



**COCHIN PORT AUTHORITY  
COCHIN-682009, KERALA, INDIA**

Tele: 91-0484-2666414, 2666871

Telefax: 91-0484-2666414

E-mail:coptce@gmail.com

**TENDER DOCUMENT FOR RENOVATION WORKS TO HARBOUR HOUSE**

**TECHNICAL BID  
(e-Tendering Mode)**

**Website:www.tenderwizard.com/CPT**

**CHIEF ENGINEER'S OFFICE  
COCHIN PORT AUTHORITY  
COCHIN-682009**

**TENDER No.T6/T-2001/2023-C**

**Rs.1,180/- (Rs.1,000/-+18% GST)**

**COCHIN PORT AUTHORITY**

**TENDER FOR ‘RENOVATION WORKS TO HARBOUR HOUSE’.  
(Tender No.T6/T-2001/2023-C)**

**CONTENTS**

Sl No:	Items	Page Nos.
1	Tender Notice	2-10
2	Tender for Works	11-12
3	Contract Data	13-16
4	Instructions to Tenderers	17-21
5	General Description and Special Conditions of Contract	22-30
6	Detailed specifications for materials to be used on works	31-38
7	Detailed Specifications for items of Works	39-62
8	Annexure-I	63
9	Annexure-II	64
10	Annxure - III	65
11	General Conditions of Contract-2016. (Attached Separately)	

**SIGNATURE OF TENDERER**

# COCHIN PORT AUTHORITY



Chief Engineer's Office  
Cochin Port Authority  
W/Island , Cochin – 682009, KERALA  
Tele: 91-0484-2666414/0484-258-2400  
website: [www.cochinport.gov.in](http://www.cochinport.gov.in)

Tender No. T6/T-2001/2023-C

Date : 23/11/2023

## 1. NOTICE INVITING TENDER

Electronic Tenders (**e-tenders**) on percentage basis are invited by Cochin Port Authority 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 WORKS TO HARBOUR HOUSE**”.

### 1. *Minimum Eligibility Criteria:*

#### a) **Experience**

The tenderers should have experience of having successfully completed during the last 7 (seven) years ending **31<sup>st</sup> October, 2023**, at least either:

i) Three Similar Works each costing not less than **Rs.19.98 lakhs**

(OR)

ii) Two Similar Works each costing not less than **Rs.24.97 lakhs**

(OR)

iii) One Similar Work costing not less than **Rs.39.96 lakhs**

#### b) **Financial Turnover**

Average Financial Turnover of the tenderer over the last three financial years ending 31<sup>st</sup> March 2023 [2020-'21, 2021-'22 & 2022-'23] shall not be less than **Rs.14.98 lakhs**.

#### *Explanatory Notes to a) & b) :*

- i. Similar work(s) means “**Civil Construction work / Civil Repair Works/ Civil Architectural Works**”. The experience certificate of works executed in private sectors/ organisations shall be considered for qualification, only on submission of TDS (**Form 26AS**) certificate along with work order and completion certificate.
- ii. **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.**

- iii. 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 Prime Contractor(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.
- iv. 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.

**Table 1**

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

- v. **Financial Turnover:**  
*In proof of Financial Turnover Audited Annual Accounts Statements (Balance Sheet & Profit & Loss Account Statement) & Turnover Certificate signed by the Chartered Accountant or IT returns duly acknowledged by the Income Tax department along with Computation Statement signed by the Chartered Accountant, for the last three years ending on March 2023 shall be produced by the tenderer.*

**2. Other Eligibility Considerations**

- 2.1 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, financial failures, disqualification/ black listing/ debarring by Govt.

departments etc.

**2.2 The bidders having EPF/ ESI registration certificates only shall be considered for qualification in the tender, if applicable, as per EPF /ESI Acts. In case, the Tenderer does not have the required number of employees which makes such registration mandatory, an Undertaking as per Annexure I to the effect shall be furnished.**

**3. 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 2**

<b>Sl. No.</b>	<b>Particulars</b>	<b>Date and Time</b>
1	Tender e- publication date	<i>23 -11-2023</i>
2	Download period of Bid Documents	<i>23-11-2023 to 30-11-2023</i>
3	Date of Pre-Bid meeting	<i>Not Applicable</i>
4	Last date for seeking clarification	<i>25-11-2023</i>
5	Last date and time of submission of Bid	<i>30-11-2023 up to 14.30 hrs</i>
6	Date and time of opening the Bid	<i>30 -11-2023 after 15.00 hrs</i>

**ii) Bid information :**

**Table 3**

i)	Estimated Amount put to Tender	<b>Rs.49,94,420.00</b>
ii)	Earnest Money Deposit	Rs.99,890/- (2%) furnished through Demand Draft or Banker's Cheque drawn in favour of Financial Adviser & Chief Accounts Officer, CoPA from any Nationalised Bank/ Scheduled Bank in India or through RTGS/NEFT mode.
iii)	Cost of Bid document	Rs.1180/- (Rs.1000/-+18% GST) (Non refundable) furnished either through Demand Draft/ Banker's Cheque drawn in favour of the Financial Adviser & Chief Accounts Officer, CoPA from any Nationalized Bank/ Scheduled Bank in India, or through RTGS/NEFT mode. being the cost of single copy of the tender document

iv)	Validity period of Tender	120 days from the Last Date of Submission of Bid.
v)	Time for Completion	<b>30 days from the date of Commencement of the work.</b>

4. This work essentially comprises of the following:
- a. Providing PVC Eaves gutter, rain water pipe etc.
  - b. Dismantling WC Pan, Bath tub, Wash basins, CP fittings, Wash basin counter, Mirror, PVC pipes, tile work, doors, handrail etc.
  - c. Providing CPVC pipes, PVC pipes, floor traps etc.
  - d. Cement concrete work.
  - e. Providing vitrified floor tiles.
  - f. Supply and fixing Toilet fittings & fixtures.
  - g. Providing wash basin counter, shower round etc.
  - h. Providing gypsum board ceiling, cloth type curtain, WPC/SPC Flooring, Modular kitchen work, Crockery units, Crockery shelves, wash basin units, Counter top wash basin, sink mixer, Electric chimney etc.
  - i. Wall painting work.
  - j. Supplying and fixing wardrobe.
  - k. Supplying and fixing veneer door Jack wood doors, FRP door etc.
  - l. Electrical Works.
  - m. Dismantling all light fittings, Electrical switches, sockets, network devices, televisions, telephones etc.
  - n. SITC of Wiring circuit/ Submain / point wirings for light/fan/telephone/inverter and other various electrical points.
  - o. Supply and fixing of Electrical fittings, DB's, MCB's, Ceiling fan, Exhaust Fan, lights fittings etc. as per requirements.
  - p. SITC of AC units with stabilizer etc.
  - q. Dismantling of damaged AC units and accessories as required.
  - r. Providing end termination of the cables using suitable materials.
  - s. Earthing the entire installation...
5. Tender documents can be downloaded from the e-Tendering portal [www.tenderwizard.com/CPT](http://www.tenderwizard.com/CPT) on the dates specified in Table 2 given above by making online requisition. Bid document will also be available in Cochin Port website ([www.cochinport.gov.in](http://www.cochinport.gov.in)) as well as Govt. tender website, [www.eprocure.gov.in](http://www.eprocure.gov.in), 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, CoPA. The bidder shall submit the Originals of (i) DD / Bankers Cheque towards the cost of tender document and EMD and (ii) Power of Attorney in favour of signatory(s) to the tender if applicable, with letter of submission in a sealed cover to the **Dy. Chief Engineer, Cochin Port Authority, W/Island, Cochin-682009, Kerala**, within 3 (Three) working days from the date

of opening of the bid. **Non submission of original financial document towards cost of tender document and EMD within 3 (Three) working days from the date of opening of the bid, will make the tender liable for rejection, and such tenders would not be evaluated further.**

6. The bidders need to obtain the one time User ID & password for log-in to in **e-Tendering** system from the service provider **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.080-40482000 / 9746118529 / 9605557738.
8. Tenders shall be submitted “**online**” strictly in accordance with the Instructions to Tenderers and Terms & Conditions given in the tender document.
9. The bidder is responsible to download Addenda/ Amendments/ Errata/ Replies to the queries of the bidders etc., if any, issued by the Employer, from the website before submission of the bid. **Any shortfall in uploading the said Addenda/ Amendments/ Errata/ Replies to the queries of Tenderer etc. duly signed along with the downloaded documents while uploading the Tender will render the Tender incomplete and such incomplete Tender Documents may be rejected by the employer and would not be evaluated.**
10. All Bids are to be submitted **online only** on the website [www.tenderwizard.com/](http://www.tenderwizard.com/) COPT. No Bids shall be accepted off-line (Hard copy).
11. **EARNEST MONEY TO BE DEPOSITED**
  - 11.1 Each tender should be accompanied by an Earnest Money amounting to **Rs.99,890/-**.
  - 11.2 The Earnest Money can be deposited through Demand Draft or Banker’s Cheque from a Scheduled Bank in India, drawn in favour of Financial Adviser & Chief Accounts Officer, COCHIN PORT AUTHORITY or online payment through RTGS/NEFT. The original DD/ Banker’s Cheque shall be submitted to the Dy.CE, Cochin Port Authority, Cochin-09, **within 3 (THREE) working days from the Bid Due date.** Scanned copy of the DD/ Banker’s Cheque shall be attached with the tender submitted “online”. If online payment is made, the evidence thereof shall be attached with the tender submitted “online”. If hard copy of the original DD/Bankers Cheque is not received within the stipulated period, or if the evidence of making online payment towards EMD is not attached with the tender submitted online, then such bids will not be further evaluated and shall be rejected summarily. The Earnest Money deposited will not carry any interest.
  - 11.3 Bank details of Cochin Port Authority are given below.

Name of bank	:	State bank of India
Name of Branch	:	Cochin Port Trust Branch
IFSC Code	:	SBIN0006367
Account No	:	41401802288
Account Holders Name	:	Cochin Port Authority

- 11.4 EMD of L1 & L2 bidder shall be refunded to the Contractor on submission and acceptance of Performance Security and entering into agreement by the L1 Bidder. EMD of other bidders will be refunded immediately after finalization of the bid.
12. Cochin Port Authority will not be held responsible for any technical snag or net work failure during online bidding. It is the bidder's responsibility to comply with the system requirements i.e. hardware, software and internet connectivity at bidder's premises, to access the e-Tender portal. Under any circumstances, Cochin Port Authority 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.
13. **Securities:**
- 13.1 Security Deposit (SD) shall be 10% of the Contract value or value of the work done whichever is higher and it shall consist of the following:
- a) **Performance Security** 5% of contract value payable on award of the work.
  - B) **Retention Money:** @ 5% of the gross amount of each bill.
- The total amount thus deposited towards SD will be retained as security for the due and proper fulfillment of the Contract and will not carry any interest. Such deposit shall be forfeited on failure to perform or non-fulfillment by the Contractor of the terms and conditions of the Contract.
- 13.2 **Performance Security:** The Performance Security retained till end of Defect Liability period (1 year from the date of completion of work) shall be 5% of Contract Value or Cost of Work Done, whichever is higher. So, initially 5% of the Contract value shall be furnished as Performance Security.
- 13.3 The Security Deposit/ Performance Security @ 5% of the value of the contract awarded (Rounded off to the nearest Rs.1000/-), shall be furnished by the Contractor to the Employer, not later than **5 days** from the date of receipt of letter of acceptance or such extension of that period as may be permitted by the official of Cochin Port writing, and shall be furnished in one of the following forms:
- i) Banker's Cheque/Demand Draft of a Scheduled Bank.
  - ii) An irrevocable Bank Guarantee(BG) enforceable and encashable at Cochin, drawn from any Scheduled Bank operating in India as per the prescribed proforma.
- 13.4 **The BG furnished towards the Performance Security shall be valid until a date 30 days from the day of expiry of the Defect Liability Period stipulated as per the terms of the Contract.**
- 13.5 If Performance Security is not furnished within the period as specified above or such extension of that period as may be permitted by the official of Cochin Port Authority in writing, Cochin Port Authority at its discretion may cancel the Letter of Acceptance without paying any compensation to such bidder, and in addition to forfeiture of EMD. In addition, such bidder shall not be eligible to participate in the tenders invited by COCHIN PORT AUTHORITY for a period of **Two Years from the date of such cancellation of Letter of Acceptance.**



- 13.6 **Retention Money:** Retention Money @ 5% shall be retained from each payment due to the Contractor.
- 13.7 Retention Money shall be deducted at 5% of the gross amount of the bill from the first Running Account bill onwards till the recovered sum alongwith Performance Security amounts to 10% of the Contract value or the value of the work done whichever is higher at all times. **Retention Money shall be refunded to the Contractor within 14 days from the date of payment of final bill.**
- 13.8 If the Cost of Work done exceeds the Contract Value, the total amount retained as Security Deposit considering the Performance Security initially submitted together with the Retention Money recovered from the running account bills, shall amount to 10% of the Cost of Work done.
- 13.9 In cases where cost of Work done exceeds the Contract Value while releasing the Retention Money after payment of Final Bill, only 5% cost of Work Done is released, instead of the entire Retention Money recovered from the bills. The balance amount shall be retained; to make up for the shortage in the Performance Security, upto the completion of Defects Liability Period.
- 14 In the event of the tenderer, after the issue of the communication of acceptance of offer by Cochin Port Authority, failing /refusing to execute the agreement as hereinafter provided, the tenderer shall be deemed to have abandoned the Contract and such an act shall amount to and be construed as the Contractor's calculated and willful breach of the Contract, the cost and consequence of which shall be to the sole account of the tenderer and upon such an event, Cochin Port Authority shall have full right to claim damages therefore either together with or in addition to the forfeiture of Earnest Money Deposit.
- 15 **Signing of Agreement:**
- 15.1 The successful tenderer will be required to execute within **8 days** from the date of receipt of Letter of Acceptance and after submission of Performance Security, an agreement at his expense on proper value Kerala State Stamp Paper in the prescribed departmental form, consisting of:
- a) The Tender Notice, all the documents including additional conditions/specifications and drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading there to, and
  - b) General Conditions of Contract-2016 (GCC), for the due and proper fulfillment of the Contract.
- If Agreement is not executed within the period as specified above or such extension of that period as may be permitted by the official of Cochin Port Authority in writing, Cochin Port Authority at its discretion may cancel the Letter of Acceptance without paying any compensation to such bidder, and in addition to forfeiture of Performance Security.
- 15.2 The Contractor shall make 10 copies of the Agreement and submit to CoPA within 7 days following the date of signing of Agreement.

- 16 Till signing of agreement the tender together with the acceptance letter shall constitute a binding Contract between the Contractor and Cochin Port.
- 17 Failure to comply with conditions **3ii(iv), 13 and 15** above will entail forfeiture of the Earnest Money.
18. **MSME Bidders who are registered with District Industries Centre (DIC) or Khadi and Village Industries Commission (KVIC) or Khadi and Village Industries Board (KVIB) or Coir Board or National Small Industries Corporation (NSIC) or directorate of Handicrafts and Handlooms or Udyog Aadhaar Memorandum or any other body specified by Ministry of MSME for similar nature of Works shall be eligible for issue of Bid Document free of cost and exemption from payment for issue of tender document & payment of EMD. 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-Tender Portal. If the Registration Certificate does not pertain to the Category of ‘Similar Works’ mentioned above, the Tender will be rejected. Further, for claiming such exemption for EMD, they would have to submit an undertaking as specified in Annexure-III in lieu of EMD.**
19. The undersigned reserves the right to reject/cancel/postpone any one or all tenders at any stage of the tender, which shall be binding on all bidders. It is not mandatory for Cochin Port to accept the bid of the Lowest Bidder, and Cochin Port at its discretion may accept the bid of any bidder, without mentioning any reason.
- 20 CoPA will determine whether the Tender is substantially responsive to the requirements of the Tender documents. For the purpose of this clause a substantially responsive Tender is one which inter alia conforms to all the terms, general conditions and specifications of the Tender documents and technically suitable. The Tenderer shall carefully submit all the documents as required under the Tender failing which the offer is liable to be treated as non-responsive. A Tender which, in relation to the cost estimates of CoPA, is seriously unbalanced may be rejected as non-responsive. The Tender which does not satisfy the pre-qualification criteria shall summarily be rejected and shall not be considered for further evaluation Tenders which do not fulfill all or any of the above conditions or which contain any other condition of any sort including conditional rebates or are incomplete in any respect is liable for rejection. Such tenders shall be entered in the tender opening register but their rates shall neither be read out nor entered in the register. Only remark mentioning the reason of rejection in brief shall be appended against such entry.
- 21 The Tenderer shall quote realistic rates in respect of the services to be provided. The rates shall be firm and no other increase or decrease in prices will be allowed during the currency of the contract. Canvassing in connection with tender is

strictly prohibited and tenders submitted by the Contractors who resort to canvassing will be liable to rejection.

**22 Taxes and Duties:**

- 22.1 Deductions towards statutory taxes as per the rules, prevailing in force at the time of payment of bills shall be made while releasing the bill amount.
- 22.2. GST for the work will be paid extra by the Port. The GST applicable as per law can be billed on the Port Authority, which will be paid to the Contractor by the Board along with the bills, for which the Contractor holds valid GST Registration number and the GST is being collected. The following are also to be considered while claiming payment towards GST:
- i. Invoice in specific format should be provided by the Contractor for every payment.
  - ii. GST Registration Number of Cochin Port Authority and the Contractor is to be clearly mentioned with all the bills.
  - iii. Invoice should be attached along with the running bills.
  - iv. The Contractor shall comply all the GST regulations, viz.; timely uploading of invoices and issue of debit/ credit notes.
- 22.3. Any stipulation by a tenderer that taxes and duties deductible from these bills should be borne by the Port Authority will result in the summary rejection of his /their tender.
- 23 Cess as per Building and other Construction Workers Welfare Cess Act (Act 28 of 1996) at the rate of one percent or at the rates prevailing in force at the time of payment of bills, of the cost of construction should be borne by the Contractor and the same will be deducted from Contractor's bills while making payment or when crediting amount to Contractor's account.
- 24 The Tender Document shall form part of the Contract.

**Sd/-**

**Dy. Chief Engineer**

**COCHIN PORT AUTHORITY**

**FOR AND ON BEHALF OF THE BOARD OF MAJOR PORT  
AUTHORITY FOR COCHIN PORT**

## 2. TENDER FOR WORKS

To

**The Board of  
Major Port Authority  
for Cochin Port  
Through  
The Chief Engineer  
Cochin Port Authority, 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 WORKS TO HARBOUR HOUSE.**
- b) Estimated cost : **Rs.49,94,420/-**
- c) Earnest Money : **Rs.99,890/-**
- d) Security Deposit : 10% of the value of the Contract awarded or value of the work done whichever is higher. (Performance Security @ 5% of contract value payable on award of the work and Retention Money 5% of the gross amount of each bill)
- 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.
- f) Time allowed for commencement of work from the date of receipt of Letter of Acceptance/work order : **3 days**
- g) Time allowed for the work from the date of commencement of work : **30 Days**
- 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 tender and conditions of Contract annexed hereto and in default to execute an agreement with CoPA in the prescribed form within prescribed period, or submission of Performance Security within the prescribed period, agree to forfeit the Earnest Money deposited by me/us, in addition to any other remedy available with Cochin Port against me/us. The sum of Rs..... which will be deposited with Financial Adviser and Chief Accounts Officer of the Port Authority as Performance Security (a) the full value of which is to be absolutely forfeited to CoPA without prejudice to any other rights or remedies of CoPA should I/We fail to commence the work specified in the Contract Data or should I/We make any delay in progress of the work or if the contract is terminated on my/our default. ; 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 General Conditions of Contract.

Dated the ..... day of ..... 2023

**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 the .....day of .....2023.

Dated.....

**Chief Engineer**

**COCHIN PORT AUTHORITY**

### 3. CONTRACT DATA

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

Sl. No.	Description	Reference Clause No. in GCC																
1	<i>The following documents are also part of the Contract</i>																	
	The Schedule of other Contractors	(8.2)																
	The Schedule of Key personnel – As per Tender	(9)																
	<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</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;">or</td> <td></td> <td></td> <td></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	1	2	Rs.15,000/- p.m	or				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	1	2	Rs.15,000/- p.m															
or																		
Diploma Engineer	1	5	Rs.15,000/- p.m															
2	The Employer is:	(1)																
	<b>The Board of Major Port Authority for Cochin Port, COCHIN PORT AUTHORITY, Cochin -9.</b>																	
	Name of Authorized Representative:																	
	Name : <b>Sri. B.Kasiviswanathan, IRSME, Chairperson, Cochin Port Authority, Cochin -9.</b>																	
3	The Engineer is																	
	Name : <b>Smt. E.Remma, Chief Engineer, Cochin Port Authority, Cochin-9.</b>																	
	Name of Nominee/Engineer-in-Charge: Name: <b>Sri. Sathyan.A.G, Dy. Chief Engineer</b>																	

Sl. No.	Description	Reference Clause No. in GCC				
4	<b>Name of Contract- RENOVATION WORKS TO HARBOUR HOUSE.</b> <b>Tender No. T6/T-2001/2023-C</b>	(1)				
5	10 copies of Contract Agreement shall be furnished by the Contractor	(7.1)				
6	Tender document and other data are available at Cochin Port web site, Government of India CPP Portal and e – tendering portal. <a href="http://www.cochinport.gov.in">www.cochinport.gov.in</a> <a href="http://www.eprocure.gov.in">www.eprocure.gov.in</a> <a href="http://www.tenderwizard.com/CPT">www.tenderwizard.com/CPT</a>	(7.2)				
7	The Intended completion date for the whole of the Work is <b>30 days</b> with the following milestones:	(17,28)				
8	<table border="1" data-bbox="313 957 1149 1241"> <thead> <tr> <th data-bbox="313 957 792 1119">Physical works to be completed</th> <th data-bbox="792 957 1149 1119">Period from the date of receipt of LoA to commence and proceed with the work</th> </tr> </thead> <tbody> <tr> <td data-bbox="313 1119 792 1241" style="text-align: center;"><b>30 days</b></td> <td data-bbox="792 1119 1149 1241" style="text-align: center;">3 days</td> </tr> </tbody> </table>	Physical works to be completed	Period from the date of receipt of LoA to commence and proceed with the work	<b>30 days</b>	3 days	
Physical works to be completed	Period from the date of receipt of LoA to commence and proceed with the work					
<b>30 days</b>	3 days					
9	<p>The following shall form part of the Contract Document:</p> <ol style="list-style-type: none"> <li>(1) Agreement</li> <li>(2) Letter of Acceptance</li> <li>(3) Bill of quantities</li> <li>(4) Contractor’s Bid</li> <li>(5) 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 (to be enumerated).</li> <li>(6) Contract Data</li> <li>(7) General Conditions of Contract</li> <li>(8) General Description and Special Conditions of Contract</li> <li>(9) Technical Specifications</li> <li>(10) Drawings if any and</li> </ol>	(2.3)				

Sl. No.	Description	Reference Clause No. in GCC
	(11) Any other documents listed in the Contract Data as forming part of the Contract.	
10	The Contractor shall submit a Program for the Works within 3 days of date of the Letter of Acceptance.	(27)
11	<b>The site possession date</b> The site will be handed over within <b>3 days</b> after issue of LoA, and failure to take over the same within such period shall be attributable to contractor alone.	(21)
12	The start date shall be <b>3 days</b> from the date of receipt of the Letter of Acceptance (LoA) by the Contractor.	(1)
13	The site is located in W/Island.	
14	The Defects Liability Period: <b>One year from the date of completion of the work.</b>	(36)
15	The minimum insurance cover for physical property, injury and death is <b>Rs.10 lakhs (Rupees Ten lakhs)</b> 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: <b>NIL</b>	(44)
17	The period between Programme updates shall be 7 days.	(27)
18	The amount to be withheld for late submission of an updated programme shall be ----- <b>NA</b>	(27)
19	The language of the Contract documents is <b>English.</b>	(3)
20	The law, which applies to the Contract, is the law of Union of India.	(3)
21	The currency of the Contract is <b>Indian Rupees.</b>	(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. - <b>NA</b>	(48)
23	The maximum amount of Liquidated Damages for the whole of the works is <b>10%</b> of the Contract Price.	(49)
24	The amounts of the advance payments :	(51)
	The advance payments as applicable to the contract are: <b>NA</b>	



<b>Sl. No.</b>	<b>Description</b>	<b>Reference Clause No. in GCC</b>
25	Repayment of advance payment for mobilization: <b>NA</b>	(51)
26	Repayment of advance payment for Construction and equipment: <b>NA</b>	(51)
27	Repayment of Secured Advance: <b>NA</b>	(51)
28	The date by which “as-built” drawings are required is within 90 days of issue of certificate of completion of whole or section of the work, as the case may be: <b>NA</b>	(58)
29	The amount to be withheld for failing to supply “as built” drawings and/or operating and maintenance manuals by the date required is ----- <b>NA</b>	(58)
30	Schedule of Rates Applicable: CPWD DSR 2018 + 55% Cost Index x 0.8768 for deducting GST.	
31	Base Rate for materials to be considered for price variation <b>NA</b>	(47)
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)

## . INSTRUCTIONS TO TENDERERS

- 4.1 Electronic Tenders (e-tenders) on percentage basis under “Two Cover system” are invited for **“Renovation works to Harbour House”**.
- 4.2 The tenderer shall submit the tender Cover-A (Hard Copy of EMD & Cost of Tender form) **within 3 (THREE) working days from the Bid Due date**. All the Technical Bid documents & Price Bid shall be submitted **“online”**.
- 4.3 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
- 4.4 The tenderer shall upload the documents indicated in 4.3 (i) & (iii) above and also the Schedule of Quantities(Percentage) [as per Cl.4.3(ii), duly filled in, **“online”**].

### **4.5 SUBMISSION OF TENDERS**

- 4.5.1 The Cover A containing hard copy of EMD & Cost of Tender form as mentioned in Table 3 of Tender Notice shall be submitted **within 3 (THREE) working days from the Bid Due date**.

#### **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.**

4.5.2.5 No changes shall be made in the tender documents. An undertaking that no changes have been made in the Tender document downloaded has to be furnished in Annexure-II

**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.**

**4.6 Minimum Eligibility Criteria: The bidders eligible for participating in the tender may be Individual, Proprietorship, Registered Partnership firms, L.L.P, Company or JV. The proof thereof shall be submitted.**

**a) Experience**

The tenderers should have experience of having successfully completed during the last 7 (seven) years ending **31<sup>st</sup> October, 2023**, at least either:

i) Three Similar Works each costing not less than **Rs.19.98 lakhs**  
(OR)

ii) Two Similar Works each costing not less than **Rs.24.97 lakhs**  
(OR)

iii) One Similar Work costing not less than **Rs.39.96 lakhs**

**b) Financial Turnover**

Average Financial Turnover of the tenderer over the last three financial years ending 31<sup>st</sup> March 2023 [2020- '21, 2021- '22 & 2022- '23] shall not be less than **Rs.14.98 lakhs.**

***Explanatory Notes to a) & b) :***

- i. Similar work(s) means “***Civil Construction work / Civil Repair Works/ Civil Architectural Works***”. 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.
- ii. 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.

- iii. 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.
- iv. 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.

**Table 1**

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

- v. **Financial Turnover:**  
*In proof of Financial Turnover Audited Annual Accounts Statements (Balance Sheet & Profit & Loss Account Statement) & Turnover Certificate signed by the Chartered Accountant or IT returns duly acknowledged by the Income Tax department along with Computation Statement signed by the Chartered Accountant, for the last three years ending on 31<sup>st</sup> march 2023 shall be produced by the tenderer.*

**c) Other Eligibility Considerations**

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, disqualification/ black listing/ debarring by Govt. departments etc.

- d) **The bidders having EPF/ ESI registration certificates only shall be considered for qualification in the tender, if applicable, as per EPF /ESI Acts. In case, the Tenderer does not have the required number of employees which makes such registration mandatory, an Undertaking as per Annexure I to the effect shall be furnished.**

#### **4.7. OPENING AND EVALUATION OF TENDERS**

4.7.1 Technical Bids of the tenders received shall be opened at 15.00 hrs. on **30/11/2023**, the last date fixed for receiving the bid, in the Dy.CE's chamber in the presence of the tenderers or their representatives as may be present.

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 Authority, 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 Authority 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 Authority 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 Authority directly by the issuing bank under registered post with AD. The Contractor shall take the responsibility of sending BGs directly to the Port Authority by the issuing bank.

**SIGNATURE OF TENDERER.**

## **5. GENERAL DESCRIPTION AND SPECIAL CONDITIONS OF CONTRACT**

### **1. SCOPE OF WORK**

1.1 The proposed work is for “**RENOVATION WORKS TO HARBOUR HOUSE**”. The work consists of the following:

- a. Providing PVC Eaves gutter, rain water pipe etc.
- b. Dismantling WC Pan, Bath tub, Wash basins, CP fittings, Wash basin counter, Mirror, PVC pipes, tile work, doors, steel handrail etc.
- c. Providing CPVC pipes, PVC pipes, floor traps etc.
- d. Cement concrete work.
- e. Providing vitrified floor tiles.
- f. Supply and fixing Toilet fittings & fixtures.
- g. Providing wash basin counter, shower round etc.
- h. Providing gypsum board ceiling, cloth type curtain, WPC/SPC Flooring, Modular kitchen work, Crockery units, Crockery shelves, wash basin units, Counter top wash basin, sink mixer, Electric chimney etc.
- i. Wall painting work.
- j. Supplying and fixing wardroobs.
- k. Supplying and fixing veneer door Jack wood doors.
- l. Electrical Works.
- m. Dismantling all light fittings, Electrical switches , sockets, network devices, televisions, telephones etc.
- n. SITC of Wiring circuit/ Submain / point wirings for light/fan/telephone/inverter and other various electrical points.
- o. Supply and fixing of Electrical fittings, DB's , MCB's, Ceiling fan, Exhaust Fan, lights fittings etc. as per requirements.
- p. SITC of AC units with stabilizer etc.
- q. Dismantling of damaged AC units and accessories as required.
- r. Providing end termination of the cables using suitable materials.
- s. Earthing the entire installation.

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 Port.

### **2. WORK SITE**

The work has to be carried out in harbor House (Chairperson's Quarters) of Cochin Port Authority at Willingdon Island. Work site is accessible through road. 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 **30 days**. 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 any 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 Authority. 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 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 Authority. 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 Authority 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 Authority, 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.
- 5.12 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.
- 5.13 The Contractor shall ensure that no labourers with criminal background are engaged for the work.
- 5.14 The contractor shall take all precautions for not to damage any cables, pipelines etc. passing through the area of work.
- 5.15 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.

**5.16 The bidders having EPF/ ESI registration certificates only shall be considered for qualification in the tenderers, if applicable, as per EPF /ESI Acts. In case, the Tenderer does not have the required number of employees which makes such registration mandatory, an Undertaking as per Annexure I to the effect shall be furnished..**

5.17 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.

5.18 The Contractor shall also be responsible for arranging and carrying out works as mentioned in Clauses 1.1 & 1.2 above.

**5.19 Defect Liability period of the work is one year from the date of completion of the work.**

## **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 Authority 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.

- 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 Authority 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, since the actual damage cannot be quantified considering the nature of contract.

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.
19. **Clause 24- Dispute- of GCC shall be modified as below;**
- 24.1 If the Contractor believes that a decision taken by the Engineer or his nominee was either outside the authority given to the Engineer or his nominee by the Contract or that the decision was General Conditions of Contract CC-15 wrongly taken, the decision shall be referred to the Employer within **7 days** of the notification of the Engineer or his nominee's decision.

20. **Clause 59.2(a) –under Clause 59- Termination-- of GCC shall be modified as below;**  
59.2 Fundamental breaches of Contract include, but shall not be limited to the following:
- (a) the Contractor stops work for **7 days** when no stoppage of work is shown on the current Program and the stoppage has not been authorised by the Engineer or his nominee:
  - (b) the Engineer or his nominee instructs the Contractor to delay the progress of the Works and the instruction is not withdrawn within **7 days**.
21. **Measurements of Work Done:**
20. Executive Engineer (hereinafter called the Engineer’s Nominee) shall, except as otherwise provided, as certain and determine by measurement the value in accordance with the Contract of work done.
21. Any disputes and differences between the parties shall be resolved in the Jurisdiction of Courts in Cochin alone.
22. In case of any contradiction between the Clauses in Tender Document and that in GCC, the clauses in the tender document shall prevail.

**SIGNATURE OF TENDERER**

## **6. DETAILED SPECIFICATIONS FOR MATERIALS TO BE USED ON WORK**

### **6.1 GENERAL**

- 6.1.1 Except where otherwise specified or authorized by the Engineer-in-Charge, materials supplied by the contractor shall conform to the latest edition of the Indian Standard Specifications and code of practices published by the Indian Standard Institution. 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.
- 6.1.2 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.
- 6.1.3 The materials required for the work shall be brought to the site and stacked at the places shown by the Engineer-in-Charge and the same shall be got approved for use in work sufficiently advance so that the progress of the work is not affected by the supply of materials.
- 6.1.4 Payment for the materials supplied, shall be given only after they are used on the work.
- 6.1.5 Tolls are payable by the Contractor as per rules for vehicles using the Port's road for supplying the materials.
- 6.1.6 All materials required to complete the work as per given specifications & drawings etc, must be manufactured and supplied using fresh raw materials. Re-moulded, re-circulated materials are not acceptable. The procurement of materials must be made directly from manufacturer or through authorized dealer/ distributors. Documentary evidences to this effect are to be made available to the engineer-in-charge for necessary checks / verification of source of supply of materials. Second hand materials/ partial used materials/ used materials would not be acceptable. The offer should be as per Technical Specification without any deviation. But any deviation felt necessary to improve performance, efficiency and utility of equipment must be mentioned in the Deviation Schedule with reasons duly supported by documentary evidences during pre bid meeting. Such deviations suggested may or may not be accepted by the employer. Any deviations projected after the pre bid meeting shall not be entertained at any cost.

### **6.2 UNPLASTICIZED PVC PIPES (FOR WATER LINE)**

- 6.2.1 All unplasticized PVC pipes shall conform to IS: 4985 and shall be of Class-5 (10kg / cm<sup>2</sup>) for water supply system unless specified otherwise and shall be designated by external diameter.
- 6.2.2 The pipes shall be supplied in random length from 4 to 7m and shall have ISI certification marks.
- 6.2.3 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.

**6.3 PVC FITTINGS (FOR WATER LINE)**

6.3.1 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).

**6.4 PVC PIPE FOR DRAINAGE DISPOSAL**

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

**6.5 AGGREGATES FOR CONCRETE**

6.5.1 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.

6.5.2 The fine aggregate shall be clean, hard, durable, uncoated, dry and free from injurious, soft or flaky pieces and organic or other deleterious substances.

6.5.3 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.

6.5.4 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.

**6.6 CEMENT**

6.6.1 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.

6.6.2 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.

6.6.3 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.

6.6.4 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.

6.6.5 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.

6.6.6 The cement shall be stored in a weather proof building with facilities for inspection.

6.6.7 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

#### 6.7 **WATER**

6.7.1 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.

6.7.2 **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.**

6.7.3 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.

#### 6.8 **ADMIXTURES IN CONCRETE**

6.8.1 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.

#### 6.8.2 **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.

#### 6.8.3 **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.

#### 6.8.4 **Retarding Admixtures**

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

### 6.9 **WATER PROOFING COMPOUND**

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

6.9.2 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.

6.9.3 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.

### 6.10 **VITRIFIED FLOORING / SKIRTING TILES**

6.10.1 Tiles shall be of approved premium quality, Johnson or Khajaria or Asian or Somany or Orient Bell or Nitro or Simpulo or Cera or approved equivalent 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.

6.10.2 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.

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

### 6.11 **GLASS**

The glass to be used on the work shall be of good quality toughened Glass conforming to IS:2553 and free from defects scratches etc. The thickness of glass shall be as specified in the Schedule of quantities.

### 6.12 **WATER THINNABLE CEMENT PRIMER**

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

### **6.13 ACRYLIC EMULSION PAINT EXTERIOR/INTERIOR**

- 6.13.1 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.
- 6.13.2 The Weather Proof Exterior Acrylic Emulsion paint shall be of approved premium quality manufactured by either Asian Paints/ Berger Paints/Nerolac Excel Paints or its equivalent. 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. . The paint shall be brought to the site of work by the Contractor in its original containers in sealed condition. The material shall be brought in at a time in adequate quantities to suffice for the whole work or at least a week’s work. The materials shall be kept in the joint custody of the Contractor and the Engineer-in-Charge. The empty containers shall not be removed from the site of work till the relevant item of the work has been completed and permission obtained from the Engineer-in-Charge.
- 6.13.3 The Contractor shall invariably produce the Test Certificates and Bills with batch number and date, signed by an authorised person of the Manufacturer / Dealer, while seeking final approval of the Engineer-in-Charge for use on the Work.

### **6.14 WHITE CEMENT BASED PUTTY**

White Cement based Putty shall be approved good quality and make (Birla White/ JK/ Asian).

### **6.15 SANITARY/ WATER SUPPLY FIXTURES/ FITTINGS**

Sanitary / Water Supply fixtures/ fittings shall be approved good quality make of Kohler/ Jaguar or equivalent make approved by the Engineer-in Charge.

### **6.16 FIBRE GLASS REINFORCED PLASTIC (FRP) DOOR FRAMES**

- 6.16.1 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./m<sup>2</sup> 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.
- 6.16.2 FRP door shall be manufactured as per specifications laid down in IS 14856, nomenclature of items & direction of Engineer-in-Charge.

### 6.16.3 Tolerance

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

### 6.16.4 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.

### 6.16.5 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.

### 6.16.6 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.

### 6.16.7 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

## 6.17 FIBRE GLASS REINFORCED PLASTIC (F.R.P.) SHUTTERS

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

6.17.2 Blocks of any seasoned hardwood of bulk density not less than 450 kg./m<sup>3</sup> 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.

### **6.17.3 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.

### **6.17.4 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.

### **6.17.5 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.

### **6.17.6 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.

### **6.17.7 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.

### **6.17.8 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.

### **6.17.9 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.

**6.18 MATERIALS NOT SPECIFIED**

6.18.1 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.

**6.19 SAMPLING AND TESTING OF MATERIALS**

6.19.1 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 per sound engineering practice. Material conforming to the specifications and approved by the Engineer-in-Charge shall only be used by the Contractor.

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

**SIGNATURE OF TENDERER**

## **7. DETAILED SPECIFICATIONS FOR ITEMS OF WORKS**

### **7.1 GENERAL**

7.1.1 Except where otherwise specified or authorized by the Engineer-in-Charge, all items of works executed by the contractor shall conform to the latest edition of the Bureau of Indian Standard Specifications and code of practices published by the B.I.S. Where no such specifications or code of practice exists the latest B.S.S. codes of practice or any other equivalent / standard code of practice shall also be considered for adoption. The tenderer while indicating any such specifications shall enclose the full set of the publication so referred and not in extracts. Photostats / 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 specialized work as may be decided by the Engineer-in-Charge which shall be final, conclusive and binding on the contractor.

#### **7.1.2 Electrical**

##### **Standards**

Erection, testing and commissioning of the equipments covered shall be done as per standard codes of practice and shall comply with requirements of following Indian Standards and other relevant standards, Indian Electricity Rules and acts and also to the regulations that are in force at the place of installation.

IS: 1255	:	Code of practice for installation and maintenance of power cables Up to and including 33 kV rating.
IS: 5216	:	Guide for safety procedures and practices in Electrical work
IS: 100118	:	Code of practice for selection, installation and maintenance for Switchgear and control gear-Part-III Installation.
IS: 13408	:	Code of practice for the selection, installation and maintenance of electrical apparatus for use in potentially explosive atmospheres (other than mining application of explosives processing and manufacture).
IS: 3043/87	:	Code of practice for installation & maintenance of earthing of installation.

### **7.2 DISMANTLING/ DEMOLISHING WORKS**

7.2.1 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.



7.2.2 WC Pans, Bath Tub, Wash Basins, CP fittings, Wash basin counter, Mirror, PVC Concealed pipe, floor/ Wall tiles, Doors windows 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.

Existing AC units and Electrical installations such as Lights, electrical switches, sockets etc, Network devices, Televisions, Telephones, existing wires above ceiling shall be removed, as per engineer-in-charge instruction with skilled (electricians) labour. Existing vent pipes shall be sealed.

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.

### **7.3 WATER THINNABLE PRIMER COAT**

7.3.1 Primer coat shall be preferably applied by brushing and not by spraying.

#### **7.3.2 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.

#### **7.3.3 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.

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.

### **7.4 PAINTING-GENERAL**

#### **7.4.1 Commencing Work**

Painting shall not be started until the Engineer-in-Charge has inspected the items to be used, satisfied himself about their proper quality and given his approval to commence the painting work with the approved materials. Painting of external surface shall not be done in adverse weather condition like hail storm and dust storm. Painting, except the priming coat, shall generally be taken in hand after practically finishing all other building works. The rooms should be thoroughly swept out and the entire building cleaned up, at least one day in advance of the Paint work being started.

#### 7.4.2 Preparation of Surface

The surface shall be thoroughly cleaned and dusted off. All rust, dirt, scales, smoke splashes, mortar droppings and grease shall be thoroughly removed before painting is started. The prepared surface shall have received the approval of the Engineer-in-Charge after inspection, before painting is commenced.

#### 7.4.3 Application

7.4.3.1 Before pouring into smaller containers for use, the Paint shall be stirred thoroughly in its containers, when applying also, the Paint shall be continuously stirred in the smaller containers so that its consistency is kept uniform.

7.4.3.2 The painting shall be laid on evenly and smoothly by means of crossing and laying off, the latter in the direction of the grains of wood. The crossing and laying off consists of covering the area over with Paint, brushing the surface hard for the first time over and then brushing alternately in opposite direction, two or three times and then finally brushing lightly in a direction at right angles to the same. In this process, no brush marks shall be left after the laying off is finished. The full process of crossing and laying off will constitute one coat.

7.4.3.3 No left over Paint shall be put back into the stock tins. When not in use, the containers shall be kept properly closed.

7.4.3.4 No hair marks from the brush or clogging of Paint puddles in the corners of panels, angles of mouldings etc. shall be left on the work.

7.4.3.5 In painting doors and windows, the putty round the glass panes must also be painted but care must be taken to see that no Paint stains etc. are left on the glass. Tops of shutters and surfaces in similar hidden locations shall not be left out in painting. However, bottom edge of the shutters where the painting is not practically possible, need not be done nor any deduction on this account will be done but two coats of primer of approved make shall be done on the bottom edge before fixing the shutters.

7.4.3.6 On painting steel work, special care shall be taken while painting over bolts, nuts, rivets overlaps etc.

7.4.3.7 The additional specifications for primer and other coats of Paints shall be as according to the detailed specifications under the respective headings.

#### 7.4.3.8 Brushes and Containers

After work, the brushes shall be completely cleaned of Paint and linseed oil by rinsing with turpentine. A brush in which Paint has dried up is ruined and shall on no account be used for painting work. The containers when not in use, shall be kept closed and free from air so that Paint does not thicken and also shall be kept safe from dust. When the Paint has been used, the containers shall be washed with turpentine and wiped dry with soft clean cloth, so that they are clean, and can be used again.

## 7.5 CEMENT PRIMER COAT

7.5.1 Cement primer coat is used as a base coat on wall finish of cement plaster before Paints are applied on them. The cement primer is composed of a medium and pigment which are resistant to the alkalis present in the cement in wall finish and provides a barrier for the protection of subsequent coats of Paints.

7.5.2 Primer coat shall be preferably applied by brushing and not by spraying. Hurried priming shall be avoided particularly on absorbent surfaces. New plaster patches in old work should also be treated with cement primer before applying Paints etc.

### 7.5.3 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.

### 7.5.4 Application

The cement 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 oil emulsion Paint is applied.

## 7.6 EXTERIOR PAINTING ON WALL

7.6.1 This paint shall be brought to the site of work by the Contractor in its original containers in sealed condition. The material shall be brought in at a time in adequate quantities to suffice for the whole work or at least a fortnight's work. The materials shall be kept in the joint custody of the Contractor and the Engineer-in-Charge. The empty containers shall not be removed from the site of work till the relevant item of work has been completed and permission obtained from the Engineer-in-Charge.

### 7.6.2 Preparation of Surface

For new work, the surface shall be thoroughly cleaned off all mortar dropping, dirt dust, algae, fungus or moth, grease and other foreign matter of brushing and washing, pitting in plaster shall be made good, surface imperfections such as cracks, holes etc. should be repaired using white cement. The prepared surface shall have received the approval of the Engineer-in-Charge after inspection before painting is commenced.

7.6.3 Before pouring into smaller containers for use, the paint shall be stirred thoroughly in its container, when applying also the paint shall be continuously stirred in smaller containers so that its consistency is kept uniform. Dilution ratio of paint with potable water can be altered taking into consideration the nature of surface climate and as per the recommended dilution given by manufacturer. In all cases, the manufacturer's instructions & directions of the Engineer-in-Charge shall be followed meticulously. The lids of paint drums shall be kept tightly closed when

not in use, as by exposure to atmosphere, the paint may thicken and also dust may accumulate.

7.6.4 Paint shall be applied with a brush on the cleaned 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.

7.6.5 The specifications in respect of scaffolding, protective measures, measurements and rate shall be as described under 2.4 above.

## 7.7 WALL PAINTING WITH PREMIUM ACRYLIC INTERIOR EMULSION PAINT

7.7.1 The wall surface shall be prepared as specified in Clause 15.5.2 above.

7.7.2 Application: The number of coats shall be as stipulated in the item. The Paint will be applied in the usual manner with brush, spray or roller. The Paint dries by evaporation of the water content and as soon as the water has evaporated the film gets hard and the next coat can be applied. The time of drying varies from one hour on absorbent surfaces to 2 to 3 hours on non-absorbent surfaces. The thinning of emulsion is to be done with water and not with turpentine. Thinning with water will be particularly required for the under coat which is applied on the absorbent surface. The quantity of water to be added shall be as per manufacturer's instructions. The surface on finishing shall present a flat velvety smooth finish. If necessary more coats will be applied till the surface presents a uniform appearance.

7.7.3 Precautions

(a) Old brushes if they are to be used with emulsion Paints, should be completely dried of turpentine or oil Paints by washing in warm soap water. Brushes should be quickly washed in water immediately after use and kept immersed in water during break periods to prevent the Paint from hardening on the brush.(b) In the preparation of wall for plastic emulsion painting, no oil base putties shall be used in filling cracks, holes etc. (c) Splashes on floors etc. shall be cleaned out without delay as they will be difficult to remove after hardening. (d) Washing of surfaces treated with emulsion Paints shall not be done within 3 to 4 weeks of application.

7.7.4 Measurements

The length and breadth shall be measured correct to a cm. Measurements of the work under this head shall be made on the basis of the area of work done and the rate quoted shall include the cost of labour, materials scaffoldings etc. required for the completion of the work.

## 7.8 WOOD WORK

7.8.1 Workmanship for the woodwork shall be good and conforming to the satisfaction of the Engineer-in-Charge.

7.8.2 Scantlings shall be accurately planed smooth to the full dimensions and rebates, roundings, mouldings etc. as directed by the Engineer-in-charge. Patching or plugging is not allowed.

- 7.8.3 Joints shall be simple, neat, and strong without wedging / filling and pinned with teak/ bamboo pins.
- 7.8.4 All wood works shall be brought to the site and approved by the Engineer-in-Charge before it is polished/ painted. The wood works brought to the site after applying polishing/ 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.
- 7.8.5 Glazing shall be with good quality glass of thickness specified in the schedule.
- 7.8.6 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.

### **7.9 PROVIDING FLOORING WITH VITRIFIED FLOOR TILES**

- 7.9.1 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/m<sup>2</sup> 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/m<sup>2</sup> shall be smeared on top of mortar bed. The joints between the tiles shall be uniform and of minimum thickness.
- 7.9.2 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 epoxy joint filler of suitable colour, and approved make.
- 7.9.3 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.
- 7.9.4 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.

### **7.10 PECAST CEMENT CONCRETE BLOCK MASONRY**

- 7.10.1 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.
- 7.10.2 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.

## **7.11 CEMENT PLASTERING**

- 7.11.1 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.
- 7.11.2 All the corners shall be rounded off to a radius of 25 mm unless otherwise specified.
- 7.11.3 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.
- 7.11.4 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.
- 7.11.5 The surface shall be cured for 7 days.
- 7.11.6 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.

## **7.12 PROVIDING AND LAYING OF PIPES FOR SEWAGE LINE**

- 7.12.1 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.
- 7.12.2 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.
- 7.12.3 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.
- 7.12.4 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.

## **7.13 PROVIDING AND LAYING WATER SUPPLY LINES FOR EXTERNAL WORKS**

### **7.13.1 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.

#### **7.13.2 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.

#### **7.13.3 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)

#### **7.13.4 Transporting**

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

#### **7.13.5 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.

#### **7.13.6 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).

#### **7.13.7 Testing of pipelines for leakage test**

The leakage test shall be conducted at a test pressure of 10 kg./cm<sup>2</sup>. 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 cm<sup>3</sup> / 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/cm<sup>2</sup>.

#### **7.13.8 Fixing of valves and fittings**

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

#### **7.13.9 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.

#### **7.13.10 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.

#### **7.14 PROVIDING AND WATER SUPPLY LINES FOR INTERNAL WORKS**

7.14.1 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.

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

#### **7.14.3 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.

#### **7.15 CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPES**

7.15.1 CPVC pipes & fittings used in hot & cold potable water distribution system shall conform to requirement of IS 15778. The material from which the pipe is produced shall consist of chlorinated polyvinyl chlorides. The polymer from which the pipe compounds are to be manufactured shall have chlorine content not less than 66.5%. The internal and external surfaces of the pipe shall be smooth, clean and free from grooving and other defects. The pipes shall not have any detrimental effect on the composition of the water flowing through it.

7.15.2 Diameter and wall thickness of CPVC pipes are as per given in Table 18.16 of CPWD Specifications.



### 7.15.3 Dimensions of Pipes

The outside diameter, outside diameter at any point and wall thickness shall be as given in Table 18.16.

### 7.15.4 Pipe Ends

The ends of the pipes meant for solvent cementing shall be cleanly cut and shall be reasonably square to the axis of the pipe or may be chamfered at the plain end.

7.15.5 **Visual Appearance** : The colour of the pipes shall be off-white. Slight variations in the appearance of the colour are permitted. The internal and external surface of the pipe shall be smooth, clean and free from grooving and other defects.

### 7.15.6 Marking

Each pipe shall be clearly and indelibly marked in ink/paint or hot embossed on white base at intervals of not more than 3 m. The marking shall show the following:

- (a) Manufacturer's name or trade-mark
- (b) Outside diameter,
- (c) Class of pipe and pressure rating, and
- (d) Batch or lot number

7.15.7 **BIS Certification Marking** : Each pipe may also be marked with the Standard Mark.

7.16 Supplying and fixing modular kitchen units counter (approximately 850mm in height and 600 mm in depth) as per the following specifications: -

- The frame work of the cabinets including drawer fascia/ sides/bottom, shelves etc. shall be made out of 16 mm thick Marine plywood (WuudPly, HD, Century, Green plywood, or approved equivalent make).
- Height of the cabinet 850mm including counter top (Counter top paid separately)
- Shutters shall be made out of 16 mm thick Marine plywood (WuudPly, HD, Centuryply wood, Green or approved equivalent make).. Each shutter shall be fixed to the frame work using two numbers of best quality Auto soft close Hinges (Ebco, Hettich, Hafele, Sleek or approved equivalent make) and provided with one approved quality and profile brush finished Stainless Steel (SS) handle of grade 304 (minimum 150 mm long)
- Each drawer fascia shall be made out of 16 mm thick Marine plywood ((WuudPly, HD, Centuryplywood, Green or approved equivalent make) and approved quality and make SS 304 grade baskets / accessories (Hettich, Ebco, Hafele, Sleek or approved equivalent make) shall be mounted on approved quality, high precision telescopic channels soft close/slides (Ebco, Hettich, Hafele, Sleek or approved equivalent make) to be designed as per drawer size and to meet the weight requirement with minimum length of 500 mm to ensure smooth movements of drawer with /without content weights and provided with approved quality 150mm size SS handles of grade 304.
- There should be a minimum of 1 No. perforated Cutlery basket (4" size), 1 No. cup & saucer basket (6" size), 1 No. 'Thali' basket (8" size), 1 No. three

tier oil/masala 'Pull out', 1 No. 2 tier detergent 'Pull out'(near sink), 1 No. shutters below the sink with bin -All items SS Food Grade ,Brand Hettich, Ebcco,Haeffele,Sleek or equivalent

- All the stainless-steel baskets shall be of maximum size which can be accommodated in the respective space available inside each cabinet for smooth functioning of railing.
- All racks (if any) shall be supported on approved quality Stainless Steel (SS) pins or Glass Studs and shall be adjustable for various height requirements.
- The unit shall be firmly fixed to the walls/slabs/floor using non-corrosive metal screws of appropriate size and rawlplugs.
- All exposed surfaces and internal surfaces of the units shall have machine pressed lamination having thickness 1mm and 0.8mm respectively of approved shade and make (Merino, Greenlam, Virgo or approved equivalent) and pasted with adhesive (Fevicol (HeatX), or approved equivalent) etc.
- The thickness of four edge band lipping for shutters and drawer fascia shall be 2mm thick, thickness of edge lipping of carcass/ plywood partition should be 0.8mm. The lipping/banding shall match with the external laminate shade.
- Payment shall be made on the basis of front elevation area of modular units only. It is clarified that sides, top and bottom surfaces will not be measured for payment (counter top (Jet black Granite in this case) is to be measured separately)

7.17 Modify existing Crockery Shelves to match design using wood beading and glass racks 12mm. (Polishing Paid separately) as per the following specifications: -

- Size (1500x1700x48)
- The Depth of the shelf is to be extended to 480mm using teak wood or equivalent).
- All sliding shutter to be replaced with openable swing shutters
- Shutters shall be made out of 6 mm thick Glass edges beveled with Teak wood frame. Shutters frame width shall be 70mm and thickness shall be 32mm.
- Each shutter shall be fixed to the frame work using two or more numbers of best quality SS Hinges (Ebco, Hettich, Hafele or approved equivalent make) and provided with one approved quality and profile brush finished or antique finish Stainless Steel (SS) handle (minimum 150 mm long).
- Wooden racks inside to be replaced with 10mm front edge polished plain glass supported using glass studs or SS 'D' brackets or SS 'L' brackets or SS 'F' brackets suitable for supporting.
- (Polishing paid separately)

- 7.18 Supply and fixing Crockery Unit size 150x60x210cm-Marine Plywood 16mm with 6mm beveled edge glass doors 4 no with 12mm glass rack (4 racks on each parts)-Bottom with Plywood 16mm laminated doors upto 60cm height: -
- Back panel shall be made out of 16 mm thick (for supporting glass racks) Marine plywood (WuudPly,HD,Centuryplywood,Green or approved equivalent make)
  - Side,Top,Bottom panel shall be made out of 16 mm thick Marine plywood (WuudPly,HD,Centuryplywood,Green or approved equivalent make)
  - Shutters shall be made out of 6 mm thick Glass edges beveled with Teak wood frame. Shutters frame width shall be 70mm and thickness shall be 32mm.
  - Each shutter shall be fixed to the frame work using two or more numbers of best quality SS Hinges (Ebco, Hettich, Hafele or approved equivalent make) and provided with one approved quality and profile brush finished or antique finish Stainless Steel (SS) handle (minimum 150 mm long).
  - Glass racks with 10mm front edge polished plain glass supported using glass studs or SS ‘D’ brackets or SS ‘L’ brackets or SS ‘F’ brackets suitable for supporting.
  - All exposed surfaces and internal surfaces of the units shall have teak wood veneer having thickness 3mm respectively of approved shade and make (Merino, Greenlam, or approved equivalent) and pasted with adhesive (Fevicol (HeatX), or approved equivalent) etc
  - (Polishing paid separately).

## **7.19 TECHNICAL SPECIFICATION – ELECTRICAL**

### **7.19.1 TECHNICAL SPECIFICATION- SUPPLY OF MATERIALS**

All materials required to complete the work as per given specifications & drawings etc, must be manufactured and supplied using fresh raw materials. Re-moulded, re-circulated materials are not acceptable. The procurement of materials must be made directly from manufacturer or through authorized dealer/distributors. Documentary evidences to this effect are to be made available to the engineer-in-charge for necessary checks / verification of source of supply of materials. Second hand materials/ partial used materials/ used materials would not be acceptable. The offer should be as per Technical Specification without any deviation. But any deviation felt necessary to improve performance, efficiency and utility of equipment must be mentioned in the Deviation Schedule with reasons duly supported by documentary evidences during pre bid meeting. Such deviations suggested may or may not be accepted by the employer. Any deviations projected after the pre bid meeting shall not be entertained at any cost. All the items shall be as per the approved make list attached and prior sanction to be taken before the supply.

#### **7.19.1.1 SUB DISTRIBUTION BOARDS**

The double door DBs are to be suitable for flush/surface mounting, with double doors and to be provided with inbuilt additional compartment for looping of loose wires/adaptor boxes for entry of armoured cables with ip 42 category of protection and conform to is: 8623-1 & 3 , iec 61439-1&3. The exact location of DB shall be finalized in consultation with the engineer-in-charge.

#### Material

The DB's are to be fabricated out of 14 SWG CRCA sheet / IK08 for double door suitable for all weather operation. E current carrying parts are to be made of electrolytic grade copper and are to be rated for the duly intended. Powder coated ensuring rust prevention and scratch resistant. DBs shall be painted epoxy gray.

#### Accessories

Following accessories are to be provided:-

- a) copper bus bars of rated current capacity per phase.
- b) special brass terminals to ensure perfect connections of incoming cable with the bus bars, colour coded interconnecting wire set.
- c) earth bars for firm earthing and for facilitating individual earthings for each outgoing terminal, door earthing etc. Specified capacity neutral link bus bars shall be provided.
- d) suitable gaskets to ensure weather proof conditions
- e) sufficient number of blanking plates.
- f) All MCB not specified otherwise shall be c curve with 10ka or above as per required breaking capacity.

The item, shall be of powder coated CRCA sheet steel double door distribution board, IK 08 etc. and neutral link with all accessories as per annexure.

### 7.19.1.2 MV Cables

#### Scope

This specification provides for manufacture and delivery of 1.1 KV grade PVC insulated cables as required.

#### Application

The 1.1 KV cable is intended for use on Distribution net work, lightings purpose etc. for outdoor application.

#### Codes & standards

All standards, specifications and codes of practice referred to herein shall be the latest editions including all applicable official amendments and revisions as on date of opening of bid. In case of conflict between this specification and those (IS: codes, standards, etc.) referred to herein, the former shall prevail. All the cables shall conform to the latest requirements of the relevant IS standards and codes for 1.1KV grades applicable .

#### Technical particulars of MV cables

i	Size of Cable	:	As per schedule of works
ii	Voltage Rating	:	1100 V
iii	Conductor Material	:	Plain Aluminium /copper as per specification.
iv	Insulation	:	i. Type Type A PVC Compound ii. Tolerance 0.1 mm + 0.1 nominal
v	Inner sheath thickness	:	As per IS
vi	Outer sheath	:	
	Process of application	:	Extrusion
	Thickness	:	As per IS.

### Technical requirements

The cables shall be suitable for laying on racks, in ducts, trenches, conduits and underground (buried) installation with chances of flooding by water. Cables shall be flame retardant and designed to withstand all mechanical, electrical and thermal stresses developed under steady state and transient operating conditions as specified elsewhere in this specification. XLPE insulation shall be suitable for continuous conductor temperature of 90°C and short circuit conductor temperature of 250°C. The aluminium used for armouring shall be of H4 grade as per IS: 8130 with maximum resistivity of 0.028264 ohm-sq.mm / mtr at 20 deg. C. The gap between armour wires / formed wires shall not exceed one armour wire / formed wire space and there shall be no cross over / over-riding of armour wires / formed wires. The minimum area of coverage of armoring shall be 90%. The breaking load of armour joint shall not be less than 95% of that of armour wire / formed wire. Zinc rich paint shall be applied on armour joint surface of GS wires / formed wires. Outer sheath shall be of PVC black in colour. In addition to meeting all the requirements of Indian standards referred to, outer sheath of all the cables shall have the following FRLS properties:

- (i) Oxygen index of min. 29 (Test method as per IS 10810 Part-58)
- (ii) Acid gas emission of max. 20% as per IEC – 754(Part-I)
- (iii) Smoke density rating shall not be more than 60% during Smoke Density Test as per ASTM D-2843.

Cores of cables shall be identified by colouring of insulation or by providing coloured tapes helically over the cores, with Red, Yellow, Blue & black colours. In addition to manufacturer's identification on cables as per IS, following marking shall also be provided over outer sheath:

#### 7.19.1.3 CONDUITS, PIPES AND ACCESSORIES.

All non-metallic conduit pipes and accessories shall be of suitable material complying with is:2509-1973 and is:3419-1989 for rigid conduits and is:9537 (part 5) 2000 for flexible conduits. the interior of the conduits shall be free

from obstructions. the rigid conduit pipes shall be isi marked. the conduits shall be circular in cross-section. the conduits shall be designated by their nominal outside diameter. no non-metallic conduit less than 20 mm in diameter shall be used. voltage rating for cu wire shall be 650/1100v frls pvc insulated. the conduit wiring system shall be complete in all respect including accessories. rigid conduit accessories shall be normally of grip type. flexible conduit accessories shall be of threaded type. bends, couplers etc shall be solid type in recessed type of works, and may be solid or inspection type as required, in surface type of works. saddles for fixing conduits shall be heavy gauge non-metallic type with base.

## 7.19.2 TECHNICAL SPECIFICATION FOR INSTALLATION OF EQUIPMENTS

### **Scope**

This specification covers the engineering requirements for erection/installation, testing, laying of cables and commissioning of equipment/items and its associated works.

### **Standards**

Erection, testing and commissioning of the equipments covered shall be done as per standard codes of practice and shall comply with requirements of following Indian Standards and other relevant standards, Indian Electricity Rules and acts and also to the regulations that are in force at the place of installation.

IS: 1255	:	Code of practice for installation and maintenance of power cables Up to and including 33 kV rating.
IS: 5216	:	Guide for safety procedures and practices in Electrical work
IS: 100118	:	Code of practice for selection, installation and maintenance for Switchgear and control gear-Part-III Installation.
IS: 13408	:	Code of practice for the selection, installation and maintenance of electrical apparatus for use in potentially explosive atmospheres (other than mining application of explosives processing and manufacture).
IS: 3043/87	:	Code of practice for installation & maintenance of earthing of installation

### **Reference**

Following documents shall be read in conjunction with this specification:

- i. Scope of work and special requirements
- ii. Schedule of items of work

- iii. Engineering Specification and Data sheet of General requirements of Electrical system

7.19.2.1 **GENERAL CONDITIONS FOR INSTALLATION OF EQUIPMENTS**

- a) The erection/installation, testing and commissioning shall be carried out in accordance with specification, data sheets, drawings, manufacturer's recommendations, and relevant standards or as directed by owner/Engineer-In-Charge. Requirements regarding erection/installation, testing and commissioning of switchboards, cables, etc, are generally explained here in. It is the responsibility of the contractor to supply all equipment, items, accessories, materials, tools, tackles, transporting, and lifting vehicles, consumables etc. required for unpacking, checking, transportation, storage, safe custody, installation, erection, testing, commissioning, return of unused equipment/items which are supplied from owner's stores and handing over of the installation to the entire satisfaction of owner.
- b) The erection scope shall include supply of all hardware and accessories such as bolts, nuts, washers, gaskets, cable termination accessories, lugs, paint, primer, sand, etc. required for completeness of the work. All consumable materials such as insulation, tape, cleaning and paint brushes, welding electrodes, rust preventive materials, jute, cotton waste, hack saw blades, bolts, nuts, inhibitive grease, fuel, lubricants, etc. and any other material required in carrying out the work, but not for incorporation in to the permanent work, shall also be included in the scope of contractor.
- c) The equipment/items to be erected shall be handled with care by experienced workers under the guidance of the competent supervisor. Proper handling and transporting equipments are to be used and dragging is to be avoided.
- d) The equipment/items supplied by the owner, shall normally be kept at their stores. The contractor shall inspect these items at the stores by unpacking the containers, if necessary. Responsibility of safe custody of materials after delivery and till handing over shall rest with the contractor. Unused materials and containers shall be returned to the stores. The items supplied by the owner shall be transported from the point of storage to the point of erection/ installation using proper capacity transporting vehicles. The scope shall include unpacking the containers, assembling parts, fixing loose items, components, etc. Materials supplied by the contractor or issued by the owner shall be given suitable protection against weather, dust and vermin. In storage places, equipments shall be placed over wooden sleepers to keep them above ground. Before carrying out erection/installation works of any item, proper care regarding leveling, alignment, access to working parts, facilities for removing the items for repair, statutory clearance, etc. shall be taken.
- e) Foundation bolts, nuts, lock nuts, washers, etc. will normally be supplied by the equipment supplier. Any further requirement of these items shall be

under the scope of contractor. The equipment shall be installed on the foundation bolts firmly such that there will not be any vibration during operations. For mounting of equipment/items on the walls/ columns / supports, suitable MS/GI brackets shall be fixed/ grouted.

- f) Electrical connections shall be done with great care using spring washers, bimetallic strips, conducting grease, etc. wherever required, to ensure good contact without creating undue stresses. Copper bus bar joints shall be made after tinning the contact area. Supply of all required accessories or electrical connections shall be included in the contractor's scope. Discrepancies if any found between drawings/ statutory requirements and actual conditions at the site, shall be immediately brought to the attention of owner's representative. If any modification is found required in the writing or to suit site condition the same shall be carried out as per the instruction of the Engineer-In-Charge without any extra cost.
- g) All equipments under erection shall be kept properly cleaned and free of dust, vermin, moisture, etc. After erection, it shall be ensure that non-foreign materials, tools or tackles are left in the equipment. All unused cable entries, cutouts, etc. shall be sealed properly. For hazardous area, blanking plugs suitable for the area classification applicable shall be used.
- h) All tests shall be carried out in the presence of owner's representative and test shall be recorded on an approved proforma duly certified. The records of all tests shall be submitted to the purchaser's representatives. All interconnected wiring shall be checked thoroughly for correct connection with the wiring and schematic drawings of the manufacturer and the drawings supplied by owner before energizing.
- i) All power and bus bar connection shall also be thoroughly inspected and checked for connections, foreign materials, tightness, etc. before energizing the equipment All components within the main equipment shall be tested for proper performance and correct operation before commissioning the equipment.
- j) All labeling shall be checked for correctness. All nuts, bolts, clamps, joints, connections, etc. shall be checked for tightness and tightened wherever required. All moving parts shall be checked for its correct movement and proper lubrication. Apply lubrication wherever required. All equipment containing liquid shall be checked for correct quantity filling and all gaskets, walls, etc, shall be checked for leak proof. Oil filling, if found required, shall be done with dry and clean oil. Gaskets shall be replaced if found required. It shall be ensured that all CT leads are loaded or shorted prior to testing and commissioning. Insulation tests shall be carried on all electrical devices, whether specifically mentioned or not, as per this work after properly cleaning these devices.
- k) All the relays and its settings after commissioning shall be furnished to the owner detailing relay type number, panel number etc. In case of any



component of an equipment supplied by the owner is found to faulty/unsuitable, the same shall be replaced by the new one issued by owner. For all relays before installation, the rating, range and auxiliary supply voltages for the relay should be checked against drawings/ schematic/ schedule.

#### 7.19.2.2 **CIVIL AND STRUCTURAL WORKS**

- a) Miscellaneous civil works associated with the erection/ installation such as excavation, dewatering and refilling of earth work for earth pits and cable trench, chipping, grouting, small cutting, etc, on floors/ walls/ columns/ structures and bringing back the same to original finish, grouting of supports, providing suitable fixing arrangements for cables, push button stations, DBs etc. shall be included in the rates quoted for erection of the respective items, unless specifically excluded in the "Schedule of Items of Work". All structural works associated with cabling, earthing, equipment erection and supporting arrangements shall be included in the scope of the contractor. All the welding and cutting works shall be carried out by certified welders. Painting shall be done on all MS materials provided, by the contractor such as base channels, frames, supports, pedestals, cable trays/racks/risers, enclosures, boxes, conduits, chequered plates, etc. Before painting, the surface should be thoroughly scraped and cleaned to remove dust, grease, plaster or any other foreign materials. It is the responsibility of the contractor to supply and install all the required materials for painting including paint. Cement concrete footing shall be provided for cable trays/racks/risers, pedestals, supports, etc. Footing shall be provided using 1:2:4 PCC with 20mm broken stone. It is responsibility of the contractor to supply and install all materials such as river sand, reinforcement rods, 20mm broken stone, etc. without any extra cost to owner. All concrete works and grouting shall be cured for a minimum period of 48 hours.
- b) Chipping, grouting, etc as recommended shall be done for completion and installation work on the finished floor, wall, roof, etc. and the surfaces has to made good after the work. It is the responsibility of the contractor to supply all necessary materials and to bring the disturbed surface to the original finish. Touch painting of scratches found on equipment, other painted metallic surfaces, galvanized, etc. associated with this work is also included in the scope of contractor without any extra cost. Base steel structures shall be painted with 2 coats of epoxy primer and 2 coats of epoxy paint.

#### 7.19.2.3 **STANDARD REQUIREMENTS FOR TESTING AND COMMISSIONING**

- a) The standard requirements for testing and commissioning are furnished below.

- b) All tests shall be carried out in the presence of Owner's representative and tests shall be recorded on an approved format duly certified. The records of all tests shall be submitted to the purchaser's representative.
- c) All interconnected wiring shall be checked thoroughly for correct connections with the wiring and schematic drawings of the manufacturer before energizing. All Power and bus bar connections shall also be thoroughly inspected and checked for correctness, foreign materials, tightness, etc. before energizing the equipment.
- d) All components within the main equipment shall be tested for proper performance and correct operation before commissioning the equipment. All labeling and nameplates shall be checked for correctness. All nuts, bolts, clamps, joints, connections, etc shall be checked for tightness and tightened wherever required. All moving parts shall be checked for its correct movement and proper lubrication. Apply lubrication wherever required. All equipment containing liquid shall be checked for correct quantity filling and all gaskets, valves, etc., shall be checked for leakproofness. Oil filling if found required shall be done with dry and clean oil. Gaskets shall be replaced if found required. The condition of the oil shall be tested in accordance with IS-335.

7.19.2.4 **GENERAL SPECIFICATIONS FOR WIRING AND ELECTRICAL INSTALLATIONS**

All the switches, plugs etc. shall be of modular type with plates, cover etc. complete. All cables shall be Fire Retardant Less smoke ,Halogen (FRLSH) PVC insulated copper conductor multi stranded cable. Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm Fire Retardant PVC insulated copper conductor multi stranded cable in surface / concealed medium class PVC conduit, with Modular type switch, modular plates, suitable size M.S. box and earthing the point with 1.5 sq.mm. FRLS PVC insulated multi stranded core cable etc as required All inter connections shall be provided as follows:

- A. The outgoing of 6 A & 10A MCBs shall be connected to the light/ fan/ plug points with 1.5 Sq mm copper cable.
- B. The outgoing of 16/20 A & 20A MCB's shall be connected to power plug points with 4/2.5 Sqmm copper cable. The other interconnections with TPN isolator shall also be carried out with suitable size of copper cables.
- C. Point wiring shall include all works necessary for complete wiring of a switch circuit of any length from the tapping point on the distribution circuit to the following through the switch.
  - a. Ceiling rose or connector (in the case of ceiling/exhaust fan point).
  - b. Ceiling rose (in the case of pendant except stiff pendant point).
  - c. Back plate (in the case of stiff pendants and fittings with down rods)
  - d. Socket and Outlets (in the case of socket outlets points)

- e. Lamp Holder (in the case of wall brackets, batten points, bulk head and similar fittings).
- D. The following shall be deemed to be included in the point wiring.
  - a. Modular Switch, plates, cover, Ceiling rose or connector etc as required.
  - b. Any special and suitable M. S. box for neatly housing the connector and covering the fan hook in case of fan point.
  - c. Earth wire from the distribution boards to all current carrying apparatus through switch boards, M. S. Boxes etc.
  - d. All metal blocks, boards, covers and M. S. Boxes, recessed or surface mounted including those required for mounting fan regulators but excluding those for fixing the distribution switch boards.
  - e. All fixing accessories such as clips, nails, screws, phil plug, rawl plug etc. as required.
  - f. Connection to ceiling rose, connector socket outlets, Lamp holders, switch, fan regulator etc.
  - g. Looping in the same switch board and inter connections between points on the same circuit.
- E. All points in the distribution system shall be measured under point wiring irrespective of length of circuit from the respective switches to the ceiling rose/connector etc.
- F. In the case of plug points the point length shall be measured from the DB to individual plug socket.
- G. In case of point with more than one light point controlled by the same switch, the complete items shall be considered as separate point and the rate shall be quoted accordingly.
- H. A light point controlled by 2 Nos. of control switches shall be measured as one point from the switch to either side of the appliance viz. total of two points.
- I. Power wiring shall be kept separate and distinct from lighting and fan wiring. All conductors shall run as far as possible along the walls and ceiling so as to be easily accessible and capable of being thoroughly inspected except for concealed system. In all types of wiring due consideration shall be given for neatness, good appearance and safety. The balancing of circuits in 3 wires on poly phase installation shall be arranged to the satisfaction of Engineer-in-charge. In large/important rooms light fans and socket outlet points shall be distributed over more than one circuit as directed by the Engineer-in-charge.
- J. The Conductor of flexible cable for interconnecting the fan/lights to the respective points shall be of copper. The minimum permissible size of conductor for flexible cable shall be 16/0.2 mm. Only three core flexible cables shall be used for connecting single phase appliances.

- L. The Control switches are to be connected to phase conductor. The complete wiring shall be done as per IE rules & regulations. In the case where the wiring is done as per phenolic laminated sheet/ hylum, the switchboards for mounting switches, plug sockets, etc shall be made of M S boxes, with hylum top cover and piano switches of 6 A capacity and suitable colour. Switch boxes shall be mounted flush with the wall. All outlets such as switches, sockets etc shall be flush mounting type.
- M. All Civil works connected with this contract like plastering, grouting, making holes for providing fans, making good any damages caused etc shall be done by the contractor. The wall/ ceiling etc shall be re plastered by providing original surface coating using putty, paints etc as required. No additional cost shall be given for repairing/resurfacing the wall, ceilings etc.
- N. The plug sockets shall be earthed continuously using separate multi stranded Cu wire (green). The light fittings and ceiling roses shall be fixed on junction boxes/ fixed on the false ceiling. All light fittings and fans shall be connected to the ceiling roses using twin core PVC insulated and overall sheathed flexible copper conductor cable
- O. All internal wiring shall be securely supported, neatly arranged readily accessible and connected to equipment terminals and terminal blocks. Wire terminations shall be made with solder less crimping type of tinned copper lugs which firmly grip the conductor and insulation. Insulated sleeves shall be provided at all the wire terminations. Engraved core identification plastic ferrules marked to correspond with the wiring diagram shall be fitted at both ends of each wire. Ferrules shall fit tightly on the wires and shall not fall off when the wire is disconnected from terminal blocks. All wires directly connected to trip circuit breaker shall be distinguished by the addition of a red coloured unlettered ferrule.

#### 7.19.2.5 **PROVIDING PLATE EARTHING**

Plate earthing shall be provided as per IS 3043/1987 using CU plates of size 600MMx600MMx3MM. The plate earth pits shall be interconnected with 40 mm x 6 mm hot dipped GI strip. Earth pit shall be provided with earth chamber and covered with concrete slab of sufficient size and quantity. Identification of earth electrodes connected to equipments shall be done properly. The earth pits shall be cleaned, covered and named. Metallic parts of all the equipments including fencing shall be earthed by 2 separate and distinct connections with earth. Earthing system shall be mechanically strong to retain electrical continuity during the life of installation.

The size & material of earthing conductor and nos. of earth pits are worked out after arriving the fault level of installation by the contractor .The CoPT shall provide available technical inputs to the contractor. If the data provided by the employer is insufficient, the contractor shall collect the same from the local CEI

dept., as per requirements. If any changes required by CEA/CEI etc the same is within scope of contractor. The contractor shall be responsible to prepare shop drawings for routes of complete system along with necessary calculations before execution for approvals along with location of pits as per site condition. The drawings given by employer are indicative and it shall be contractor's responsibility to achieve the necessary values for earthing. Contractor shall also incorporate necessary requirements as per local codes / approving authorities.

#### 7.19.2.6 **PIPE EARTHING FOR LT ELECTRICAL EQUIPMENTS**

GI pipe 40 mm dia, B class, shall be used for pipe earthing light poles including supply of CU wire for connection to equipments.

- a) The length of the GI pipe shall be min. 4 feet length.
- b) The diameter of the pipe shall be min. 40 mm.
- c) The GI pipe shall be of class B type.
- d) No brick work chamber and its cover is required.
- e) The earth pipes shall be connected to equipments with 10SWG bare copper

#### 7.19.2.7 **LAYING MV CABLES**

The termination of the cable in the terminal box shall be done with thermoplastic compression cable gland with copper socket /lugs of proper size. The cable shall be laid through the ground at a depth of 40 cm from the ground level and filled with loose excavated good soil/earth without brick protection after cable laying. In case laying of cables through ground is not possible, the cable shall be clamped along the wall. The cable shall be laid nearer to the cable trenches for LT power cables wherever possible. For drain / road crossing, the cable shall be laid through HDPE/GI pipe where ever possible, in open area and trench. The payment tiles etc. removed for laying the cables shall be replaced properly to the original condition .

HDPE/GI pipe shall be laid at a depth of 60cm from the ground level for laying the LT/ signal cables at road crossing/hard surfaces/along the bridge etc as per schedule . After taking the trench and laying the pipe in loose/ hard surface, the trench area shall be filled with excavated loose soil and top surface shall be neatly cleared. The HDPE pipe shall be made from high-density polyethylene (HDPE) resins (ISI) meeting the following requirements:

The HDPE material supplied under this specification shall be high density, high molecular weight conforming to relevant IEC/BIS. The HDPE material shall conform to ASTM D 3350/ IS 14930. Suitable size PVC flexible pipe with collar shall be provided for the end portion of HDPE pipe. LT Cables shall be laid for giving power supply to the bridge/street lights and laying the cable through conduits, HDPE /GI pipes, by clamping at min. 2 feet interval with Aluminum strips and SS screws etc. as per schedule.

#### 7.19.2.8 **PROVIDING END TERMINATION OF LT CABLES**

Supply and making of end terminations with brass/ pvc glands, lugs etc complete suitable for cables as per schedule of work. the item shall be single compression type tinned/nickel plated (coating thickness not less than 20 microns in case of tin and 10 to 15 microns in case of nickel) brass cable/pvc glands shall be provided by the contractor for all power and control cables to provide dust and weather proof terminations. they shall comprise of heavy duty brass casting, machine finished and tinned to avoid corrosion and oxidation. rubber components used in cable gland shall be neoprene and of tested quality. required number of packing glands to close unused openings in gland plates shall also be provided. for copper cable the termination materials shall be copper materials.

**7.19.2.9 SPECIAL CONDITIONS FOR ELECTRICAL WORKS.**

- a) All current carrying component in all installation shall be of appropriate rating of voltage and frequency as required at respective areas.
- b) All equipments to be supplied and works to be executed shall conform to the CEA/IS/IEC standards including protection and metering accessories. No extra amount will be paid in this regard.
- c) All testing and calibration etc are to be carried out as per requirement of statutory authority concerned.

On completion of work the contractor has to submit necessary completion statement/ drawing, equipment details etc. before energisation.

<b><u>APPROVED MAKES</u></b>		
1	1.1 KV XLPE CABLE	CCI / INCAB/ UNIVERSAL/ RPG/ NICCO/ TORRENT / POLYCAB / PARAMOUNT/ KEI / HAVELLS / FINOLEX / V-GUARD/ L&T / PRIMECAB / RR KABEL / GLOSTER
2	CABLE TERMINATION KIT	RAYCHEM /MAHINDRA / DENSON/3M/CCI / CABSEAL
3	TOD ENERGY METER	L&T/ ENERCON
4	ENERGY METER / AMMETER / VOLTMETER	SIMCO / MECO/ L&T/ HPL/ AE / RISHAB / SCHNEIDER / SECURE /SOCOMECE / CONZERVE /SIEMENS/ABB/C&S
5	RELAYS	ABB/ L&T/ SIEMENS / RISHAB / GE /SCHNEIDER / ALSTOM / EASUN REYROLLE / C&S
6	CURRENT / POTENTIAL TRANSFORMER	INTRANS/ KAPPA/ INDUS/ CG/ CYRO/ABB/BHEL/CG/ MEGAWIN/TRANSDELTA / KEL
7	MCCB / MCB / CONTACTOR / TIMER	LEGRAND / MERLIN GERIN / MK / ABB/ INDOASIAN / L &T / SIEMENS /SCHNEIDER / HPL
8	LT ACB	LEGRAND / ABB/ L &T /SIEMENS /SCHNEIDER
9	INDUSTRIAL PLUG WITH MCB	ABB / HAGER / HAVELLS / INDOASIAN / CROMPTON / LEGRAND / SCHNEIDER / L& T / HPL
10	PLUG SOCKETS -IP66	MENNEKES / HENSEL / MERLIN GERIN / L&T / ABB / WALTHER / CAPE

11	STREET LIGHT POLE / HIGHMAST	BAJAJ / VALMONT / ASTER / CG / PHILIPS / K LITE / UNIQUE POLES/UTKARSH
12	LED street / flood light fittings	OSRAM / BAJAJ/ CG/ PHILIPS / WIPRO/ GE
13	LED light fittings	OSRAM / BAJAJ/ CG/ PHILIPS / WIPRO/ GE /POLYCAB / Lighting Technologies
14	BATTERY	EXIDE / AMARON / PRESTOLITE / AMCO / STANDARD FURUKAWA
15	BATTERY CHARGER	WAVES ELECTRONICS / DUBAS / AMAR RAJA / TATA LIEBERT / NUMERIC /SAFE POWER /APC / GE / DELTA / ELNIX / DB POWER
16	PVC CONDUIT PIPES / CASING & CAPPING	BALCO/ ATUL/ GEO/ CLIPSAL/ PRECISION/ AVONPLAST/ KONSEAL
17	HDPE PIPE/ FLEXIBLE HOSE	KONDOOR or any other make with BIS
18	WIRING CABLE	FINOLEX/ QFLEX/ RR KABEL/ RPG CABLES/ LAPP KABEL/ V-GUARD/ HAVELLS/ L&T/ RALLISON
19	INSTRUMENTATION / TELEPHONE CABLES	TRACO / HINDUSTAN CABLES / DELTON / FINOLEX / USHA BELTRON / PRIMECAB / VIDYA
20	MODULAR SWITCHES/ PLUG SOCKETS/ CEILING ROSE	ANCHOR/ MK/ LEADER / CRABTREE/SIEMENS/ FINOLEX/LEGRAND/ABB / INDOASIAN
21	MV PANEL / DISTRIBUTION BOARD	ABB/ INTRANS/ MEGAWIN/HESSEL/ WAVES/POWER CONTORLS / ABB /L&T/ SIEMENS/SCHNEIDER /HENSEL/MENNEKAS/HAGGER/ IMPERIAL
30	CEILING/ WALL MOUNTED / EXHAUST FAN	CROMPTON / BAJAJ / USHA / KHAITAN / HAVELLS / ORIENT / ALMONARD
31	UPS	DB POWER/ TATA LIEBERT / NUMERIC/ SAFE POWER/ APC/ GE / DELTA/ SOCOMEC / VGUARD / EMERSON
32	AIR-CONDITIONER	VOLTAS / BLUE STAR / CARRIER / LG / HITACHI / DAIKIN
33	DIESEL ENGINE	CUMMINS / ASOK LEYLAND / GREAVES COTTON / CATTER PILLAR / MITSUBISHI/ VOLVO / KIRLOSKAR / MAHINDRA
34	ALTERNATOR	CROMPTON GREAVES / STAMFORD / LEROYSOMER / KIRLOSKAR / KEL / BHEL
35	FRP CABLE TRAY	PUSTRON/ SUMIP/ ERCON OR FIRM HAVING ISO AND CERTIFICATES AS PER THE TENDER SPECIFICATION .
36	GI CABLE TRAY	PUSTRON/ SUMIP/ ERCON/L&T OR REPUTED MAKE WITH ISO CERTIFICATION.

**SIGNATURE OF TENDERER**

**COCHIN PORT AUTHORITY**

**RENOVATION WORKS TO HARBOUR HOUSE**

**UNDERTAKING REGARDING EPF AND ESI REGISTRATION**

I/ We, M/s..... (Name & Address of the tenderer) solemnly affirm and undertake that I/ We do not have the required number of employees for taking registration under EPF Organisation and ESI Corporation. I/ We also undertake that I/ We take the full responsibility for all the consequences arising due to the above and shall indemnify CoPA officials for any actions taken in this regard

**SIGNATURE OF TENDERER**



PROFORMA OF UNDERTAKING THAT NO CHANGES HAVE BEEN MADE IN  
THE TENDER DOCUMENT DOWNLOADED

I/We.....  
.....  
.....do hereby confirm that no changes have been made in the Tender  
document downloaded and submitted by us for the Tender No .....

Yours faithfully,

Signature :

Name & Designation :

FORMAT OF DECLARATION IN-LIEU OF EMD

(To be submitted on the Bidder's Letter Head)

I/We .....(Insert Name and Address of Bidder) am/are submitting this declaration in lieu of Earnest Money Deposit for the Tender for .....  
.....(Insert Title of the Tender) (Tender No.....), thereby fully accepting that I/We will be suspended and shall not be eligible to participate in the Tenders invited by Cochin Port, for a period of Two years from the date of such Suspension Orders, under the following circumstances:-

- a) If after the award of work, I/We fail to furnish the required Performance Security/ Security Deposit or sign the Contract, within the time limits specified in the Tender Document.

Signature of the Tenderer with seal