possible. The time interval allowed between successive trowelling is very important. Immediately after laying only just sufficient trowelling shall be done to give a level surface. Excessive trowelling in the earlier stages shall be avoided as this tends to work a layer rich in cement to the surface, some time. After the first trowelling, the duration depending upon the temperature, atmospheric conditions and the rate of setting of cement used, the surface shall be retro welled many times at intervals to close any pores in the surface, and to bring to surface and scrap off any excess water in concrete or laitance (it shall not be trowelled back into the topping). The final trowelling shall be done well before the concrete has become too hard but at such a time that considerable pressure is required to make any impression on the surface. Trowelling of rich mix of dry cement and fine aggregate on to the surface shall not be permitted. Trowel marks should not be seen on the finished surface.

Coloring pigment if required shall be added to the rendering to give desired color and shade to the flooring at no extra cost as directed by Engineer-in-Charge.

1.1.5 CURING:

The completed flooring shall be protected from sun, wind and rain for the first two days and movement of persons over the floor is prohibited during this period. The finished surface shall be covered and cured continuously form the next day after finishing, at least for a period of 7 days. Bunding with moorum for curing is prohibited as it will leave permanent stain on the finished floor.

Curing shall be done by spreading sand and kept damp throughout the curing period of seven days minimum. The surface shall be protected from any damage to it whatsoever. The surface shall then be allowed to dry slowly. All corners, junctions of floor with plastered wall surface shall be rounded off when required at no extra cost.

1.1.6 MODE OF MEASUREMENT:

The rate for flooring and skirting shall be in square metre of the area covered.

The length and width of the flooring shall be measured net between the faces of skirting or dado or plastered faces of walls which is the proudest.

All openings in flooring exceeding 0.1 sqm in area where flooring is not done shall be deducted and net areas only shall be measured and paid for. Flooring under dado, skirting or plaster shall not be measured for payment.

Nothing extra shall be paid for laying the floor at different levels in the same room.

The dimensions shall be measured up to two places of decimals of a metre and area worked out up to two places of decimal of a square metre.

1.1.7 IS CODES AND STANDARDS:

IS: 1200 (Part-11): Method of measurement of Building and Civil engineering work, paving, floor finishes, dado and skirting.

IS: 2571 : Code of practice for laying Cast-in-Situ cement concrete

Flooring.

1.2 GRANITE STONE FLOORING/DADO/SKIRTING:

The specifications for dressing, laying, curing, finishing, measurements, etc. for the granite stone flooring shall be same as that of works for the Marble flooring, skirting and risers of steps as stated above.

The physical properties of Granite slabs and method of tests are given as under;

Characteristics	Requirements	Method of Test
Moisture absorption after 24 hrs immersion in cold water	Maximum - 0.5%	IS: 1124
Hardness	-	-
Specific gravity	Minimum - 2.6	IS: 1122

Granite stone tiles and slabs shall be pre polished (mirror polished), eggshell polished, flame finished or given any other surface treatment as specified, as per the Architectural drawings and as directed by the Engineer-in-charge.

Granite stone slabs shall be individually packed in cardboard paper. These shall be handled carefully to prevent any damage. The stone slab procured shall be free of any surface defect or any edge damage. The damaged stones shall not be allowed to be used in the work. So the Contractor shall procure additional such quantities, to cover such contingencies. However nothing extra shall be payable on this account. The stone slabs snail not be waxed or touched up with dyes / colours.

The following tolerances shall be allowed in the dimension of granite stone slab:

Slabs:	**Tolerance:**
a) Length	+1mm
b) Width	+1mm
c) Thickness	+1mm
d) Angularity at corners	+0.25%

The stones (slab and tiles) not meeting the above tolerance limits shall be rejected and not permitted to be used in the work. Nothing extra shall be payable on this account.

The edge moulding / nosing polishing to the cut exposed edges of the granite stone slab to be used in flooring, skirting, dado, sills, jambs, soffits on top of the storage cabinets, risers, treads etc. shall be provided in a workmanlike manner as per the architectural drawings and shall be payable under relevant items of work.

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1.3 KOTA STONE IN RISERS OF STEPS, SKIRTING AND DADO:

1.3.1 GENERAL:

Specification of Kota stone slab and dressing shall be same as that of Kota stone flooring as stated above except that the thickness of the slabs shall as specified in the description of the item. The slabs may be of uniform size if required.

1.3.2 PREPARATION OF SURFACE AND LAYING:

Specifications for preparation of surface and laying of slab shall be same as that of marble stone slab in risers of steps, skirting and dado as stated above except that the joints of the slabs shall be set in grey cement mixed with pigment to match the shade of the slabs.

1.3.3 CURING, POLISHING AND FINISHING:

Specifications for curing, polishing and finishing shall be same as that of marble stone slab in risers of steps, skirting and dad as stated above except that first polishing with coarse grade carborundum stone shall not be done.

1.3.4 MODE OF MEASUREMENT:

The finished surface area shall be measured in Sqm for payment.

1.3.5 IS CODES AND STANDARDS:

IS: 3316 : Specification for Structural Granite.
IS: 14223 (P-1) : Polished building stone
IS: 1443 : Method of laying tile flooring

1.4 VITRIFIED TILE FLOORING/ DADO/ SKIRTING:

1.4.1 GENERAL:

The tiles shall be of approved make and shall generally conform to IS 15622. They shall be flat, and true to shape and free from blisters crazing, chips, welts, crawling or other imperfections detracting from their appearance. The tiles shall be tested as per IS 13630.

The tiles shall be square or rectangular of nominal sizes such as: 600 x 600 mm; 1000 x 1000 mm or as per schedule of quantities / drawings or as directed by the Engineer-in-Charge. Thickness shall be as per recommendations of the approved manufacturers. Technical specifications of the tiles shall be generally conforming to the following standards:

SL.	Property	Expected Standards
1	Deviation in length	(+/-) 0.6%
2	Straightness of sides	(+/-) 0.5%
3	Rectangularity	(+/-) 0.6%
4	Surface flatness	(+/-) 0.5%
5	Water absorption	< 0.5%
6	Mohs hardness	> 6
7	Flexural strength	> 27 N/mm^2
8	Abrasion resistant	< 204 mm^2
9	Skid resistance	> 0.4
10	Glossiness	Minimum 85% reflection

1.4.2 PREPARATION OF SURFACE AND LAYING:

Base concrete or the RCC slab on which the tiles are to be laid shall be cleaned, wetted and mopped. The bedding for the tile shall be with cement mortar 1:4 (1 cement : 4 coarse sand) or as specified. The average thickness of the bedding shall be 20 mm or as specified while the thickness under any portion of the tiles shall not be less than 10 mm.

Mortar shall be spread, tamped and corrected to proper levels and allowed to harden sufficiently to offer a fairly rigid cushion for the tiles to be set and to enable the mason to place wooden plank across and squat on it.

Over this mortar bedding neat grey cement slurry of honey like consistency shall be spread at the rate of 3.3 kg of cement per square metre over an area upto one square metre. Tiles shall be soaked in water washed clean and shall be fixed in this grout one after another, each tile gently being tapped with a wooden mallet till it is properly bedded and in level with the adjoining tiles. The joints shall be kept as thin as possible and in straight lines or to suit the required pattern.

The surface of the flooring during laying shall be frequently checked with a straight edge about 2 m long, so as to obtain a true surface with the required slope. Where full size tiles cannot be fixed these shall be cut (sawn) to the required size, and their edge rubbed smooth to ensure straight and true joints.

After tiles have been laid surplus cement slurry shall be cleaned off.

1.4.3 POINTING AND FINISHING:

The joints shall be cleaned off the grey cement slurry with wire/coir brush or trowel to a depth of 2

mm to 3 mm and all dust and loose mortar removed. Joints shall then be flush pointed with white cement added with pigment if required to match the colour of tiles. Where spacer lug tiles are provided, the half the depth of joint shall be filled with polysulphide or as specified on top with under filling with cement grout without the lugs remaining exposed. The floor shall then be kept wet for 7 days. After curing, the surface shall be washed and finished clean. The finished floor shall not sound hollow when tapped with a wooden mallet.

1.4.4 MODE OF MEASUREMENT:

The finished surface area shall be measured in Sqm for payment.

No deduction shall be made nor extra paid for voids not exceeding 0.20 square metre. Deductions for ends of dissimilar materials or other articles embedded shall not be made for areas not exceeding 0.10 square metre.

1.5 CERAMIC TILE FLOORING:

1.5.1 GENERAL:

The tiles shall be of approved make and shall generally conform to IS: 15622. They shall be flat and true to shape and free from blisters, crazing, chips, welts, crawling or other imperfections detracting from their appearance. The tiles shall be tested in accordance with IS: 13630.

The thickness and size of the tile shall be same as specified in the schedule of quantities or as directed by Engineer-in-Charge.

The length of all four sides shall be measured correct to 0.1 mm and average length / breadth shall not vary more than ± 0.8 mm from the specified dimension. The variation of individual dimension from average value of length/breadth shall not exceed ± 0.5 mm. Tolerance in thickness shall be ± 0.4 mm.

The top surface of the tiles shall be glazed and the glaze shall be either glossy or matt as specified. The underside of the tiles shall not have glaze on more than 5% of the area in order that the tile may adhere properly to the base. The edges of the tiles shall

be preferably free from glaze. However, any glaze if unavoidable, shall be permissible on only upto 50 per cent of the surface area of the edges.

1.5.2 PREPARATION OF SURFACE AND LAYING:

Base concrete or the RCC slab on which the tiles are to be laid shall be cleaned, wetted and mopped. The bedding for the tile shall be with cement mortar 1:4 (1 cement: 4 coarse sand) or as specified. The average thickness of the bedding shall be 10 mm while the thickness under any portion of the tiles shall not be less than 5 mm.

Mortar shall be spread, tamped and corrected to proper levels and allowed to harden sufficiently to offer a fairly rigid cushion for the tiles to be set and to enable the mason to place wooden plank across and squat on it.

Over this mortar bedding neat grey cement slurry of honey like consistency shall be spread at the rate of 3.3 kg of cement per square metre over such an area as would accommodate about twenty tiles. Tiles shall be soaked in water washed clean and shall be fixed in this grout one after another, each tile gently being tapped with a wooden mallet till it is properly bedded and in level with the adjoining tiles. The joints shall be kept as thin as possible and in straight lines or to suit the required pattern.

The surface of the flooring during laying shall be frequently checked with a straight edge about 2 m long, so as to obtain a true surface with the required slope.

Where full size tiles cannot be fixed these shall be cut (sawn) to the required size, and their edge rubbed smooth to ensure straight and true joints.

Tiles which are fixed in the floor adjoining the wall shall enter not less than 10 mm under the plaster, skirting or dado.

After tiles have been laid surplus cement slurry shall be cleaned off.

1.5.3 POINTING AND POLISHING:

The joints shall be cleaned off the grey cement slurry with wire/coir brush or trowel to a depth of 2 mm to 3 mm and all dust and loose mortar removed. Joints shall then be flush pointed with white cement added with pigment if required to match the colour of tiles. Where spacer lug tiles are provided, the half the depth of joint shall be filled with polysulphide or as specified on top with under filling with cement grout without the lugs remaining exposed. The floor shall then be kept wet for 7 days. After curing, the surface shall be washed and finished clean. The finished floor shall not sound hollow when tapped with a wooden mallet.

1.5.4 MODE OF MEASUREMENT:

The finished surface area shall be measured in Sqm for payment.

No deduction shall be made nor extra paid for voids not exceeding 0.20 square metre. Deductions for ends of dissimilar materials or other articles embedded shall not be made for areas not exceeding 0.10 square metre.

1.6 GLAZED CERAMIC TILES IN SKIRTING AND DADO:

1.6.1 GENERAL:

The tiles shall be of approved make and shall generally conform to IS 15622. The tiles shall be pressed ceramic covered by a glaze thoroughly matured and fitted to the body. The tiles shall be sound, true to shape, flat and free from flaws and other manufacturing defects affecting their utility.

The top surface of the tiles shall be glazed. The underside of the tiles shall not have glaze on more than 5% of the area in order that the tile may adhere properly to the base. The edges of the tiles shall be free from glaze, however, any glaze if unavoidable shall be permissible on only upto 50 per cent of the surface area of edges.

The glaze shall be free from welts, chips, craze, specks, crawling or other imperfections detracting from the appearance when viewed from a distance of one metre. The glaze shall be either glossy or matt as specified. The glaze shall be white in colour except in the case of colored tiles when colours shall be specified by the Engineer-in-Charge. There may be more than one colour on a tile.

The thickness of the tiles shall be 5 mm or 6 mm or as specified in the schedule of quantities.

1.6.2 PREPARATION OF SURFACES:

The joints of masonry wall shall be raked out to a depth of at least 15mm. In case of concrete walls, the surfaces shall be chipped and roughened with wire brushes. The surface shall be cleaned thoroughly, washed with water and kept wet before skirting work is commenced.

1.6.3 LAYING:

12 mm thick plaster of cement mortar 1:3 (1 cement : 3 coarse sand) mix of as specified shall be applied and allowed to harden. The plaster shall be roughened with wire brushes or by scratching diagonal at closed intervals.

The tiles should be soaked in water, washed clean, and a coat of cement slurry applied liberally at the back of tiles and set in the bedding mortar. The tiles shall be tamped and corrected to proper plane and lines. The tiles shall be set in the required pattern and jointed. The joints shall be as fine as possible. Top of skirting or dado shall be truly horizontal and joints truly vertical except where otherwise indicated. Odd size/cut size of tile shall be adjusted at bottom to take care of slope of the flooring. Skirting and dado shall rest on the top of the flooring. Where full size tiles cannot be fixed these shall be cut (sawn) to the required size and their edges rubbed smooth. Skirting /dado shall not project from the finished “surface of wall” by more than the tile thickness, undulations if any shall be adjusted in wall.

1.6.4 CURING AND FINISHING:

The joints shall be cleaned off the grey cement grout with wire/coir brush or trowel to a depth of 2 mm to 3 mm and all dust and loose mortar removed. Joints shall then be flush pointed with white cement added with pigments if required to match the colour of tiles. The work shall then be kept wet for 7 days.

After curing, the surface shall be washed and finished clean. The finished work shall not sound hollow when tapped with a wooden mallet.

1.6.5 MODE OF MEASUREMENT:

Length shall be measured correct to a cm. Height shall be measured correct to a cm in the case of dado and 5 mm in the case of riser and skirting. The area shall be calculated in square metre, correct to two places of decimal. Length and height shall be measured along the finished face of the skirting or dado including curves where specials such as

coves, internal and external angles and beads are used. Where cornices are used the area of dado shall be measured excluding the cornices. Nothing extra will be paid for cutting (sawn) the tiles to sizes.

1.6.6 IS CODES AND STANDARDS:

IS: 13630 (P 1-15)	:	Method of testing of Ceramic tile
IS: 13712	:	Specification for Ceramic tile (Definition, Classification and Characteristics)
IS: 15622	:	Specifications for pressed ceramic tile.

1.7 CEMENT CONCRETE FLOORING WITH HARDENER TOPPING.

1.7.0 GENERAL

62 mm thick cement concrete flooring with Hardener topping comprising of an under layer of 50 mm thick cement concrete of mix 1:2:4(1 cement : 2 coarse sand : 4 graded stone agrregate 20 mm nominal size) and 12 mm thick cement hardener topping layer of mix 1:2 (1 cement hardener mix : 2 parts of screened & washed stone agrregate 6 mm nominal size) by volume, hardening compound mixed @ 2 litres per bag of cement and laying the concrete in alternate panels of 2m x 2m (max) including cleaning the surface to make free from foreign particles, cost of all materials, conveyance, taxes, loading, unloading, royalty, T&P, etc, all complete as per the direction of Engineer-in-Charge.

1.7.1 BASE CONCRETE:

Flooring shall be laid on base concrete where so provided. The base concrete shall be provided with the slopes required for the flooring. Flooring in verandah, Courtyard, kitchens & baths shall have slope ranging from 1 : 48 to 1 : 60 depending upon location and as decided by the Engineer-in-Charge. Floors in water closet portion shall have slope of 1:30 or as decided by the Engineer-in-Charge to drain off washing water. Further, necessary drop in flooring in bath, WC, kitchen near floor traps ranging from 6 mm to 10 mm will also be provided to avoid spread of water. Necessary margin to accommodate this drop shall be made in base concrete. Plinth masonry off set shall be depressed so as to allow the base concrete to rest on it. The flooring shall be commenced preferably within 48 hours of the laying of base concrete. The surface of the base shall be roughened with steel wire brushes without disturbing the concrete. Immediately before laying the flooring, the base shall be wetted and a coat of cement slurry @ 2 kg of cement spread over an area of one sqm so as to get a good bond between the base and concrete floor. If the cement concrete flooring is to be laid directly on the RCC slab, the top surface of RCC slab shall be cleaned and the laitance shall be removed and a coat of cement slurry @ 2 kg of cement spread over an area of one sqm so as to get a good bond between the base and concrete floor.

1.7.2 UNDER LAYER:

Cement concrete flooring of specified thickness and mix (mentioned in item for under layer) shall be laid as under layer. The top surface shall be roughened with brushes while the concrete is still green and the forms/strips shall be kept projecting up 12 mm over the concrete surface to receive the hardening compound topping.

1.7.3 TOPPING:

This shall consist of 12 mm thick layer of mix 1:2 (1 cement: 2 stone aggregate 6 mm nominal size) by volume or as otherwise specified with which metallic hardening

compound is mixed in the ratio of 1 :4 (hardener : 4 cement) by weight.with cement on a clean dry pucca platform. This dry mixture shall be mixed with stone aggregate 6 mm nominal size or as otherwise specified in the ratio of 1 : 2 (1 cement : 2 stone ggregate) and well turned over. Just enough water shall then be added to this dry mix as required for floor concrete. The mixture so obtained shall be laid in 12 mm thickness, on cement concrete floor within 2 to 4hours of its laying. The topping shall be laid true to provide a uniform and even surface. It shall be firmly pressed into the bottom concrete so as to have good bond with it. After the initial set has started, the surface shall be finished smooth and true to slope with steel floats.

1.7.4 CURING:

The completed flooring shall be protected from sun, wind and rain for the first two days and movement of persons over the floor is prohibited during this period. The finished surface shall be covered and cured continuously form the next day after finishing, at least for a period of 7 days. Bunding with morum for curing is prohibited as it will leave permanent stain on the finished floor. Curing shall be done by spreading sand and kept damp throughout the curing period of seven days minimum. The surface shall be protected from any damage to it whatsoever. The surface shall then be allowed to dry slowly. All corners, junctions of floor with plastered wall surface shall be rounded off when required at no extra cost.

1.7.5 MODE OF MEASUREMENT:

The rate for flooring and skirting shall be in square metre of the area covered.

The length and width of the flooring shall be measured net between the faces of skirting or dado or plastered faces of walls which is the proudest.

All openings in flooring exceeding 0.1 sqm in area where flooring is not done shall be deducted and net areas only shall be measured and paid for. Flooring under dado, skirting or plaster shall not be measured for payment.

Nothing extra shall be paid for laying the floor at different levels in the same room.

The dimensions shall be measured upto two places of decimals of a metre and area worked out upto two places of decimal of a square metre.

1.7.6 IS CODES AND STANDARDS:

IS: 1200 (Part-11) : Method of measurement of Building and Civil engineering work, paving, floor finishes, dado and skirting.

IS: 2571 : Code of practice for laying Cast-in-Situ cement concrete Flooring.

1.8 WOODEN FLOORING

Mikasa Pristine, Plank Thickness 14 mm, Top Layer 2.5 mm Veneer/Hardwood, Middle Layer 10 mm Pine Wood having Density 650 kg/m3, Bottom Layer 1.5 mm Balancing Veneer, Plank Size of 1800mm X 135mm, Natural/ Stained/ Smoked, Satin lacquered/ Matt lacquered/ Brushed, Square Edge/ Micro-Bevelled Edge/Bevelled Edge, PlankLok Joint, Glueless Installation, Prefinished Surface with 7 times UV hardened acrylic lacquered, free from formaldehyde emission as strictly following EU E1 norms, Re-sanding and Refinishing 2 times after 10 years interval, Moisture Content 7-9%, Free of insects, woodworms as secured by process temperatures, Fire Class G, highest Fire classification as per Swedish Building Code BBR 94, on top of 2mm moisture barrier and a substrate of smoothly finished cement and sand plastered surface with cement slurry coating all complete as per direction of Engineer-in-charge.

F. EXTERNAL AND INTERNAL PAINTING WORKS:

1. SCOPE:

The work covered under this specification shall consist of furnishing the various types of painting works as described in the schedule of quantities or as per the direction of Engineer-in-Charge.

1.1 MATERIALS:

The materials such as paints, putty, oil, varnishes, etc shall be of approved make, quality and manufacturer. If for any reason, thinning is necessary in case of ready mixed paint, the brand of thinner recommended by the manufacturer or as instructed by the Engineer-in-Charge shall be used.

Approved paints, oils or varnishes shall be brought to the site of work by the contractor in their original containers in sealed condition. The materials shall be brought in at a time in adequate quantities to suffice for the whole work or at least a fortnights work. The materials shall be kept in the joint custody of the contractor and the Engineer-in-charge. The empties shall not be removed from the site of work, till the relevant item of work has been completed and permission obtained from the Engineer -in-Charge.

The contractor shall associate the chemist of paint manufacturers before commencement of work, during and after the completion of work who shall certify the suitability of the surface to receive painting and the paint before use etc.

1.2 SCAFFOLDING:

Wherever scaffolding is necessary, it shall be erected on double supports tied together by horizontal pieces, over which scaffolding planks shall be fixed. No ballies, bamboos or planks shall rest on or touch the surface which is being painted.

Where ladders are used, pieces of old gunny bags shall be tied on their tops to avoid damage or scratches to walls. For painting of the ceiling, proper stage scaffolding shall be erected. Painting shall not be started until and unless the Engineer-in-Charge has inspected the items of work to be painted, satisfied himself about their proper quality and given his approval to commence the painting work. Painting, except the priming coat, shall generally be taken in hand after all other builders work, practically finished. The rooms should be thoroughly swept out and the entire building cleaned up at least one day in advance of the paint work being started.

1.3 PREPARATION OF SURFACE:

The surface shall be thoroughly cleaned. All dirt, rust, scales, smoke and grease shall be thoroughly removed before painting is started. Minor patches if any in plastered/form finished surfaces shall be repaired and finished in line and level in C.M. 1:1 and cracks & crevices shall be filled with approved filler, by the contractor at no extra cost to the Department. The prepared surface shall have received the approval of the Engineer-in-Charge after inspection, before painting is commenced.

1.4 APPLICATION:

Before pouring into smaller containers for use, the paint shall be stirred thoroughly in its containers. When applying also, the paint shall be continuously stirred in the smaller containers so that consistency is kept uniform.\

The external surfaces of the buildings under reference including the R.C.C. Jalli, fins and the panels above and below the window etc. shall be finished in different colours of

approved shade. The contractor will make suitable samples at site for Departments approval before taking up the work in hand and they will be allowed to proceed with the work only after getting Departments approval for the same.

The painting shall be laid on evenly and smoothly by means of crossing and laying off, the later in the direction of the grain in case of wood. The crossing & laying off consists of covering the area with paint, brushing the surface hard for the first time and then brushing alternately in opposite directions two or three time and then finally brushing lightly in direction at right angles to the same. In this process, no brush marks shall be left after the laying off is finished. The full process of crossing and laying will constitute one coat.

Where so stipulated, the painting shall be done with spraying. Spray machine used may be (a) a high pressure (small air aperture) type or (b) a low pressure (large air gap) type, depending on the nature and location of work to be carried out. Skilled and experienced workmen shall be employed for this class of work. Paints used shall be brought to the requisite consistency by adding a suitable thinner. Spraying should be done only when dry condition prevails.

Each coat shall be allowed to dry out thoroughly and rubbed smooth before the next coat is applied. This should be facilitated by thorough ventilation.

Each coat except the last coat shall be lightly rubbed down with sand paper or fine pumice stone and cleaned of dust before the next coat is laid.

No left over paint shall be put back into the stock tins. When not in use, containers shall be kept properly closed.

The final painted surface shall present a uniform appearance and no streaks, blisters, hair marks from the brush or clogging of paint puddles in the corners of panels, angles of mouldings etc. shall be left on the work.

In case of cement based paints/primers, the absorbent surfaces shall be evenly damped so as to give even suction. In any weather, freshly painted surfaces shall be kept damp for at least two days.

In painting doors and windows, the putty around the glass panes must also be painted, but care must be taken to see that no paint stains etc. are left on the glass. Tops of shutters and surfaces in similar hidden locations shall not be left out while painting. Prospect covers of electrical switch boxes have to be painted from inside by removing them. Care shall be taken while removing them in position after painting with respective approved paints. In painting steel work, special care shall be taken while painting over bolts, nuts, rivets, overlaps etc.

The additional specifications for primer and other coats of paints shall be as in accordance to the detailed specifications under the respective headings. Any damage caused during painting work to the existing works/surfaces shall be made good by the contractor at his own cost.

1.5 BRUSHES AND CONTAINERS:

After panting work is completed, the brushes shall be completely cleaned of paint by linseed oil rinsing with turpentine. A brush in which paint has dried up is ruined and shall on no account be used for painting work. The containers when not in use, shall be kept closed and free from air so that paint does thicken and also shall be kept safe from dust When the paint has been used, the containers shall be washed with turpentine and wiped dry with soft clean cloth, so that they are clean, and can be used again.

1.6 MODE OF MEASUREMENT:

Painting, unless otherwise stated shall be measured by area in square metre. Length and breadth shall be measured correct upto two places of decimal of a metre.

No deduction shall be made for opening not exceeding 0.05 sqm. and no addition shall be made for painting to the beading, moulding edges, jambs, soffits, sils, architraves etc. of such openings.

In measuring painting, varnishing, oiling etc. of joinery and steel work etc., the co-efficient as in the following table shall be used to obtain the areas payable. The co-efficient shall be applied to the areas measured flat and not girthed in all cases.

In case of painting of door shutter with push plates in plastic laminate, deduction will be made for area of such laminations.

1.7 PRECAUTION:

All furniture, lightings, fixture, sanitary, fittings, glazing, floors etc. shall be protected by covering and stains, smears, splashing, if any shall be removed and any damage done shall be made good by the contractor at his cost.

1.8 PRIMING COAT ON WOOD WORK, IRON OR PLASTERED SURFACE:

1.8.1 GENERAL:

The primer for wood work, iron work or plastered surface shall be as specified in the description of the item.

Primer for wood work / Iron & Steel / Plastered / Aluminium surfaces shall be as specified below:

SL. No.	Surfaces on which primer to be applied	Primer to be used
a	Wood Work (Hard or Soft Wood)	Pink conforming to IS 3536-1966
b	Resinous Wood or Ply wood	Aluminium Primer
c	Iron & Steel, Aluminium and galvanized steel work	Zinc chromate primer conforming to IS 104-1962
d	Plastered surfaces, Cement brick work, Asbestos surfaces for oil bound	Cement Primer

The primer shall be ready mixed primer of approved band and manufacture.

1.8.2 PREPARATION OF SURFACE:

a. WOOD WORK:

The wood work to be painted shall be dry and free from moisture.

The surface shall be thoroughly cleaned. All unevenness shall be rubbed down smooth with sand paper and shall be well dusted. Knots, if any, shall be covered with

preparation of red lead made by grinding red lead in water and mixing with strong glue sized and used hot. Appropriate filler material with same shade as paint shall be used where so desired by the Engineer-in-charge.

The surface treated for knotting shall be dry before painting is applied. After the priming coat is applied, the holes and indentation on the surface shall be stopped with glaziers putty or wood putty (for specifications for glaziers putty and wood putty – refer as mentioned herein before). Stopping shall not be done before the priming coat is applied as the wood will absorb the oil in the stopping and the latter is therefore liable to crack.

b. IRON & STEEL WORK:

All rust and scales shall be removed by scrapping or by brushing with steel wire brushes. Hard skin of oxide formed on the surface of wrought iron during rolling which becomes loose by rusting, shall be removed.

All dust and dirt shall be thoroughly wiped away from the surface.

If the surface is wet, it shall be dried before priming coat is undertaken.\

c. PLASTERED SURFACE:

The surface shall ordinarily not be painted until it has dried completely. Trial patches of primer shall be laid at intervals and where drying is satisfactory, painting shall be taken in hand. Before primer is applied, holes and undulations, shall be filled up with plaster of Paris / putty and rubbed smooth.

1.8.3 APPLICATION:

The primer shall be applied with brushes, worked well into the surface and spread even and smooth. The procedure of application shall be same as stated above.

1.9 OIL BOUND WASHABLE DISTEMPER:

1.9.1 GENERAL:

Oil bound washable distemper confirming to IS 428 of approved brand and manufacturer shall be used for commencing the work. The primers where used as on new work shall be cement primer or distemper primer as described in the item. These shall be of the same manufacture as distemper. The distemper shall be diluted with water or any other prescribed thinner in a manner recommended by the manufacturer. Only sufficient quantity of distemper required for day's work shall be prepared.

The distemper and primer shall be brought by the contractor in sealed tins in sufficient quantities at a time to suffice for a fortnight's work, and the same shall be kept in the joint custody of the contractor and the Engineer-in-Charge. The empty tins shall not be removed from the site of work, till this item of work has been completed and passed by the Engineer-in-Charge.

1.9.2 PREPARATION OF SURFACE:

For new work the surface shall be thoroughly cleaned of dust, old white or colour wash by washing and scrubbing. The surface shall then be allowed to dry for at least 48 hours. It shall then be sand papered to give a smooth and even surface. Any unevenness shall be made good by applying putty, made of plaster of paris mixed with water on the entire surface including filling up the undulations and then sand papering the same after it is dry.

1.9.3 APPLICATION:

PRIMING COAT:

The priming coat shall be with distemper primer or cement primer, as required in the description of the item. If the wall surface plaster has not dried completely, cement primer shall be applied before distempering the walls. But if distempering is done after the wall surface is dried completely, distemper primer shall be applied.

Oil bound distemper is not recommended to be applied, within six months of the completion of wall plaster. However, newly plastered surfaces if required to be distempered before a period of six months shall be given a coat of alkali resistant priming Paint conforming to IS 109 and allowed to dry for atleast 48 hours before distempering is commenced.

The distemper primer shall be applied uniformly over the finished surface with adequate number of coats. The operation for each coat shall consist of a stroke of the brush given from the top downwards, another from the bottom upwards over the first stroke, and similarly one stroke horizontally from the right and another from the left before it dries.

Each coat shall be allowed to dry before the next one is applied. Further each coat shall be inspected and approved by the Engineer-in-Charge before the subsequent coat is applied. No portion of the surface shall be left out initially to be patched up later on.

For new work, three or more coats shall be applied till the surface presents a smooth and uniform finish through which the plaster does not show. The finished dry surface shall not show any signs of cracking and peeling nor shall it come off readily on the hand when rubbed.

DISTEMPERING:

For new work, after the primer coat has dried for at least 48 hours, the surface shall be lightly sand papered to make it smooth for receiving the distemper, taking care not to rub out the priming coat. All loose particles shall be dusted off after rubbing. One coat of distemper properly diluted with thinner (water or other liquid as stipulated by the manufacturer) shall be applied with brushes in horizontal strokes followed immediately by vertical ones which together constitute one coat.

The subsequent coats shall be applied in the same way. Two or more coats of distemper as are found necessary shall be applied over the primer coat to obtain an even shade.

A time interval of at least 24 hours shall be allowed between successive coats to permit proper drying of the preceding coat.

15 cm double bristled distemper brushes shall be used. After each days work, brushes shall be thoroughly washed in hot water with soap solution and hung down to dry. Old brushes which are dirty and caked with distemper shall not be used on the work.

1.10 CEMENT PAINT:

1.10.1 GENERAL:

The cement paint required for the work shall be in conformity with IS 5410 and shall be of approved brand and manufacturer.

The cement Paint shall be brought to the site of work by the contractor in its original containers is sealed condition. The material shall be brought in at a time in adequate quantities to suffice for the whole work or at least a fortnight's work. The materials shall be kept in the joint custody of the Contractor and the Engineer-in-Charge. The empty containers shall not be removed from the site of work till the relevant item of the work has been completed and permission obtained from the Engineer-in-Charge.

1.10.2 PRPARATION OF SURFACE:

For New Work, the surface shall be thoroughly cleaned of all mortar dropping, dirt dust, algae, grease and other foreign matter by brushing and washing. Pitting in plaster shall be made good and a coat of water proof cement Paint shall be applied over patches after wetting them thoroughly.

1.10.3 PREPARATION OF MIX:

Cement Paint shall be mixed in such quantities as can be used up within an hour of its mixing as otherwise the mixture will set and thicken, affecting flow and finish. Cement Paint shall be mixed with water in two stages. The first stage shall comprise of 2 parts of cement Paint and one part of water stirred thoroughly and allowed to stand for 5 minutes. Care shall be taken to add the cement Paint gradually to the water and not *vice versa*. The second stage shall comprise of adding further one part of water to the mix and stirring thoroughly to obtain a liquid of workable and uniform consistency. In all cases the manufacturer's instructions shall be followed meticulously.

The lids of cement Paint drums shall be kept tightly closed when not in use, as by exposure to atmosphere the cement Paint rapidly becomes air set due to its hygroscopic qualities.

In case of cement Paint brought in gunny bags, once the bag is opened, the contents should be consumed in full on the day of its opening. If the same is not likely to be consumed in full, the balance quantity should be transferred and preserved in an airtight container to avoid its exposure to atmosphere.

1.10.4 APPLICATION:

The solution shall be applied on the clean and wetted surface with brushes or spraying machine. The solution shall be kept well stirred during the period of application. It shall be applied on the surface which is on the shady side of the building so that the direct heat of the sun on the surface is avoided. The method of application of cement Paint shall be as per manufacturer's specification. The completed surface shall be watered after the day's work.

The second coat shall be applied after the first coat has been set for at least 24 hours. Before application of the second or subsequent coats, the surface of the previous coat shall not be wetted.

For new work, the surface shall be treated with three or more coats of water proof cement Paint as found necessary to get a uniform shade.

1.10.5 PRECAUTION:

Water proof cement Paint shall not be applied on surfaces already treated with white wash, colour wash, distemper dry or oil bound, varnishes, Paints etc. It shall not be applied on gypsums, wood and metal surfaces.

If water proofing cement is required to be applied on existing surface, previously treated with white wash, colour wash etc., the surface shall be thoroughly cleaned by scrapping off all the white wash, colour wash etc. completely. Thereafter, a coat of cement primer shall be applied followed by two or more coat of water proof cement.

1.11 WEATHER SHIELD PAINT:

1.11.1 GENERAL:

The paint shall be of approved brand and manufacturer.

This paint shall be brought to the site of work by the contractor in its original containers in sealed condition. The material shall be brought in at a time in adequate quantities to suffice for the whole work or at least a for night's work. The materials shall be kept in the joint custody of the contractor and the Engineer-in-Charge. The empty containers shall not be removed from the site of work till the relevant item of work has been completed and permission obtained from the Engineer-in-Charge.

1.11.2 PREPARATION OF SURFACE:

For new work, the surface shall be thoroughly cleaned off all mortar dropping, dirt dust, algae, fungus or moth, grease and other foreign matter of brushing and washing, pitting in plaster shall make good, surface imperfections such as cracks, holes etc. should be repaired using white cement. The prepared surface shall have received the approval of the Engineer in charge after inspection before painting is commenced.

1.11.3 APPLICATION:

Paint shall be applied with a brush on the cleaned and smooth over a coat of cement primer of approved brand and manufacturer. Horizontal strokes shall be given, First and vertical strokes shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush marks.

Before pouring into smaller containers for use, the paint shall be stirred thoroughly in its container, when applying also the paint shall be continuously stirred in the smaller containers so that its consistency is kept uniform. Dilution ratio of paint with potable water can be altered taking into consideration the nature of surface climate and as per recommended dilution given by manufacturer. In all cases, the manufacturer's instructions & directions of the Engineer-in-charge shall be followed meticulously.

The lids of paint drums shall be kept tightly closed when not in use as by exposure to atmosphere the paint may thicken and also be kept safe from dust.

Each coat shall be allowed to dry before the next one is applied. Further each coat shall be inspected and approved by the Engineer-in-Charge before the subsequent coat is applied. No portion of the surface shall be left out initially to be patched up later on.

1.12 DULUX WEATHER SHIELD TEXTURED PAINT:

1.12.1 GENERAL:

Dulux Weather Shield TEX offers designer textured finishes which can unleash your creativity and create personalized surroundings though a range of effects. Weather Shield TEX is formulated with special materials such as tough mineral crystals that give it unparallel toughness, durability, making it a perfect choice for exterior painting and also for interiors. Its high consistency and filling properties allow it to hide the imperfections of the surface.

This paint shall be brought to the site of work by the contractor in its original containers in sealed condition. The material shall be brought in at a time in adequate quantities to suffice for the whole work or at least a for night's work. The materials shall be kept in the joint custody of the contractor and the Engineer-in-Charge. The empty containers shall not be removed from the site of work till the relevant item of work has been completed and permission obtained from the Engineer-in-Charge.

1.12.2 PREPARATION OF SURFACE:

Ensure surface is thoroughly clean, dry and free from all loose dirt, chalk, grease, fungi, algae and flaking paint. This can be achieved by brushing with a wire/stiff coir brush followed by water jetting if required. Fill up all minor cracks and defects with cement and sand mixture in the ratio 1:3. Avoid application of putty or filling compounds while painting an exterior surface. Application of one coat of ICI Pre-treatment coat is recommended for better performance of the paint.

1.12.3 APPLICATION:

Priming: Apply one coat Weather Shield Alkali Bloc or ICI Exterior Primer or Weather Shield Tex Ultrafine after dilution with water in 1:1 ratio by volume. Apply it with brush or roller on the whole the surface. Let it dry for 4 hours. It is recommended that the priming coat is also be tinted in the same shade as the Texture coat.

Thinning: No thinning of the material is recommended for the final coat. But for ease of application a little water can be sprinkled.

Finishing: Create the desired finish using a trowel. Different finishes can be created, depending on the movement of the hand. Let it dry for 4 hours. Hard dry time is overnight.

Clean Up: Clean the application elements with clean water immediately after use.

Note:

1. Additional coat of Weather Shield, Weather Shield MAX or Tile Shield can be applied to enhance performance.

2. Do not apply in temperatures lower than 5º C, relative humidity higher than 85% or when immediate rains are forecasted.

1.12.4 SAFETY, HEALTHY AND ENVIRONMENTAL INFORMATION:

Store container in upright position, with lid tightly closed, in a cool, dry place. Keep out of the reach of children and away from food, drink and animal feed. May be harmful if swallowed. In case if ingestion seek immediate medical attention. Ensure good ventilation at all times. Do not breathe vapour or spray. Avoid inhalation of dust by

wearing a suitable nose pad during sanding and surface preparation. Wear eye protection during application. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Remove slashes from the skin with soap and water or recognized skin cleanser. Do not pour leftover paint down the drains or in water courses. Contain spillage using sand or earth. Safety Data Sheet available for professional user on request.

1.13 PLASTIC EMULSION PAINT:

1.13.1 GENERAL:

This shall be polyvinyl based Acrylic / plastic emulsion paint of approved manufacture of the required shade conforming to IS 5411-1969.

The primer to be sued for the painting with acrylic emulsion on cement concrete surfaces, plastered surfaces, A.C. sheets, timber and metal surfaces, if necessary shall be of approved base and as per recommendations of the manufacturers.

Plaster filler to be used for filling up (putting) uneven surfaces, small cracks and holes etc. shall be of approved compound and as per recommendations of the manufacturers. No oil based putty shall be used. The putty should be made from a mixture of whiting and plastic emulsion paint or as per manufacturer's recommendations.

1.13.2 PREPARATION OF SURFACE:

For new work, the surface shall be thoroughly cleaned off all mortar dropping, dirt dust, algae, fungus or moth, grease and other foreign matter of brushing and washing, pitting in plaster shall make good, surface imperfections such as cracks, holes etc. should be repaired using white cement. The prepared surface shall have received the approval of the Engineer in charge after inspection before painting is commenced.

1.13.3 APPLICATION:

Paint shall be applied with a brush on the cleaned and smooth over a coat of cement primer of approved brand and manufacturer. Horizontal strokes shall be given, First and vertical strokes shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush marks.

Before pouring into smaller containers for use, the paint shall be stirred thoroughly in its container, when applying also the paint shall be continuously stirred in the smaller containers so that its consistency is kept uniform. Dilution ratio of paint with potable water can be altered taking into consideration the nature of surface climate and as per recommended dilution given by manufacturer. In all cases, the manufacturer's instructions & directions of the Engineer-in-charge shall be followed meticulously.

The lids of paint drums shall be kept tightly closed when not in use as by exposure to atmosphere the paint may thicken and also be kept safe from dust.

Each coat shall be allowed to dry before the next one is applied. Further each coat shall be inspected and approved by the Engineer-in-Charge before the subsequent coat is applied. No portion of the surface shall be left out initially to be patched up later on.

All the finishing coats shall be of matt finish or any other finish as required by the Engineer-in-charge. The number of finishing coats shall be as specified in the item.

1.13.4 MODE OF MEASUREMENT:

All the measurements for payment shall be taken on net surface area actually painted, unless otherwise specified. Deduction will be made from the areas for fixtures, frills, ventilation, outlets, electrical boxes and such obstructions not painted, if they are individually more than 0.05 sqm.

Acrylic emulsion paint is required to be provided on plastered and concrete surfaces in portions of the building. The Department shall reserve the option to delete or increase quantities in full or part from the scope of contract during progress of work.

All wood surfaces are to be pointed with semi glossy synthetic enamel paint with an approved primer.

All shades and colours of paints shall be subjected to review and prior approval of Engineer-in-charge shall be taken before the application.

1.14 SYNTHETIC ENAMEL PAINTING:

1.14.1 GENERAL:

Synthetic Enamel Paint (conforming to IS 2933) of approved brand and manufacture and of the required colour shall be used for the top coat and an undercoat of ordinary Paint of shade to match the top coat as recommended by the same manufacturer as far the top coat shall be used.

1.14.2 PREPARATION OF SURFACE:

WOODEN SURFACE:

The wood work to be painted shall be dry and free from moisture. The surface shall be thoroughly cleaned. All unevenness shall be rubbed down smooth with sand paper and shall be well dusted. Knots if any shall be covered with preparation of red lead made by grinding red lead in water and mixing with strong glue sized and used hot. Appropriate filler material conforming to IS 345 with same shade as Paint shall be used where specified. The surface treated for knotting shall be dry before Paint is applied. After obtaining approval of Engineer-in-Charge for wood work, the priming coat shall be applied before the wood work is fixed in position. After the priming coat is applied, the holes and indentation on the surface shall be stopped with glazier's putty or wood putty.

Stopping shall not be done before the priming coat is applied as the wood will absorb the oil in stopping and the latter is therefore liable to crack.

IRON AND STEEL SURFACE:

All rust and scales shall be removed by scrapping or by brushing with steel wire brushes. Hard skin of oxide formed on the surface of wrought iron during rolling which becomes loose by rusting, shall be removed.

All dust and dirt shall be thoroughly wiped away from the surface. If the surface is wet, it shall be dried before priming coat is undertaken.

1.14.3 APPLICATION:

The number of coats including the undercoat shall be as stipulated in the item.

Under Coat: One coat of the specified ordinary Paint of shade suited to the shade of the top coat, shall be applied and allowed to dry overnight. It shall be rubbed next day with the finest grade of wet abrasive paper to ensure a smooth and even surface, free from brush marks and all loose particles dusted off.

Top Coat: Top coats of synthetic enamel Paint of desired shade shall be applied after the undercoat is thoroughly dry. Additional finishing coats shall be applied if found necessary to ensure properly uniform glossy surface.

1.15 WALL CARE PUTTY:

1.15.1 GENERAL:

Wall care putty consists of white cement, high quality polymers and specialty chemicals and mineral fillers and is formulated to make it suitable to apply even on damp surfaces. Being cement based putty, it has better compatibility with the base plaster and forms a durable base for paints. It can be applied on both, Interior and exterior plastered surfaces. It is a water resistant base coating to the plastered surfaces to provide fine levelling and a protective base for the surfaces to be painted.

Wall care putty shall have superior water resisting properties to prevent paint from flaking even if the walls are damp. It should fill-up fine pores in walls and ceilings to get the smooth and dry surface for painting. Wall care putty shall have better properties in terms of water-resistance, adhesive strength and durability as compared to the ordinary putties. The putty shall provide a breathable surface and allow any trapped moisture to move out keeping the wall dry and clean.

Wall care Putty shall be in dry free flowing powder form. Required quantity of Wall care putty shall be procured from the reputed manufacturers like M/s. Birla White Wall Care Putty or equivalent approved manufacturers, or from their authorised dealers. The putty shall conform to the International standards.

1.15.2 PREPARATION OF SURFACE:

Surface should be clean of loose particles, dirt, grease and traces of foreign material. Sand papering or chipping shall be done if so required.

Loose plastered areas/defective materials shall be removed & surface re-plastered and cracks filled-up properly.

Uneven ceiling/wall surfaces shall be made even by re-plastering. Surface should be pre-wetted prior to application. This helps in providing a strong bond with substrate.

1.15.3 MIXING:

12 to 16 litres of clean water shall be required for a bag of 40 kg of wall care putty. Required quantity of putty (which is required to be used at a time) shall be added to the water in right proportion. (Considering pot life of the mix as 60 minutes).

Mix shall be stirred continuously by using an electric mixer or by hand to obtain a homogeneous lump-free paste.

The paste shall be allowed to stand for about 10 minutes for the additives to dissolve.

The paste shall be re-mixed again for about 2 minutes. This mix should be used within 60 minutes.

1.15.4 APPLICATION:

The plastered surface shall be dampened with clean water and excess water shall be allowed to be drained off. Using a steel trowel/blade, the above mix shall be applied to a thickness of about 1 – 2 mm. Then the surface shall be levelled and smoothened. This first coat shall be cured lightly after it dries-up. Then second coat shall be applied after first coat is fully dried and set. Second coat shall be cured lightly for two days. Over plastered / Coarse putty substrate, fine wall care putty of about 1 to 1.5 mm thickness shall be applied, to smoothen the surface with a steel trowel. Finished surface of wall care putty shall not require any dressing by Emery Paper but if at all it is done, the paper should not be less than 500 numbers. The thickness of each coat should not exceed 1.5mm and total wall putty thickness should not exceed 3mm.

If specified in the description of item, coarse wall care putty of about 6 to 10 mm thickness shall be applied to remove the undulations and level the surface. More number of coats of coarse putty shall be applied to cover up undulations, only after approval of the Engineer-in-Charge.

Coverage of wall care putty depends upon surface quality. However, approximate coverage for fine wall care putty shall be 20-22 Sqft/kg and for coarse wall care putty, it shall be 9-10 Sqft/kg. Application of primer before painting is not necessary over the surfaces finished with wall care putty.

1.16 IS CODES AND STANDARDS:

IS 102 -1962 : Ready Mixed paint, brushing, red lead, Non-setting priming

IS 104 -1979 : Specification for Ready Mixed paint, brushing, Zinc Chrome Priming

IS 428-1969 : Distemper, Oil emulsion, colour as required

IS 5410 -1992 : Cement Paint

IS 5411 -1974 : Plastic emulsion paint: Part-1 : For interior use.

G. CARPENTRY AND JOINERY WORKS

1. SCOPE:

The work covered under this specification consists of furnishing of all kinds of carpentry and joinery works in accordance with their specification and drawing.

1.1 GENERAL:

All timber used for carpentry and joinery works shall be new. It shall be well seasoned by a suitable process conforming to IS : 1141-1973 before being planed to the required sizes. It shall be sound, straight, free from sap, radial cracks, decay, fungal growth, boxed heart, pitch pockets, borer holes, splits, loose knots, flaws or any other defects and shall show a clean surface when cut. Timber shall conform to the requirements of IS

: 1003 (Part 1&2)-1983 to 1991. The finished components shall be given suitable preservative treatment wherever necessary.

All timber mentioned in the item in schedule of quantities shall be from the heart of a sound tree of nature growth entirely free from sap wood. It shall be uniform in texture, straight in fibre and shall be well and properly seasoned. It will be free from large, loose, dead or cluster knots, wedges, injuries, open shakes, borer holes, rot, decay date, discoloration, soft or spongy spot, hollow pockets, pith or centre bore and all other defects or any other damages of harmful nature which will affect the strength, durability, appearance and its usefulness for the purpose for which it is required. Only properly seasoned timber shall be used.

1.2 TIMBER:

The timber shall be free from decay, fungal growth, boxed heart, pitch pockets or streaks on the exposed edges, splits and cracks. The timber shall be graded as first grade and second grade on the basis of the permissible defects in the timber as given in Appendix 'A' of Chapter 9.0 of CPWD Specification (Vol-I). For both the grades, knots should be avoided over a specified limit.

1.2.1 TEAK WOOD:

Timber shall be of good quality and well-seasoned. It shall have fairly uniform colour, reasonable straight grains and shall be free from all defects as mentioned in previous clauses. No individual hard and sound knot shall be more than 6 sq. cm. in size and aggregate area of all such knots shall not exceed 2 % of the area of the piece. There shall not be less than 5 growth rings per 2 cm of the width.

For 1st class Teak wood; Individual hard and sound knot shall not be more than 25mm in diameter and aggregate area of all knots shall not exceed one percent of the area of the piece. Sapwood shall not be allowed.

For 2nd class Teak Wood; Individual hard and sound knot shall not be more than 40 mm in diameter and aggregate area of all knots shall not exceed one and half percent of the area of the piece. Wood shall be generally free from sapwood, but traces of sapwood may be allowed.

1.2.2 SAL WOOD:

Sal is about 30 percent heavier than teak, 50 percent harder, and about 20 to 30 percent stronger. In shock resistance it is about 45 percent above teak. Its heart wood is a naturally durable wood, and usually remains immune to attack by white ants and fungi for a long period, while its sapwood is very perishable and should not be used. Well dried sal is not a really easy wood to saw and work. It is a rough constructional wood than a carpentry timber. No individual hard and sound knot shall exceed 25 mm in diameter and the aggregate area of all the knots shall not exceed 1% of the area of the piece.

It can be used for a variety of purposes, such as for frames of doors and windows, beams, rafters, flooring, piles, bridging, tool handles, tent pegs etc.

1.3 MOSITURE CONTENT:

The maximum permissible limits of moisture content shall be from 10 to 16 percent for timber 50 mm and above in thickness, and 8 to 14 percent for timber less than 50 mm, for different regions as specified in IS : 287 – 1973.

As per IS: 287 – 1973, the country has been broadly divided into Four Zones, based on humidity variations, as follows :

Zone I : Average annual relative humidity less than 40 %

Zone II : Average annual relative humidity 40 to 50 %

Zone III : Average annual relative humidity 50 to 67 %

Zone IV : Average annual relative humidity more than 67 %

The maximum moisture contents of timber for various zones are as follows :

Climate Zones as per IS 287-1973

Sl. No.	**Description**	**Percentage of Moisture Content of Oven dry weight timber**			
		Zone-I	**Zone-II**	**Zone-III**	**Zone-IV**
a	For joinery including frames, staircases, mouldings and other joiner's work, 50mm and above in thickness	10	12	14	16
b	Ditto, thinner than 50 mm.	08	10	12	14

A relaxation of 3 to 5% may be allowed upon local conditions, at the discretion of the Engineer-in-Charge. Where joints are strengthened by steel straps, bolts, etc., relaxation upto 7 ½% may be permitted.

1.4 SEASONING AND TREATMENT:

All timber shall be well seasoned by a suitable process confirming to IS:1141 – 1973, before being planned to the required sizes. Sap wood, where permitted, and hard wood shall be treated with suitable preservatives as specified in IS:401 – 1982, Code of practice for preservation of timber (3 rd revision). The finished components shall be given suitable treatment.

Timber shall be free from decay, fungal growth, boxed heart, pitch pockets or streaks on exposed edges, bore holes, splits and cracks.

1.5 PRESERVATION OF TIMBER:

Preservative treatment does not improve basic properties of timber but gives varying degree of protection against deterioration due to attacks by fungi, termites, borers and marine organisms. Preservative treatment, where specified, shall be done using Oil type, Organic solvent type or Water-soluble type preservative. Oil type preservatives shall be used if the timber is not required to be polished or painted. Before preservative treatment, the timber shall be sawn and seasoned. All surfaces exposed after treatment, except due to planning, shall be thoroughly brushed with the preservation before jointing. Preservative treatment of timber shall be done as per IS 401 in a plant approved by the Engineer-in-Charge.

1.6 PERMISSIBLE DEFECTS:

Second Class Individual sound knot and hard knot shall not be more than 40 mm dia and the knots shall not be more than 1.5% of the area of piece.

Pitch pockets or streaks are permissible except on exposed edges provided that they are clean and filled up with suitable putty or filler. When pitch pockets or streaks are located on the exposed edges of the core, they shall be cut out and filled with pieces of wood of similar species with grain running in the same direction. The piece shall be well glued.

It shall be generally free from sap wood but traces of sap wood shall be permitted.

Pint holes shall be permitted, provided they are filled.

Wormholes shall be permitted, provided they are not more than 10 mm in diameter and not more than one per member and provided such worm holes are plugged with similar timber in such a manner that the plugging merges with the surrounding area both as to colour and grain.

1.7 WORKMANSHIP FOR DOOR, WINDOW FRAMES:

All members of frames of doors, windows and ventilators, etc. shall be at right angles, checked from the inside surfaces of the respective members.

Timber for door, window and ventilators frames shall be as specified. Timber shall be sawn in the direction of the grains. All members of a frame shall be of the same species of timber and shall be straight without any warp or bow. Frames shall have smooth, well-planed (wrought) surfaces except the surfaces touching the walls, lintels, sill etc., which may be left clean sawn. Rebates, rounding or moulding shall be done before the members are jointed into frames. The depth of the rebate for housing the shutters shall be 15 mm, and the width of the rebates shall be equal to the thickness of the shutters. A tolerance of ± 2 mm shall be permitted in the specified finished dimensions of timber sections in frames.

The Jamb posts shall be through tenoned in to the mortise of the transoms to the full thickness of the transoms and the thickness of the tenon shall be not less than 2.5 cm. The tenons shall closely fit into the mortise without any wedging or filling. The contact surface of tenon and mortise before putting together shall be glued with polyvinyl acetate dispersion based adhesive conforming to IS 4835 or adhesive conforming IS 851 and pinned with 10 mm dia hard wood dowels, or bamboo pins or star shaped metal pins.

The joints shall be at right angles when checked from the inside surfaces of the respective members. The joints shall be pressed in position. Each assembled door frame shall be fitted with a temporary stretcher and a temporary diagonal brace on the rebated faces.

The frames shall be got approved by the Engineer-in-Charge before being painted, oiled or otherwise treated and before fixing in position. The surface of the frames abutting masonry or concrete and the portions of the frames embedded in floors shall be given a coating of coal tar. Frames shall be fixed to the abutting masonry or concrete with holdfasts or metallic fasteners as specified. After fixing, the jamb posts of the frames shall be plugged suitably and finished neat. Vertical members of the door frames shall be embedded in the floor for the full thickness of the floor finish and shall be suitably strutted and wedged in order to prevent warping during construction. A minimum of three hold fasts shall be fixed on each side of door and window frames one at centre point and other two at 30 cm from the top and bottom of the frames. In case of window and ventilator frames of less than 1 m in height two hold fasts shall be fixed on each side at quarter point of the frames. Hold fasts and metallic fasteners shall be measured and paid for separately.

1.8 HOLD FAST:

Three holdfasts shall be fixed to each post of the door frame. The M.S. holdfasts shall be of size 37.5cm x 40 mm x6 mm or as required at site and shall be fixed to the frames by means of screws and not nails . The other end of the holdfasts shall be fixed into jambs with [1:2:4] P.C.C. of dimensions as directed. Ends of holdfasts will be fish tailed. Corner straps of M.S. sheets shall be provided and fixed on corners with screws.

Whenever asked for metal fastener or bolts as directed shall be used for rough ground, framing, hangers etc.

1.9 FLUSH DOOR SHUTTER:

1.9.1 GENERAL:

Flush door shutter shall have a solid core and may be of the decorative or non-decorative type conforming to I.S. 2202. The thickness and type of shutter shall be as specified in item of schedule of quantities.

The shutter shall be free from twist or wrap in it’s plane. The moisture content in timbers used in the manufacture of flush door shutters shall be not more than 12 percent when tested according to I.S. 1708.

1.9.2 CORE:

The core of flush door shall be a block board having wooden strips held in a frame constructed of stiles and rails. Each stile and rail shall be a single piece without any joint. The width of the stiles and rails shall not be less than 75 mm and not more than 100 mm. The width of each wooden strip shall not exceed 25 mm. Stiles, rails and wooden strips forming the core of a shutter shall be of equal and uniform thickness. Wooden strips shall be parallel to the stiles.

End joints of the pieces of wooden strips of small lengths shall be staggered. In a shutter, stiles and rails shall be of one species of timber. Wooden strips shall also be of one species only but it may or may not be of the same species as that of the stiles and

rails. Any species of timber may be used for core of flush door. However, any non-coniferous (Hard wood) timber shall be used for stiles, rails and lipping.

1.9.3 FACE PANEL:

The face panel shall be formed by gluing, by the hot-press process on both faces of the core, either plywood or cross-bands and face veneers. The thickness of the cross bands as such or in the plywood shall be between 1.0 mm and 3.0 mm. The thickness of the face veneers as such or in the plywood shall be between 0.5 mm and 1.5 mm for commercial veneers and between 0.4 mm and 1.0 mm for decorative veneers, provided that the combined thickness of both is not less than 2.2 mm. The direction of the veneers adjacent to the core shall be at right angles to the direction of the wooden strips. Finished faces shall be sanded to smooth even texture. Commercial face veneers shall conform to marine grade plywood and decorative face veneers shall conform to type I decorative plywood in IS 1328.

1.9.4 LIPPING:

Lipping, where specified, shall be provided internally on all edges of the shutters. Lipping shall be done with battens of first class hardwood or as specified of depth not less than 25 mm. For double leaved shutters, depth of the lipping at meeting of stiles shall be not less than 35 mm. Joints shall not be permitted in the lipping.

1.9.5 REBATING:

The shutters shall be single leaf or double leaves as shown in the drawings or as directed by the Engineer-In-charge. In case of double leaves shutters the meeting at stiles shall be rebated by one third the thickness of the shutter. The rebating shall be either splayed or square type.

1.9.6 VISION PANEL:

Wherever specified the opening for glazing of size as shown in drawing or as directed shall be made in the shutter for vision panel and or louver. Opening for glazing shall be lipped internally with teakwood batten of specified size.

1.9.7 TOLERANCE:

Tolerance on width and height shall be (+) 3 mm and on thickness it shall be (+) 1.2 mm. The thickness of the door shutter shall be uniform throughout with a permissible variation of not more than 0.8 mm when measured at any two points.

1.9.8 ADHESIVE:

Adhesive used for bonding various components like core, core frame, lipping, cross bands, face veneers, plywood etc. of flush door shutters and for bonding plywood shall be phenol formaldehyde synthetic resin conforming to I.S. 848.

1.9.9 TESTS:

Samples of flush door shutters shall be subjected to the following tests:

(a) End Immersion Test
(b) Knife Test
(c) Glue Adhesion Test

One end of each sample shutter shall be tested for End Immersion Test. Two specimens of 150 x 150 mm size shall be cut from the two corners at the other end of each sample

shutter for carrying out Glue Adhesion Test. Knife Test shall be done on the remaining portion of each sample shutter. Test shall be done as laid down in Appendix F of Chapter 9 (CPWD Specification Vol-I).

1.9.10 FIXING:

For side hung shutters of height upto 1.2 m, each leaf shall be hung on two hinges at quarter points and for shutter of height more than 1.2 m, each leaf shall be hung on three hinges one at the centre and the other two at 200 mm from the top and bottom of the shutters. Top hung and bottom hung shutters shall be hung on two hinges fixed at quarter points of top rail or bottom rail. Centre hung shutter shall be suspended on a suitable pivot in the centre of the frame. Size and type of hinges and pivots shall be as specified. Flap of hinges shall be neatly counter sunk into the recesses cut to the exact dimensions of flap. Screws for fixing the hinges shall be screwed in with screw driver and not hammered in. Unless otherwise specified, shutters of height more than 1.2 mm shall be hung on butt hinges of size 100 mm and for all other shutters of lesser height butt hinges of size 75 mm shall be used. For shutter of more than 40 mm thickness butt hinges of size 125 × 90 × 4 mm shall be used. Continuous (piano) hinges shall be used for fixing cup-board shutters where specified.

1.9.11 FITTINGS:

1.9.11.1 GENERAL:

Fittings shall be of iron, brass, aluminium or as specified. These shall be well made, reasonably smooth and free from sharp edges, corners, flaws and other defects. Screw holes shall be countersunk to suit the head of specified wood screws. All hinge pins shall be of steel and their riveted heads shall be well formed.

Iron fittings shall be finished bright or black enameled or copper oxidised or painted as specified. Brass fittings shall be finished bright, oxidised or chromium plated and aluminium fittings shall be finished bright or anodised as specified. Fittings shall be got approved by the Engineer before fixing. Screws used for fittings shall be of the same metal and finish as the fittings. However, anodized cadmium/chromium plated M.S. screws of approved quality shall be used for fixing aluminium fittings.

1.9.11.2 BUTT HINGES:

These shall be mild steel but hinge (medium), brass butt hinges, extruded aluminium alloy butt hinges or as specified. Type (light/medium/heavy weight) and size shall be as specified in the drawing or schedule of items. Brass / Aluminium and M.S butt hinges shall conform to Indian Standard Specification for butt hinges IS : 205-1992 and IS : 1341-1992 respectively. Hinges shall be finished bright or satin polished or anodised.

1.9.11.3 TOWER BOLT:

The type of tower bolt to be used for commencing the work shall conform to IS 204 (Part 1 and 2) -1991 and 1992.

The barrel type tower bolt shall be of bright finished/stove enamelled/ black painted mild steel tower bolts, brass barrel tower bolts with cast brass barrel and rolled or drawn brass bolt/brass barrel tower bolts with barrel of extruded sections of brass and rolled or drawn brass bolt/brass barrel tower bolts with brass sheet barrel and rolled or drawn

brass bolt. Aluminium barrel tower bolts with barrel and bolt of extruded section of aluminium alloy-bolts and barrel anodised.

1.9.11.4 DOOR HANDLE:

Door handles shall conform to IS : 208-1987 and shall be of 4 types. Type 1 is cast Iron / Brass / Aluminium or zinc alloy die casting and available in 75,100,125 150mm sizes. Type 2 is mild steel pressed oval in 75, 100,115 and 135mm sizes. Type 3 is mild steel present half oval in 75,90 and 100mm sizes. Type 4 is fabricated (brass / aluminium alloy) in 75,100 and 125mm sizes. The size of the handle shall be determined by inside (grip) size overall size and internal depth of the handles shall be as detailed in IS : 208-1987.

Finish for type 1 shall be satin/nickel plating, copper oxidising and bronze finish for cast-brass and zinc die cast handles and stove enamelled black or copper oxidized for cast iron handles. Aluminium handles shall be anodized. Type 2 and 3 handles shall be stove enamelled black. For type 4 it shall be satin finish, nickel plating, copper oxidized and bronze finish for brass handles and anodizing for aluminium handles.

1.9.11.5 MORTICE LOCK AND REBATED MORTICE LOCK:

Mortice lock with latch and pair of lever handles shall have body of steel, Aluminium alloy or brass and shall be right or left handed as shown in the drawing or as directed by the Engineer. It shall be of the best Indian make of approved quality and shall conform to IS: 2209 / 6607-1976/1972. The shape and pattern shall be approved by the Engineer. The size of the lock shall be determined by its length. The lock for single leaf door shall have plain face and that for double leaf door a rebated face. Lever handles with springs shall be mounted on plates and shall weigh not less than 0.5 kg per pair.These shall be of brass, finished, bright chromium plated or oxidised. The locks shall be of 65, 75 and 100 mm sizes.

1.9.11.6 DOOR STOPPER:

It is made of aluminium alloy/ brass with springs of phosphor bronze or hard drawn steel wire and tongue of aluminium/brass/nylon/ plastic. The floor door stoppers shall conform to IS : 1823-1980 and shall be best Indian make of approved quality. Width of cover plate is 40mm but its overall length is 140mm for 30 and 35mm thick shutters & 150mm for 40 and 45mm shutters. The body shall be cast in one piece and fixed to cover plate by brass or M.S screws. On the extreme end there shall be rubber cushion to absorb shocks. The extension of the door stopper shall be in flush with floor and be finished bright/satin/chromium plated or anodised.

1.9.11.7 ALDROPS:

These shall be oxidized brass or anodized aluminium, iron oxidized or as specified and shall be capable of smooth sliding action and shall be as per relevant I.S. Brass sliding door bolt (aldrop) shall be made from rolled brass generally confirming to IS : 2681. M.S. sliding door bolt shall generally conform to I.S.281. The hasp shall be of cast brass and screwed to the bolt in a workman like manner. Alternatively the hasp and the bolt may be in one piece. Bolts shall be finished to shape and threaded with worth standard and provided with round brass washers and nuts of square or hexagonal shape. All components shall be smooth and polished. The leading dimensions of aldrop shall be as the length of the bolt and specified diameter.

1.9.11.8 HYDRAULIC DOOR CLOSER:

This shall be generally conform to IS : 3564. Hydraulic door closer shall be of approved quality and make. The operation of the Hydraulic door closer shall be very smooth. This should be of H.D.-66 for external/main doors and elegant - 63 for all internal doors.

The overall height should not be more than 170 mm. for H.D.-66 and 160 mm. for elegant - 63, base shall be 110 x 60 mm. for H.D.-66 and 100 x 55 mm. for elegant - 63 weighing not less than 4.5 kg. for H.D.-66 and 4 Kg. for elegant - 63. Speed of the Hydraulic door closer shall be adjustable and latch closing also shall be adjustable type. Suspension and lubrication of door closer shall be in perfect line and level.

1.10 MODE OF MEASUREMENT:

The work covered under the respective items in schedule and the above specifications shall be measured as follows :

The cubic contents for wood work shall be measured for the finished size, limiting to those shown in the drawings or ordered by the Engineer-in-charge. The cross sectional dimensions shall be measured equivalent to nearest enclosing rectangle (least rectangle/square) for wrought and planed sizes. The cubical content shall be worked out correct upto three places of decimals of a cubic metre. The frames embedded below finished floor shall not be measured.

The square meter areas for shutters shall be measured for the exposed surfaces of shutter between frames from inside or outside whichever is more. The linear dimensions shall be measured upto two places of decimals of a metre. The area for payment shall be worked out correct upto two places of decimals of a square metre.

1.11 IS CODES AND STANDARDS:

IS 204 (Part-I)	: Specification for tower bolts (Ferrous metal)
IS 204 (Part-II)	: Specification for tower bolts (Non ferrous metal)
IS 208	: Specification for door handle
IS 1200 (Part-XXI)	: Method of measurement of Building and Civil Engineering Works (Wood work and Joinery)
IS 1341	: Specification for steel butt hinges.
IS 2202 (Part-I & II)	: Specification for Wooden Flush door (Solid Core Type)
IS 2209 (Part-I)	: Specification for Mortice Lock
IS 3564	: Specification for door closers
IS 4992	: Specification for door handles for Mortice lock

H. STEEL WORK:

3. STEEL WORK IN BUILT UP SECTION (RIVETED / BOLTED / WELDED):

The steel work in built up section (Riveted / Bolted / Welded) such as trusses, framed work etc. is specified in this clause.

1.1 LAYING OUT:

A figure of the steel structure to be fabricated shall be drawn on a level platform to full scale. This may be done in full or in parts, as shown on drawings or as directed by the Engineer-in-Charge. Steel tape shall be used for measurements.

1.2 FABRICATION:

Fabrication shall generally be done as specified in IS 800. In major works or where so specified, shop drawings giving complete information for the fabrication of the component parts of the structure including the location, type, size, length and details or rivets, bolts or welds, shall be prepared in advance of the actual fabrication and approved by the Engineer-in-charge. The drawings shall indicate the shop and field rivets, bolts and welds. The steel members shall be distinctly marked or stenciled with paint with the identification marks as given in the shop drawings.

Great accuracy shall be observed in the fabrication of various members, so that these can be assembled without being unduly packed, strained or forced into position and when built up, shall be true and free from twist, kinks, buckles or open joints.

Wooden or metal sheet templates shall be made to correspond to each member, and position of rivet holes shall be marked accurately on them and holes drilled. The templates shall then be laid on the steel members, and holes for riveting and bolting marked on them. The ends of the steel members shall also be marked for cutting as per required dimensions. The base of steel columns and the positions of anchor bolts shall be carefully set out at the required location.

The steel section shall be straight or to be straightened or flattened by pressure unless required to be of curvilinear form and shall free from twists. These shall be cut square either by shearing or sawing to correct length and measured by steel tape. No two pieces shall be welded or joined to make up for the required length of member.

1.3 MAKING HOLE:

Holes through more than one thickness of materials for members, such as compound stanchion and girder flanges shall, where possible, be drilled after the members are assembled and tightly clamped or bolted together. Punching may be permitted before assembly, provided the holes are punched 3mm less in diameter than the required size and reamed after assembly to the full diameter. The thickness of material punched shall be not greater than 16 mm.

The diameter for rivets and black bolts holes shall be taken as the nominal diameter of a rivet/ black bolts plus 1.5 mm for rivets/ bolts of nominal diameter less than or equal to 25 mm" and 2.0 mm for rivets of nominal diameter exceeding 25 mm, unless specified otherwise. Holes for turned and fitted bolts shall be drilled or reamed large by 0.2 to 8 mm depending upon the dia. of bolts. Holes shall have their axis perpendicular to the surface bored through. The drilling or reaming shall be free from burrs, and the holes shall be clean and accurate. Holes for rivets and bolts shall not be formed by gas cutting process.

Holes for counter sunk bolts shall be made in such a manner that their heads sit flush with the surface after fixing.

1.4 ASSEMBLY:

Before making holes in individual members, for fabrication and steel work intended to be riveted or bolted together shall be assembled and clamped properly and tightly so as to ensure close abutting, or lapping of the surfaces of the different members. All stiffeners

shall be fixed (or placed) tightly both at top and bottom without being drawn or caulked. The abutting joints shall be cut or dressed true and straight, and fitted close together.

Web plates of girders, which have no cover flange plates, shall have their ends flush with the tops of angles unless otherwise required. The web plate when spliced shall have clearance of not more than 5mm. The erection clearance of cleated ends of members connecting steel to steel shall preferably be not greater than 1.5 mm. The erection clearance at the ends of beams without web cleats shall not be more than 3 mm at each end but where for practical reasons, greater clearance is necessary, seating designed suitably shall be provided.

Column splices and butt joints of struts and compression members requiring contact for stress transmission shall be accurately, machined and close butted over the whole section. In column caps and bases, the ends of shafts together with the attached gussets, angles, channels etc. after riveting together shall be accurately machined so that the parts connected, butt against each other over the entire surfaces of contact. Connecting angles or channels shall be fabricated and placed in position with great accuracy so that they are not unduly reduced in thickness by machining.

The ends of all bearing stiffeners shall be machined or grounded to fit tightly both at top and bottom.

1.5 RIVETING:

Rivets shall be used, where slip under load has to be avoided.

Members to be riveted shall have all parts firmly placed and held together before and during riveting, and special care shall be taken in this respect for all single riveted connections. For multiple riveted connections, a service bolt shall be provided in every third or fourth hole.

The riveting shall be carried out by using machines of the steady pressure type. However, where such facilities are not available hand riveting may be permitted by the Engineer-in-charge. The rivets shall be heated red hot, care being taken to control the temperature of heating so as not to burn the steel. Rivets of diameter less than10mm may be driven cold. Rivets shall be finished neat with heads full and of equal size. The heads shall be central on shanks and shall grip the assembled members firmly.

All loose, burnt, or badly formed rivets with eccentric or deficient heads shall be cut out and replaced. In cutting out rivets, care shall be taken so as not to injure the assembled members. Caulking and recapping shall not be permitted.

For testing rivets, a hammer weighing approx. 0.25 kg shall be used and both heads of the rivet (Specially the machine head) shall be tapped. When so tested, the rivets shall not give a hollow sound and a jar where so specified, other tests shall be carried out to ensure the soundness of rivets.

All rivets heads shall be painted with approved steel primer paint within a week of their fixing.

1.6 BOLTING:

The nominal length of the bolt shall be the distance from the underside of the head to the further end of the shank. The nominal diameter of the bolt shall be the diameter at the shank above the screwed threads. Bolts, nuts and washers shall be thoroughly cleaned and dipped in double boiled linseed oil, before use. All bolts heads and nuts shall be hexagonal unless specified otherwise. The screwed threads shall conform to IS 1363 and the threaded surface shall not be tapered. The bolts shall be of such length as to project at least two clear threads beyond the nuts when fixed in position, and these shall fit in the holes without any shake. The nuts shall fit in the threaded ends of bolts properly.

Where necessary, washers shall be tapered or otherwise suitably shaped to give the heads and nuts of bolts a satisfactory bearing. The threaded portion of each bolt shall project through the nut at least two thread. In all cases where the full bearing area of the bolt is to be developed, the bolt shall be provided with a washer of sufficient thickness under the nuts to avoid any threaded portion of the bolt being within the thickness of the parts bolted together.

Where there is a risk of the nuts being removed or becoming loose due to vibrations or reversal of stresses, these shall be secured from slackening by the use of lock nut, spring washers as directed by the Engineer-in-charge.

1.7 WELDING:

Welding shall be in accordance with I.S. 816-1969, I.S. 819-1957, I.S. 1024-1979, I.S. 1261-1959, I.S. 1323- 1982 and I.S. 9595-1980 as appropriate. For welding of any particular type of joint, welders shall give evidence of having satisfactory completed appropriate tests as described in any of I.S. 817-1966, I.S. 1393-1961, I.S. 7307(Part-I)-1974, I.S. 7310 (Part-I)-1974 and I.S. 7318 (Part-I)-1974 as relevant.

Welding Consumables: Covered electrodes shall conform to I.S. 814 (Part-I)-1974 and I.S.814 (Part-II)-1974 or I.S. 1395-1982 as appropriate.

Filler rods and wires for gas welding shall conform to I.S. 1278-1972.

The bare wire electrodes for submerged arc welding shall conform to I.S. 7280-1974. The combination of arc and flash shall satisfy the requirements of I.S. 3613-1974.

The filler rods and bare electrodes for gas shielded metal, arc welding shall conform to I.S. 6419-1971 and I.S. 6560-1972 as appropriate.

Types of Welding: Arc welding (direct or alternating current) or Oxyacetylene welding may be used. Field welding may be used. Field welding shall be by D.C.

Size of Electrode Runs: The maximum gauge of the electrodes for welding any work and the size of run shall be based on the following tables.

Average thickness of plate or section	**Maximum gauge or diameter of electrodes to be used.**
Less than 3/16"	10 S.W.G.
3/16" and above but less than 5/16"	8 S.W.G.

5/16" and above but less than 3/8"	6 S.W.G.
3/8" and above but less than 5/8"	4 S.W.G.
5/8" and above but less than 1"	5/16"dia.
1" and above thick section	3/8" dia.

Note: On any straight weld the first run shall not ordinarily be deposited with a larger gauge electrode than No.8 S.W.G. For subsequent runs the electrode shall not be increased by more than two electrode size between consecutive runs.

Welding Contractors: The contractor shall ensure that each welding operator employed on fabrication or erection is an efficient and dependable welder, who has passed qualifying tests on the types of welds which will be called upon to make. Sample test shall have to be given by the contractor to the entire satisfaction of the Engineer-in-charge.

Welding Procedure:

a) Welding should be done with the structural steel in flat position in a down hand manner wherever possible. Adequate steps shall be taken to maintain the correct arc length, rate of travel, current and polarity for the type of electrode and nature of work. Welding plant capacity shall be adequate to carry out the welding procedure laid down. Adequate means of measuring the current shall be available either as a part of the welding plant or by the provision of a portable ammeter. In checking the welding current, a tolerance of 10% or 30 amperes from the specified value whichever is less shall be permitted.

b) The welding procedure shall be such as to ensure that the weld metal can be fully and satisfactory deposited through the length and thickness of all joints so that distortion and shrinkage stresses are reduced to the minimum and thickness of welds meet the requirements of quality specified.

WORKMANSHIP:

Preparation of Fusion Faces : Fusion faces shall be cut by stearing machine or gas cutting and later dressed by filling or grinding so that they shall be free from irregularities such as would interfere with the deposition of the specified size of weld to cause the defects. Fusion faces and the surrounding surfaces shall be free from heavy slag, oil paint or any substance which might affect the quality of the weld or impede the progress of welding. The welding face shall be free of rust and shall have metal shine surfaces.

The parts to be welded shall be brought into as close contact as possible and the gap due to faulty workmanship or incorrect fit up shall not exceed 1/16". If separation of 1/16" or more occurs locally, the size of the fillet weld shall be increased at such position by an amount of equal to the width of the gap.

The parts to be welded shall be maintained to their correct position during welding. They shall be securely held in position by means of tack welds, service bolts, clamps or rings

before commencing welding so as to prevent and relative movement due to distortion, wind or any other cause.

Step Back Method Should be Used to Avoid Distortion: The minimum leg length of a fillet weld as deposited should not be less than the specified size and the throat thickness as deposited should be not less than that tabulated below:

Throat Thickness of Fillet

Angle between fusion faces 600-900 910-1000 1010-1060 1070-1130 1140-1200

Throat thickness in cms. 0.70 0.65 0.60 0.55 0.50

Angle between fusion	600-900	910-1000	1010-1060	1070-1130	1140-1200
Throat thickness in cms.	0.70	0.65	0.60	0.55	0.50

In no case should a concave weld be deposited without the specific approval of the Engineer-in-Charge unless the leg length is increased above the specified length so that the resultant throat thickness is as great as would have been obtained by the deposition of a flat. All welds shall be deposited in a pre-arranged order and sequence taking due account of the effects of distortion and shrinkage stresses.

After making each run of welding, all slag shall be removed and final run shall be protected by clean boiled linseed oil till approved.

The weld metal, as deposited, shall be free from crack, slag, excessive porosity, cavities and other faults. The weld metal shall be properly fused with the parent metal without overlapping or serious undercutting at the toes of the weld.

The surfaces of the weld shall have a uniform and consistent contour and regular appearance. In welds containing crack, porosity or cavities in which the weld metal tends to overlap on the parent metal without proper fusion, the defective portions of the welds shall be out cut and re-welded. Where serious under cutting occurs, additional weld metal shall be deposited to make good reduction. Testing of welded joints shall be done as per relevant IS codes 3600, 3613, 4260, 7205, 7215, 7307, 7310, 7318.

1.8 ERECTION:

Steel members shall be hoisted and erected in position carefully, without any damage to itself, other structures and equipment and injury to workmen. The method of hoisting and erection proposed to be adopted by the contractor shall be got approved from the Engineer-in-charge in advance. The contractor however shall be fully responsible for the work being carried out in a safe and proper manner without unduly stressing the various members and proper equipment such as derricks, lifting tackles, winches, ropes etc. shall be used.

The work of erection may be done in suitable units as may be directed by the Engineer-in charge. Fabricated members shall be lifted at such points so as to avoid deformation

or excessive stress in members. The structure or part of it placed in position shall be secured against over-turning or collapse by suitable means.

During execution, the steel members shall be securely bolted or otherwise fastened when necessary temporarily braced to provide for all loads including those due to erection equipment and its operation to be carried safely by structure during erection. The steel members shall be placed in proper position as per approved drawing, final riveting or permanent bolting shall be done only after proper alignment has been checked and confirmed.

Trusses shall be lifted only at nodes. The trusses above 10 m in span shall not be lifted by slinging at two mid points of rafters, which shall be temporary braced by a wooden member of a suitable section. After the trusses are placed in position, purlins and wind bracings shall be fixed as soon as possible.

The end of the truss which faces the prevailing winds shall be fixed with holding down bolts, and the other end kept free to move. In case of trusses of spans upto 10m the free end of the truss shall be laid on lead sheet or steel plate as per design, and the holes for holding down bolts shall be made in the form of oblong slots so as to permit the free movements of the truss end. For larger spans the truss shall be provided with proper bearing as per design.

Columns and stanchions shall be erected truly vertical with the necessary cross bracing etc. and the base shall be properly fixed with the foundation concrete by means of anchor bolts etc. as per drawing.

Anchor bolts to be placed in the concrete foundation should be held in position with a wooden template. At the time of concreting anchor bolt locations shall be provided with suitable timber mould or pipe sleeve to allow for adjustment which shall be removed after initial setting of concrete. The spaces left around anchor bolts shall be linked to a stopping channel in the concrete leading to the side of the pedestal and on the underside of the base plate to allow the spaces being grouted up after the base plate is fixed in the position along with the column footing. Grouting shall be of cement mortar 1:3 (1 cement: 3 coarse sand) or as specified.

1.9 PAINTING:

All surfaces which are to be painted, oiled or otherwise treated shall be dry and thoroughly cleaned to remove all loose scale and loose rust. Surfaces not in contact but inaccessible after shop assembly, shall receive the full specified protective treatment before assembly. This does not apply to the interior of sealed hollow sections. Part to be encased in concrete shall not be painted or oiled. A priming coat of approved steel primer such as Red Oxide/Zinc Chromate primer conforming to IS 2074 shall be applied before any member of steel structure are placed in position or taken out of workshop.

1.10 MEASUREMENT:

The work as fixed in position shall be measured in running metres correct to a millimeter and their weight calculated on the basis of standard tables correct to the nearest kilogram.

The standard weight of steel sections shall conform to IS 808 with tolerance in sizes as per IS 1852. Tolerance in weight is given in Table 10.3. Steel sections shall be acceptable within tolerance limits. Payment for steel sections shall be made as per actual weight within tolerances. Sections having weight on higher side than permissible tolerance may be acceptable but payment shall be made on the basis of standard weight only. Steel sections having weight variations lower than permissible variation shall not be acceptable.

Unless otherwise specified. Weight of cleats, brackets, packing pieces, bolts nuts, washers, distance pieces, separators diaphragm gussets (taking overall square dimensions) fish plates etc. shall be added to the weight of respective items. No deductions shall be made for skew cuts. In riveted work, allowance is to be made for weight of rivet heads. Unless otherwise specified and addition of 2.5% of the weight of structure shall be made for shop and site rivet heads in riveted steel structures. No deduction shall be made for rivet/ or bolt holes (excluding holes for anchor or holding down bolts). Deduction in case of rivet or bolt hole shall, however, be made if its area exceeds 0.02 m2.

The weight of steel sheet and strips shall be taken from relevant Indian Standards based on 7.85 kg/m2 for every millimeter sheet thickness. For rolled sections, steel rods and steel strips, weight given in relevant Indian Standards shall be used.

4. COLLAPSIBLE STEEL GATE:

2.1 GENERAL:

These shall be of approved manufacture and shall be fabricated from the mild steel sections.

The gates shall consist of double or single collapsible gate depending on the size of the opening. These shall consist of vertical double channels each 20 x 10 x 2 mm. at 10 cm. centre to centre braced with flat iron diagonals 20 x 5 mm and top and bottom rails of T-iron 40 x 40 x 6 mm @ 3.5 kg/m with 40 mm dia. ball bearings in every fourth double channel, unless otherwise specified. Wherever collapsible gate is not provided within the opening and fixed along the outer wall surface, T- iron at the top may be replaced by flat iron 40 x 10 mm.

The collapsible gate shall be provided with necessary bolts and nuts, locking arrangement, stoppers and handles. Any special fittings like spring, catches and locks, shall be so specified in the description of item where so required. The gate shall open and close smoothly and easily.

2.2 FIXING:

T- iron rails shall be fixed to the floor and to the Lintel at top by means of anchor bolts embedded in cement concrete of floor and lintel. The anchor bolts shall be placed approximately at 45 cm centres alternatively in the two flanges of the T- iron. The bottom runner (T- iron) shall be embedded in the floor and proper groove shall be formed along the runner for the purpose. The collapsible shutter shall be fixed at sides by fixing the end double channel with T-iron rails and also by hold- fasts bolted to the end double channel and fixed in masonry of the side walls on the other side. In case the collapsible shutter is not required to reach the lintel, beam or slab level, a Tee-section suitably

designed may be fixed at the top, embedded in masonry and provided with necessary clamps and roller arrangement at the top. All the adjoining work damaged in fixing of gate shall be made good to match the existing work, without any extra cost.

2.3 PAINTING:

All the members of the collapsible gate including T-iron shall be thoroughly cleaned off rust, scales, dust etc. and given a priming coat of approved steel primer conforming to IS 2074 before fixing them in position.

2.4 MEASUREMENT:

The height and breadth shall be measured correct to a cm. The height of the gate shall be measured as the length of the double channels and breadth from outside to outside of the end fixed double channels in open position, of the gate. The area shall be calculated in square metres, correct to two places of decimal.

5. MS STEEL SHUTTER:

3.1 GENERAL:

These shall be manufactured as per drawing and specification. These shall be fabricated from mild steel sheets and angle iron.

The doors shall be provided as double leaf shutters unless otherwise specified. The shutters shall be fabricated with frame of M.S. angle 40 x 40 x 6 mm @ 3.5 kg/ metre and two diagonal braces of the same section unless otherwise specified. The frame shall be riveted and/ or welded at the junctions. Wherever riveting shall be done 3.15 mm (10 G) thick gusset plate shall be provided at the junction. M.S. sheet of 1 mm thickness or as specified shall be fixed to the frame with rivets or welds as approved by the Engineer-in-charge.

Alternatively the diagonal bracing may be replaced by one horizontal and two cross flats 30 x 6 mm unless otherwise specified. The outer frame shall be provided with cleats made of section 40 x 10 mm and bent in the shape of angle cleats with one arm 150 mm long and the other arm 50 mm long and fixed to the angle iron frame of the door with two 12 mm dia bolts and nuts. For doors upto 2.40 m height, two angles cleats per door shall be provided.

The cleat shall have a vertical leg of 150 mm which shall be fixed with frame and horizontal leg of about 50 mm which shall be provided with a hole of 24 mm dia and fixed in the projected pin of the pin clamp.

3.2 FITTINGS AND FIXTURES:

The shutters shall be fixed to the wall masonry with four pin clamps (pintles) where the height of the shutter is up to 2.4 m. Each pin clamp shall consist of 50 x 6 mm flat iron 45 cm long bent and forked at one end and provided with 20 mm diameter M.S. pin on the other. The pin shall be firmly riveted or welded to the pin clamp, the other end of which shall be embedded in masonry by means of cement concrete block 40 x 23 x 20 cm of 1:3:6 mix (1 cement :3 coarse sand:6 graded stone aggregate 20 mm nominal size). It shall be so placed that bottom pin shall face upwards and “top pin downward”in order that the gate may not be removed by lifting over pins.

One hook with eye 45 cm long of 10 mm diameter shall be provided for each shutter to keep it fixed in open position. The hook shall be fixed in wall masonry with wooden block and the eye shall be fixed on 6 mm thick M.S. plate as staple and fixed in the shutter frame with rivet or weld.

A cement concrete block 15 x 10 x 20 cm in 1:2:4 (1 cement:2 coarse sand:4 grades stone aggregate of 20 mm nominal size) mix shall be embedded in the floor or at junction of two shutters so that door shutter open only on the outside and not on the inside.

The shutters shall also be provided with locking arrangement and two handles of the shape and pattern as approved by the Engineer-in-charge.

3.3 PAINTING:

All the members of the door including angle iron shall be thoroughly cleaned off rust, scales, dust etc. and given a priming coat of approved steel primer i.e. Red Oxide/ Zinc chrome primer confirming to IS 2074 before fixing them in position.

3.4 MEASUREMENT:

The width and height of shutters shall be measured to the nearest cm. The area shall be calculated in square metre correct to two places of decimal.

6. MS ROLLING SHUTTER:

4.1 GENERAL:

Rolling shutters shall conform to IS 6248. These shall include necessary locking arrangement and handles etc. These shall be suitable for fixing in the position as specified i.e. outside or inside on or below lintel or between jambs of the opening. The door shall be either push and pull type or operated with mechanical device supplied by the firm. Shutters upto 10 sq. metre shall be of push and pull type and shutters with an area of over 10 sq. metre shall generally be provided with reduction gear operated by mechanical device with chain or handle, if bearings are specified for each of operation, these shall be paid for separately.

4.2 SHUTTER:

The shutter be built up of inter locking lath section formed from cold rolled steel strips. The thickness of the sheets from which the lath sections have been rolled shall be not less than 0.90 mm for the shutters upto 3.5 m width. Shutters above 9 metres width should be divided in 2 parts with provision of one middle fixed or movable guide channel or supported from the back side to resist wind pressure. The lath section shall be rolled so as to have interlocking curls at both edges and a deep corrugation at the centre with a bridge depth of not less than 12 mm to provide sufficient curtain of stiffness for resisting manual pressures and normal wind pressure. Each lath section shall be continuous single piece without any welded joint. When interlocked, the lath sections shall have a distance of 75 mm rolling centers. Each alternate lath section shall be fitted with malleable cast iron or mild steel clips securely riveted at either ends, thus locking in the lath section at both ends preventing lateral movement of the individual lath sections. The clips shall be so designed as to fit the contour of the lath sections.

4.3 SPRING:

The spring shall be of coiled type. The spring shall be manufactured from high tensile spring steel wire or strips of adequate strength conforming to IS 4454- Part I.

4.4 ROLLER AND BRACKETS:

The suspension shaft of the roller shall be made of steel pipe conforming to heavy duty as per IS 1161. For shutter upto 6 metre width and height not exceeding 5 metre, steel pipes of 50 mm nominal bore shall be used. The shaft shall be supported on mild steel brackets of size 375 x 375 x 3.15 mm for shutters upto a clear height of 3.5 metre. The size of mild steel brackets shall be 500 x 500 x 10 mm for shutters of clear height above 3.5 m and upto 6.5 m. The suspension shaft clamped to the brackets shall be fitted with rotatable cast iron pulleys to which the shutter is attached. The pulleys and pipe shaft shall connected by means of pretensioned helical springs to counter balance the weight of the shutter and to keep the shutter in equilibrium in any partly open position.

When the width of the opening is greater than 3.5 mtr. The cast iron pulleys shall be interconnected with a cage formed out of mild steel flats of at least 32 x 6 mm and mild steel dummy rings made of similar flats to distribute the torque uniformly. Self aligning two row ball bearing with special cast iron casings shall be provided at the extreme pulley and caging rings shall have a minimum spacing of 15mm and at least 4 number flats running throughout length of roller shall be provided.

In case of shutters of large opening with mechanical device for opening the shutter the roller shall be fitted with a purion wheel at one end which in contact with a worm fitted to the bracket plate, caging and pulley with two ball bearing shall be provided.

4.5 GUIDE CHANNEL:

The width of guide channel shall be 25 mm the minimum depth of guide channels shall be as follows:

Clear width of Shutter	**Depth of Guide Channel**
Upto 3.5 Mtr	65mm
From 3.5 Mtr to 8 Mtr	75mm
From 8 Mtr and above	100mm

The gap between the two legs of the guide channels shall be sufficient to allow the free movement of the shutter and at the same time close enough to prevent rattling of the shutter due to wind.

Each guide channel shall be provided with a minimum of three fixing cleats or supports for attachment to the wall or column by means of bolts or screws. The spacing of cleats shall not exceed 0.75 m. Alternatively, the guide channels may also be provided with suitable dowels, hooks or pins for embedding in the walls.

The guide channels shall be attached to the jambs, plumb and true either in the overlapping fashion or embedded in grooves, depending on the method of fixing.

4.6 COVER:

Top cover shall be of mild steel sheets not less than 0.90 mm thick and stiffened with angle or flat stiffeners at top and bottom edges to retain shape.

Lock plates with sliding bolts, handles and anchoring rods shall be as per IS 6248.

4.7 FIXING:

The arrangement for fixing in different situations in the opening shall be as per IS 6248.

Brackets shall be fixed on the lintel or under the lintel as specified with rawl. Plugs and screws bolts etc. The shaft along with the spring shall then be fixed on the brackets.

The lath portion (shutter) shall be laid on ground and the side guide channels shall be bound with ropes etc. The shutter shall then be placed in position and top fixed with pipe shaft with bolts and nuts. The side guide channels and cover frames shall then be fixed to the walls through the plate welded to the guides. These plates and bracket shall be fixed by means of steel screws bolts, and rawl plugs concealed in plaster to make their location invisible. Fixing shall be done accurately in a workmen like manner that the operation of the shutter is easy and smooth.

4.8 MEASUREMENT:

Clear width and clear height of the opening for rolling shutter shall be measured correct to a mm. The clear distance between the two jambs of the opening shall be clear width and the clear distance between the sill and the soffit (bottom of lintel) of the opening shall be the clear height.

The area shall be calculated in square metres correct to two places of decimal.

7. TUBULAR / HOLLOW SECTION TRUSSES:

5.1 GENERAL:

The structural steel tubes shall be of Hot finished seamless type confirming to the requirements of IS 1161. The steel tubes when analysed in accordance with the method specified in IS 228 shall show not more than 0.06 percent sulphur, and not more than 0.06 per cent phosphorous.

Tubes shall be designated by their nominal bore. These shall be light, medium or heavy as specified depending upon the wall thickness. The standard size and weights of tubes are listed in Appendix C of CPWD Specification (Vol-I). Hollow sections shall be as per IS 4923.

Tubes shall be clean finished and reasonably free from scale. They shall be free from cracks, surface flaws, laminations and other defects. The ends shall be cut clean and square with axis of tube, unless otherwise specified.

Wall thickness of tubes used for construction exposed to weather shall be not less than 4 mm and for construction not exposed to weather it shall be not less than 3.2 mm where structures are not readily accessible for maintenance, the minimum thickness shall be 5 mm.

5.2 FABRICATION:

The component parts of the structure shall be assembled in such a manner that they are neither twisted nor otherwise damaged and be so prepared that the specified cambers, if any, are, maintained. The tubular steel work shall be painted with one coat of approved steel primer after fabrication. All fabrication and welding is to be done in an approved workshop. The joint details shall be generally as per S.P-38 of B.I.S publication.

All material before being assembled shall be straightened, if necessary, unless required to be of curvilinear form and shall be free from twist.

Washers shall be specially shaped where necessary, or other means, used to give the nuts and the heads of bolts a satisfactory bearing.

In all cases, where the full area of the bolts is to be developed, the threaded portion of the bolt shall not be within the thickness of the parts bolted together and washers of appropriate thickness shall be provided to allow the nuts to be completely tightened.

Where welding is adopted, it shall be as per IS 816.

The ends of all the tubes, for columns transmitting loads through the ends, should be true and square to the axis of the tubes and should be provided with a cap or base accurately fitted to the end of the tube and screwed, welded or shrunk on. The cap or base plate should be true and square to the axis of the column.

When the end of a tube is not automatically sealed by virtue of its connection be welding to another member the end shall be properly and completely sealed. Before sealing, the inside of the tubes should be dry and free from loose scale.

In tubular construction the ends of tubes may be flattened or otherwise formed to provide for welded. Riveted or bolted connections provide that the methods adopted for such flattening do not injure the material. The change of sections shall be gradual.

5.3 HOISTING AND ERECTION:

Tubular trusses shall be hoisted and erected in position carefully, without damage to themselves, other structure, equipment and injury to workman.

The method of hoisting and erection proposed to be adopted shall be got approved from the Engineer-in-charge. The contractor shall however be fully responsible, for the work being carried out in a safe and proper manner without unduly stressing the various members. Proper equipment such as derricks, lifting tackles, winches, ropes etc. shall be used.

5.4 MEASUREMENT:

The work as fixed in place shall be measured in running metres correct to a centimeter on their weights calculated on the basis of standard tables correct to the nearest kilogram unless otherwise specified.

Weight of cleats, brackets, packing pieces bolts nuts, washers distance pieces separators diaphragm gussets (taking overall square dimensions) fish plates, etc. shall be added to the weight of respective items unless otherwise specified. No deduction shall be made for skew cuts.

8. MS GRILL IN WINDOWS:

M.S. bars and M.S. grills with round, square bars and with flat shall be cut and/or fabricated and fixed as per drawing and/or welded all as directed by Engineer-in-Charge.

M.S. round or square bars of required sizes shall be fixed in window frames by providing through hole on one side of the frame and a hole 50mm deep in other and the bars should be exact length to reach 50mm in one and flush with outside of the frame on the other side of the frame. On steel windows, the round or square bars shall be welded on the frame with good workmanship.

M.S. grills shall be fabricated and fixed to frames by screws. The welding, cutting holes through flats, bending etc. shall be carried out to required length and design and precision and the complete work shall give neat appearance. All the excess welding sports, etc. shall be properly ground and finished smooth.

All the steel concealed or exposed shall receive one coat of red oxide zinc chromate primer. All exposed steel work shall be given further two coats of synthetic enamel paint of approved make, quality, colour and shade. The grill when directed shall be fixed in the masonry, jambs with screws fixed on wooden gutties embedded in masonry all as directed.

The grill shall be true to pattern in form and dimensions. Gills shall not be painted until they have been inspected and approved by the Engineer-in-Charge.

6.1 MEASUREMENT:

M.S. bars and M.S. grills shall be measured in kgs.

The length of bars going into the wooden window frames shall not be measured. Measurements shall be length of bars between the window frames. For steel windows, the length of bars and flats will be measured as provided and fixed.

For grill work, the complete length of M.S. bars and flats as fixed as per drawing shall be measured separately correct to a cm.

The exact weight in kg correct to two places of decimals shall be calculated from standard tables. No allowance shall be made for wastage, welding, nuts, bolts, screws, holdfasts, if any. No deduction shall be made for holes in flats, etc.

9. STAINLESS STEEL RAILING:

All Pipes to be Stainless as per SS 304 Grade with tube thickness of 1.6 mm having tolerance level as per ASTM A554.

All components in railing including baluster, pipes, caps etc. to be in Gritt Satin finish.

The balusters shall have a standard height of 856 mm. All components used in the baluster to be manufactured using SS 304 grade material turned and finished on CNC and other automatic Machines.

The base plate of the Baluster is to be solid Stainless Steel of size 103 mm dia and 6 mm in thickness. All connectors is to be fixed to the Baluster using Allen Bolts. The baluster shall have Zero welding except on the bottom plate.

Balusters to be fixed using Stainless Steel M8 Fasteners with SS 304 grade Stainless Steel Caps f. The Baluster neck to be modular and can be tilted as per the handrail. The neck plate is to be 2 mm thick in Stainless Steel 304.

Handrails to be connected to the neck plate using Stainless Steel CSK M5*10 mm Screw only.

Balusters are to be installed with a centre to centre distance of 1 mt. However this distance can vary as per site conditions.

The item shall be measured in Kgs or as specified in the schedule of quantities.

10. IS CODES AND STANDARDS:

IS 1038	:	Steel doors, Windows and ventilators
IS 1081	:	Code of practice for fixing and glazing of steel and Aluminium doors, windows, ventilators.
IS 1200 (Part-VIII)	:	Method of Measurement
IS 800	:	Code of practice for use of structural steel in general in steel construction
IS 1161	:	Steel tubes for structural purposes
IS 4923	:	Hollow Steel Sections for Structural Use – Specification
IS 6248	:	Metal rolling shutters and rolling grills.

J.UPVC GLAZED WINDOWS/VENTILATOR:

1.1 SCOPE:

The work covered under this specification consists of fabricating, supplying and installing in position UPVC glazed windows and ventiators in strict accordance with these specifications and drawings.

1.2 GENERAL:

The contractor shall submit shop drawings of fabrication and erection for approval of the Engineer-In-charge.

No fabrication work shall be undertaken prior to the approval of the Engineer-In-charge.

The contractor shall submit samples of all materials to be used for manufacturing of windows and venilator for approval of the Engineer-In-charge before bulk procurement.

1.3 MATERIALS:

comprising of uPVC multi-chambered frame and mullion (where ever required) extruded profiles duly reinforced with 1.60 ± 0.2 mm thick galvanized mild steel section made from roll forming process of required length (shape & size according to uPVC profile), uPVC extruded glazing beads of appropriate dimension, EPDM gasket with 5mm Clear soft coating glass saint gobain ST-167, G.I fasteners 100 x 8 mm size for fixing frame to finished wall, plastic packers, plastic caps and necessary stainless steel screws etc.

GLAZING BEADS :

Glazing beads shall be of the one foot snap in design and shall be extruded U PVC mitred at the corners. All glazing beads shall be with a co-extruded gasket of a multi-fin design to maintain security and weather performance. Gasket material shall be thermo Plastic Elastomer.

GLAZING GASKETS:

All glazing gaskets as well as weather seals are to be extruded from non migratory EPDM . Glazing gaskets shall be a continuous length. Gasket may be subjected to random testing and shall be obtained from the profile Systems supplier.

WEATHER SEALS

Weather seals shall consist of a double sealing Systems. Seals on the sash and the frame shall be continuous length and for outward opening windows the seal on the sash shall be joined to a 50mm length of pressure relief seal at the bottom of the opening whereas the seal on the frame shall be joined on the top of opening.

Weather seals and pressure relief seals, which shall be obtained from the profile Systems supplier, shall be capable of removal without disturbing the glazing Systems or removal of the frame or sash.

GLAZING :

All glazing shall be internally beaded. The windows shall be constructed in such a manner that the glazing or deglazing can take place without the removal of the sash or frame.

WELDED JOINTS :

All corner joints shall be homogeneously fusion heat welded in accordance with the instructions of the profile Systems supplier. The resulting joints shall be finished by the grooving/knifing method. Solvent welded joints shall not be allowed.

REINFORCEMENT:

All transoms and mullions shall be fully reinforced, irrespective of size, with corrosion resistant galvanized steel. All other profiles to be reinforced as per the specification of the profile Systems supplier which shall suit the proposed style application relative to exposure, elevation and height above the ground level. Reinforcing shall be secured by suitable screws in accordance with the instructions of the profile Systems supplier.

All galvanized steel reinforcing profiles shall comply with BS 2989 1982 Grade G 275N / IS 4759-1996 or equivalent.

MECHANICAL JOINTS :

The mechanical jointing of mullions and transoms shall be carried out in strict accordance with the instructions/recommendations of the profile Systems supplier using only approved mechanical coupling components.

HARDWARE GENERAL :

All hardware shall be manufactured from corrosion resistant material and be approved by the

profile Systems supplier.
All ferrous screws, nuts, bolts and other fastening or fixing shall be of stainless grade or of a suitable coated steel recommended for use in the fabrication of UPVC windows. Metal that are in contact with each other shall be compatible so as to prevent galvanic corrosion of dissimilar metals by electrolytic action. All hardware should ideally be fixed by attachments through the UPVC to the reinforcement; alternatively it should be fixed in purpose designed screw ports or at least two thickness of UPVC.

Hardware with provision for adjustment shall be accessible for adjusting after the window has been installed. Hardware used to open and close the window shall be replaceable without removing the outer frame from the structure.

FRICTION HINGES:

Top hung and side hung opening out lights shall have two friction stays per light and be of stainless steel construction.
The size of the friction stay will depend on size, weight, hanging and exposure of the relevant sashes. This will be determined from table provided by the hinge manufacturer. All side hung friction stays are to be incorporate a riser block to allow the sash to be supported in its closed position.

BUTT HINGES:

Where external butt hinges are used they must be of the security pin type which do not allow removal of the hinge pin from outside.
ESPAGNOLETTE HANDLES :

All espagnolette striking plates are to be purpose designed and secured to the outer frame by approved screw fixing. The espagnolette mechanism shall be of multi locking points dependants on size. All ironmongery where possible shall be screwed into frame reinforcing, or fixing screws must penetrate a minimum of two wall thickness or an equivalent screw port, to obtain sufficient purchase.

1.4 FIXING IN POSITION :
The gap between the structural opening and the uPVC frame shall be between 5 to 10mm all round, which should be filled by injectable PU foam after completion of fixing for best frame and wall bonding, and for sound and thermal insulation and finally applying neutral cure low modules Silicone sealant to make joint water proof. Fixing points shall be to all four sides of a frame, spaced 150mm to 250mm from corners and not more than 600mm apart elsewhere. Fixing shall be by direct drilling 10mm hole through U PVC frame to building wall. Each fixing shall penetrate into building structure by no less than 40mm.and ultimate fixing with anti corrosive plated anchor bolts through these holes. All heads of all fixing screws shall be covered with appropriate plastic cover caps. Necessary allowances shall be made while manufacturing the frames of windows and ventilator for receiving plaster.

2. MODE OF MEASUREMENT:
The unit of measurement shall be in Sqm or as specified in the schedule of quantities

3. IS CODES AND STANDARDS:
IS 3400(PART -2,4,10 &23) : Code of practice for use of material for

gasket, weathe seals and weather- stripping

IS 1200 (P-VIII) : Method of measurement

IS 875 -3 : Wind load on building and structure determine glazing thickness.

5 HANDICAPPED TOILET

20.1.01 GENERAL: The fixtures such as white glazed vitreous chin water closet (European Patter) P or S type with cistern, seat cover wash hand basin of size 460x360 mm with one pair basin bolt one number hinged rail 760 mm long and four numbers grab rail 600 mm long each along with PVC wall inserter and brass screw for handicapped toilet shall be aligned and fixed as per IS codal Specification for each of the above mentioned fixtures for easy accessible of handicapped personnel etc as per direction of Engineer in-charge.

6 HEALTH FAUCET

21.1.01 GENERAL: The fixtures with one meter long easy flex tube in Chrome Finish and wall hook along with one end adjustable CP on brass revolving nut with washer for suitable to angular stop cock outlet thread and other end of the chrome finish flex tube shall be provided with faucet sprayer and it shall be fixed as per direction of Engineer in-charge.

7 CP ON BRASS SPREADER

22.1.01 GENERAL: The fixtures CP on brass spreader shall be fixed on the top of the flat back urinal with help of brass or steel screw and the inlet of the CP brass on spreader shall be joined to the Brass tube both side nut and washer of auto closing flush cock etc after direction of Engineer in-charge.

8 CP EXTENSION PIECE

23.1.01 GENERAL: The fixtures CP on Brass extension Piece of 15 mmx50 mm long shall be provided to the concealed CPVC pipe elbow to angle stop cock,bib cock, flush cock for adjustment of gap of plastering of wall etc complte as per direction of Engineer in charge.

9 INBUILT RO PURIFIER WITH CHILLER

24.1.01 GENERAL: The fixtures chiller cum water dispenser with inbuilt RO purifier.It is ABS front cover and stainless steel body with elegant looks. Purification by RO+UF+TDS controller for commercial offices.A complete water Chilling capacity upto 25 ltr/hr & Purification capacity 20 ltr.

10 ANCHORING ARRANGEMENT FOR HANGING SWR PIPELINES WITH FITTINGS

25.1.01 GENERAL: For anchoring the hanging lines of SWR pipes and fittings such as P trap, bends, tees, elbows, offsets under the roof slab Flush anchor 12mm dia x 50 mm long, anchor rod with both side thread 12mm x 1000mm long, anchor clamp and ring shall be fixed to the roof slab for fastening/hanging to maintain the gradient for free flow of sewerage etc all complete as per direction of Engineer in -charge.

11 SINKING OF BORE WELL.

26..1.01 GENERAL: Vertical Electro-resistivity sounding test (V.E.S) shall be Performed to obtain adequate pervious zone as per the direction of Engineer in-charge.

26..1.02 TECHNICAL SPECIFICATION: Drilling of perfectly vertical borehole 250mm x 150mm dia upto

100mtr depth below ground level through consolidated and unconsolidated rock with DTH/combination drilling rig(1200 cfm/300 Psi) as required to suite the site condition with lowering of 200mm dia PVC schedule 80 pipes as per ASTM D-1785/2004 or housing/Casing treated with Socket with or without well screen as per the necessary for soft, medium, hard and boulder formation. PVC casing pipe if required to prevent collapse of overburden shall be provided by the contractor including lowering and withdrawing after the completion of tubewell and development of tubewell by the help of air & measurement of Discharge and drawdown of the tubewell. The tubewell should be covered to Prevent from dropping Foreign materials by Trespassers etc complete as per direction of Engineer in-charge.

12 GRAVITY SEWERAGE.

27.1.01 GENERAL: For gravity sewerage disposal earthwork shall be executed in all kinds of soil within 50mtr initial lead & 1.5mtr initial lift including dressing, levelling & breaking clods to maximum 5cm to 7cm & laying in layers not exceeding 0.3mtr depth & as per specification & Direction of Department.

27.1.02 Foundation trenches and plinth shall be filled with excavated & selected earth, Laying in layers not exceeding 23cm thick well-watered & rammed etc. complete including labour, T&P lead & lift cost & conveyance, loading, unloading etc. complete as per Specification & direction of Engineer in-charge.

27.1.03 Centrifugally cast (spun) RCC non pressure pipes of class NP2 with socket & spigot ends conforming to IS :458 with ISI mark shall be provided in standard length and required diameter i.e. 200 mm Nominal bore and 250 mm nominal bore RCC S/S pipes suitable for push on joints including lowering the pipes in to trenches to required depth below G.L with proper alignment & gradient, testing ,commissioning (de-watering) if required including rubber gasket as per IS-5382/1985 with ISI mark with all taxes and duties etc all complete as per Specification & direction of Engineer in-charge.

27.1.04 Cement Concrete Pedestal shall be casted of C.C 1:2:4 with 12mm size hard granite crusher broken chips (hgcb) as shown in drawing for support of the RCC NP2 pipe of Nominal dia i.e 200 mm & 250 mm RCC NP2 Pipe.

13 PUMPS & APPURANTENCES

28.1.01 GENERAL: Supply installation, testing and commissioning of Submersible Pump sets with delivery Piping arrangements.

28.1.02 Submersible pump set three Phase 50 Hz of 70mtr head and 12-15 m^3 per hour shall be provided to each tubewell including HDPE (high density polyethylene pipes) delivery pipe 10 $kgcm^2$ of material grade P.E-80, & three core flat cable with bore bunched copper conductor installed sheathed with PVC for submersible motor with voltage up to 1100 volt conforming to IS 694-1990 of required length control panel and required accessories suitable for 200x150 mm size Production well shall be provided in each Production well etc. complete as per Specification & direction of Engineer in-charge.

14 CENTRIFUGAL PUMPS & APPURANTENCES

29.1.01 GENERAL: Supply installation, testing and commissioning of Centrifugal Pump sets with delivery Piping arrangements for both drinking water & Flushing water application.

29.1.02 Centrifugal pump set (split casing) and capacity of each pump with total head 45 mtr and discharge 15m^3/hr shall be provided as per Engineer in-charge .

29.1.03 Induction motor of TEFC (Totally Enclosed, Fan Cooled) of three phase 50 Hz shall be coupled with a common base and electrical control panel suitable for the pump set shall be provided as per Engineer in-

charge.

29.1.04 Base concrete shall be provided on the floor with grouting of Base bolt for fixing the pump and motor of required size over the base plate. The pump and motor shall be aligned properly, to run without vibration.

29.1.05 Butterfly valve, Non return valve (Pressure rating PN1.0) ,threaded or flanged short piece along with Piping arrangement shall be provided for both side suction and delivery of pumps .

29.1.06 In case of negative suction flanged end foot valve with strainer shall be provided.

15 RAIN WATER RECHARGE PITS.

30.1.01 GENERAL: Construction of Eleven chambers of rain water recharge pit number I of size 1.2 Mtr x 2 Mtr x 2 Mtr with perforated Bore 150 mm dia Bore 15 mtr as per drawing and Specification etc complete as per direction of Engineer in-charge.

30.1.02 Providing and fixing CI precast concrete manhole cover over tank and pumping including cost, conveyance, taxes of all materials, cost of all labour, labour cess, T&P, etc complete as per direction of Engineer in-charge.

30.1.03 Supplying & laying in trenches 110mm dia Unplasticized UPVC pipes including jointing with supplied solvent cement by non-heat application method including testing as per standard specification including earth work excavation of 300mm deep trenches in all kinds of soil in proper slope with type-c standard bedding CC 1:4:8 the required depth & refilling of pipe line etc complete as per direction of Engineer in-charge.

30.2.04 After construction of recharge pit required size of stone boulder 5cm to 20cm shall be spreaded inside the recharge pit upto 500 mm thickness from the bottom level for both of pits as per direction of Engineer in-charge.

30.2.05 Filling leveling and spreading of gravel of size 5 mm to 10 mm over 5cmx20cm boulder inside of the recharge pit upto 300 mm over boulder layer for both of pits as per direction of Engineer in-charge.

30.2.06 Filling levelling and spreading of Coarse sand of size 1.5 mm to 2 mm size over gravel 5mmx10 mm gravel inside of the recharge pit upto 150 mm over gravel layer for both of pits as per direction of Engineer in-charge.

30.2.07 Polypropylene step irons(rungs) shall be provided in two parallel lines of 300mm spacing in vertical wall with center to center 375 mm staggered. The Polypropylene step iron steps shall be minimum 150 mm wide.

16 RECHARGE BORE WELL (200mm/150mm dia).

31.1.0 GENERAL: Labour for drilling a perfectly vertical bore hole of specified dia(200mmx150mm) for a specified depth of 40 mtrs below the ground level through consolidated and unconsolidated rock with down the hole hammer drilling rigs or combination drilling rigs including use of own rigs with its accessories, T&P and consumables etc for lowering of 200mm dia PVC pipes for housing as per the direction of Engineer in charge etc complete as per direction of Engineer in-charge.

31.1.02 GENERAL: Lowering of 200mm dia PVC casing with or without slotted pipes as per the necessity from ground level and fitted and fixed up in perfectly vertical position, including cutting and threading pipe and slotted pipe and supplying and fixing all the jointing materials,T&P, etc complete as per direction of Engineer in-charge.

31.1.03 GENERAL: Cleaning and developing the borewell using compressor continuously worked till clear and adequate discharge is obtained from the bore well including supply and use of all necessary equipment and cost of all labours etc complete as per direction of Engineer in-charge.

17 Horizontal Check Valve:

32.1.01 GENERAL:A valve which permits fluid to flow in one direction but checks all return flow.It is operated by Pressure alone, having no external means of control.The flow is controlled by means of a disc raising and falling on to a seat with the fluid pressure(lift check);the return may sometimes be added by a spring (spring loaded check). The flow may also be controlled by means of a flap swinging up and down with pressure on to a seat (swing check).

The item includes provision of check valve of specified diameter as mentioned in the schedule including fixing. Check valves is a valve suitable for controlling or stopping the back-flow towards in water supply lines.

32.1.02 MATERIAL: The horizontal check valve of nominal sizes 8 to 100mm suitable for working temperatures upto 45^0 C and non-shock working Pressure up to 1.6 MPa, for water works purposes.

32.1.03 FIXING: The horizontal check valve shall be fixed in the delivery pipeline near the pump to permit fluid flow in one direction and prevent water hammerage .

18 PIPE COLOUR CODE

Sl no.	Pipe Lines	Ground / Base colour	First colour Band	Second colour Band
1	Cooling Tower	Sea green	French Blue	
2	Boiler Feed	Sea green	Gulf Red	
3	Condensate	Sea green	Light Brown	
4	Drinking Water (All cold water line after filter)	Sea green	French Blue	Single red
5	Treated water(soft water)	Sea green	Light orange	
6	Domestic Hot water	Sea green	Light Grey	
7	Drainage	**Black**		

19 MOCKUP AND TRIAL ASSEMBLY .

The installation of the sanitary fixtures and fittings shall be as per the shop drawings approved by the Engineer-in-Charge. The tenderer shall have to assemble at least one set of each type of sanitary fixtures and fittings in order to determine precisely the required supply and disposal connections. Relevant instructions from manufacturers shall follow as applicable. This trial assembly shall be developed to determine the location of puncture holes, holding devices etc, which will be required for final installation of all sanitary fixtures and fittings. The above assembly shall be subjected to final approval by the Engineer-in-Charge. The fixtures in the trial assembly can be used for final installation without any additional payment for fixing or dismantling of the fixtures.

TECHNICAL SPECIFICATION OF INTERNAL ELECTRIFICATION WORKS

Scope of Work

The scope, among others, includes the following,

- Main power supply with DG set and UPS
- LT Distribution
- Emergency Power supply system
- Uninterrupted power supply system
- Internal electrification
- Earthing
- Lightning & Surge Protect
- Fire Fighting System
- Fire Alarm and Public announcement system

LT Distribution

- LT Power panels shall be as close as possible to load centres. It shall be supplied from an authorized vendor as per the approved makes.

- It shall be segregated into two sections in such a way that any one can be taken for preventive maintenance with Hospital in running condition. The design should be such so that the downtime is minimized.
- All panels shall be equipped with ACB/ MCCB of adequate KA rating. MCCB to be restricted upto 630A rating. For rating above 630 Amp, ACB shall be used. ACB shall be of drawout type.

- All MCCB/ ACB controlling the input power supply shall be of Electronic/ Microprocessor based with site tunable O/C, E/F, release. In case of MCCB, $I_{cu} = I_{cs}$.

- All major loads like Air Conditioners, Medical equipments, Gas plant, STP, Pumps, Fire fighting, etc shall have independent feeder.

- XLPE Aluminum armored cable shall be used for power distribution. Aluminum flats/ copper cables shall be used for internal connection in LT Panels.

- Entire installation shall have G.I. ladder type cable trays with supporting system. Suitable GI covers to be provided as mechanical shielding wherever required to avoid damage to cables.

- Earthing conductor to be laid for the entire system to achieve earth resistance not more than 4 Ohm for GI and less than 1Ohm for copper.

- Automatic P.F. Control with panel with auto / manual selector switch shall be provided in the main substation to maintain minimum P.F. of 0.95. It shall be have built-in reactive power compensation filters to contain the Harmonic less than 5%. Copper detune reactors shall be provided with the capacitors. Additional capacitors shall be provided duly interlocked with the incomer breaker of transformer to compensate no load magnetizing current.

- DG set and the LT panels shall have provision for auto change over in the event of power failure.

- All safety components like surge Arresters, Electrical and mechanical interlock system, indicating lamp, relays, digital meters, potential & current transformers, power pack, protective devices, etc. shall be built in & acceptable to the user.

Emergency Power supply system

As per NFPA, installation shall be divided into Emergency, Essential, and Critical circuits. As per NEC of India 2011 also, the installation shall have Standby, Safety supply and Extra Safety supply system. The entire power supply is planned to be backed up with DG sets, Essential and Emergency systems are taken care. For Life safety equipment which need less than 10secs interruption, UPS supply is suggested. For Critical branch circuits like Lighting etc, separate Lighting UPS/ Inverter is suggested.

Emergency power supply to be planned with Diesel Generator sets for 100% backup.

Uninterrupted power supply system

UPS power to be provided for all critical areas like OT's, ICU's, Work stations, Server loads, Emergency lighting, Medical equipment's, etc. as per specified norms.

Internal Electrification

The internal wiring shall be done in recess with stranded copper conductor drawn through heavy guage PVC conduit. MS conduit shall be used in case of surface conduit wiring. Modular switch and sockets shall be used mount on GI boxes.

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

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

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

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

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

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

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

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

Conduit wiring

For recessed conduit wiring system the conduit shall be placed in the ceiling / columns etc. before the casting of the slab or column. The conduit pipes shall be properly positioned and fixed so that it will not

be displaced at the time of concrete. The junction boxes provided shall be so arranged that its cover will be flushed with the finished surface of the ceiling or column.

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

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

Earthing

Earthing shall generally be carried out in accordance with the requirements of Indian Electricity Rules and the relevant rules and regulations of electrical supply authorities. The complete earthing work for the installation covered by this specifications shall also be provided taking into account Indian Standard Specification No.IS:732 and IS:3043. The earthing system adopted shall also have adequate mechanical strength.

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

Lighting Protection:

- Lightning Protection is planned based on IS 2309 using Conventional type Air Finals and connected with Copper plate earth stations in Ground in the open area.
- Earth Resistance value shall be less than 10 Ohm
- All horizontal air terminations shall be interconnected such that no part of the roof is more than 5 m away from the nearest horizontal conductor.
- Every down conductor is proposed to be connected to a separate earth station
- All Earth stations are proposed to be interconnected as a Equi potential bar

Surge Protection:

The switching surges due to start of major Motors can create switching surges, other than Lightning Surges. These switching surges shall be arrested at the main Panel and also near critical equipment. The Insulation requirements of various Electrical equipment ie 415V/ 240V are specified by IEC 60364-4.

Surge Protection devices are proposed at all following locations

- Main PCC
- Feeders feeding Critical medical equipment
- Distribution Boards feeding Critical loads

Installation, testing and Commissioning:

The supplier shall be responsible for the installation testing the commissioning of all the equipment and materials supplied by him against this specification. This shall also include the provision of miscellaneous wiring and supports and earthing in compliance with Indian Electricity rules and to he full satisfaction of the Government Electrical Inspector. All small items such as clamps, bolts, nuts, racks,

supports, miscellaneous wiring etc. required to make the installation complete, shall constitute the part of major items specified in the bill of quantities and the tenderer should quote for each item taking these into consideration.

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

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

Drawing showing the position of light fittings, main board, switches, sockets and routes of pipes and cables shall be submitted by the agency for approval before execution of work.

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

Installation and Maintenance Tools:

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

Drawings:

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

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

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

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

(a) The arrangement and support of conduit pipe.

(b) The position of light fittings, switches / plug socket and switch boards

(c) Earthing installations

(d) Layout plan showing the entire cable network

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

Test:

Manufactures standard tests in accordance with Indian Standard and other standards, adopted shall be carried out on all the equipment and accessories covered by this specification so as to ensure efficient and satisfactory performances of all the components and also the equipment as a whole under working conditions at site. The tenderer shall submit a complete list of all such tests. If the purchaser, if so desired for special tests, to be carried out, under certain conditions the same shall be made by the successful tenderer

at his own expenses. All equipment shall be tested at site before the commissioning in accordance with the adopted standard and Indian Electricity Rules. Voltage test shall be carried out on each circuit on completion of wiring and cabling.

Technical Data:

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

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

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

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

Exception to Specifications:

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

PVC insulated Cables and Wires:

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

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

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

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

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

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

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

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

Switches and Plug Sockets

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

Ceiling Fans and Exhaust Fans:

Ceiling fans shall conform to Indian standard specification IS: 374-1960. The fans shall be supplied with all standard accessories like regulator and capacitors etc. Ceiling fans shall be 5 star rated.

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

LUMINAIRES & LAMPS

All light fittings shall be LED type and shall be of reputed make. The type of luminaires shall be as specified in the BOQ. The lamps shall be of the high efficiency type. The LED fittings should have a lumen output not less than 100 Lumen/watt and shall be provided with surge arresters.

Lighting fixtures and accessories shall be designed for continuous trouble free operation under diversed atmospheric conditions without deterioration of materials. Degree of protection of enclosure shall be IP-65 for outdoor fixtures. Bulkhead fixture shall be provided with IP-54 protection and all internal lighting fixtures shall be IP20.
Fixtures shall be so designed as to facilitate easy maintenance including cleaning, replacement of lamps / ballasts.

All fixtures shall be supplied complete with lamps and accessories, like electronic ballasts, power factor improvement capacitors, etc. Out door type fixtures shall be provided with weather proof terminal and control gear housing with IP-54 protection.

Each fixture shall have a terminal block suitable for loop-out connection by 1100 V PVC insulated copper conductor wires up to 2.5 sq.mm. Fixtures shall be pre-wired.

All hardwares used in the fixtures shall be suitably treated against corrosion

Earthing: Each lighting fixtures shall be provided with an earthing terminal. All metal parts shall be bonded to earth.

Metal used in BODY of lighting fixtures shall be not less than 22 SWG to comply with specification. Sheet steel reflectors shall have a thickness of not less than 20 SWG. The metal parts of the fixtures shall be completely free from burrs and tool marks.

Painting/Finish: All surfaces of the fixtures shall be thoroughly cleaned treated and degreased before painting.

The housing shall be powder coated/stove-enameled or anodized as required. The surface shall be scratch resistant.

Reflectors shall be made of CRCA sheet steel/aluminium /Silvered glass/Chromium plated copper sheet as asked for. The thickness of reflectors shall be as per relevant standards. Reflectors made of steel shall have stove enamelled/ vitreous enamelled/epoxy coating finish. Aluminium used for reflectors shall be anodised/epoxy stove enamelled /mirror polished. The finish for the reflector shall be as specified. The reflectors shall be free from scratches and shall have a smooth and glossy surface having optimum light reflecting coefficient. Reflectors shall be easily removable from the housing for cleaning and maintenance without use of tools.

LED (Light Emitting Diode) Light Fittings:-

LED's are small semiconductor components that convert electrical current into visible light. LED's are used as a light source after many benefits as follows

- Compact in size.
- High Luminous Intensity.
- Saturated vibrant colors.
- Fully Dimmable from 0% to 100%.

- Instead On/Off no accelerated again due to switching cycles.
- Long life time.
- No direct IR or UV emission.
- Mechanically robust shock and vibration proof.

LED's are based on the semiconductor diode. When the diode is forward biased (switched on), electrons are able to recombine with holes and energy is released in the form of light. This effect is called electroluminescence and the color of the light is determined by the energy gap of the semiconductor. The LED is usually small in area (less than 1 mm2) with integrated optical components to shape its radiation pattern and assist in reflection.

ELECTRONIC DRIVERS:-

Drivers are convert the line voltage into a constant voltage or constant current on the output side, these drivers are available with different combinations of output voltage / Current total output power, housing and IP protection options.

Drivers are developed for the lighting industry and meet the requirements of relevant mandatory national and international standards for Electronic drivers.

Electronic Drivers are consuming a minimum of energy.

Electronic drivers are compact and require a minimum space for installation.

Electronic drivers are protected against short circuit and Electrical & Thermal overload.

The Drivers shall be having following Protections

Over Load,
Short circuit
Over temperature,
No load and partial load,
Surge protection,
Lightning Protection,

Internal Lighting:

- General Areas : Concealed/ surface mounted LED Lights.
- Corridors, Toilets, Change rooms, etc. : Concealed/ surface mounted LED lights.
- Service rooms like Sub-station, STP, etc. : Water proof light fittings with LED Lamps.
- Infrared sensor. : In common Corridors , Lobbies, Common Toilets.

External Lighting:

- Street light poles : To suit width of roads. Extruded/Swedged poles with MH/T5/LED lamps.
- Landscape lights : LED.
- Flood lighting : LED.

Emergency Lighting System:

- Through Centralised Inverter /UPS.
- It shall have SMF Batteries to provide minimum 20 minutes back-up time.
- Emergency lighting shall cover all areas like lift, sub-station, service rooms, reception, Minimum 10 to 15% of lighting system to be provided for corridors, Consultation rooms, Waiting areas, Lobbies, Toilets, etc.
- Distribution system shall be separate for Emergency lighting system.

LIST OF APPROVED MAKES FOR ELECTRICAL WORKS

FOR ELECTRICAL WORKS

Sl.No.	Items Description	Make of the Components
1	XLPE Insulated L.T cables	POLYCAB / HAVELLS / FINOLEX / KEI / UNIVERSAL / GLOSTER
2	Flexible – Copper Cables / Control Cables / Special Cables	POLYCAB / HAVELLS / FINOLEX / LAPP / GLOSTER
3	Decorative Luminaries Fancy Light Fittings	Philips / / WIPRO / HAVELLS / CG Philips / WIPRO /HAVELLS / CG
4	High efficiency fluorescent lamp	Osram / Philips / CG
5	Outdoor Light Fittings	Philips / / WIPRO /HAVELLS / CG
6	LED Light Fittings	Philips / WIPRO / HAVELLS / CG
7	LED's	Cree / Luxion / Nichia/OSRAM
8	PIR Sensors	Philips / /MK (Honeywel)/Schneider/Legrand
9	MCB/ RCDs/Surge suppressors /MCB Type Isolators	Hager/Schneider (MG) / Siemens/ LEGRAND
10	MCBs and MCBDBs (double shutter)	Hager/Schneider (MG) / Siemens / LEGRAND
11	MPCBs	Schneider (NSX) / LEGRAND
12	Modular switches & Sockets	LEGRAND(Myrius)/ Anchor(Vision+)/ MK (Blenze) / Havells (Crabtree-Morena)
13	Heavy duty cable Lugs/ Cable glands	Dowells / SMI / Comet / Jainson
14.1	Industrial type Switch sockets – Moulded	Legrand//Schneider/
14.2	Industrial Switch sockets	Legrand//Schneider
15.1	MS Conduits	AKG/BEC / Supreme/NATIONAL/ PRECISION
15.2	PVC Conduits	AKG/BEC / Supreme/NATIONAL/ PRECISION
16	Wires (PVC/FRLS)	POLYCAB / HAVELLS / FINOLEX / KEI / UNIVERSAL / GLOSTER
17	Exhaust Fans	CROMPTON/GEC/Anchor/Khaitan/Almonard
18	Cable/Earth pit markers	Suraba/SMI
19	Terminals	Elmex / Wago
20	Rubber Mat	Jyothi
21	Push Button Station	Siemens / Teknic / Schneider
22	DOL/Star Delta Starter	Siemens/Schneider /Legrand
23	Earth pit marker	
24	Fire Barriers	3M / Hilti / Viper
25	Cable Trays	Profab / Patny
26	Fabricated Wire ways / Raceways Readymade Wire ways / Raceways	Profab / Panty

27	Inverter With 1 and half Hour battery Backup	DUBAS/Consul neowatt/ Power one
28	Chemical Earthing/ Maintenance Free earthing	Jef Ecosafe /Galaxy
29	Transformers	Crompton /Areva/alpha/Schneider/Orissa Transformer/Kirloskar
30	HT Panels	Schneider / ABB/Siemens/L&T/Crompton
31	PVC flexible conduit pipes	As per approval by Engineer-in-Charge.
32	33 kV HT cables	POLYCAB / FINOLEX / HAVELLS / GLOSTER
34	Lightning system	Erico / Indelec
35	Street Light poles	Bajaj / K-Lites / Bombay Poles
36	Ceiling fans	Usha / Crompton / ORIENT
37	GI pipes	Jindal / Prakash / BEC /Tata/SAIL
38	MS pipes	Tata / Sail / /Jindal
39	MS Steel	Tata / Sail
40	Cable jointing kit	Raychem
41	Transient Voltage Surge Suppressor	ASCO
42	Sandwich /air insulated Busducts/rising Mains	Godrej/Schneider/L&T/ C&S
43	Battery Charger	AMARON/ HBL-NIFE / DUBAS
44	SMF Battery	AMARON / Rocket /Panasonic/Exide

LIST OF APPROVED MAKES FOR L.T SWITCHBOARDS AND COMPONENTS

Sl.No.	Items Descriptions	Make of Components
1	Switchboard manufacturer /Main power centre / Sub power control centre	EAP/ Tricolite / AC power/ System House of L&T, Siemens , ABB
2	ACB	Schneider/ ABB /L&T/Siemens
3	MCCBs / MPCBs	Schneider/ ABB /L&T/Siemens
4	Contactors and O/L Relay	Schneider / Siemens/L&T
5	Load Monitors / Controller and all Digital meters	Schneider / Siemens/L&T/IMP/AE
6	Multi Data Meters (MDM) with RS-485 port	Schneider / Siemens/L&T/IMP/AE
7	MCBs	Hager/Schneider / Legrand/L&T/Siemens
8	Capacitor	SIEMENS /MEHER / NEPUTUNE / L&T / SCHNIDER.
9	CTs and PTs	CIRCUTOR /Kappa /Kalpa
10	Control Switches	Kaycee / Siemens / Salzer
11	ELR / Earth Fault Relay	CIRCUTOR/CSPCL/ PROKDVS/ NUGUBA
12	Protective Relays	Schneider / CSPCL
13	Push Buttons	Siemens / Teknic / Schneider/L&T
14	Indicating lamps (LED type)	Siemens / Teknic / Schneider / VAISHNO /BINAY
15	Wires (HHFR)/FRLS/PVC	POLYCAB / FINOLEX / HAVELLS /Anchor
16	Lugs. Glands	Dowells / HMI / Comet / BRACO / HEX
17	Terminals	Elmex / Wago – Finger touch proof
18	Ferrules	Mayfair

19	Bus bar supports	Powermak or approved equivalent
20	Energy Meter with RS-485 Port	Schneider / Siemens/L&T/IMP/AE
21	Panel Digital Meters	CIRCUTOR /INFO NRG / CONZERV / L&T / AE / SECURE
22	Name plates	Screen printed acrylic
23	Surge Protective Devices	ZOTUP/Schneider / OBO Bettermann
24	Power factor control relay	CIRCUTOR /EPCOS
25	Capacitor (MPP gas filled only), Inductor and Thyristor modules combination	CIRCUTOR /EPCOS
26	Switch fuse/Fuse switch / HRC fuses	EPCOS / Siemens
27	Power pack	Minilec / / Hi-rel
28	PLC load management	Allen Bradely / SIEMENS /HONEYWELL / JOHNSON
29	ATS	ASCO /Socomec/Siemens/L&T/Emersion

LIST OF APPROVED MAKES FOR 33kV HT PANELS & ACCESSORIES :

11kV Breakers	:	SCHNEIDER / ABB / L&T/Crompton
11kV On load isolator	:	SCHNEIDER / ABB / L&T/Crompton
Indicating Meters	:	Schneider / Siemens/L&T/IMP/AE
Trivector meter – Electronic Solid State With RS485 communication port.	:	L & T or Approved equivalent
Microprocessor based Numerical Relays	:	Siemens / Schneider / Areva
Microprocessor based Differential & other Relays	:	Siemens / Schneider / Areva
CTs & PTs	:	As per OEMs Standards
Indicating Lamps & Push Buttons	:	Siemens / Schneider / Tecknic
Terminals	:	Phoenix / Wago / Elmex
ON-OFF Switch with lost motion device	:	Kaycee / Alstom

LIST OF MAKES for 33kV outdoor items / equipments at point of supply shall be generally as per Local EB approved list

a) 11KV Gang Operated Air Break : Southern switchgear / Switchgear manufacuturing company / AMEI power Ltd .

b) 11KV Lightning Arrestors : Oblum / LAMCO / Jayashree

c) 11KV Insulators : Jayashree / BHEL

LIST OF MAKES FOR BUS DUCTS / RISING MAINS /Tap off box:

The busducts / rising mains of following makes shall be offered.

1. Godrej
2. Schneider
3. L&T
4. C&S

C O D E S

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

a) Indian Boiler Act, 1923 and Rules and Regulations made their under

b) Indian Electricity Act, 1923 and Rules and Regulations made there under

c) Indian Factories Act, 1948 and Rules and Regulations made there under

d) The minimum wages Act

e) The Women's Compensation Act

f) The Payment of Wages Act

g) The Fatal Accident Act

h) The Industrial Employment Act

i) The Employment provident Fund Act

j) Indian Explosive Act 1984 the Rules and Regulations made there under

k) Indian Petroleum Act 1934, and Rules and Regulations made there under

l) A.S.M.E. Test Codes

m) AIRE Test, Codes

n) American Society of Materials Testing Codes

o) Standards of the Indian Standards Institution

1)	Low Tension Circuit Breakers :	IS 2516-1955 Part I Sec.1
2)	Switchgear Bus Bars	IS 375-1963
3)	HRC fuse links	IS 2208-1962
4)	Distribution fuse boards	IS2675-1966
5)	Enclosure for Low Voltage switchgear	IS214701962
6)	PVC Cables	IS1554-1975
7)	Tabular fluorescent lamps for Cameral lighting service	IS2418-1963
8)	Tungsten Filament Lamps for cameral service	IS415-1963
9)	Ceiling Fans	IS274-1966
10)	Flood lights	IS1947-1961
11)	Wall Glass flame-proof electric light fittings	IS2206-1962 (Part 1)
12)	Watertight Electric Light Fittings	IS3553-1956
13)	Steel Boxes for Enclosure of Electrical Accessories	IS5133-1969
14)	Fittings for Rigid Steel conduit	IS2667-1979
15)	Rigid steel circuits for electrical wiring	IS3837-1966
16)	Accessories for Rigid Steel Conduits for Electrical Wiring	IS3837-1966
17)	Switch Socket Outlets	IS3837-1966
18)	PVC Wiring	IS694-1977
19)	Switches for domestic and similar purpose	IS3854-1966
20)	PVC wiring	IS694-1977
21)	Call Bell and Buzzers	IS2268-1966
22)	Straight through joint boxes and leads sleeves or paper insulated cables-	EID-0032-1964

23)	Earthing	IS3043-1966
24)	Electrical Wiring installations	IS732-1963
25)	Switchgear	IS3072-1965 (Part I)
26)	Lighting protection	IS2309 –1969
27)	Public Address system	IS1882-1962
28)	Low Tension switch use units	IS4064-1978
29)	Code of Practice for Automatic FIRE ALAM system	IS2189-1970
30)	Specification for Heat Sensitive Fire Detectors	IS2175-1977
31)	Guide for Safety procedure in Electric work	IS5216-1969
32)	Rubber Mats for Electric works	IS5424-1969

p) Other internationally approved standards and / or Rules and Regulations touching the subject matter of the contract

Specification of Fire Protection, Detection and Public Address system

Complete fire and safety shall be designed and installed as per guidelines of NBC latest version. The public announcement system wherever provided shall be integrated with Fire alarm system.
The alarm system shall be addressable type.

1. In the event of failure or refused to execute the order the ISD will be forfeited and the order will be cancelled after the completion time period from the date of issue of the order. In the event of delay in supply erection, testing and commissioning of the materials with work pertaining to order, penalty @ 0.5% of the order value per month delay will be imposed subject to a maximum of 5% (Five percent) along with the EMD.

2. All the materials should be ISI marked and duly approved by the fire Deptt. Govt. of Odisha.

3. 3rd Party Audit should be done by registred agency of Fire Deptt. Govt. of Odisha by the firm.

4. Drawing and designed duly approved by the Fire Deptt. Govt. of Odisha should be submitted before execution of work.

5. If addition alternation required as per guideline of Fire Deptt., the fire will execute the same with due approval of the authority.

After completion of the work the firm should made a mock fire drill demonstration in presence of Engineer-in-Charge, authorized officer of the Fire Deptt. and building authority

CODES & STANDARDS

The equipment and installation work shall conform to latest editions of applicable Indian / International Standards. The standards shall include but not be limited to the following: National Building Code (NBC-2016) of India latest version, Part – 4, Fire and Life Safety.

- Stipulations of local authority.
- IEC 60849: 1998 - Sound systems for emergency purposes.

All the security systems shall be installed complying with the following codes and regulations.

- National and local statuary regulations.
- Health & safety at Work Acts.
- IEE Regulations
- Equipment manufacturer's instructions.
- Regulations and conditions of utilities suppliers.
- Any statutory Safety Guides.

LIST OF MAKES

Fire Detection and Alarm System

1) Fire Alarm & Control Panel - Bosch / Cooper / Edwards / Siemens/Honeywell
2) Repeater Panel (Optional) - Bosch / Cooper / Edwards / Siemens/Honeywell
3) Detectors / Manual Call Point / Hooter /Relay Modules/ Response Indicator - Bosch / Cooper / Edwards / Siemens/Honeywell
5) Batteries - Amaron / AMCO / Panasonic

Public Address System

1) Controller - Bosch / Heinrich / Honeywell

2) Router - Bosch / Heinrich / Honeywell
3) Call Station / Call Station Keypad - Bosch / Heinrich / Honeywell
4) Amplifier / Speaker - Bosch / Heinrich / Honeywell

D.G. Set

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

Diesel Engine

Duty : Continuous running

Type: 4 Stroke, Turbo Charged

Capacity: 990 Liter.

Cooling: Radiator

Governing: Full electronic

Fuel injection: Electronic Unit injectors

Alternator :

Rating: 625 KVA at 415 volt, 0.8pf, 50Hz, 3phase, 4wire@1500rpm.

Duty: Continuous running

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

Efficiency:92%

- Above engine alternator should be assembled on a steel fabricated common base frame.
- Five sided Acoustic enclosure would be required to reduce noise.
- 990 L fule tank would be placed outside acoustic enclosure.
- 2Nos. 12Volt, having Ampere- Hr rating as prescribed by the manufacturer of Engine along with battery charger, as required.
- Set of Antivibration mountings.
- First fill of engine oil.
- Heavy duty silencer.

Design Criteria

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

IRRESPECTIVE OF ANYTHING MENTIONED IN THIS TECHNICAL SECTION, THE STIPULATION OF RELEVANT CODES PUBLISHED BY BIS SHALL GOVERN.

Tenderer(s) is/are required to submit the information in the following Schedules

SCHEDULE - A

CERTIFICATE OF NO RELATIONSHIP

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

(*) - Strike out which is not applicable

Signature of the Tenderer
Date:-

SCHEDULE - B

EXISTING COMMITMENTS AND ON-GOING WORKS :

Description of works	Place & State	Contract No.	Name & Address of Employer	Value of Contract (₹. In lakh)	Stipulated Period of Completion	Value of works* remaining to be completed (₹. In lakh)	Anticipated date of completion
1	2	3	4	5	6	7	8

* The above information is to be certified by the Engineer in Charge / Employer not below the rank of Executive Engineer or equivalent. In case there is no existing commitment and on-going works, the bidder will furnish a declaration in shape of affidavit that he has no work in hand in schedule B. If it is found incorrect, the bid shall be summarily rejected.

Signature of the Tenderer

Date……..

SCHEUDLE – C

CERTIFICATE OF TOOLS AND PLANTS

I/We hereby certify that the following tools and plants, machineries and vehicles are in my /our possession and in working order.

Sl. No	Type of Equipments	No. of machines required	No. of machines owned / leased/hired
1	Water Tanker of 3000litre capacity mounted with Truck / Tractor - 05%	2	
2	Truck / Tipper - 10%	4	
3	Welding machine 05%	2	
4	Generator of 40 KVA Capacity 10%	1	
5	Concrete Batching Plant of Capacity 15 cum/hr 15%	1	
6	Concrete Mixer 10 %	2	
7	Concrete vibrator 10%		
	a) Concrete vibrator : Needle (40mm)	4	
	b) Concrete vibrator : Needle (20mm)	4	
	c) Concrete vibrator : Screed type	2	
	d) Concrete vibrator : Plate type	2	
8	Complete staging, shuttering, centering arrangement - - 20% a) For steel shuttering – Not older than 5 years b) For wooden/Ply shuttering – Not older than 2 years (No marks will be awarded if the shuttering material area is less than 2000 sqm)	4000 sqm	
9	5 Ton Capacity Winch Machine (Mechanical/Power) – - 05%	2	
10	Water Pump – 5 HP Capacity- 1No. 1 HP Capacity- 1No. 05%	2	
11	Hydraulic Excavator with Bucket capacity not less than 0.5 cum. 05%	1	

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

Signature of the Tenderer
Date.

SCHEDULE – D

WORK EXPERIENCE
LIST OF SIMILAR NATURE OF PROJECTS EXECUTED

PART A – WORKS CITED

Sl. No.	Name of Work & Location	Name of Employer	Agreement No. & Date	Stipulated Date of Completion	Actual Date of Completion	Reasons for Delay, if any

Note: The above information is to be certified by the Engineer-in-Charge / Employer not below the rank of Executive Engineer.

PART B – ITEM-WISE QUANTITIES EXECUTED

(In support of Clause 116(g)(i). Quantities from different works during one financial year may be aggregated. Different major items may be considered from different financial years, within the last five financial years, i.e. FY 2021-22 to FY 2025-26.)

(1) M-25 RCC – Minimum Qualifying Quantity: 2,741 Cum

Sl. No.	Ref. to Work (Sl. No. from Part A)	Financial Year	Quantity Executed (Cum)	Certifying Officer & Certificate No./Date

Total Quantity Claimed: _____ Cum
Qualifies (Yes/No): _____

(2) PCC in 1:3:6 – Minimum Qualifying Quantity: 3,794 Cum

Sl. No.	Ref. to Work (Sl. No. from Part A)	Financial Year	Quantity Executed (Cum)	Certifying Officer & Certificate No./Date

Total Quantity Claimed: _____ Cum
Qualifies (Yes/No): _____

(3) Brickwork – Minimum Qualifying Quantity: 3,808.00 Cum

Sl. No.	Ref. to Work (Sl. No. from Part A)	Financial Year	Quantity Executed (Cum)	Certifying Officer & Certificate No./Date

Total Quantity Claimed: _____ Cum
Qualifies (Yes/No): _____

(4) Galvalume Sheet Roofing – Minimum Qualifying Quantity: 14,802 Sq.m

Sl. No.	Ref. to Work (Sl. No. from Part A)	Financial Year	Quantity Executed (Sq.m)	Certifying Officer & Certificate No./Date

Total Quantity Claimed: _____ Sq.m
Qualifies (Yes/No): _____

(5) Reinforcement Steel – Minimum Qualifying Quantity: 3,347 Quintal

Sl. No.	Ref. to Work (Sl. No. from Part A)	Financial Year	Quantity Executed (Quintal)	Certifying Officer & Certificate No./Date

Total Quantity Claimed: _____ Quintal
Qualifies (Yes/No): _____

Note: Self-attested copies of certificates issued by the concerned Executive Engineer / Competent Officer in charge of execution shall be attached in support of the quantities claimed above. Failure to submit the required proof shall result in non-consideration of the tender.

Signature of the
Tenderer Date.

SCHEDULE – E

INFORMATION REGARDING CURRENT LITIGATION, DEBARRING EXPELLING OF TENDERER OR ABANDONMENT OF WORK BY THE TENDERER

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

Note:

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

Signature of Tenderer

SCHEDULE – F

AFFIDAVIT

1. The undersigned do hereby certify that all the statements made in the required attachments are true and correct.
2. The undersigned also hereby certifies that neither my / our firm / company / individuals _____ nor any of its constituent partners have abandoned any road/ bridge/Irrigation /Buildings or other project work in India nor any contract awarded to us for such works have been rescinded during the last five years prior to the date of this bid.
3. The undersigned hereby authorise(s) and request(s) any bank, person, firm or Corporation to furnish pertinent information as deemed necessary and as requested by the Department to verify this statement or regarding my (our) competency and general reputation.
4. The undersigned understands and agrees that further qualifying information may be requested and agree to furnish any such information at the request of the Department.

(Signature of Tenderer)
Title of Officer
Name of Firm
Date:

SCHEDULE - G

CERTIFICATE OF EMPLOYMENT OF UNEMPLOYED GRADUATE ENGINEER / DIPLOMA HOLDERS
(For Super Class / Special Class/ 'A' Class Contractors only)

I / We hereby certify that at present, the following Engineering personnel are working with me / in our firm / company and their bio-data are furnished below.

Sl. No.	Name of Engineering personnel appointed for supervising contractor's work with address	Qualification	Date of Appointment	Monthly emolument	Whether full time engagement and continuous	If they are superannuated / retired / dismissed or removed personnel from state Govt./ Central Govt. / Public Sector Undertaking / private Companies and s or any one ineligible for Government service
1	2	3	4	5	6	7

Signature of the Tenderer.
Date:-

SCHEDULE – H

SAMPLE FORMATS

UNDERTAKING

This is to certify that

1. My firm has neither been associated, directly or indirectly, with the Consultant or with any other entity that has prepared the design, specifications, and other documents for the Project nor has any person associated with been proposed as Project Manager for the Contract.

2. My firm has not engaged any agency and any of its affiliates engaged by the Engineer-in-Charge to provide consulting services for the preparation or supervision of this work.

3. My firm has not engaged any Engineer of gazetted rank employed in Engineering or Administrative duties in an Engineering Department of the Government of Odisha or other gazetted officer retired from Government service during last two years without prior permission of the Government of Odisha in writing on or before submission of this tender. I am aware that my contract is liable to be cancelled if either I or any of my employees is found any time to be such a person who had not obtained the permission of the Government of Odisha as aforesaid.

Signature of the Tenderer.
Date:-

Note: i. Strike out whichever is not applicable
ii. In case any person is under his employment with due permission from Government, the same may be cited in a separate letter.

SCHEDULE – I

RELATIONSHIP DECLARATION

To,

The Tender Inviting Officer,

Subject: (Name of the Work)

Reference: (Bid reference number)

Sir,

Pursuant to clause 2 of the ITB, it is to inform you that I have relative(s) employed as an Officer in the rank of an Assistant Engineer/Under Secretary under the _____Department. His (Their) details are as follows.

Relationship:

Name:

Designation

Office

Address

Pursuant to clause 2 of the ITB, I am submitting herewith the names of persons who are working under my firm having near relatives to any gazetted officer in the rank of an Assistant Engineer/Under Secretary in the _____Department.

Sl No	Name of my employee and his designation in the firm	Presently working at	Details of his relatives working in the Department
			Relationship Name: Designation Office Address
			Relationship Name: Designation Office Address

I am also duty bound to inform the relationship of any subsequent employment with any gazetted officer in the rank of an Assistant Engineer/Under Secretary in the _____Department. I **am aware that a**ny breach of this condition would render my firm liable for penal action for suppression of facts.

Yours Sincerely

Signature of the
Tenderer.

Date:-

SCHEDULE – J

MEMORANDUM OF UNDERSTANDING

First Party I Sri/Smt.……, Aged …. years, S/O ..... , At / P.O. / Dist.....(hereinafter called the First Part)

AND

Second Party I Sri/Smt.……, Aged …. years, S/O- ……..., At / P.O. / Dist-……. (hereinafter called the Second Part) having H.T. / L.T. license registration No……. valid upto ……..

AND WHEREAS the First Party of 1st part is the managing partner of …….

AND WHEREAS the First Party willing to appoint the Second Party to execute the E.I. portion for the tender work, "....."

AND WHEREAS the Second Party accepted the offer of First Party.

NOW THIS DEED OF AGREEMENT WITNESSES AS FOLLOWS;

1) That, the Second Party shall do all E.I. works, if the tender is awarded to First Party.
2) That, the Second Party shall fulfill all the E.I. work as per the tender schedule by instruction of Engineer-in-Charge.
3) That, the First Party shall receive payment, signing the bill the document for the work concerned.
4) That, the Second Party shall abide the rules, regulations and specifications of E.I. works of above said matter.

In witness where of Both the party have signed in presence of

WITNESS

W_1 –

W2-

Annexure-II

(1) BANK GUARANTEE FOR EARNEST MONEY DEPOSIT (EMD)

WHEREAS _____ (name and address of Bidder) (hereinafter called "the Bidder") has submitted their offer dated _____for the work of _____(herein after called the "Bid") against the employer's Bid Identification No_____ KNOW ALL MEN by these presents that WE _____of _____(Name of Bank) having Our registered office at _____are bound unto General Manager, Odisha State Agricultural Marketing Board, Bhubaneswar (herein after called "Employer") unconditionally & irrevocably for the sum_____(Rupees _____) for which payment will and truly to be made to the said employer, the Bank binds itself, its successors and assigns by the presents.

Sealed with the

Common seal of the said Bank this _____day of _____20_____

THE CONDITIONS OF THIS OBLIGATION ARE:

If the Bidder withdraws or amends, impairs or derogates from the bid in any respect within the period of validity of this bid.

If the Bidder having been notified of the acceptance of his Bid by the employer during the period of its validity in accordance with Instruction to Bidders of the Bid document.

If the Bidder fails to furnish the initial Security Deposit and Additional Performance Security for the due performance of the contract.

Fails or refuses to accept/execute the contract.

WE undertake to pay the employer up to the above amount upon receipt of its first written demand, without the employer having to substantiate its demand, provided that in its demand the employer will note that the amount claimed by it, is due to it, owing to the occurrence of one or both the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including 60 days after the period of tender validity as specified in DNIT and any demand in respect thereof should reach the Bank not later than the above date.

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

(Signature of the authorized officer of the Bank)

……..……..

……..……..

Name and designation of the officer

……..…….

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

Our_____Branch at Bhubaneswar (Name & Address of the _____ branch) is liable to pay the guaranteed amount depending on the filing of claim and any part thereof under this Bank Guarantee only and only if it is served upon us by the employer at our Bhubaneswar Branch, a written claim or demand and received by us at our Bhubaneswar branch on or before Dt. _____otherwise bank shall be discharged of all liabilities under this guarantee thereafter.

(Signature of the authorized officer of the Bank)

……..……..

……..……..

Name and designation of the officer

……..…….

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

ANNEXURE – III

BANK GUARANTEE FOR ADDITIONAL PERFORMANCE SECURITY (APS)

To

---------- (name of Tenderer)

WHEREAS the bid of ---------- (name and address of Contractor)(Hereinafter called "the Contractor") for the work _____ [name of work] (hereinafter called "the contract")

AND WHEREAS it has been stipulated by you for the said tender that the Contractor shall furnish you with a Bank Guarantee by a Nationalized/Scheduled Bank in India, counter guaranteed by its local branch at Bhubaneswar towards Additional Performance Security (APS), in accordance with the relevant clause of the DTCN to participate in the Tender

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

NOW THEREFORE we hereby affirm that we are the Guarantors and responsible to you, on behalf of the Contractor, up to a total of Rs _____ [amount of guarantee] _____ [in words], such sum being payable in the types and proportions of currencies in which the contract price is payable, and we undertake to pay you upon your first written demand declaring the Contractor to be in default under the contract and without cavil or argument, any sum or sums within the limits of _____ [amount of guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

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

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

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

(Signature of the authorized officer of the Bank)

……..……..

……..……..

Name and designation of the officer

……..…….

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

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

(Signature of the authorized officer of the Bank)

……..……..

……..……..

Name and designation of the officer

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

ANNEXURE – IV

BANK GUARANTEE FOR INITIAL SECURITY DEPOSIT(ISD)

To

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

WHEREAS the bid of ---------- (name and address of Contractor)(Hereinafter called "the Contractor") has been accepted vide letter of acceptance (LoA) No. _____dated _____ _____of **General Manager, Odisha State Agricultural Marketing Board, Bhubaneswar** to execute the work _____ [name of work] (hereinafter called "the contract")

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

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

NOW THEREFORE we hereby affirm that we are the Guarantors and responsible to you, on behalf of the Contractor, up to a total of Rs _____ [amount of guarantee] _____ [in words], such sum being payable in the types and proportions of currencies in which the contract price is payable, and we undertake to pay you upon your first written demand declaring the Contractor to be in default under the contract and without cavil or argument, any sum or sums within the limits of _____ [amount of guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

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

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

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

(Signature of the authorized officer of the Bank)

……..……..

……..……..

Name and designation of the officer

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

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

(Signature of the authorized officer of the Bank)

……..……..

……..……..

Name and designation of the officer