



COCHIN PORT TRUST

COCHIN-682009, KERALA, INDIA

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**TENDER DOCUMENT FOR RENOVATION OF EASTERN
HALF OF CFS OFFICE AT GROUND FLOOR AREA.**

TECHNICAL BID (e-Tendering Mode)

Website:www.tenderwizard.com/CPT

CHIEF ENGINEER'S OFFICE

COCHIN PORT TRUST

COCHIN-682009

TENDER No.T6/T-1932/2020-C

PRICE: Rs.1575/-

COCHIN PORT TRUST

**TENDER FOR ‘RENOVATION OF EASTERN HALF OF CFS OFFICE AT
GROUND FLOOR AREA
(Tender No.T6/T-1932/2020-C)**

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SIGNATURE OF TENDERER

COCHIN PORT TRUST

CHIEF ENGINEER'S OFFICE,
COCHIN – 682009

No.T6/T-1932/2020-C

Dated:-16/11/2020

1. NOTICE INVITING TENDER

1. Electronic Tenders (**e-tenders**) on percentage basis are invited by Cochin Port Trust from reputed Contractors in Single Stage Two Cover Bidding procedure [Technical Bid and Financial Bid], meeting the Minimum Eligibility Criteria specified below for the Work of '**RENOVATION OF EASTERN HALF OF CFS OFFICE AT GROUND FLOOR AREA**'.

2. **Minimum Eligibility Criteria (MEC):**

a) Experience

The Bidders should have experience of having successfully completed during the last 7 (seven) years ending **31st October 2020** at least either :

- (i) Three Similar works each costing not less than **Rs. 29.13 lakhs**

(OR)

- (ii) Two Similar works each costing not less than **Rs.36.41 lakhs**

(OR)

- (iii) One Similar work costing not less than **Rs. 58.25 lakhs**

b) Financial Turnover

Average Financial Turnover of the Bidder over the last three financial years ending **31st March 2020** (viz. 2017-'18, 2018-'19 and 2019-'20) should not be less than **Rs. 21.84 lakhs**

Explanatory notes to a) & b :

Note 1:- Similar Work(s) means "Civil Construction Works".

Note 2:- Following enhancement factors will be used for the costs of Works executed for bringing the financial figures to a common base value in respect of the Works completed in past years.

Table 1.1

Year before	Multiplying Factor
One year (February 2019)	1.07
Two years (February 2018)	1.14
Three years (February 2017)	1.21
Four years (February 2016)	1.28
Five years (February 2015)	1.35
Six years (February 2014)	1.42

Note 3:- The experience certificate of Works executed in private sectors /

organisations shall be considered for qualification, only on submission of TDS certificate along with Work order and completion certificate.

Note 4:- Satisfactory Client / Owners's Certificate or documentary proof shall be submitted in support of the Assignments / Works performed and claimed by the Bidder in Annexure 4 to fulfill the eligibility criteria for qualification. A statement duly certified by the Chartered Accountant showing the average annual Financial Turnover over the last 3 financial years and audited financial statements for the last three years shall be submitted.

Note 5:- The Works reckoned for the above purpose are those executed by the Bidders as prime Contractor or proportionately as member of joint venture or as a Sub Contractor, authorized and approved by the Employer of the Work (s) against which the Bidder has claimed his experience.

3. Other Eligibility Considerations:

3.1 Even though the Bidders meet the above qualifying criteria, they are subject to be disqualified if they have:

- i) made misleading or false representations in the forms, statements and attachments submitted in proof of the qualification requirements; and/or
- ii) record of poor performance such as abandoning the Works, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures etc.

3.2 The contractor shall be registered under EPF and ESI Act and the employees employed under them shall be covered in the EPF and ESI scheme, as applicable under the act.

If the number of employees proposed to be engaged in the work is less than the threshold limit under ESI/ EPF act, an undertaking to this effect shall be included in the tender submission.

4. Pertinent information to the tender is given in the following Tables:

i) Schedule of different activities till submission of the Bid are detailed as under:

Table 1.2

Sl. No.	Particulars	Date and Time
1	Tender e-publication date	16-11-2020
2	Download period of Bid Documents	16/11/2020 to 07/12/2020
3	Date of Pre Bid meeting	Not Applicable
4	Last date for seeking clarification	14 hours on 07/12/2020
5	Last date and time of submission of Bid	07/12/2020 upto 14.30 hrs

6	Date and time of opening the Bid	07/12/2020 after 15.00 hrs
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ii) **Bid information :**

Table 1.3

i)	Estimated Amount put to Tender	: Rs. 72,81,340/-
ii)	Earnest Money Deposit	: Rs.72,820/- shall be furnished either through Demand Draft / Pay Order / Banker's Cheque drawn in favour of Financial Adviser & Chief Accounts Officer, CoPT, payable at Kochi, from any Nationalised Bank/ Scheduled Bank in India.
iii)	Cost of Bid document	Rs.1575/- (Rs.1500 + 5% GST) (Non refundable) furnished either through Demand Draft /Banker's Cheque drawn in favour of the FA & CAO, CoPT, payable at Kochi, from any Nationalised Bank/ Scheduled Bank in India being the cost of single copy of the Tender Document
iv)	Validity period of Tender	: 120 days from the Last Date for Receipt of Tenders.
x)	Time for Completion	: 6 (Six) months

5. Tender Documents can be downloaded from the e-Tendering portal www.tenderwizard.com/CPT on the dates specified in the above table by making online requisition. Bid document will also be available in Cochin Port website (www.cochinport.gov.in) as well as Central Public Procurement (CPP) Portal which can be downloaded for submission. The cost of Bid document shall be furnished in the form of Demand Draft/ Banker's Cheque drawn in favour of FA & CAO, CoPT along with the submission of Bid.
6. The Bidders need to obtain the one time User ID & password for log-in to in **e-Tendering** system from the service provider M/s. **KEONICS** by paying registration amount of **Rs.1124/-** by online payment using Credit/Debit Card/Net banking or DD in favour of "KSEDCL, Bangalore.
7. The intending Bidder must have valid Class-II or III digital signature certificate to submit the Bid. For further details and to obtain the digital signature please contact e-Tender Help Desk No.080-49352000 / 9605557738
8. Tenders shall be submitted "**online**" strictly in accordance with the Instructions to Bidders and Terms & Conditions given in the Tender Document.
9. The Bidder is responsible to download Addenda/ Amendments/ Errata/ Replies to the queries of Bidder etc., if any, issued by CoPT, from the website before submission of the Bid. Any shortfall in submissions of the said Addenda/

- Amendments/Errata/Replies to the queries of Bidder etc. duly signed along with the downloaded documents while submitting the Bid will not be considered. Incomplete Bid documents may be rejected.
10. All Bids are to be submitted **online only** on the website www.tenderwizard.com/CPT. No Bids shall be accepted off-line (Hard copy).
 11. Cochin Port Trust will not be held responsible for any technical snag or network failure during online Bidding It is the Bidders responsibility to comply with the system requirement i.e. hardware, software and internet connectivity at Bidder's premises to access the e-Tender portal. Under any circumstances, Cochin Port Trust shall not be liable to the Bidders for any direct/indirect loss or damages incurred by them, arising out of incorrect use of the e-Tender system or internet connectivity failures.
 12. The complete Tender Document shall be submitted online as tender offer on or before the due date and time of submission. The scanned copy of financial instruments towards cost of Tender Document and EMD / Bid Security shall be uploaded with the Tender Document - Technical Bid while submitting the tender electronically in the e-procurement Portal. The Bidder shall submit the originals of (i) DD/ Pay Order/ Banker's Cheque / Bank Guarantee (BG) towards the cost of Tender Document and EMD, and (ii) Power of Attorney, if applicable, **along with letter of submission** in a sealed cover duly mentioning the Tender No. & Name of Work, due date of opening of Bid and Name of the Bidder to the **Chief Engineer, Cochin Port Trust, W/Island, Cochin – 682009, KERALA, upto 15.00 hrs. on 07/12/2020. Non submission of the original financial instruments towards cost of Tender Document and EMD within the above period leads to disqualification of Bids.**
 13. Bidders who are registered with National Small Industries Corporation (NSIC), Govt. of India enterprises under "Single Point Registration Scheme" of Ministry of MSME for similar nature of Works shall be eligible for issue of Tender Document free of cost and exemption from payment of Earnest Money Deposit. They are required to submit documentary proof of such registration along with the offer, as detailed in Instructions to Bidders, for claiming the available exemptions and a scanned copy of Exemption Certificate duly notarized shall be uploaded in the e – tendering Portal. ***If Registration Certificate does not pertain to Similar Works mentioned above, the tender will be rejected.***
 14. The undersigned reserves the right to reject/cancel/postpone any one or all tenders at any stage of the tender, which will be binding on all Bidders.

SUPTDG ENGINEER(CM)
COCHIN PORT TRUST
TeleFax : 91 0484 2666414
Email : sathyan@cochinport.gov.in

2. TENDER FOR WORKS

To

**The Board of Trustees,
Cochin Port Trust
Through
The Chief Engineer
Cochin Port Trust, Cochin -9**

I/We hereby tender for the execution of the work specified in the underwritten memorandum within the time specified in such memorandum at the rates specified in the schedule attached hereto and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in 'clause 16' of the General Conditions of Contract and with such materials as are provided for, by and in all other respects in accordance with such conditions so far as applicable.

MEMORANDUM

- a) General description of work : **RENOVATION OF EASTERN HALF OF CFS OFFICE AT GROUND FLOOR AREA.**
- b) Estimated cost : **Rs. 72,81,340/-**
- c) Earnest Money : **Rs.72,820/-**
- d) Security Deposit : 10% of the value of the Contract awarded or value of the work done whichever is higher. (Performance Security @ 5% and Retention Money @ 5%)
- e) Percentage, if any, to be deducted from the bills : The Retention Money will be recovered from the first running bill onwards at the rate of 5% of the gross amount of each bill. Also refer Clause 1.16 in the Tender Notice.
- f) Time allowed for commencement of work from the date of receipt of work order : **7 days**
- g) Time allowed for the work from the date of commencement of work : **6 Months**
- h) Schedule, specifications, conditions, drawings etc. : As per "Contents" sheet attached.

Should this tender be accepted, I/We hereby agree to abide by and fulfill all the terms and provisions of the said conditions of Contract annexed here to so far as applicable

or in default thereof forfeit and pay to the Board the sum of money mentioned in the said conditions and to execute an agreement with the Board in the prescribed form or in default thereof to forfeit the Earnest Money deposited by me/us. The sum of Rs..... has been deposited with Financial Adviser and Chief Accounts Officer of the Port Trust as Earnest Money: (a) the full value of which is to be absolutely forfeited to the Board in office without prejudice to any other rights or remedies of the said Board in office should I/We fail to commence the work specified in the Contract Data or should I/We not deposit the full amount of Performance Security specified in the Contract Data in accordance with clause 52 of the said conditions of Contract otherwise the said sum of Rs. shall be retained by the Board as on account of such security deposit as aforesaid; or (b) the full value of which shall be retained by the Board on account of the security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered, upto maximum of the percentage mentioned in Contract Data and those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 40.3 of the Conditions of Contract.

Dated the day of 2020

Signature of the Tenderer

Address :

Witness :

Address :

Occupation :

ACCEPTANCE

The above tender is hereby accepted by me for and on behalf of the Board.

Dated theday of2020.

Dated.....

Chief Engineer

Cochin Port Trust

3. CONTRACT DATA

Items marked “N/A” do not apply in this Contract.

Sl. No.	Description	Reference Cl.No. of GCC												
1	<i>The following documents are also part of the Contract</i>													
	The Schedule of other Contractors ----- i)	(8.2) N.A												
	The Schedule of Key personnel	(9) N.A												
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Qualification of Staff</th> <th style="text-align: center;">No.</th> <th style="text-align: center;">Min. Experience (Years)</th> <th style="text-align: center;">Rate of recovery in case of non-compliance</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Graduate Engineer or</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">Rs.15,000/- p.m</td> </tr> <tr> <td style="text-align: center;">Diploma Engineer</td> <td style="text-align: center;">1</td> <td style="text-align: center;">5</td> <td style="text-align: center;">Rs.15,000/- p.m</td> </tr> </tbody> </table>	Qualification of Staff	No.	Min. Experience (Years)	Rate of recovery in case of non-compliance	Graduate Engineer or	1	2	Rs.15,000/- p.m	Diploma Engineer	1	5	Rs.15,000/- p.m	
Qualification of Staff	No.	Min. Experience (Years)	Rate of recovery in case of non-compliance											
Graduate Engineer or	1	2	Rs.15,000/- p.m											
Diploma Engineer	1	5	Rs.15,000/- p.m											
2	The Employer is	(1)												
	The Board of Trustees, Cochin Port Trust, Cochin -9													
	Name of Authorized Representative:													
	Name: Dr. M. Beena, Chairperson, Cochin Port Trust, Cochin -9.													
3	The Engineer is:													
	Name : Shri. G. Vaidyanathan, Chief Engineer, Cochin Port Trust, Cochin-9.													
	The Nominee/ Engineer-in-Charge is:													
	Name : Smt. C.S.Rekha, Exe. Engineer(CM-I)													
4	Name of Contract: “RENOVATION OF EASTERN HALF OF CFS OFFICE AT GROUND FLOOR AREA. Tender No : T6/T-1932/2020-C	(1)												
5	10 copies of Contract Agreement shall be furnished by the Contractor	[7.1]												

Sl. No.	Description	Reference Cl.No. of GCC				
6	Tender Document and other data are available at : Chief Engineer's Office, Cochin Port Trust, W/Island, Cochin – 682009, KERALA.	(7.2)				
7	The Intended Completion Date for the whole of the Work is 2 Months with the following milestones:	(17.28)				
8	<table border="1" data-bbox="342 709 1081 919"> <thead> <tr> <th data-bbox="342 709 716 825">Physical works to be completed</th> <th data-bbox="716 709 1081 825">Period from the date of receipt of LoA to proceed with the work</th> </tr> </thead> <tbody> <tr> <td data-bbox="342 825 716 919">6 Months</td> <td data-bbox="716 825 1081 919">7 days</td> </tr> </tbody> </table>	Physical works to be completed	Period from the date of receipt of LoA to proceed with the work	6 Months	7 days	
Physical works to be completed	Period from the date of receipt of LoA to proceed with the work					
6 Months	7 days					
9	<p>The following shall form part of the Contract Document:</p> <ol style="list-style-type: none"> (1) Form of Agreement (2) Letter of Acceptance (3) Contractor's Bid (4) Contract Data (5) General Conditions of Contract (GCC) (6) Instructions to Tenderers (7) General Description and Special Conditions of Contract (8) Detailed Specifications for Materials and Works (9) Drawings (if any) (10) Schedule of quantities and (11) Any other documents listed in the Contract Data as forming part of the Contract. (12) Correspondence exchanged after the opening of the Bid and before the issue of Letter of Acceptance by which the Condition of Contract are amended, varied or modified in any way by mutual consent 	(2.3)				
10	The Contractor shall submit a Program for the Works within 7 (Seven) days of date of the Letter of Acceptance.	(27)				
11	The site possession date: The site will be handed over within 7 (Seven) days after receipt of LoA and the site is free from encumbrances.	(21)				
12	The Start Date shall be within 7 (Seven) days from the	(1)				

Sl. No.	Description	Reference Cl.No. of GCC
	date of receipt of the Letter of Acceptance (LoA) by the Contractor.	
13	The site is located at W/ Island	
14	The Defects Liability Period is : One year from the date of completion of work.	(35)
15	The minimum insurance cover for physical property, injury and death is Rs.10 lakhs (Rupees Ten lakhs) per occurrence with the number of occurrences unlimited. After each occurrence, Contractor will pay additional premium necessary to make insurance valid always.	(13)
16	The following events shall also be Compensation Events: -----	(44) N/A
17	The period between Programme updates shall be 30 days	(27)
18	The amount to be with held for late submission of an updated Programme shall be Rs..... (Rupees.....)	(27) N/A
19	The language of the Contract documents is English.	(3)
20	The law, which applies to the Contract, is the law of Union of India.	(3)
21	The currency of the Contract is Indian Rupees.	(46)
22	The proportion of payments retained (Retention Money) shall be 5% from each bill subject to a maximum of 5% of the Contract price or value of the work done whichever is higher.	(48)
23	The maximum amount of Liquidated Damages for the whole of the works is 10% of the Contract Price.	[49]
24	The amounts of the advance payments : The advance payments as applicable to the Contract are: -----	[51] N/A
25	Repayment of advance payment for mobilization : -----	[51] N/A
26	Repayment of advance payment for Construction and Equipment: -----	[51] N/A
27	Repayment of Secured Advance: -----	N/A
28	The date by which “As Built Drawings” are required is within -- days of issue of certificate of completion of whole or section of the work, as the case may be.	(58) N/A
29	The amount to be withheld for failing to supply “As Built Drawings” and/or operating and maintenance manuals by the date required is Rs..... (Rupees -----)	(58) N/A
30	Schedule of Rates Applicable: CPWD DSR 2018 + 55% Cost Index x 0.8768 for deducting GST.	

Sl. No.	Description	Reference Cl.No. of GCC
31	Base Rate for materials to be considered for price variation :----- (i) Cement consumed for various items of work : Rs..... per tonne (ii) Reinforcement steel used under various items : Rs..... per tonne (iii) Structural Steel used under various items: Rs..... per tonne (iv) Bitumen under various items in: Rs..... per tonne (v) Bitumen Emulsion (MS&RS) under various items in: Rs..... per tonne	(47) N/A
32	Permissible wastage on theoretical quantities of (a) Cement : 2% (b) Steel Reinforcement and structural steel sections for each diameter, section and category : 5.99% (c) Bitumen/Bitumen Emulsion : 2.5%	(47)

4. INSTRUCTIONS TO TENDERERS

- 4.1 Electronic Tenders (e-tenders) on percentage basis under “Two Cover system” are invited for **“Renovation of eastern half of CFS office at ground floor area.”** The tenderer shall submit the tender Cover-A (Hard Copy of EMD & Cost of Tender form). All the Technical Bid documents & Price Bid shall be submitted **“online”**.
- 4.2 The Tender Document will be available as three separate files in the e-tendering Portal:
- i. A. Technical Bid Documents (as per Sl. No 1 to 7 of the Contents sheet)
 - ii. B. Price Bid: Schedule of quantities of Work- Schedule-A and
 - iii. C. General Conditions of Contract-2016
- 4.3 The tenderer shall upload the documents indicated in 4.2 (i) & (iii) above and also the Schedule of Quantities(Percentage) [as per Cl.4.3(ii), duly filled in, **“online”**].

4.4 SUBMISSION OF TENDERS

- 4.5.1 The Cover A shall contain – hard copy of EMD as described in Clause 1.9.1 of Tender Notice & Cost of Tender form as mentioned in Clause 1.2 of Tender Notice shall be submitted before **15.00 Hrs on 07/12/2020**.

4.5.2 Technical Bid (Online mode)

Technical Bid shall contain all technical and commercial details except Schedule of Quantities. It shall consist scanned/ soft copies of the following documents.

- a) A covering letter from the tenderer enlisting the enclosures/ attachments.
- b) Original Tender Document (Technical Bid) except Schedule of Quantities.
- c) Copy of the documents in proof of fulfillment of the Minimum Qualification Criteria.
- d) Copy of PAN Card, ESI/EPF & GST Registration documents.
- e) Copy of Authorisation documents of Signatory of the bid in case of Registered Partnership firm / Limited company
- f) Partnership deed or Memorandum and Article of Association of the company and registration certificate of the company as the case may be.
- g) Any other relevant document.

4.5.2.3 Scanned copies of all documents as per Clause 4.5.2, EMD and Cost of Tender Form shall be submitted as “Technical Bid”.

4.5.2.4 Departmental Tender Document (except Schedule of Quantities), along with scanned copies of Cost of Tender form, EMD and other documents as per Clause 4.5.2 shall be submitted ‘online’ before 14.30 hrs of opening date of the Tender. **In no case shall filled in Price Bid - Schedule of Quantities be submitted in hard copy, as it shall result in rejection of the tender.**

4.5.3 Price Bid:

4.5.3.1 Price Bid shall contain only the “Schedule of Quantities”, which shall be submitted only in e-tendering mode.

4.5.3.2 **Tenderer should ensure that his tendered percentage as per ‘Price Bid’ is not mentioned anywhere in any other documents, directly or indirectly. If any such mention is made, the tender will become invalid and shall become liable for rejection.**

4.5.3.3 Tenderer shall quote the percentage in figures with Above/Below the departmental rate in the last page of Price Bid, where space provided.

4.6 PRE-QUALIFICATION CRITERIA

4.6.1. Selection criteria for qualifying the tenderers for opening the Price Bids in Cover ‘B’ of the tender will be as below:

(i) **Experience :**

The tenderer should have successfully completed at least one similar work of value not less than **Rs. 58.25** lakhs

OR

two similar works, each of value not less than **Rs.36.41** lakhs

OR

three similar works, each of value not less than **Rs. 29.13** lakhs,

during the preceding seven years ending **31st October 2020**.

Explanatory notes:

- a) Similar work(s) means “**Civil construction works**”.
- b) Copy of completion certificates of each work issued by the owner/responsible officer of the owner under whom he has executed such contract shall be attached. The certificate shall contain details of work involved specifying the nature of work, the completion cost of the work, date of commencement & date of completion of the work.

- c) The experience certificate of works executed in private sectors/ organisations, shall be considered for qualification, only on submission of TDS certificate along with work order and completion certificate.
- d) The works reckoned for the above purpose are those executed by the tenderers as prime Contractor or proportionately as member of joint venture or sub Contractor. The sub-Contractor shall be an authorized and approved sub-Contractor by the Employer of the work(s) against which the tenderer has claimed his experience. The tenderer shall attach attested copy(s) of approval issued by the Employer(s) authorizing as a sub-Contractor; in proof of the claim of the tenderer as a sub-Contractor. The tenderer is also obliged to produce the original of the certified copy(s) on request by the department.
- e) Following enhancement factors will be used for the costs of works executed for bringing the financial figures to a common base value in respect of the works completed in the past years.

Year before	Multiplying factor
One year	1.07
Two years	1.14
Three years	1.21
Four years	1.28
Two years	1.35
Six years	1.42

(ii) **Financial Turnover:**

Average Annual Turnover of the tenderer during the last three financial years ending 31st March 2020 shall not be less than **Rs.21.84** Lakhs.

In proof of this Audited Annual Accounts Statements or IT returns duly acknowledged by the Income Tax department along with computation statement signed by the Auditor/ Chartered Accountant for the last three years shall be produced by the tenderer.

4.7. OPENING AND EVALUATION OF TENDERS

4.7.1 Cover 'A' containing the **EMD and cost of tender form** shall be opened at **15.00 hrs. on 07/12/2020**, the last date fixed for receiving the bid, in the SE's chamber in the presence of the tenderers or their representatives as may be present. Scanned copy of EMD & Cost of Tender form submitted online also opened at 15.00 Hrs on 07/12/2020. Technical Bid documents of only those tenderers shall be opened whose documents furnished in Cover A is found in order.

4.7.2 After opening the Technical Bid documents, it shall be thoroughly checked for completeness with respect to the details stipulated to be submitted as Technical Bid by the tenderer. The Price Bid of those tenderers satisfying the tender requirements shall only be opened. The Price Bid of those tenderers who are found responsive and satisfactory on evaluation of Technical Bid documents,

will be opened after bringing all tenderers to the same footing and giving notice to the short listed tenderers, on a date to be decided and intimated later.

4.8 GENERAL INSTRUCTIONS TO TENDERERS

- 4.8.1 The submission of a tender by the tenderer implies that he has read the whole tender Documents including GCC-2016.
- 4.8.2 The tenderer is advised to visit and examine the site of work and its Surroundings, discuss with connected agencies and collect all necessary information on his own responsibility for preparing the tender.
- 4.8.3 The tenderer is expected to examine the Tender Documents including all conditions, specifications, forms etc and also conditions in the G.C.C. Failure to furnish the information required in the Tender Documents/ G.C.C. or submission of a tender not conforming to the requirements in every respect, is likely to result in the rejection of the tender.
- 4.8.4 The tenderer shall quote for the work on percentage basis. The departmental rate for each item of work is given in the Schedule of Quantities. The tenderer shall fill the percentage above or below the Departmental rate, in the column provided for the purpose in the Schedule.
- 4.8.5 In case of discrepancy between the specifications and the drawings, the following order of preference shall be observed:
- a. Conditions & Specifications of tender
 - b. Drawings.
 - c. B.I.S Specifications.
 - d. Sound Engineering Practice.
- 4.8.6 If there are varying or conflicting provisions made in any document forming part of the Contract, the Chief Engineer, Cochin Port Trust, Cochin-682009 shall be the deciding authority with regard to the intention of the document which will be binding on the tenderer/ Contractor.
- 4.8.7 Any error in description, any omissions there shall not vitiate the Contract or release the Contractor from the execution of whole or any part of the works comprised therein according to specifications or from any of his obligation under the Contract.
- 4.8.8 The Chief Engineer, Cochin Port Trust shall have the right to omit or Suspend certain items of work or revise or amend the Tender. Documents at any time prior to the due date of submission of the tender. Such revisions or amendments or extensions if any, shall be communicated to all the bidders who have downloaded the Tender Documents, in the form of an addendum by telefax /e- mail / writing. In order to afford the Bidders with reasonable time to take addendum into account, or for any other reason, the Port Trust may, at its discretion, extend the due date for submission of tender.

- 4.8.9 All payments due to the Contractor under this Contract will be made in Indian Rupees only.
- 4.8.10 Tenders received after the date specified for submission shall not be opened.
- 4.8.11 The Bank Guarantees (BGs) to be furnished by the Contractors in connection with the tender shall be sent to by the Chief Engineer, Cochin Port Trust directly by the issuing bank under registered post with AD. The Contractor shall take the responsibility of sending BGs directly to the Port Trust by the issuing bank.

SIGNATURE OF TENDERER.

GENERAL DESCRIPTION AND SPECIAL CONDITIONS OF CONTRACT

1. SCOPE OF WORK

1.1 The proposed work is for “*RENOVATION OF EASTERN HALF OF CFS OFFICE AT GROUND FLOOR AREA*”. The work consists of the following:

- (i) Various dismantling works;
- (ii) Plain and Reinforced Cement Concrete works
- (iii) Filling with excavated earth and 6mm metal mixed with quarry dust;
- (iv) Precast Cement Concrete Masonry work;
- (v) Flooring with vitrified/ ceramic flooring tiles & dadoing with glazed tiles;
- (vi) Painting work with cement primer, Acrylic emulsion paint, Synthetic Enamel paint etc.;
- (vii) Wood work;
- (viii) Providing and fixing factory made uPVC Glazed windows.
- (ix) Steel work welded in built up sections FOR Grill work;
- (x) Providing and fixing FRP doors;
- (xi) Fabricating and fixing Aluminium doors, windows, ventilators and partitions;
- (xii) Providing and fixing European Type/ squatting pan (Indian Type) water closets, Wall urinals, Wash basins;
- (xiii) Pipe line work with PVC pipes;

1.2 The work shall be meticulously planned in consultation with the departmental supervisory staff and nearby users, so that minimum inconvenience is caused to the functions of the wharf.

2. WORK SITE

The work has to be carried out at Container Freight Station of Cochin Port Trust. The sites are accessible through road and water. These areas are operational and protected areas and hence security rules and regulations including obtaining passes etc. for work are to be observed by the contractor. The work is to be carried out without disturbing the normal Port operations.

3. TIME SCHEDULE AND MONITORING OF PROGRESS

3.1 The tenderer shall prepare and attach with the tender a detailed work schedule indicating key activities and critical items for completing the work within the

stipulated Contract period of **Six** months. This time schedule will form the basis for monitoring the progress of work.

4. MATERIALS / FACILITIES TO BE PROVIDED BY DEPARTMENT

4.1. CONTRACTOR'S WORK AREA

Space will be made available to the Contractor free of rent for storing materials and equipments etc., adjacent to the work site for the duration of the Contract. After the work is over, Contractor shall at his cost, reinstate the area by clearing the temporary works, debris etc. as decided by the Engineer's Nominee.

5. CONTRACTOR'S RESPONSIBILITY

- 5.1. The tenderer shall visit the area before tendering. It will be deemed that the tenderer has visited the site and studied the site conditions before submitting the tender. The tenderer should get himself acquainted with the nature and extent of the work. No claim whatsoever will be entertained on the plea of ignorance of difficulties involved in execution of work or carriage of materials etc.
- 5.2. All materials, plants and equipments, required for the work shall be provided by the Contractor at his own cost, and shall conform to relevant I.S. Specification unless otherwise specified.
- 5.3. Samples of all materials, to be incorporated in the work shall be got approved by the Engineer's Nominee before procurement.
- 5.4. The Contractor shall thoroughly study the specifications and errors / omissions/modifications if any shall be brought to the notice of the Engineer – in-Charge well in advance so that a final decision in the matter could be given in time.
- 5.5. All labour, skilled or unskilled shall be provided by the Contractor. Settling any dispute with the labour will be Contractor's responsibility. Insurance as per Indian Workmen's Compensation Act for the Contractors' workmen and Public Liability Policy shall be provided by the Contractor at his own cost.
- 5.6. The Contractor shall be solely responsible for any damage or injury to the persons or things caused or suffered during the execution of the work and shall be made good or compensated at his own cost.
- 5.7. The Contractor shall take all care and precautionary measures for avoiding any kind of damage/accidents in the work site due to any of his reasons. The Contractor shall indemnify the Port against any compensation whatsoever

payable to the workmen for accident or loss arising out of and in the course of their employment under this Contract.

- 5.8. The work shall be arranged by the Contractor without causing any damage to Port structures. Any damage or accident caused by the Contractor's operation shall be compensated / made good at Contractor's risk and cost to the satisfaction of the Engineer's Nominee of the works, failing which department will do the rectification work and the cost incurred will be recovered from his bill or from security deposit.
- 5.9. The Contractor shall not construct any structure, even of temporary nature, for any purpose at site, except with the written permission of the Engineer's Nominee of the work and any construction so put up shall be removed by the Contractor whenever the Engineer's Nominee calls upon the Contractor to do so.
- 5.10. The Contractor shall remove all temporary works, clear and make good the site, at his cost to the satisfaction of the Engineer's Nominee before the site is returned to the Port Trust. All materials shall be disposed to any place as pointed out by the Engineer's Nominee of the work and site shall be cleared in every respect at no extra cost after completion of work.
- 5.11. The Contractor shall provide at his own cost 1 No. AC Indica Car or equivalent type of vehicle with 4 persons capacity, at his own cost, exclusively for the departmental staff for supervision works, throughout the contract period including extended contract period, if any, limiting to a maximum distance of 750Km. The supply shall commence not later than 15 days from the date of commencement of Work. The vehicle shall be available round the clock on all days including Sundays and holidays. The vehicle shall have valid registration and insurance. All consumables and stores for the safe Working of the vehicle and its operators as necessary should be provided by the Contractor and nothing will be given by the Port for the running of the vehicle under this contract. The Contractor shall be solely responsible for the consequences arising out of any loss or damage/accident etc. caused to the vehicle on duty. If the Contractor fails to provide vehicle as above, the department will hire the same, the actual cost of which will be deducted from the Contractor's bills or an amount of **Rs.5,000/- per day** or part thereof shall be deducted from the Contractor's running bills. If the Contract Works are not completed within the stipulated period or within the granted extended time of completion, the vehicle facility shall be maintained by the Contractor at his own cost till the completion of the Work. In case of any failure by the Contractor to do so, an amount of Rs.5,000/- per car per day or part thereof shall be debited to the Contractor's account.
- 5.12. The Contractor shall remove all materials brought to work site / stacked at the work site or anywhere else within the Port area and clear the site at his cost to

the full satisfaction of the Engineer's Nominee before the site is returned to the Port Trust. All such materials including debris, tools & plants etc. shall be disposed off to any place as pointed out by the Engineer's Nominee or be taken away from the location and shall be cleared in every respect and to reinstate to its original condition at no extra cost to the Port Trust immediately after completion of the work. In case, any such material is found left in the work site or anywhere in the Port area, rent for the storage space occupied by the Contractor, either for stacking the materials /debris or for areas used for such purpose but not cleared thereafter, will be recovered as per the prevailing Scale of Rate of Cochin Port Trust, for the rent applicable for open storage space for commercial purpose, for the period for which the area had been occupied by the Contractor. In addition to the above, in case the Port requires the area immediately for its use, Port will repossess the land after restoring it to its original condition, material will be confiscated and disposed off at the risk and cost of the Contractor, after issuing two notices giving 15 days' time each for removing the material. All expenses incurred in this shall be recovered by disposing off the material if any confiscated. If any balance amount still remains to be realized that will be recovered from the Contractor by appropriate means.

- 5.13 The Contractor shall observe all safety regulations during the execution of the work. Safety measures, precautions, warning signals etc. shall be taken/provided at the Contractor's cost, as directed by the Engineer-in-Charge of the work. The Contractor shall provide all necessary personnel protection equipments such as helmet, lifeguard, goggles, boots, safety belts etc. to the workmen at his own cost and it shall be the Contractor's responsibility to ensure that they use it while on the work site.
- 5.14 The Contractor shall ensure that no labourers with criminal background are engaged for the work.
- 5.15 The contractor shall take all precautions for not to damage any cables, pipelines etc. passing through the area of work.
- 5.16. **The Contractor shall comply with all the provisions of the Indian Workmen's Compensations Act, Public Liability Policy, Provident Fund Regulations, Employees Provident Fund and ESI Act etc. amended from time to time and rules framed there under and other laws affecting the Contract labour that may be brought in to force from time to time.**
- 5.17. **The contractor shall be registered under EPF and ESI Act and the employees employed under them shall be covered in the EPF and ESI scheme, as applicable under the act.**

If the number of employees proposed to be engaged in the work is less than the threshold limit under ESI/ EPF act, an undertaking to this effect shall be included in the tender submission.

- 5.18. The Contractor shall provide, at every work place, at which 20 or more women workers are ordinarily employed, crèches of reasonable size and with adequate facility for the use of their children under the age of six years at his risk and cost.
- 5.19 The Contractor shall also be responsible for arranging and carrying out works as mentioned in Clauses 1.1 & 1.2 above.

6. POWER AND WATER

- 6.1 Electric power required for the work can be supplied by the department from the nearest existing line of the Port Trust at prevailing rates. The cost of drawing temporary lines/ cables/ providing switches and making connection and metering arrangements etc, shall be borne by the Contractor. If there is any disruption in the power supply due to supply failure/ restrictions imposed by the Kerala State Electricity Board, the department shall not be held responsible and the Contractor has to make suitable alternative arrangements at their cost.
- 6.2 Water required for the work shall be arranged by the Contractor at his own cost.

7. WORKMANSHIP

- 7.1 All the works shall be done strictly according to relevant B.I.S. specifications unless otherwise specified. Whenever special conditions and other specifications deviate from the B.I.S. the former shall prevail.
- 7.2 The whole work shall be completed in a diligent manner within the Contract period and defect or imperfection if any, observed during the Defect Liability Period/ guarantee period the same shall be rectified at Contractor's cost to the full satisfaction of the Engineer's Nominee within the time allowed.
- 7.3 Precautions shall be taken for not to damage cables/ pipe lines etc.
- 7.4 The work shall be arranged in the order of preference and as directed by the Engineer's Nominee of work.

8. TEMPORARY WORKS

- 8.1 All scaffolding, staging, bracing and other temporary works required for proper execution of the works, shall be provided by the Contractor at his own cost, unless stated otherwise and that should be inclusive of all materials, labour, supervision and other facilities. The layout and details of such temporary works shall have prior approval of the Engineer's Nominee, but the Contractor shall be responsible for proper strength and safety of the same. All temporary works shall be so constructed as not to interfere with any permanent work or with the work of other agencies. If it is necessary to remove any of the temporary works at any time to facilitate execution of works or work by other agencies, such removal and re erection, if required, shall be carried out by the Contractor at

the direction of Engineer's Nominee without any delay and any extra cost on this account shall be borne by the Contractor.

- 8.2 On completion of the works, temporary works if any provided by the Contractor shall be removed from the site and the area shall be reinstated to the original condition at his own risk and cost.

9. TIME FOR COMPLETION

- 9.1 The time allowed for carrying out the work as mentioned in the memorandum shall be strictly observed by the Contractor. The work shall throughout the time period be proceeded with diligence, time being deemed to be the essence of the Contract. The number of days lost due to heavy rain shall be certified by the Engineer's Nominee. The Contract period shall be extended for such certified days also without imposing compensation for delayed performance.

- 9.2 The whole work shall be completed in accordance with the provisions under Contract Data or such extended time as may be allowed as per clause 29 of G.C.C.

10. WORKING TIME

The normal working time of the Port Trust is from 8 a.m. to 4.00 p.m. on all weekdays. If the Contractor wishes to carry out the work beyond normal working hours and or on holidays, he should get specific approval from the Engineer's Nominee for the same. Necessary supervision will be arranged by the department and the expenditure to be incurred in this connection will be borne by the department.

11. RATES FOR VARIOUS ITEMS

The rate specified for each item shall be all inclusive value of the finished work, income tax and other taxes but excluding Service Tax.

12. ALTERATIONS / ADDITIONS / OMISSIONS

The quantities given in the bill of quantities (Schedule of items) are only approximate and payment will be made as per actual quantity of work done and rate specified.

13. MEASUREMENT

The quantities shall, unless otherwise stated, be measured in accordance with I.S.1200.

14. For levying compensation as per Clause-49 of General Conditions of Contract (GCC), the Employer is not required to have documentary evidence to quantify

or prove the losses suffered by the Employer due to delay in completion of work by the Contractor, as per conditions.

15. Clause-25 of GCC- 'Settlement of Disputes and Arbitration' is not applicable in this Contract.
16. Clause-26 of GCC- 'Computerised Measurement Book' is modified to the extent as detailed below.

Measurements of Work Done:

Executive Engineer (hereinafter called the Engineer's Nominee) shall, except as otherwise provided, ascertain and determine by measurement the value in accordance with the Contract of work done.

All measurement of all items having financial value shall be entered in Measurement Book and/or level field book so that a complete record is obtained of all works performed under the Contract.

All measurements and levels shall be taken jointly by the Engineer's Nominee or his authorised representative and by the Contractor or his authorised representative from time to time during the progress of the work and such measurements shall be signed and dated by the Engineer's Nominee and the Contractor or their representatives in token of their acceptance. If the Contractor objects to any of the measurements recorded, a note shall be made to that effect with reason and signed by both the parties.

If for any reason the Contractor or his authorised representative is not available and the work of recording measurements is suspended by the Engineer's Nominee or his representative, the Engineer's Nominee and the Department shall not entertain any claim from Contractor for any loss or damages on this account. If the Contractor or his authorised representative does not remain present at the time of such measurements after the Contractor or his authorised representative has been given a notice in writing three (3) days in advance or fails to countersign or to record objection within a week from the date of the measurement, then such measurements recorded in his absence by the Engineer's Nominee or his representative shall be deemed to be accepted by the Contractor.

The Contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for measurements and recording levels.

Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement or any general or local custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of Indian Standards and if for any item no such standard is available then a mutually agreed method shall be followed.

The Contractor shall give not less than seven days' notice to the Engineer's Nominee or his authorised representative in charge of the work before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer's Nominee or his authorised representative in charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of measurements without such notice having been given or the Engineer's Nominee's consent being obtained in writing the same shall be uncovered at the Contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.

Engineer's Nominee or his authorised representative may cause either themselves or through another officer of the department to check the measurements recorded jointly or otherwise as aforesaid and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.

It is also a term of this Contract that recording of measurements of any item of work in the measurement book and/or its payment in the interim, on account or final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the Contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.

17. Clause 45 and Clause 80 of GCC shall be modified as below;

Clause 45-Rates for items to be inclusive of Taxes The rate quoted by the Contractor shall be inclusive of the cost of provision of plant and equipment, materials, labour, execution, supervision, maintenance, overheads and profits and every incidental and contingent cost and charges whatsoever excluding Goods and Service Tax (GST). GST as may be applicable from time to time shall be shown separately in the invoice. The Employer will perform such duties in regard to the deduction of such taxes at sources as per applicable law. Any new Taxes, levies, duties imposed after signing the Contract shall be reimbursed by the Employer on production of documentary evidence. The invoice to be submitted by the Contractor should include the GST Registration Number of the Contractor as well as the Employer.

Clause 80-Taxes and Duties Income Tax The Contractor and his staff shall be responsible for payment of all personal income taxes to the concerned authorities as per the law in force from time to time. Deduction of Income Tax shall be made by the Employer from each certificate of payment to the Contractor at the rate of 2% plus surcharge or such other rates as may be specified by the Central Government from time to time, on the gross amount of

the Contractor's bill for payment. The Contractor shall comply all the GST Regulations viz. timely uploading of bills, issue of debit/ credit notes etc.

18. Sub clause **43.2** under **Clause 43:Payments,.....** in GCC 2016 stands amended as given below:

43.2 Payment of bills for Civil Works shall be regulated as detailed hereunder:

43.2.1 Any Interim/Final bill which is incomplete in any respect shall be returned to the Contractor within 5 days of date of submission of bill to the Engineer or his Nominee.

43.2.2 Interim bills shall be paid within 21 days of date of submission of bills in full shape, by the Contractor, as detailed below.

43.2.3 Clarifications/corrections if any required on an Interim bill submitted, shall be sought from the Contractor within 4 days of submission of the bill and also, all such clarifications/corrections required shall be sought at one go except in exceptional circumstances. The Contractor shall submit the clarifications including carrying out corrections in the bill, if required, within 4 days thereafter. The clarified / corrected bill shall be verified and forwarded to Finance Department within the next 4 days. Clarifications if any required by the Finance Department shall be sought within 3 days and the Engineer/Nominee shall clear it on top priority within the next 3 days and, finally, the bill shall be paid to the Contractor within 3 days thereafter, i.e., within a total 21 days of date of submission of bills in full shape, as indicated above.

43.2.4 However, on request by the Contractor, 75% of the bill amount shall be paid within 7 days of submission of the bill. Balance amount of the verified bill shall be paid within 21 days of the submission of the bill, on completion of all contractual requirements as brought out at sub clause 43.2.3. above.

43.2.5 Final bill shall be paid within 3 months of issue of Taking Over Certificate by the Engineer / Nominee, as detailed below.

43.2.6 The Contractor shall submit the Final bill to the Engineer / Nominee within 20 days of issue of Taking Over Certificate by

the Engineer / Nominee. The bill shall be checked and all clarifications/corrections required on the bill submitted, shall be sought from the Contractor within 15 days thereafter. The Contractor shall submit the clarifications including carrying out corrections in the bill, if required, within the next 10 days. The clarified / corrected bill shall be verified and forwarded to Finance Department within the next 15 days. Thereafter, clarifications if any required by the Finance Department shall be sought within 10 days and the Engineer/Nominee shall clear it on top priority within the next 10 days and, finally, the bill shall be paid to the Contractor within 10 days thereafter, i.e., within a total 3 months of issue of Taking Over Certificate by the Engineer / Nominee, as indicated above.

43.2.7 However, on request by the Contractor, 50% of the final bill amount shall be paid within 7 days of submission of the bill, which will be adjusted against the final bill payment, on completion of all contractual requirements as brought out at sub clause 43.2.6. above.

SIGNATURE OF TENDERER

6. DETAILED SPECIFICATIONS FOR MATERIALS TO BE USED ON WORK

Except where otherwise specified or authorized by the Engineer-in-Charge, materials supplied by the Contractor shall conform to the latest edition of code of practices published by the Bureau of Indian Standard. Samples of materials to be supplied by the Contractor shall be shown to the Engineer-in-Charge sufficiently in advance for approval of its quality for use on the Work.

All the materials to be used on the Works shall have **BIS certification** mark if so available, unless otherwise specified elsewhere or shall be of approved brand with equivalent material as approved by the Engineer-in-Charge. Wherever, any brands are specified for the materials /products to be used on the Work, its equivalent quality material shall also be used, with the approval of the Engineer in Charge.

All materials supplied shall be stored appropriately to prevent deterioration/damage from any cause what so ever and to the entire satisfaction of the Engineer-in Charge.

The materials required for the Work shall be brought to the site and stacked at places shown by the Engineer-in-Charge and the same shall be got approved for use in Work sufficiently in advance so that the progress of the Work is not affected by the supply of materials.

1. AGGREGATES FOR CONCRETE

- 1.1 Aggregates (fine and coarse) for concrete shall comply with the requirements of IS:383 – ‘Specifications for coarse and fine aggregate from natural sources for concrete’. Aggregate shall be obtained from sources approved by the Engineer-in-Charge. Aggregates, which are not perfectly clean, shall be washed in clean water to the entire satisfaction of the Engineer-in-Charge.
- 1.2 The fine aggregate shall be clean, hard, durable, uncoated, dry and free from injurious, soft or flaky pieces and organic or other deleterious substances.
- 1.3 Each type of aggregate shall be stored separately for the approval of Engineer-in-Charge. Wet aggregate delivered at the site shall be kept in storage for at least 24 hours to ensure adequate drainage before being used for concreting.
- 1.4 Contractor shall maintain at site at all times such quantities of each type of aggregate as are considered by the Engineer-in-Charge to be sufficient to ensure continuity of Work.

2. CEMENT

- 2.1 Quality of cement used for the Work shall be 43 grade ordinary Portland cement conforming to IS:8112 or 53 grade ordinary Portland cement conforming to IS:12269 or Pozzolona cement conforming to IS:1489 unless otherwise approved by the Engineer-in-Charge.
- 2.2 The cement required for the Work will have to be procured by the Contractor and shall comply with the relevant IS. As far as possible, the cement required for the Work will have to be procured from the government agencies. The cement shall, if required by the Chief Engineer / Engineer-in-Charge, be tested and analyzed by an independent analyst at the Contractor’s cost and result

- produced to the Engineer-in-Charge.
- 2.3 Supply of cement shall be taken in 50kg bags bearing manufacture's name and ISI marking. Samples of cement arranged by the Contractor shall be taken by the Engineer-in-Charge and got tested in accordance with provisions of relevant BIS codes. In case, test results indicate that the cement arranged by the Contractor does not conform to the relevant BIS codes, the same shall stand rejected and shall be removed from the site by the Contractor at his own cost within a week's time of written order from the Engineer-in-Charge to do so.
- 2.4 A cement godown of adequate capacity as directed by the Engineer-in-Charge shall be constructed by the Contractors at the site of the Work for which no extra payment shall be made. Double lock provision shall be made to the door of the cement godown. The key of one lock shall remain with the Engineer-in-Charge or his authorized representative and the key of the other lock shall remain with the Contractor. The Contractor shall be responsible for the watch and ward and safety of the cement godown. The Contractor shall facilitate the inspection of the cement godown by the Engineer-in-Charge.
- 2.5 The cement brought to the site and cement remaining unused after completion of Work shall not be removed from the site without written permission from /of the Engineer-in-Charge.
- 2.6 The cement shall be stored in a weather proof building with facilities for inspection.
- 2.7 The Contractor shall maintain a cement register showing dates of receipt and issue, quantities used daily and balance which shall be accessible to the Engineer-in-Charge.

3. STEEL REINFORCEMENT

- 3.1 The reinforcement steel used for the Work will have to be procured by the Contractor and shall be HYSD bars of Fe 500 / Fe415 grade conforming to IS:1786 unless otherwise approved by the Engineer-in-Charge.
- 3.2 The reinforcement steel required for the Work will have to be procured by the Contractor and shall comply with the relevant IS. The Contractor shall obtain approval from the Engineer-in-Charge well in advance for purchase of steel.
- 3.3 The Contractor shall have to obtain and furnish test certificates to the Engineer-in-Charge in respect of all supplies of steel brought by him to the site of Work. Samples shall also be taken and got tested by the Engineer-in-Charge as per provisions in this regard in relevant BIS codes. In case the test results indicate that the steel arranged by the Contractor does not conform to BIS codes, the same shall stand rejected and shall be removed from the site of Work by the Contractor at his cost within a week's time of written orders from the Engineer-in-Charge to do so.
- 3.4 The steel reinforcement shall be brought to the site in bulk supply of 10 tonnes or more or as decided by the Engineer-in-Charge.
- 3.5 The steel reinforcement shall be stored by the Contractor at site of Work in such a way as to prevent distortion and corrosion and nothing extra shall be paid on this account. Bars of different sizes and lengths shall be stored separately to facilitate easy counting and checking.

- 3.6 For checking nominal mass, tensile strength, bend test etc., specimen of sufficient length as per IS:432/ IS:1608/ IS:1599 or as specified by the Engineer-in-Charge shall be cut from each size of the bar at random at frequency not less than the specified below.

Size of bar	For consignment below 100 tonnes	For consignment over 100 tonnes
Under 10 mm dia	One sample for each 25 tonnes or part thereof	One sample for each 40 tonnes or part thereof
10 mm to 16 mm dia	One sample for each 35 tonnes or part thereof	One sample for each 45 tonnes or part thereof
Over 16 mm dia	One sample for each 45 tonnes or part thereof	One sample for each 50 tonnes or part thereof

- 3.7 The Contractor shall supply free of charge the steel required for testing. The cost of tests shall be borne by the Contractor.

- 3.8 Steel brought to site and steel remaining unused shall not be removed from site without the written permission of the Engineer-in-Charge.

4. WATER

- 4.1 Clean fresh water free from oils, acids, alkalies, salt, sugar, organic materials or other harmful materials shall be used for washing aggregates, mixing and curing of concrete. The water used shall comply with clause 5.4 of IS:456-2000. Potable water is generally considered good for mixing concrete.

- 4.2 **Cochin Port Trust will not provide/supply water for the Work.** Water has to be arranged by the Contractor himself for the construction works including curing work **at his own risk and cost.**

- 4.3 Samples of water arranged by the Contractor shall be taken by the Engineer in Charge and got tested in accordance with the provisions of relevant BIS codes. In case test results indicate that the water arranged by the Contractor does not conform to the relevant BIS codes, the same shall not be used for any Works. The cost of tests shall be borne by the Contractor.

5. ADMIXTURES IN CONCRETE

- 5.1 Admixtures may be used in concrete only with the approval of Engineer based upon evidence that, with the passage of time, neither the compressive strength nor its durability reduced. Calcium chloride shall not be used for accelerating setting of the cement for any concrete containing reinforcement, or embedded steel parts. When calcium chloride is permitted to be used, such as in mass concrete works, it shall be dissolved in water and added to the mixing water in an amount not to exceed 1.5% of the volume of the cement in concrete. When admixtures are used, the designed concrete mix shall be corrected accordingly.

Admixtures shall be used as per manufacturer's instructions and in the manner and with the control specified by Engineer-in-Charge.

5.2 Air Entraining Agents

Where specified and approved by Engineer, neutralised vinyl resin or any other approved air-entraining agent may be used to produce the specified amount of air in the concrete mix and these agents shall conform to the requirements of ASTM standard 6260, air entraining admixtures for concrete. The recommended total air content of the concrete is 4% plus minus 1%. The method of measuring air content shall be as per IS : 1199.

5.3 Water Reducing Admixtures

Where specified and approved by Engineer-in-Charge water reducing lignosulfonate mixture shall be added in quantities specified by Engineer. The admixtures shall be added in the form of a solution.

5.4 Retarding Admixtures

Where specified and approved by Engineer-in-Charge retarding agents shall be added to the concrete mix in quantities specified by Engineer.

6. WATER PROOFING COMPOUND

6.1 Water proofing compound shall be used for cement mortar for plastering or concrete work, wherever specified.

6.2 Integral cement water proofing compound conforming to IS 2645 and of approved brand and manufacture, enlisted by the Engineer-in-Charge from time to time shall be used.

6.3 The contractor shall bring the materials to the site in their original packing. The containers will be opened and the material mixed with dry cement in the proportion by weight, recommended by the manufacturers or as specifically described in the description of the item. Care shall be taken in mixing, to see that the water proofing material gets well and integrally mixed with the cement and does not run out separately when water is added.

7. 6 MM SIZE AGGREGATE

6mm size graded aggregate conforming to IS 383 shall be used and which are not perfectly clean shall be washed in clean water to the entire satisfaction of the Engineer-in-Charge.

8. PRECAST CEMENT CONCRETE BLOCKS

8.1 Factory made precast solid concrete blocks shall be of size 300 mm x 200 mm x 150 mm or nearest available size conforming to IS : 2185 – Part I - 1979 in plain cement concrete of M-10 grade with 20mm /12mm graded metal. However, the length and shape of blocks to be provided at junctions shall be suitably modified to fit into the general configuration. These blocks are to be cast in appropriate moulds preferably steel moulds, which shall provide a smooth surface. The finished blocks shall be cured properly for a minimum period of 14 days. Blocks damaged during the removal of forms and handling will be rejected.

9. SAND FOR MAKING MORTAR FOR MASONRY WORK / PLASTERING WORK

9.1 Sand used for masonry mortar shall conform to IS: 2116. Sand used for plastering shall conform to IS: 1542.

10. VITRIFIED FLOORING / SKIRTING TILES

10.1 Tiles shall be of approved premium quality, Johnson or Khajaria or Asian or Somany or Orient Bell make and of approved colour and shade. The tiles shall be generally conforming to IS:13756/ IS:15622 with water absorption less than 0.08% and having modulus of rupture greater than 500kg/sq.cm & modulus hardness 8.0. The tiles shall be flat, true to shape and free from cracks, crazing spots, clipped edged and corners. The tiles shall be of minimum 600mm x 600mm size and shall have minimum thickness of 10mm.

10.2 The top surface of the tiles shall be glossy/ mat finish / antiskid as specified in the Schedule of quantities and as approved by the Engineer-in-Charge. The underside of the tiles shall be completely free from glazing in order to adhere properly to the base.

10.3 Manufactures test Certificate for water absorption, breaking strength, abrasion resistance and crazing has to be produced by the contractor.

11. CERAMIC TILES FOR FLOORING

11.1 Ceramic tiles shall be of approved premium quality, Johnson or Khajaria or Nitco or Asian or Orient Bell make and of approved colour and shade. The tiles shall generally conform to IS:15622 and shall be conforming to Group B II. The abrasion resistance of the tiles shall be of Class IV and above. They shall be flat, true to shape and free from cracks, crazing spots, clipped edged and corners. The flooring tiles shall be of antiskid type tiles and shall be of minimum 300mm x 300mm size with thickness not less than 8mm.

11.2 The top surface of the tiles shall be antiskid as specified in the Schedule of quantities and as approved by the Engineer-in-Charge. The underside of the tiles shall be completely free from glazing in order to adhere properly to the base.

11.3 Manufactures test Certificate for water absorption, breaking strength, abrasion resistance and crazing has to be produced by the contractor

12. CERAMIC TILES FOR SKIRTING/ DADOING

12.1 Ceramic tiles shall be of approved premium quality, Johnson or Khajaria or Nitco or Orient Bell make, luster printed and of approved colour and shade. The tiles shall generally conform to IS : 15622 and shall be conforming to Group B III or higher quality. They shall be flat, true to shape and free from cracks, crazing spots, clipped edged and corners. The glazing shall be of uniform shade. The tiles shall be of minimum 300mm x 200mm size. It shall have thickness not less than 6mm.

12.2 The top surface of the tiles shall be glossy as approved by the Engineer-in-Charge. The underside of the tiles shall be completely free from glazing in order to adhere properly to the base.

12.3 Tests like water absorption, impact strength and crazing has to be carried out for the tiles and certificates shall be produced. The cost towards these tests has to be borne by the contractor.

13. STRUCTURAL STEEL

13.1 The mild steel flats / plates used for the work shall conform to I.S. 2062. The material shall be free from visible as well as hidden defects such as pitting cracks, laminations,

- twists etc. and excessive rusting.
- 13.2 It is not necessary for the Contractor to obtain separate approval in case mild steel tube/pipe/plate is purchased from Steel Authority of India Ltd. or TATA Iron & Steel or Jindal Steel & Power Ltd. (JSPL). For purchase from other sources, the contractor shall apply sufficiently in advance and obtain written permission of the Engineer-in-Charge for making purchase from such sources.
- 13.3 Mild Steel Rectangular / Square Hollow Sections used shall be of Yst 310 grade conforming to IS : 4923. Pipes shall be designated by their outer dimension and weight per metre. It shall be free from visible as well as manufacturing defects such as pitting, cracks, laminations, twists etc. and excessive rusting.
- 13.4 Mild Steel tubular sections used shall be of Yst 320 grade conforming to IS 806 & 1161. Tubes shall be designated by their nominal bore and weight per metre. It shall be free from visible as well as manufacturing defects such as pitting, cracks, laminations, twists etc. and excessive rusting.

14. SYNTHETIC ENAMEL PAINT

- 14.1 The Synthetic Enamel paint shall be of approved premium quality and shall conform to IS : 2923 (2003). The coverage shall conform to the Manufacturer's specification. The colour / shade shall be as per schedule or as per the direction of Engineer – in – Charge.

15. WATER THINNABLE CEMENT PRIMER

- 15.1 The primer used for the work shall be Silicon based primer, manufactured by Asian/ Nerolac/ Berger/ Nitco of premium quality.

16. ACRYLIC EMULSION PAINT EXTERIOR/INTERIOR

- 16.1 The weather proof exterior acrylic emulsion paint shall be of approved premium quality either "Weather coat" by Berger or Nerolac Excel or "Weather shield" by ICI Dulux or Snowcyl XT-premium by Snowcem India Ltd. or Jotun Paints/ Asian paints. The interior acrylic emulsion paint shall be of approved premium quality either manufactured by Berger or Dulux or Nicholson or Jotun Paints/ Asian paints. The coverage shall conform to the manufacture's specification. The colour/ shade shall be as per direction of the Engineer-in-Charge.

17. FIBRE GLASS REINFORCED PLASTIC (FRP) DOOR FRAMES

- 17.1 Door Frames shall be three legged of cross section 90 mm x 45 mm having single rebate of size 32 mm x 15 mm to receive shutter of 30 mm thickness. The frame shall be made of laminate of thickness of 2 mm and shall be filled with wooden blocks of exterior grade MDF or seasoned and treated hard wood inside the laminate in all the three legs of the frame. The frame to be moulded by either hand lay up or resin transfer moulding process. The process shall consist of laying gelcoat at 1000 gms./m² and laid over with layer of FRP Mat (CSM mat) gelcoat and FRP (CSM Mat) are defined in IS 14856. The CSM mat shall be bonded with Isophatholic resin in the ratio not less than 1:2 (One part of Mat to two parts of Isopathlic resin and fillers & additives) by weight. The edge shall be sealed with gelcoat and FRP mat to obtain smooth finish. Sufficient roving shall be laid in the corner to have smooth curve while laying the CSM mat.

17.2 FRP door shall be manufactured as per specifications laid down in IS 14856, nomenclature of items & direction of Engineer-in-Charge.

17.3 Tolerance

Tolerance of size of frame to be + 2 mm and on size of rebate to be + 1 mm.

17.4 Finish

The surface of the moulded frame shall be free from any visible defects such as small pores, crazing, blistering, wrinkling, impurities, defective impregnation, colour blots and aggregate defects, as mentioned in IS 14856. Scattered pin holes duly repaired and finished by applying resin and not noticeable shall be acceptable. Frame laminate shall be flat and shall have smooth and level surface. Laminate shall be finished in colour & shade as approved by Engineer-in-Charge.

17.5 Fixing of Frame

The frames are to be fixed in prepared openings in the walls. All civil work and tiling should be completed before the fixing of the frames. The frames are to be fixed directly on the plastered wall. In case tiling is to be done in the place the frames are to be fitted, a 50 mm strip should be left untiled at the location where the frames are to be fitted. The frames are erected in the prepared opening such that the vertical members of the door frame are embedded 50 mm in the floor. The frame shall be fitted truly in plumb. A minimum of three anchor bolts or screws of size 65/100 shall be used to fix each vertical member. One bolt shall be fixed at 200 mm from the top member and one bolt shall be fixed at 200 mm from the floor. The third anchor bolt shall be fixed in the center. The top horizontal member shall be fixed using two 65/100 size anchor bolts or screws at a distance of 200 mm from both the corners.

17.6 Measurements

The outer length of the vertical and horizontal members of door frame shall be measured in running metres including embedded length in floor corrected upto a cm.

17.7 Rate

The rate includes the cost of the materials and labour involved in all the operations described above. The cost of anchor bolts or screws for joining the frame is included in the rate. Any other hardware, which may be required, shall be paid for separately

18. FIBRE GLASS REINFORCED PLASTIC (F.R.P.) SHUTTERS

18.1 F.R.P. Shutters shall be manufactured conforming to the specifications as per IS 14856 and nomenclature of item & direction of Engineer-in-Charge.

18.2 Blocks of any seasoned hardwood of bulk density not less than 450 kg./m³ at 12 per cent moisture content or any other material of sufficient thickness and length shall be provided inside the shutter at suitable place to hold fittings and fixtures such as aldrops, tower bolt, handle, sliding door bolt, mortice lock etc.

Blocks for hinges shall be provided at three locations, unless otherwise specified by the purchaser. One at the centre and other two at 200 mm from the top and the bottom of the shutter. Blocks shall be provided at predetermined places in the shutter so as to fix hinges mortice locks, tower bolts, aldrops, door closures, etc. The finished surface shall be buffed and polished with wax.

18.3 **Location of Fittings and Accessories**

The lock rail of door shutters shall be so placed that its centre line is at a height $850 + 5$ mm from the bottom of the shutter. Door shutter shall be fixed to the frame with three hinges, unless otherwise specified by the purchaser, of the type specified. These locations shall be, one at centre and other two at 200 mm from the top and the bottom of the shutter, where blocks have already been provided and suitable indication by depressing the profile has been made. Screws for fixing the hinges shall be screwed in with screwdrivers & not hammered. The length of screw should be 8/30 mm. The hinges used shall be stainless steel or aluminum.

18.4 **Finish**

The surface of the moulded frame shall be free from any visible defects such as small pores, crazing, blistering, wrinkling, impurities, defective impregnation, colour blots and aggregate defects, as mentioned in IS 14856. Scattered pin holes duly repaired and finished by applying resin and not noticeable shall be acceptable. Frame laminate shall be flat and shall have smooth and level surface. Laminate shall be finished in colour & shade as approved by Engineer-in-Charge.

18.5 **Fixing of Shutters**

Door shutter shall be side hung on three bolt hinges of size 100 mm, one at the centre and the other two at 200 mm from the top and bottom of the shutter. The flat of the hinges shall be neatly counter sunk in to the recesses cut out to the exact dimensions of the hinge flap. The door shall be drilled on the thickness to fit hinges. Screws for fixing the hinges shall be screwed in with screwdrivers and not hammered. The length of the screws should be 8 mm/30 mm. The hinges used should be of stainless steel.

18.6 **Tolerance**

The tolerance on the width and the height of the door shall be + 5 mm and the tolerance on the nominal thickness of the door shall be + 2 mm.

18.7 **Fittings**

Fittings shall be provided as per schedule of fittings decided by Engineer-in-Charge. In moisture prone areas M.S. fittings and screws should not be used. Hardware such as handles, tower bolt, stopper, buffer etc. should be directly screwed (not pre-drilled) and fitted on the door.

18.8 **Measurements**

Length and width of the shutters shall be measured to the nearest cm in closed position covering the rebates of the frames but excluding the gap between the shutter and the frame. Area is calculated to the nearest 0.01 sqm.

18.9 **Rate**

The specified rate include the cost of the door shutter and labour involved in fixing of the shutter including fittings & fixtures on the door shutter, hinges & screws as provided

19. **WOOD**

19.1 Timber for door frames shall be as specified in Bill of Quantities. 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.

20. **ALUMINIUM SECTIONS**

20.1 Aluminium sections used for fixed/openable windows, ventilators, partitions, frame work & doors etc. shall be suitable for use to meet architectural designs to relevant works and shall be subject to approval of the Engineer-in-Charge for technical, structural, functional and visual considerations. The aluminium extruded sections shall conform to IS 733 and IS 1285 for chemical composition and mechanical properties. The stainless steel screws shall be of grade AISI 304.

20.2 The permissible dimensional tolerances of the extruded sections shall be as per IS 6477 and shall be such as not to impair the proper and smooth functioning/operation and appearance of door and windows.

20.3 Aluminium glazed doors, windows etc. shall be of sizes, sections and details as shown in the drawings. The details shown in the drawings may be varied slightly to suit the standards adopted by the manufacturers of the aluminium work, with the approval of Engineer-in-Charge. Before proceeding with any fabrication work, the contractor shall prepare and submit, complete fabrication and installation drawings for each type of glazing doors, windows, ventilators and partition etc. for the approval of the Engineer-in-Charge. If the sections are varied, the contractor shall obtain prior approval of Engineer-in-Charge and nothing extra shall be paid on this account.

20.4 Powder Coating

20.4.1 **Material:** The powder used for powder coating shall be Epoxy/polyester powder of make approved by the Engineer-in-Charge. The contractor shall give detailed programme for powder coating in advance, to facilitate the inspection by Engineer-in-Charge or his authorized representative.

20.4.2 **Pre-treatment:** Each aluminium alloy extrusion or performed section shall be thoroughly cleaned by alkaline or acidic solutions under the conditions

specified by chemical conversion coating supplier and then rinsed. A chemical conversion coating shall be applied by treatment with a solution containing essentially chromate ions or chromate and phosphate ions as the active components as applicable. The amount of the conversion coating deposited depends on the type used by the conversion coating chemical supplier. The conversion coating shall be thoroughly rinsed either with the solution specified by the conversion coating chemical supplier or with de-mineralized water and then dried at the temperature for the time specified by the conversion coating chemical supplier. The contractor shall submit the detail specifications and application procedure for application of conversion coating for approval of Engineer-in-Charge. The metal surface after the conversion coating pretreatment and prior to the application of the coating shall be free from dust or powdery deposits.

20.4.3 **Process:** The polyester powder shall be applied by electrostatic powder spray method. Before start of powder coating the contractor shall submit detail specification for application of polyester powder from manufacturer of the polyester powder for approval of Engineer-in-Charge. The powder coating shall be applied as per the specification approved by Engineer-in-Charge.

20.4.4 **Thickness:** The thickness of the finished polyester powder coating measured by micron meter shall not be less than 50 micron nor more than 120 micron at any point.

20.4.5 **Performance Requirements for the Finish**

(i) *Surface appearance:* The finish on significant surfaces shall show no scratches when illuminated and is examined at an oblique angle, no blisters, craters; pinholes or scratches shall be visible from a distance of about 1 m. There shall not be any visible variation in the colour of finished surfaces of different sections and between the colours of different surfaces of same section.

(ii) *Adhesion:* When a coated test piece is tested using a spacing of 2 mm between each of the six parallel cuts (the cut is made through the full depth of powder coating so that metal surface is visible) and a piece of adhesive tape, approximately 25 mm x 150 mm approved by the Engineer-in-Charge is applied firmly to the cut area and then removed rapidly by pulling at right angles to the test area, no pieces of the finish other than debris from the cutting operation shall be removed from the surface of the finish.

20.4.6 **Protection of Powder Coated / Anodizing Finish :** It is mandatory that all aluminium members shall be wrapped with self adhesive non-staining PVC tape, approved by Engineer-in-Charge.

21. EPDM- GASKETS

21.1 The EPDM Gaskets shall be of size and profile as shown in drawings and as called for, to render the glazing, doors, windows, ventilators etc. air and water tight. Samples of gaskets shall be submitted for approval and the EPDM gasket approved by Engineer-in-Charge shall only be used. The contractor shall submit documentary proof of using the above material in the work to the entire satisfaction of Engineer-in-

Charge.

22. SEALANT

- 22.1 The sealants of approved grade and colour shall only be used. The silicone for perimeter joints (between Aluminium section and masonry) shall be of make approved by the Engineer in Charge.

23. PRE-LAMINATED PARTICLE BOARD

- 23.1 Pre laminated particle boards shall be Particles board laminated on both surfaces by synthetic resin impregnated base papers under heat and pressure. Pre-laminated particle boards shall be of Grade I corresponding to IS 3087 & 12823 Type-II.

24. GLASS

- 24.1 The glass to be used on the work shall be of good quality of make “Saint Gobain” or “Modiguard” conforming to IS:2835 and free from defects scratches etc. The thickness of glass shall be as specified in the Schedule of quantities.

25. HYDRAULIC FLO -8OR SPRING

- 25.1 The hydraulic floor spring shall be heavy duty double action floor spring of make approved by the Engineer-in-Charge suitable for door leaf of weight minimum 100 kg. The top cover plate shall be of stainless steel, flushing with floor finish level. The contractor shall cut the floor properly with stone cutting machine to exact size & shape. The spindle of suitable length to accommodate the floor finish shall be used. *The contractor shall give the guarantee duly supported by the company for proper functioning of floor spring at least for 10 years.*

26. PVC PIPE FOR DRAINAGE DISPOSAL

- 26.1 PVC pipes shall conform to IS 4985 and class as specified in the schedule.

27. UNPLASTICIZED PVC PIPES (FOR WATER LINE)

- 27.1 All unplasticized PVC pipes shall conform to IS: 4985 and shall be of Class-5 (10kg / cm²) for water supply system unless specified otherwise and shall be designated by external diameter.
- 27.2 The pipes shall be supplied in random length from 4 to 7m and shall have ISI certification marks.
- 27.3 The internal and external surface of the pipe shall be smooth and clean, free from grooving and other defects. The end shall be cleanly cut and shall be square with the axis of the pipe. Slight shallow longitudinal grooves or irregularities in the wall thickness shall be permissible provided the wall thickness remains within the permissible limits.

28. PVC FITTINGS (FOR WATER LINE)

- 28.1 All fittings shall be of injection moulded PVC socket type with BIS's certification mark and designated by the diameters of their sockets. All fittings shall in all respects comply with IS:7834 (Part I-VIII).

29. MIRROR

29.1 The mirror shall be of superior glass with edges rounded off or beveled, as specified. It shall be free from flaws, specks or bubbles. The size of the mirror shall be as specified and its thickness shall not be less than 5.5 mm. It shall be uniformly silver plated at the back and shall be free from silvering defects. Silvering shall have a protective uniform covering of red lead paint. Where beveled edge mirrors of 5.5 mm thickness are not available, fancy looking mirrors with PVC beading/border or aluminium beading or stainless steel beading/border based on manufacture's specifications be provided nothing extra shall be paid on this account. Backing of mirrors shall be provided with environmentally friendly material other than asbestos cement sheet.

30. MATERIALS NOT SPECIFIED

30.1 All materials not herein detailed and fully specified but which may be required for use on Works, shall be subjected to the approval of the Engineer-in-Charge without which they shall not be used anywhere in the permanent Works

31. SAMPLING AND TESTING OF MATERIALS

31.1 Sampling and testing of the material supplied by the Contractor for use on the Work shall be done as per the provisions of the relevant BIS codes/specifications. In the absence of BIS specification in a particular case, the sampling and testing shall be done as directed by the Engineer-in-Charge as sound engineering practice. Material conforming to the specifications and approved by the Engineer-in-Charge shall only be used by the Contractor.

31.2 All the sampling and testing shall be done at the Contractor's cost.

SIGNATURE OF TENDERER

7. DETAILED SPECIFICATIONS OF ITEMS OF WORKS

1. Except where otherwise specified or authorised by the Engineer-in-Charge all items of Works executed by the Contractor must conform to the latest edition of the Bureau of Indian Standard (BIS) Specifications, I.R.C., MORT&H's specifications and Code of practices published by BIS. Where no such specifications or code of adoption. The Bidder while indicating such specifications shall practice exists the latest BSS codes of practice shall also be considered for enclose the full set of the publication so referred and not in extracts. Photostat / Xerox copies in duplicate shall be forwarded which shall not be returned to the Contractor. In absence of any specification the department reserves the right to adopt trade specifications and /or sound engineering practices for the specialised Work as may be decided by the Engineer-in-Charge which shall be final, conclusive and binding on the Contractor.

Detailed specifications of items of Works are described below:

2. DISMANTLING/ DEMOLISHING WORKS

- 2.1 The tenderer shall inspect the site and carry out the required investigation by himself about the present position and condition of the existing structures and assess the difficulties and the work involved in its dismantling and removal. It will be deemed that the tenderer has satisfied himself the condition of the structure and the nature of the work involved for the dismantling and removal and estimated its cost accordingly and port will be in no way responsible for the lack of such knowledge and also consequences thereof to the tenderer. The dismantling shall be done carefully without causing any damage to the remaining portions / structure.
- 2.2 Wooden boardings in lining of walls and partitions, Old Brick masonry/ PCC/ RCC works/ old plaster etc., are to be dismantled as per the direction of Engineer-in-charge. All the dismantled usable materials shall be stacked at the area pointed out by the Engineer –in –charge and all unusable materials shall be disposed by the contractor.
- 2.3 All the dismantling works shall be done carefully without causing any damage to the adjacent portion/existing structure. The unserviceable dismantled / cut materials shall be disposed off within 6kms of the work site and levelled as directed by the Engineer-in-Charge.

3. EARTHWORK EXCAVATION

- 3.1 Contractor shall be responsible for the true and proper setting out of the work in relation to original points, lines and levels of reference and for corrections of the level dimension and alignment of all parts of work.
- 3.2 All excavations shall be carried out to give exact length, width and depth as per profiles indicated in the drawings or as directed by the Engineer-in-Charge. The phasing and method of excavation shall be to the approval of Engineer-in-

Charge. The contractor shall provide suitable arrangements to prevent water from any source entering into excavated pits at his cost.

- 3.3 Necessary shoring and timbering shall be provided as per IS:3764 for preventing slipping of the soil in trenches and for protecting the safety and stability of the existing structures. Dewatering, if required shall also be carried out to keep the excavated surface dry for construction. The cost for pumping or bailing out water by using pump set will be paid separately. Excavation taken wider or deeper than required shall be filled back with crusher run screening or selected materials approved by the Engineer-in-Charge, thoroughly compacted in layers of thickness not more than 20 cm or as decided by the Engineer-in-Charge.

4. RE BARING FOR FIXING REINFORCEMENT

- 4.1 Rebars shall be of Fe 500D or more grade bars of diameter specified in the schedule.
- 4.2 Rebars shall be fixed to the existing RCC beams by drilling holes of 250 mm deep and required diameter.
- 4.3 The holes shall be thoroughly cleaned to all dust, dirt, loose concrete etc. from the hole.
- 4.4 The rebars shall be fixed in the hole by using heavy duty injection adhesive for rebar fixing in Wet/ Dry conditions “ HILTY HIT-RE 500 “ or its approved equivalent product.
- 4.5 The adhesive shall be applied as per the manufactures specification.
- 4.6 Payment
Payment shall be done per number of rebars fixed (ie; for a depth of 250 mm. Remaining portion of reinforcement will be measured and paid for the reinforcement item).
- 4.7 The rate quoted shall include drilling holes, cleaning the holes , rebars, heavy duty injection adhesive for rebar fixing in Wet/ dry conditions “ **HILTY HIT-RE 500** “ or its approved equivalent product , fixing the rebars in the holes using adhesive etc.

5. PLAIN AND REINFORCED CEMENT CONCRETE

5.1 General

The concrete used for all Works, concreting procedure etc. shall be in accordance with IS:456–2000.

5.2 Concrete Mix

Mix used for R.C.C. shall be of minimum M20 grade unless otherwise specified. Design mix shall be used for M20 and higher grade of concrete unless otherwise specified in the schedule.

5.3 Nominal Mix

For nominal mix concrete, proportion of fine aggregate to coarse aggregate shall be 1:2 by volume. The minimum cement content per cubic metre of nominal mix concrete shall be as given below. Water cement ratio not exceeding 0.50.

Sl. No	Type of concrete	Cement content per Cu. M
1	Cement concrete 1:4:8 (1 cement: 4 sand: 8, 40 mm size graded metal)	170 Kg.
2	Cement concrete 1:2:4 (1 cement: 2 sand: 4, 20 mm size graded metal)	320 Kg
3	1:1.50:3 with 20mm size graded metal	400 Kg.

5.4 Design Mix

5.4.1 For design mix concrete of following grades of concrete the minimum cement content per cubic metre and maximum water cement ratio are as given below.

Sl. No	Grade of Concrete	Minimum cement content in Kg / m ³	Maximum free Water cement ratio
1	M20	350	0.55
2	M25	330	0.55
3	M30	340	0.50

5.4.2 For design mix concrete, the Contractor shall make calculations jointly with Engineer-in-Charge and carryout all necessary tests at Contractor's cost to determine the proportion by weight of cement, aggregates (coarse and fine), admixture if required and water necessary to produce concrete of required grade having the desired Workability and, water cement ratio not exceeding the allowable limit, prior to commencement of Work. The Contractor shall submit the following for the approval of Engineer-in-Charge.

- (i) The proportion of cement, coarse aggregate, fine aggregate and water so determined.
- (ii) The sieve analysis of aggregates which he proposes to use in the Works.
- (iii) Full details of the tests conducted.
- (iv) All calculations relevant to mix design.

5.4.3 When the proportions are submitted to the Engineer-in-Charge which he considers will produce concrete having the required properties, it shall become the declared proportions to be used for the Work. The Agreement by the Engineer-in-Charge to such declared proportions shall not relieve the Contractor of any of his responsibilities to use in the Work at all times concrete

having the required properties. No deviation from the declared proportions shall be allowed unless and until the Engineer-in-Charge shall have given his written authorisation for the adoption of revised proportions for the concrete.

- 5.4.4 Sampling, testing and acceptance criteria for designed mix concrete shall be as per clause 15, 16 & 17 of IS:456 - 2000 unless otherwise specified. Sampling and testing shall be done at Contractor's own cost. Testing shall be done in a laboratory approved by the Engineer-in-Charge.

5.5 Size of Coarse Aggregate

For all concrete, plain or reinforced of M20 and higher grades, 20 mm size graded aggregate conforming to IS:383 shall be used unless otherwise specified. If 20 mm graded aggregates as per IS:383 are not readily available, graded 20 mm aggregate shall be obtained by blending 20 mm and 12.5/ 10 mm aggregates in the proportion arrived based on the combined sieving of aggregates.

5.6 Mixing of Concrete

- 5.6.1 Concrete shall be mixed in a drum or pan type batch mixer, the type and capacity of which is to be approved by the Engineer-in-Charge. Time allowed for mixing, after all ingredients have been placed in the mixers shall not be less than two minutes. If there is segregation after unloading from the mixer, the concrete should be remixed.
- 5.6.2 Ready mix concrete from outside source shall be allowed for use on the work subject to the conditions that: (i) written permission shall be obtained from the Engineer-in-Charge, (ii) all quality control measures as stipulated by the Engineer-in-Charge are strictly adhered to by the Contractor at his cost, (iii) all design mix calculations as per Clause 2.3.4 of Tender Document shall be submitted by the contractor for approval of the Engineer-in-Charge & approval obtained; and (iv) all expenses towards conveyance and incidentals of providing departmental supervision at the mixing plant shall be borne by the Contractor.

5.7 Assembly of reinforcement for Reinforced Cement Concrete.

- 5.7.1 The steel bars used for reinforcement Works shall be either mild steel bars conforming to IS:432 (Part I) or HYSD bars, conforming to IS:1786 (Grade Fe 500 / Fe 415) or both.
- 5.7.2 The Contractor shall, when ordered, submit to the Engineer-in-Charge the detailed bar bending schedule for his scrutiny and approval sufficiently in advance (about four weeks) of the due date of commencement of the relevant items of Works. While Working out the bar bending schedule, the Contractor shall ascertain the length of bars likely to be made available to him and the schedule shall be so made, keeping the wastage/ cut bits of bars to bare minimum without hampering technical requirements. If the size of the steel bars specified in the drawing or schedule is not available, the nearest size available shall be used. Revised drawing shall be issued to the Contractor substituting the new size of reinforcement and bar bending schedule shall be prepared by the Contractor accordingly. No extra payment shall be made to the

Contractor for making this substitution. The fabrication of reinforcement shall commence only after the bar bending schedule is approved by the Engineer-in-Charge.

- 5.7.3 Reinforcement shall be cut to the exact length and made truly straight and then bent to the exact shape and dimensions as indicated in the drawings. The bending and fixing of bars shall be done in accordance with IS:2502 unless otherwise specified.
- 5.7.4 All cut bits of steel are the property of the Contractor. However, the Contractor can dispose them off only with the permission in writing of the Engineer-in-Charge. If the department requires the cut lengths, they are to be handed over to the department and will be paid for at the rates at which they were purchased by the Contractor.
- 5.7.5 The reinforcement shall be cleaned by wire brush etc. to remove oil, grease, loose mill scale, loose rust or other deleterious matter that may reduce or destroy bond etc. before tying in position and also immediately before placing the concrete.
- 5.7.6 All reinforcement shall be placed and maintained in accordance with the drawings. Tolerance on placing of reinforcement shall be in accordance with clause 12.3 of IS:456-2000. Bolts, nuts, washers and rivets etc. required for complete erection of reinforcement and keeping in position shall be supplied by the Contractor at his own cost.

5.8 Form Work

- 5.8.1 The steel/ marine plywood formwork shall be used for concrete work. The form work shall be designed and constructed to the shape, lines and dimensions shown in the drawings within the tolerance limit and specified in clause 11.1 of IS:456-2000. Joints of the form works shall be made water tight by providing suitable beadings / gasket as approved by the Engineer-in-Charge. All rubbish, particularly chippings, 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 contact with the reinforcement.
- 5.8.2 Before reuse, all forms shall be thoroughly scraped, cleaned, nails removed, holes that may leak suitably plugged and joints examined and when necessary, repaired and the inside retreated to prevent adhesion, to the satisfaction of Engineer. Warped timber shall be resized. Contractor shall equip himself with enough shuttering material to complete the job in the stipulated time.
- 5.8.3 Forms for sloped surfaces shall be built so that the formwork can be placed board -by- board immediately ahead of concrete placement so as to enable ready access for placement, vibration inspection and repair of the concrete. The formwork shall also be built so that the boards can be removed one by one from the bottom up as soon as the concrete has attained sufficient stiffness to prevent sagging. Surfaces of construction joints and finished surfaces with slopes steeper than 4 horizontal: 1 vertical shall be formed as required herein.
- 5.8.4 For forms for curved surfaces, the Contractor shall interpolate intermediate sections as necessary and shall construct the forms so that the curvature will be

continuous between sections. Where necessary to meet requirements for curvature, the form timber shall be built up of laminated splines cut to make tight, smooth form surfaces. After the forms have been constructed, all surface imperfections shall be corrected and all surface irregularities at matching faces of form material shall be dressed to the specified curvature.

- 5.8.5 Care shall be taken to see that the faces of formwork coming in contact with concrete are perfectly cleaned and two coats of mould oil or any other approved material applied before fixing reinforcement and placing concrete. Such coating shall be insoluble in water, non-staining and not injurious to the concrete. It shall not become flaky or be removed by rain or wash water. Reinforcement and/or other items to be cast in the concrete shall not be placed until coating of the forms is complete; adjoining concrete surface shall also be protected against contamination from the coating material.

5.9 Cover to Reinforcement

Cover as specified in drawing shall be provided by using precast cement concrete block made from concrete of same grade as that of main Work unless otherwise directed by the Engineer-in-Charge.

5.10 Transporting, placing, compacting and curing of concrete

- 5.10.1 Transporting, placing, compacting and curing of concrete shall be as per clause 13 of IS:456-2000.
- 5.10.2 Concrete shall be transported from the mixer to the Worksite as rapidly as possible which will prevent the segregation or loss of any ingredient, and for maintaining the Workability.
- 5.10.3 The concrete shall be placed and compacted before setting commences and should not be subsequently disturbed. Care should be taken to avoid displacement of reinforcement or movement of formwork.
- 5.10.4 All concrete shall be vibrated unless otherwise specified or approved by the Engineer-in-Charge and such vibrating shall be as required by the Engineer-in-Charge. The mechanical vibrators complying with IS:2505, IS:2506 or IS:4656 shall be used for compacting concrete. All vibrations shall be carried out to a plan approved by the Engineer-in-Charge. No Workman shall be allowed to operate the vibrator without having received instructions and training in its use. Care must be taken to avoid segregation and excessive vibration.
- 5.10.5 Concreting shall be carried out continuously upto construction joints, the positions and arrangement of which shall be as directed by the Engineer-in-Charge. When the Work has to be resumed the construction joints shall be prepared in accordance with clause 13.4 of IS:456-2000.
- 5.10.6 Unless otherwise specified, all concrete shall be kept continuously in a damp condition by ponding or by covering with a layer of sacking, canvas, hessian or similar materials with fresh water for not less than 7 days after laying the concrete. If curing is not done properly the department will be at liberty to engage labour for curing and the expenditure incurred will be recovered from the Contractor's bill. The decision of the Engineer-in-Charge will be final on this.
- 5.10.7 Stripping time for the form Work shall be as stipulated in clause 11.3 of

IS:456-2000. Any impression, fins etc. that may occur from the form Work shall be removed and treated with cement mortar 1:1.5 (1 cement: 1.5 sand).

5.10.8 Contractor shall arrange to fix any fixtures wherever necessary while doing concreting Work without any extra cost. Cost of fixtures will be paid separately, if it is provided by the Contractor.

5.10.9 The unit rate quoted by the tenderer shall be for the finished Work and deemed to include cost of all materials and labour, provision of holes, recess, other contingent items etc. required for the completion of Work but excluding shuttering as specified in the schedule etc.

6. FILLING WITH SELECTED EXCAVATED EARTH

The area shall be filled in layers 15 - 30 cm, of thickness or as specified in items specification, watered and compacted with hand rammers as directed by the Engineer-in-Charge, so as to avoid any settlement at later stage. For the final layer the surface shall be flooded with water and water allowed to stand for 24 hours. The finished level of the filling shall be trimmed to the level specified.

7. PECAST CEMENT CONCRETE BLOCK MASONRY

7.1 The blocks shall be laid to level and alignment to bring out joint not more than 10 mm wide between the blocks. The grade of mortar shall be specified in the schedule of items. Curing shall be done for 7 days.

7.2 Payment for cement concrete block masonry shall be made on cubic meter. The rate shall include all labour and materials including curing etc. complete required for completion of work.

8. CEMENT PLASTERING

8.1 Cement plastering shall be with the grade of mortar and of thickness specified in the schedule. The surface to be plastered shall be thoroughly cleaned and kept wet for 4 hours before plastering.

8.2 All the corners shall be rounded off to a radius of 25 mm unless otherwise specified.

8.3 Where smooth finishing is specified in the schedule the plastering shall be floated over with neat cement slurry using 2.2 kg of cement per square metre immediately after the final coat of plastering and rate quoted for plastering shall include cost of this finishing work.

8.4 The plastered surface on which glazed tiles or other similar type of finishing are to be provided subsequently shall not be finished smooth but shall be scarified for forming a base for providing the final surface finish as required.

8.5 The surface shall be cured for 7 days.

8.6 The rate shall include all labour and materials including scaffolding, curing etc. complete required for completion of work. Measurement of the work under this head shall be made on the basis of the area of work done.

9. PROVIDING FLOORING WITH VITRIFIED FLOOR TILES/ CERAMIC FLOOR TILES

9.1 The tiles shall be set in cement mortar 1:4 (1 cement : 4 sand) of average 20 mm thick laid to required level/ slope. Before laying cement mortar, the concrete surface shall be scrubbed with wire brush, all loose particles, foreign matters etc. shall be removed and the surface shall be made clean. Any undulations in the concrete shall be chipped

off or made good with additional concrete of the same grade used for the under layer. The surface thus prepared shall be wetted and smeared with a coat of cement slurry using cement at the rate of 2.2 kg/m² of area just before the application of the mortar, so as to get good bond between base course concrete and plastering. For fixing tiles to mortar, neat cement slurry of honey like consistency using cement at the rate of 3.3 kg/m² shall be smeared on top of mortar bed. The joints between the tiles shall be uniform and of minimum thickness.

- 9.2 After laying the tiles, the surplus cement grout along the joints shall be cleaned off. The day after the tiles are laid, all joints shall be cleaned with wire brush to a depth of 5mm and pointed with tile jointing powder, of same colour as tiles, of approved make.
- 9.3 When the floor is ready to use the same shall be washed clean and dried with soft cloth or linen. If any tile is disturbed or damaged it shall be refitted or replaced and properly jointed and pointed.
- 9.4 Measurement of the work under this head including cement mortar bed shall be made on the basis of the area of work done and rate quoted shall include the cost of all labour, materials, scaffolding etc required for completion of work.

10. PROVIDING GLAZED CERAMIC WALL TILES

- 10.1 Dadoing with glazed tiles shall be done using tiles of approved quality set in plastered and scarified surface. Glazed tiles shall be chamfered at all edges / corners.
- 10.2 The plastered and scarified surface shall be wetted and neat cement Slurry of honey like consistency-using cement at the rate of 3.30kg/m² shall be smeared on the surface just before fixing the tiles. The tiles shall be laid over the slurry to the correct level and alignment with Minimum joint thickness. The joints shall be raked and pointed with tile jointing powder of same colour as tiles. Finally the surface shall be cleaned with oxalic acid.
- 10.3 All the exterior corners of columns, walls etc. to be provided with PVC corner beading of approved quality and colour of tiles.
- 10.4 The unit rate is inclusive of providing bed plastering with cement mortar 1:3,12mm thick and fixing glazed tiles over it and jointing with grey cement slurry @ 3.3kg per sqm, including pointing.

11. WATER THINNABLE PRIMER COAT

- 11.1 Primer coat shall be preferably applied by brushing and not by spraying.
- 11.2 **Preparation of the Surface**

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.

11.3 Application

The water thinnable primer shall be applied with a brush on the clean dry and smooth surface. 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. It shall be allowed to dry for at least 48 hours, before emulsion Paint is applied.

- 11.4 Measurements of the work under this head shall be made on the basis of the

area work done and the rate quoted shall include the cost of labour, materials scaffoldings etc. required for the completion of the work.

12. PROVIDING AND APPLYING ACRYLIC SMOOTH EMULSION PAINT OF EXTERIOR/ INTERIOR GRADE

- 12.1 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. Over the prepared surface one base coat of primer for exterior paint of same brand shall be applied with hand brush in horizontal stroke followed immediately by a vertical one which together shall constitute one coat. After the primer coat has dried for at least 48 hours, the surface shall be lightly sand papered to make it smooth. All loose particles shall be dusted off after rubbing and the surface cleaned well. The first finishing coat of exterior/ interior paint shall then be applied with hand brush in horizontal stroke followed immediately by a vertical one which together shall constitute one coat. The second coat shall be applied in the same way of first coat to obtain an even surface, after the first finishing coat dried as per the directions of the Engineer-in-Charge.
- 12.2 Two or more coats shall be applied @ 1.67 ltr/ 10 m² over and including priming coat of exterior primer applied @ 2.20 kg/ 10 m²
- 12.3 Measurements of the work under this head shall be made on the basis of the area of work done and rate quoted shall include the cost of labour, materials, scaffolding etc. required for the completion of work.

13. WOOD WORK

- 13.1 Workmanship for the woodwork shall be good and conforming to the satisfaction of the Engineer-in-Charge.
- 13.2 Scantlings shall be accurately planed smooth to the full dimensions and rebates, roundings, mouldings etc. as per drawings. Patching or plugging is not allowed.
- 13.3 Joints shall be simple, neat, and strong without wedging / filling and pinned with teak/bamboo pins.
- 13.4 All wood works shall be brought to the site and approved by the Engineer-in-Charge before it is painted or oiled. The wood works brought to the site after applying painting, but without obtaining prior approval from the Engineer-in-charge shall be rejected. All concealed timber surfaces and portions of timber butting against wall and lintel shall receive one coat of primer and 2 coats of coal tar or bituminous paint.
- 13.5 Frame shall be fixed to walls using M.S clamps as per schedule of fittings. The M.S clamps shall receive two coats of coal tar or bituminous paint before its embedment in concrete. In case of door frames without sills, vertical members shall be buried in the floor at least 40 mm deep.
- 13.6 Door frames wherever M.S clamps could not be provided, have to be fixed by using M.S corkscrew of 12mm x 100mm by drilling, plugging etc. No extra payment shall be made for this work.
- 13.7 Glazing shall be with good quality glass of thickness specified in the drawing. The glass panes shall be fixed by teak wood beading. A thin layer of approved quality readymade putty shall be applied between glass panes and sash bar / frames and glass panes and beading.
- 13.8 Fittings specified in the schedule shall be of approved quality / type. All fixtures /

fittings shall be got approved by the Engineer-in-Charge before its use on work.

14. WOODEN FRAME WORK

14.1 Joints

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.

14.2 Fixing of Frames

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. Hold fasts and metallic fasteners shall be measured and paid for separately.

15. STEEL WORK IN BUILT UP SECTIONS AND TUBULAR SECTIONS

15.1 Fabrication and erection of steel work shall be in accordance with the provisions of IS : 800. The steel sections as specified shall be cut square accurately to correct lengths. The cut edges should be dressed to a neat and workmanship finish and be free from distortion where parts are to be in contact metal to metal. All materials shall be straight and if necessary, before being worked shall be straightened and / or flattened and shall be free from twists.

15.2 The component parts shall be assembled and aligned in such a manner that they are neither twisted nor otherwise damaged and shall be so prepared that the specified camber, if any, is provided. Proper clamps, clips, jigs and other fasteners (bolts and welds) shall be placed in a balanced pattern to avoid any distortion in the members and to ensure their correct positioning.

15.3 Welded connections shall be provided for joints except for the joints specially provided for erection purposes. For joints provided for erection purposes, bolted connections shall be used.

- 15.4 All bolts shall be provided with washers of sufficient thickness. The threaded portion of each bolt shall project through the nuts at least one thread.
- 15.5 Welding shall be done in accordance with the specifications laid down in IS 816 and as per detailed working drawing. Welding edges and the adjacent areas of the members (extending upto 20mm) shall be thoroughly cleaned of all oil, grease, scale and rust and made complete dry. Gaps between the members to be welded shall be kept free from all foreign matters. The welding procedure adopted and consumables used shall be got specifically approved by the Engineer in Charge. Excessive convexity, shrinkage cracks, under cutting, improperly fitted/misaligned parts, members distorted by the heat of welding etc. due to faulty welds shall be corrected – whole or portions – as directed by the Engineer-in-Charge.
- 15.6 The steel sections as specified shall be straightened and cut square to correct lengths. The steel work shall be hoisted and placed in position, carefully without any damage to itself and other building work and injury to workmen.
- 15.7 The suitability and capacity of all plants and equipment used for the work shall be to the complete satisfaction of the Engineer-in-Charge.
- 15.8 Proper access platform and safety arrangements shall be provided for working and inspection at no extra cost wherever required.
- 15.9 The electrodes required for the welding work shall be got approved before use. The electrodes should be stored properly without exposing them to atmospheric action. Proper protection should be given for site fabrication. The welding must be carried out under a covered roof.
- 15.10 The contractor should possess plant and equipments, derricks, lifting tackles, wire ropes, chain pulleys, jacks, winches, welding sets etc that may be required for fabrication and erection. The equipment being used shall be kept in good condition throughout.
- 15.11 All damages to steel work caused during the transit or otherwise at the time of fabrication or erection and after erection shall be made good at no extra cost.
- 15.12 Prior to the positioning of the steel work over the supports, all laitance and loose material shall be removed by wire brushing and chipping and bearing surfaces cleaned and made thoroughly wet and cement grout shall be applied or as directed by the Engineer-in-Charge.
- 15.13 The rates given shall be for the finished items of work including supplying, fabricating, erecting and alignment with necessary appropriate materials, all connections, welding, rectification wherever necessary, transporting and handling charges, all accessories including cost of labour, materials, equipments, scaffolding, all lifts etc. complete.
- 15.14 The finished steel work shall be measured in kg. inclusive of the weight of cleats, brackets, distance pieces, separators, gusset plates etc., but no allowance shall be made for the welded material. The measurement for plates used on the work shall be made for the actual quantity used in works. The rate quoted per kg. shall be inclusive of cost of all materials, labour, erecting in position, scaffolding, all lifts, etc. complete

16. PROVIDING AND APPLYING SYNTHETIC ENAMEL PAINT

- 16.1 The surface shall be thoroughly cleaned off all dirt, rust, dust, grease etc. with

- wire brush, sand paper etc., and be made perfectly clean and dry while painting.
- 16.2 The number of coats shall be as per schedule. Successive coats shall be applied only on the next day after rubbing with the finest grade of wet abrasive paper and dusting of the loose particles. The primers and paints used shall be of approved quality.
- 16.3 Measurements of the work under this head shall be made on the basis of the area of work done and rate quoted shall include the cost of surface preparation, materials, labour, scaffolding etc. required for the completion of works as detailed above.
- 17. FIBRE GLASS REINFORCED PLASTIC (FRP) DOOR FRAMES**
- 17.1 Door Frames shall be three legged of cross section 90 mm x 45 mm having single rebate of size 32 mm x 15 mm to receive shutter of 30 mm thickness. The frame shall be made of laminate of thickness of 2 mm and shall be filled with wooden blocks of exterior grade MDF or seasoned and treated hard wood inside the laminate in all the three legs of the frame. The frame to be moulded by either hand lay up or resin transfer moulding process. The process shall consist of laying gelcoat at 1000 gms./m² and laid over with layer of FRP Mat (CSM mat) gelcoat and FRP (CSM Mat) are defined in IS 14856. The CSM mat shall be bonded with Isophatholic resin in the ratio not less than 1:2 (One part of Mat to two parts of Isopathlic resin and fillers & additives) by weight. The edge shall be sealed with gelcoat and FRP mat to obtain smooth finish. Sufficient roving shall be laid in the corner to have smooth curve while laying the CSM mat.
- 17.2 FRP door shall be manufactured as per specifications laid down in IS 14856, nomenclature of items & direction of Engineer-in-Charge.
- 17.3 Tolerance**
Tolerance of size of frame to be + 2 mm and on size of rebate to be + 1 mm.
- 17.4 Finish**
The surface of the moulded frame shall be free from any visible defects such as small pores, crazing, blistering, wrinkling, impurities, defective impregnation, colour blots and aggregate defects, as mentioned in IS 14856. Scattered pin holes duly repaired and finished by applying resin and not noticeable shall be acceptable. Frame laminate shall be flat and shall have smooth and level surface. Laminate shall be finished in colour & shade as approved by Engineer-in-Charge.
- 17.5 Fixing of Frame**
The frames are to be fixed in prepared openings in the walls. All civil work and tiling should be completed before the fixing of the frames. The frames are to be fixed directly on the plastered wall. In case tiling is to be done in the place the frames are to be fitted, a 50 mm strip should be left untiled at the location where the frames are to be fitted. The frames are erected in the prepared opening such that the vertical members of the door frame are embedded 50 mm in the floor. The frame shall be fitted truly in plumb. A minimum of three anchor bolts or screws of size 65/100 shall be used to fix each vertical member. One bolt shall be fixed at 200 mm from the top member and one bolt shall be

fixed at 200 mm from the floor. The third anchor bolt shall be fixed in the center. The top horizontal member shall be fixed using two 65/100 size anchor bolts or screws at a distance of 200 mm from both the corners.

17.6 Measurements

The outer length of the vertical and horizontal members of door frame shall be measured in running metres including embedded length in floor corrected upto a cm.

17.7 Rate

The rate includes the cost of the materials and labour involved in all the operations described above. The cost of anchor bolts or screws for joining the frame is included in the rate. Any other hardware, which may be required, shall be paid for separately

18. FIBRE GLASS REINFORCED PLASTIC (F.R.P.) SHUTTERS

18.1 F.R.P. Shutters shall be manufactured conforming to the specifications as per IS 14856 and nomenclature of item & direction of Engineer-in-Charge.

18.2 Blocks of any seasoned hardwood of bulk density not less than 450 kg./m³ at 12 per cent moisture content or any other material of sufficient thickness and length shall be provided inside the shutter at suitable place to hold fittings and fixtures such as aldrops, tower bolt, handle, sliding door bolt, mortice lock etc. Blocks for hinges shall be provided at three locations, unless otherwise specified by the purchaser. One at the centre and other two at 200 mm from the top and the bottom of the shutter. Blocks shall be provided at predetermined places in the shutter so as to fix hinges mortice locks, tower bolts, aldrops, door closures, etc. The finished surface shall be buffed and polished with wax.

18.3 Location of Fittings and Accessories

The lock rail of door shutters shall be so placed that its centre line is at a height 850 + 5 mm from the bottom of the shutter. Door shutter shall be fixed to the frame with three hinges, unless otherwise specified by the purchaser, of the type specified. These locations shall be, one at centre and other two at 200 mm from the top and the bottom of the shutter, where blocks have already been provided and suitable indication by depressing the profile has been made. Screws for fixing the hinges shall be screwed in with screwdrivers & not hammered. The length of screw should be 8/30 mm. The hinges used shall be stainless steel or aluminum.

18.4 Finish

The surface of the moulded frame shall be free from any visible defects such as small pores, crazing, blistering, wrinkling, impurities, defective impregnation, colour blots and aggregate defects, as mentioned in IS 14856. Scattered pin holes duly repaired and finished by applying resin and not noticeable shall be acceptable. Frame laminate shall be flat and shall have smooth and level surface. Laminate shall be finished in colour & shade as approved by Engineer-in-Charge.

18.5 Fixing of Shutters

Door shutter shall be side hung on three bolt hinges of size 100 mm, one at the centre and the other two at 200 mm from the top and bottom of the shutter. The flat of the hinges shall be neatly counter sunk in to the recesses cut out to the exact dimensions of the hinge flap. The door shall be drilled on the thickness to fit hinges. Screws for fixing the hinges shall be screwed in with screwdrivers and not hammered. The length of the screws should be 8 mm/30 mm. The hinges used should be of stainless steel.

18.6 Tolerance

The tolerance on the width and the height of the door shall be + 5 mm and the tolerance on the nominal thickness of the door shall be + 2 mm.

18.7 Fittings

Fittings shall be provided as per schedule of fittings decided by Engineer-in-Charge. In moisture prone areas M.S. fittings and screws should not be used. Hardware such as handles, tower bolt, stopper, buffer etc. should be directly screwed (not pre-drilled) and fitted on the door.

18.8 Measurements

Length and width of the shutters shall be measured to the nearest cm in closed position covering the rebates of the frames but excluding the gap between the shutter and the frame. Area is calculated to the nearest 0.01 sqm.

18.9 Rate

The specified rate include the cost of the door shutter and labour involved in fixing of the shutter including fittings & fixtures on the door shutter, hinges & screws as provided

19. PROVIDING AND FIXING EUROPEAN TYPE WATER CLOSET WITH FLUSHING ARRANGEMENTS.

19.1 The European type water closet shall be fixed on the floor on a cushion of cement concrete 1:5:10. The closet shall be fixed on the concrete bedding with SS fixing screws suitably grouted. The concrete bedding shall be left at 10mm above the finished floor level of the toilet room. The water closet shall be provided with a matching P or S trap suitable for the conditions. The joint between the water closet and the trap shall be made leak proof with cement mortar 1:1. The plastic seat cover with lid shall be fixed over the closet with CP brass hinges and nuts and rubbers. Slim type PVC flushing cistern of 10-litre capacity or nearest available size shall be fixed on the wall using suitable brackets firmly embedded in the wall. The cistern shall be provided with 32mm OD PVC flush pipe with suitable fittings.

19.2 Any cutting, breaking etc. made on walls and or flooring for the purpose shall be made good as part of this item.

20. PROVIDING AND FIXING URINAL

- 20.1 Fixing urinal shall consist of a wall urinal, an automatic flushing cistern of 5 litres and waste pipes etc. Waste pipe shall be of 32mm nominal bore.
- 20.2 Urinal shall be fixed in position by using wooden plugs and screws. The size of wooden plugs shall be 50mmx50mm at base, tapering to 38mmx38mm at top and length 5cm. These shall be fixed to the wall in cement mortar 1:3. After the flange is fixed in the wall, the mortar shall be cured till it is set.
- 20.3 Each urinal shall be connected to 32mm dia. Waste pipe which shall discharge in to the channel or a floor trap. The connection between the urinal and flush or waste pipe shall be made by means of putty or white lead mixed with chopped hemp. The unit rate quoted shall also include supply and fixing 12mm CP brass stop cock etc. complete.

21. PROVIDING AND FIXING WASH HAND BASIN

- 21.1 Washbasin shall be fixed over on galvanized iron rag bolt, embedded in M-15 grade cement concrete in wall. Each basin shall be provided with 32mm dia chromium plated (CP) waste coupling and a 32mm dia PVC waste pipe and one number approved quality CP pillar tap. The cast iron brackets shall be painted with one coat of primer and two coats of synthetic enamel paint. The work shall be carried out as per the directions of the Engineer-in-charge. Water connections shall be done under separate item.

22. PROVIDING AND LAYING OF PIPES FOR SEWAGE LINE

- 21.2 Transporting laying and joining of pipes
Transporting, laying and joining of PVC pipes shall be done in accordance with IS.7634. Pipes fittings shall be transported from the stacking place to the work site with sufficient care to avoid damage to them.
- 21.3 Other materials to be made available by the Contractor.
All materials required for joining and laying pipes including lead spun yarn, solvent cement etc shall be brought by the Contractor at his own cost.
- 21.4 Joining of PVC pipes
Joining of PVC pipes shall be done in accordance with IS:7634. Solvent welded joint shall be used for joining of PVC pipes .Solvent welded joint shall be achieved by Non-heat application method .Solvent cement used for the joint shall conform to the details given under Para2.2.3 of IS.7635.
- 21.5 Payment
Payment shall be made on running meters basis measured center line length including all the fittings, valves bolts nuts etc. No separate payment shall be made for fixing fittings, valves etc for completing the works to the full satisfaction .The rate quoted shall include the cost of materials like lead spun yarn, solvent cement/ bolts/ nuts etc to be made available by the Contractor for joining pipes, providing suitable connections to the existing delivery line and providing the line as aforesaid.

23. PROVIDING AND LAYING WATER SUPPLY LINES FOR EXTERNAL WORKS

23.1 General

All the pipes of different diameters shall be conforming to BIS specifications. The rate quoted shall include cost of all specials like bends, tees, reducers etc., cost of burying or fixing on walls using all fittings as the case may be etc. complete, but excluding cost of taps, valves etc.

23.2 Trenching for laying pipe lines

Forming trenches for laying pipes shall be in accordance with IS:3114. Trenching for laying to depth of 500 to 900mm and width as required at site including removal of all obstructions met while excavating, shoring and bailing out of water, if necessary. The width of the trench shall be as small as possible but shall provide sufficient space for jointing the pipes and for providing concrete encasement wherever required.

23.3 Transporting, laying, jointing and testing of pipes

Transporting, laying, jointing and testing of PVC pipes shall be done in accordance with IS:7634 (Part-III)

23.4 Transporting

Pipes, fittings and valves etc. shall be transported from the stacking place to the worksite with sufficient care to avoid damage to them.

23.5 Other materials to be made available by the contractor

All other materials except those supplied under specific items in the schedule, required for jointing and laying pipes and fixing valves, including rubber gasket, lead, spun yarn, solvent cement etc. shall be brought by the contractor at his own cost.

23.6 Jointing of PVC pipes

Jointing of PVC pipes shall be done in accordance with IS:7634 (Part III), solvent welded joint shall be used for jointing of PVC pipes. Solvent welded joint shall be achieved by non-heat application method. Solvent cement used for the joint shall conform to the details given under Para 2.2.3 of IS:7634 (Part III).

23.7 Testing of pipelines for leakage test

The leakage test shall be conducted at a test pressure of 10 kg./cm². No pipe installation shall be accepted until the leakage per hour in cubic centimeter is less than the quantity (Q) determined by the formula

$$Q = \frac{N \times D \times \sqrt{P}}{3.3}$$

Where Q = Allowable leakage in cm³ / hour,

- N = No. of joints in the length of the pipeline tested,
D = Diameter of pipe in mm, and
P = Test pressure during the leakage test in kg/cm².

23.8 Fixing of valves and fittings

Fixing of valves and fittings shall form part of laying the pipeline as directed by the Engineer-in-Charge.

23.9 Payment

Payment shall be done on running meter basis measured center line length including all the fittings, valves, bolts, nuts etc. No separate payment shall be made for fixing fittings, valves etc. for completing the work to the full satisfaction. The rate quoted shall include the cost of all specials like bends, 'tee's, reducers etc. and materials like rubber gasket, lead, spun yarn, solvent cement, bolts, nuts etc. to be made available by the contractor for jointing pipes, providing suitable connections to the existing delivery line and testing the line as aforesaid.

23.10 Back filling

The soil under the pipe shall be solidly tampered to provide a firm and continuous support for the pipelines. If it is desired to observe the joints or couplings during testing they shall be kept exposed as directed by the Engineer-in-Charge, and the exposed parts shall be backfilled after the test to the satisfaction of the Engineer-in-Charge. This shall be continued till the ground surface in the general area.

Surplus excavated material shall be cleared from the site and disposed off within a lead of 100m as directed by the Engineer-in-Charge.

24. PROVIDING AND WATER SUPPLY LINES FOR INTERNAL WORKS

24.1 The pipes shall be laid and properly clamped to wooden plugs embedded on the wall. Alternatively, plastic or aluminum clamps of suitable design with steel screws shall be used. Horizontal pipes shall be supported with clamps at spacing not more than 1m center to center. For vertical pipes spacing may be increased by 50%. The pipes shall be aligned properly before fixing them on wooden plugs with clamps. Even if the wooden plugs are fixed using a plump line the pipe shall also be checked for alignment before clamping.

24.2 Connection to bib tap/stop valve shall be done by means of G.I adapter of approved quality and make.

24.3 Payment

Payment shall be done on running meter basis measured centerline length including all the fittings, valves, bolts, nuts, etc. No separate payment shall be made for fixing fittings valves etc. for completing the work to the full satisfaction. The rate quoted shall include the cost of fittings like tees, bends

reducer etc. and materials like solvent cement / bolts/nits/rubble gasket etc, to be made available by the Contractor for jointing pipes etc. and cost incurred for cutting the existing walls slabs, sunshade etc, and making good the same using concrete, mortar paint etc, as per the direction of Engineer-in-charge.

25. **SCHEDULE OF FITTINGS FOR CIVIL WORKS**

Sl. No.	Description	Details
1.	FRP moulded doors	1. 125mm size IS: 12817 marked stainless steel butt hinges with S.S. screws – 3 numbers minimum. 2. 200mm ISI marked oxidised S.S. tower bolt with 25mm S.S. screws – 1No. 3. 150mm S.S. Aldrop with necessary nuts and bolts - 1No.

SIGNATURE OF TENDERER