



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

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**TENDER DOCUMENT FOR CIVIL RENOVATION WORKS, PROVIDING
NEW ELECTRICAL FACILITIES & REWIRING AT WHARF
SUPERINTENDANT OFFICE BUILDING AT ERNAKULAM WHARF.**

TECHNICAL BID (e-Tendering Mode)

Website:www.tenderwizard.com/CPT

CHIEF ENGINEER'S OFFICE

COCHIN PORT AUTHORITY

COCHIN-682009

TENDER No.T6/T-2100/2026-C

Rs.1,180/- (Rs.1,000.00 + 18% GST)

COCHIN PORT AUTHORITY

TENDER FOR “CIVIL RENOVATION WORKS, PROVIDING NEW ELECTRICAL FACILITIES & REWIRING AT WHARF SUPERINTENDANT OFFICE BUILDING AT ERNAKULAM WHARF”.

(Tender No.T6/T-2100/2026-C)

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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

Tender No. T6/T-2100/2026-C

Date :16/07/2026

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 **“CIVIL RENOVATION WORKS, PROVIDING NEW ELECTRICAL FACILITIES & REWIRING AT WHARF SUPERINTENDANT OFFICE BUILDING AT ERNAKULAM WHARF”**.

1. Minimum Eligibility Criteria:

a) Experience

The tenderers should have experience of having successfully completed during the last 7 (seven) years ending **30th JUNE, 2026**, at least either:

- i. Three Similar Works each costing not less than **Rs.18.98 lakhs**
(OR)
- ii. Two Similar Works each costing not less than **Rs. 23.73 lakhs**
(OR)
- iii. One Similar Work costing not less than **Rs. 37.97 lakhs**

b) Financial Turnover

Average Financial Turnover of the tenderer over the last three financial years ending 31st March 2025[2022-'23, 2023-'24 &2024-'25] shall not be less than **Rs.14.24 lakhs**.

Explanatory Notes to a) & b):

- i. Similar work(s) means **“Civil Construction Works / Civil Repair Works or Renovation works of Buildings”**. The experience certificate of works executed in private sectors/ organisations shall be considered for qualification, only on submission of TDS certificate (**Form No.26AS**) along with work order and completion certificate.
- ii. The experience certificate of works executed in Public Sector / Govt Organisations on submission should accompany with TDS certificate (**Form No.26AS**) along with work order and completion certificate.

- iii. Copy of completion certificates of each work issued by the employer/ owner/ responsible officer of the employer/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.
- iv. 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.
- v. 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

- vi. **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 **31st March 2025** 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, or financial failures, disqualifications/ 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. The contractor/ approved Sub-contractor if any , shall comply with all the provisions of The Code on Wages (2019), The Code on Social Security (2020), The Industrial Relations Code (2020), and The Occupational Safety, Health and Working Conditions (OSH) code (2020) etc. Amended from time to time and rules framed there under and other laws affecting the contract labour that may be brought into force from time to time.

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

Sl. No.	Particulars	Date and Time
1	Tender e- publication date	<i>16-07-2026</i>
2	Download period of Bid Documents	<i>16-07-2026 to 05-08-2026</i>
3	Date of Pre-Bid meeting	<i>Not Applicable</i>
4	Last date for seeking clarification	<i>29-07-2026</i>
5	Last date and time of submission of Bid	<i>05-08-2026 up to 14.30 hrs</i>
6	Date and time of opening the Bid	<i>05-08-2026 after 15.00hrs</i>

ii) Bid information :

Table 3

i)	Estimated Amount put to Tender	Rs.47,45,720.00 (Rs.47,45,710.60)
ii)	Earnest Money Deposit	Rs.94,920.00 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/ Insurance Surety Bond from the Insurance Company duly approved by Insurance Regulatory and Development Authority of India.
iii)	Cost of Bid document	Rs.1,180/- (Rs.1000.00+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 Commercial 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	6 Months from the date of commencement
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4. This work essentially comprises of the following:

CIVIL WORKS

- (i) Dismantling of various sanitary, Carpentry and Masonry items.
- (ii) Repairs and new plastering works.
- (iii) Water proofing works.
- (iv) Installing PVC rainwater pipes and eaves gutter .
- (v) Structural steel works & finishing with epoxy paint.
- (vi) Providing, fixing, supplying, laying & jointing various plumbing & Sanitary items made of PVC, CPVC, CI, C.P Brass, PTMT etc.,
- (vii) Providing ,fixing panelled or paneled and glazed shutters for doors , windows or clerestory windows etc.,
- (viii) Providing and fixing Fiber Glass Reinforced plastic (FRP) Door Frames.
- (ix) Providing and fixing aluminium work for doors, windows, ventilators and partitions. Also paneling & glazing works included.
- (x) Painting and Associated works.
- (xi) Cleaning and disposing of all dismantled materials and debris from the site after completion of work.
- (xii) Dismantling of Old Plastering, Roofing, aluminium/ Gypsum partitions, doors, windows, fixed glazing and false ceiling etc.
- (xiii) Providing and fixing tiled false ceiling of Calcareous & Siliceous materials reinforced with cellulose fiber.
- (xiv) Polishing on marble work/Granite work/stone work & Melamine polishing on wood work.
- (xv) Providing wood work in frames of doors, windows, clerestory windows and other frames.

ELECTRICAL WORKS

- i. SITC of 4 way, MCB DB/VDB as per schedule at various locations including MCBs, RCBOs, TP MCBs etc.
- ii. Supply of Electrical Wiring Materials for wiring and Installation, Testing, Commissioning of Circuit/Sub main/ group controlled (looped) light point/Point wirings for light/ fan /telephone/ TV Plug & Sockets/Bell Push/Exhaust Fans/Wall mounted fans and various other electrical points as per schedule using FRLSH PVC insulated copper conductor cables.
- iii. Laying of PVC Sheathed Alarmored, PVC sheathed LT cables of sizes as per schedule.
- iv. Supply, laying and clamping of following sizes of 1 no. XLPE /PVC insulated and PVC sheathed armoured aluminium UG power cable, 1.1 KV grade using

clamps/underground noted along with the cables, spacing of clamps not exceeding 60cms, making good the damages , colour washing etc. (3.5core 25 sq mm, 3.5core 50 sq mm)

- v. Providing End Terminations for the above LT cables.
- vi. Supply and Fixing of 7/9/10/15/18/45 W etc. LED lamps and fittings for LED Panel Light/ LED Tube light/wall lights/ceiling mounted Lights/surface mounted lights/Bollard lights/ Mirror Lights/Bulk Head Lights etc.
- vii. SITC of 4 Nos of 1.5 TR with stabilizer, Inverter type AC units including copper piping, drain piping and 4 KVA stabilizer with 25 A modular socket & 25 A SP MCB.
- viii. Supply and laying of 2 pair/20 pair 0.5 mm dia FRLS PVC annealed copper conductor , telephone cables and Krone box with connectors(20 pair/100 pair)and end termination.
- ix. SITC of 20/25 mm PVC conduit along with accessories as required.
- x. Supply and Laying of cat 6 E LAN cables with termination with RJ 45 jack as required.
- xi. Dismantling of the Electrical fittings , old wiring materials, , Switch boards, Panels, fans, Telephone materials etc. and shifting to store/ dumping yard etc. as instructed by EIC
- xii. Dismantling of old AC units from the current location and shifting of the same to the new locations as instructed by EIC including complete installation, testing and commissioning.
- xiii. Providing Earthing for the entire installation.

5. Tender documents can be downloaded from the e-Tendering portal 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) as well as Govt. tender website, www.eprocure.gov.in, which can be downloaded for submission. The cost of bid document and EMD shall be furnished in the form of Demand Draft/ Banker's Cheque drawn in favour of FA & CAO, CoPA or through RTGS/NEFT mode. The bidder shall submit the Originals of (i) DD / Bankers Cheque towards the cost of tender document and EMD and (ii) Power of Attorney (Proforma attached as Annexure III) in favour of signatory(s) to the tender if applicable, with letter of submission in a sealed cover to the **Superintending Engineer-I, Cochin Port Authority, W/Island, Cochin-682009, Kerala**, on due date of Submission of bid within the prescribed time limit **Non submission of original financial document towards cost of tender document and EMD will make the tender liable for rejection, and such tenders would not be evaluated further (Except MSME exemption cases).**
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 **óKSEDCL, 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/cpt. 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.94,920.00**.
 - 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/ Insurance Surety Bond from the Insurance Company duly approved by Insurance Regulatory and Development Authority of India. The original DD/ Banker's Cheque shall be submitted to the CHIEF ENGINEER, Cochin Port Authority, Cochin-09, **on the due date of submission of the bid within the prescribed time limit**. 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 respective bidders 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 **14 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/ online payment through RTGS/NEFT. If online payment is made, the evidence thereof shall be submitted to the office.
- ii) An irrevocable Bank Guarantee (BG) enforceable and encashable at Cochin, drawn from any Scheduled Bank operating in India as per the prescribed proforma attached as Annexure V.
- iii) Insurance Surety Bond from the Insurance Company duly approved by Insurance Regulatory and Development Authority of India.

13.4 **The BG furnished towards the Performance Security shall be valid until a date 60 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. **If an MSME registered contractor failed to comply with the conditions 13.5 an amount equal to 2% of the Estimated amount shall be recovered from any amount due to the contractor.** 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 along with 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.

If an MSE registered contractor failed to comply with the conditions 13.5 an amount equal to 2% of the Estimated amount shall be recovered from any amount due to the contractor. 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.**

15. Signing of Agreement:

- 15.1 The successful tenderer will be required to execute within **21 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, 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. **If an MSME registered contractor failed to comply with the conditions 13.5 an amount equal to 2% of the Estimated amount shall be recovered from any amount due to the contractor.**
18. **Micro & Small Enterprises (MSE's) 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.**
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:**
 - 21.1 TDS as per Income Tax Law & GST law shall also be deducted at prevailing rates.
 - 21.2 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.

- 21.3 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.
- 21.4 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/-

**THE SUPERINTENDING ENGINEER-I
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.

M E M O R A N D U M

- | | | | |
|----|---|---|--|
| a) | General description of work | : | CIVIL RENOVATION WORKS, PROVIDING NEW ELECTRICAL FACILITIES & REWIRING AT WHARF SUPERINTENDANT OFFICE BUILDING AT ERNAKULAM WHARF. |
| b) | Estimated cost Put to Tender | : | Rs.47,45,720.00 (Rs.47,45,710.60) |
| c) | Earnest Money | : | Rs.94,920.00 |
| 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 | : | 7 days |

- g) Time allowed for the work from the : **6 Months**
date of commencement of work
- i) Schedule, specifications, conditions, : As per 'Contents' sheet attached.
drawings etc.

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 2026

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 2026.

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	The following documents are also part of the Contract				
	The Schedule of other Contractors				(8.2)
	The Schedule of Key personnel ñ As per Tender				(9)
	Qualification of Staff	No.	Min. Experience (Years)	Rate of recovery in case of non-compliance	
	Graduate Engineer or Diploma Engineer	1 1	2 5	Rs.15,000/- p.m	
2	The Employer is:				(1)
	The Board of Major Port Authority for Cochin Port, COCHIN PORT AUTHORITY, Cochin -9.				
	Name of Authorized Representative:				
	Name : Dr.M.Angamuthu I.A.S, Chairperson, Cochin Port Authority, Cochin -09.				
3	The Engineer is				
	Name : Col Jassar S M Chief Engineer , Cochin Port Authority, Cochin-09.				
	Name of Nominee/Engineer-in-Charge: Name: Sri. Sudhir.J.Sawant, Superintending Engineer-I				
4	Name of Contract- CIVIL RENOVATION WORKS, PROVIDING NEW ELECTRICAL FACILITIES & REWIRING AT WHARF SUPERINTENDANT OFFICE BUILDING AT ERNAKULAM WHARF. Tender No. T6/T-2100/2026-C				(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 ñtendering portal.				(7.2)

Sl. No.	Description	Reference Clause No. in GCC
	www.cochinport.gov.in www.eprocure.gov.in www.tenderwizard.com/CPT	
7	The Intended completion date for the whole of the Work is 6 Months with the following milestones:	(17,28)
8	Milestone dates:	
	Physical works to be completed	Period from the date of receipt of LoA to commence and proceed with the work
	6 Months	7 days
9	The following shall form part of the Contract Document: (1) Agreement (2) Letter of Acceptance (3) Bill of quantities (4) Contractor's Bid (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). (6) Contract Data (7) General Conditions of Contract (8) General Description and Special Conditions of Contract (9) Technical Specifications (10) Drawings if any and (11) Any other documents listed in the Contract Data as forming part of the Contract.	(2.3)
10	The Contractor shall submit a Program for the Works within 3 days of date of the Letter of Acceptance.	(27)
11	The site possession date The site will be handed over within 7 days after issue of LoA, and failure to take over the same within such period shall be attributable to contractor alone. Note: In case complete handover of site is not possible, Engineer-in-Charge at his discretion, can handover the site in Phase-wise manner as deemed sufficient conforming to the completion timeline.	(21)

Sl. No.	Description	Reference Clause No. in GCC
12	The start date shall be 7 days from the date of receipt of the Letter of Acceptance (LoA) by the Contractor.	(1)
13	The site is located in Willingdon Island.	
14	The Defects Liability Period: One year from the date of completion of the work.	(36)
15	The minimum insurance cover for physical property, injury and death is Rs.10 lakhs (Rupees Ten lakhs) per occurrence with the number of occurrences unlimited. After each occurrence, Contractor will pay additional premium necessary to make insurance valid always.	(13)
16	The following events shall also be Compensation Events: NIL	(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 ----- NA	(27)
19	The language of the Contract documents is English.	(3)
20	The law, which applies to the Contract, is the law of Union of India.	(3)
21	The currency of the Contract is Indian Rupees.	(46)
22	The proportion of payments retained (Retention Money) shall be 5% from each bill subject to a maximum of 5% of the contract price.	(48)
23	The maximum amount of Liquidated Damages for the whole of the works is 10% of the Contract Price.	(49)
24	The amounts of the advance payments :	(51)
	The advance payments as applicable to the contract are: NA	
25	Repayment of advance payment for mobilization: NA	(51)
26	Repayment of advance payment for Construction and equipment: NA	(51)
27	Repayment of Secured Advance: NA	(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: NA	(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 ----- NA	(58)
30	Schedule of Rates Applicable: Civil Works-(DSR 2023 + Cost	

Sl. No.	Description	Reference Clause No. in GCC
	Index 35%) multiplied by a factor 0.8246 to exclude GST. Electrical Works ñ (DSR 2022 + Cost Index 35%) multiplied by a factor 0.8754 to exclude GST.	
31	Base Rate for materials to be considered for price variation NA	(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)

SIGNATURE OF TENDERER

4. INSTRUCTIONS TO BIDDERS

- 4.1 Electronic Tenders (e-tenders) on percentage basis under ‘Two Cover system’ are invited for **“CIVIL RENOVATION WORKS, PROVIDING NEW ELECTRICAL FACILITIES & REWIRING AT WHARF SUPERINTENDANT OFFICE BUILDING AT ERNAKULAM WHARF”**.
- 4.2 The tenderer shall submit the tender Cover-A (Hard Copy of EMD & Cost of Tender form **on the due date of submission of the tender within the prescribed time limit**. 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:
- Technical Bid Documents (as per Sl. No 1 to 7 of the Contents sheet)
 - Price Bid: Schedule of quantities of Work- Schedule-A and
 - 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 **on the due date of submission of the tender within the prescribed time limit**.
- 4.5.2 Technical Bid (Online mode)**
- 4.5.2.1 Technical Bid shall contain all technical and commercial details except Schedule of Quantities. It shall consist scanned/ soft copies of the following documents.
- A covering letter from the tenderer enlisting the enclosures/ attachments.
 - Original Tender Document (Technical Bid) including all Addendum/Corrigenda if any except Schedule of Quantities.
 - Copy of the documents in proof of fulfilment of the Minimum Qualification Criteria
 - Copy of PAN Card, ESI/EPF & GST Registration documents.
 - Copy of Authorisation documents of Signatory of the bid in case of Registered Partnership firm / Limited company
 - Partnership deed or Memorandum and Article of Association of the company and registration certificate of the company as the case may be.
 - Bank information for e-payment system (Annexure IV)
 - Power of Attorney (Annexure III)
 - 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**.

4.5.2.6 Bidder or his authorised person has to visit the site at their own expense and after obtaining permission from EE(M), Also Undertaking as per **Annexure-VII** to the effect that site visit has been conducted prior to quoting shall be submitted along with Technical Bid, failing which the submitted tender shall be summarily rejected .

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 **30th JUNE, 2026**, at least either:

i. Three Similar Works each costing not less than **Rs.18.98 lakhs**

(OR)

ii. Two Similar Works each costing not less than **Rs. 23.73 lakhs**

(OR)

iii. One Similar Work costing not less than **Rs. 37.97 lakhs**

b) Financial Turnover

Average Financial Turnover of the tenderer over the last three financial years ending 31st March 2025/2022-'23, 2023-'24 &2024-'25/ shall not be less than **Rs.14.24 lakhs**.

Explanatory Notes to a) & b) :

- i. Similar work(s) means **"Civil Construction Works / Civil Repair Works or Renovation works of Buildings."**. The experience certificate of works executed in private sectors/ organisations shall be considered for qualification, only on submission of TDS certificate (**Form No.26AS**) along with work order and completion certificate.
- ii. The experience certificate of works executed in Public Sector / Govt Organisations on submission should accompany with TDS certificate (**Form No.26AS**) along with work order and completion certificate.
- iii. **Copy of completion certificates of each work** issued by the employer/owner/ responsible officer of the employer/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.

- iv. 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.
- v. 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

vi. 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 31st March 2025 shall be produced by the tenderer.

a) 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.
- b) 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. The contractor/ approved**

Sub-contractor if any , shall comply with all the provisions of The Code on Wages (2019), The Code on Social Security (2020), The Industrial Relations Code (2020), and The Occupational Safety, Health and Working Conditions (OSH) code (2020) etc. Amended from time to time and rules framed there under and other laws affecting the contract labour that may be brought into force from time to time.

4.7. OPENING AND EVALUATION OF TENDERS

- 4.7.1 Technical Bids of the tenders received shall be opened at 15.00 hrs. on **05/08/2026**, the last date fixed for receiving the bid, in the Superintending Engineer-I'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 (**Annexure VII shall be submitted**).
- 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.

4.9 Bid Validity

Bids shall remain valid for a period **not less than One hundred and Twenty days (120 days)** from the deadline date for bid submission. A bid valid for a shorter period shall be rejected by the Employer as non-responsive.

In exceptional circumstances, prior to expiry of the original time limit, the Employer may request the Bidder to extend the period of validity for an additional period. The request and bidders response shall be made in writing. A bidder agreeing to the request will not be permitted to modify his bid (ie, the extension shall be unconditional).

SIGNATURE OF TENDERER.

5. GENERAL DESCRIPTION AND SPECIAL CONDITIONS OF CONTRACT

1. SCOPE OF WORK

1.1 The proposed work is for óCIVIL RENOVATION WORKS, PROVIDING NEW ELECTRICAL FACILITIES & REWIRING AT WHARF SUPERINTENDANT OFFICE BUILDING AT ERNAKULAM WHARF”.

The work consists of the following:

CIVIL WORKS

- (i) Dismantling of various sanitary, Carpentry and Masonry items.
- (ii) Repairs and new plastering works.
- (iii) Water proofing works.
- (iv) Installing PVC rainwater pipes and eaves gutter .
- (v) Structural steel works & finishing with epoxy paint.
- (vi) Providing, fixing, supplying, laying & jointing various plumbing & Sanitary items made of PVC, CPVC, CI, C.P Brass, PTMT etc.,
- (vii) Providing ,fixing panelled or paneled and glazed shutters for doors , windows or clerestory windows etc.,
- (viii) Providing and fixing Fiber Glass Reinforced plastic (FRP) Door Frames.
- (ix) Providing and fixing aluminium work for doors, windows, ventilators and partitions. Also paneling & glazing works included.
- (x) Painting and Associated works.
- (xi) Cleaning and disposing of all dismantled materials and debris from the site after completion of work.
- (xii) Dismantling of Old Plastering, Roofing, aluminium/ Gypsum partitions, doors, windows, fixed glazing and false ceiling etc.
- (xiii) Providing and fixing tiled false ceiling of Calcareous & Siliceous materials reinforced with cellulose fiber.
- (xiv) Polishing on marble work/Granite work/stone work & Melamine polishing on wood work.
- (xv) Providing wood work in frames of doors, windows, clerestory windows and other frames.

ELECTRICAL WORKS

- i. SITC of 4 way, MCB DB/VDB as per schedule at various locations including MCBs, RCBOs, TP MCBs etc.
- ii. Supply of Electrical Wiring Materials for wiring and Installation, Testing, Commissioning of Circuit/Sub main/ group controlled (looped) light point/Point wirings for light/ fan /telephone/ TV Plug & Sockets/Bell Push/Exhaust Fans/Wall mounted fans and various other electrical points as per schedule using FRLSH PVC insulated copper conductor cables.
- iii. Laying of PVC Sheathed Alarmored, PVC sheathed LT cables of sizes as per schedule.

- iv. Supply, laying and clamping of following sizes of 1 no. XLPE /PVC insulated and PVC sheathed armoured aluminium UG power cable, 1.1 KV grade using clamps/underground noted along with the cables, spacing of clamps not exceeding 60cms, making good the damages , colour washing etc. (3.5core 25 sq mm, 3.5core 50 sq mm)
- v. Providing End Terminations for the above LT cables.
- vi. Supply and Fixing of 7/9/10/15/18/45 W etc. LED lamps and fittings for LED Panel Light/ LED Tube light/wall lights/ceiling mounted Lights/surface mounted lights/Bollard lights/ Mirror Lights/Bulk Head Lights etc.
- vii. SITC of 4 Nos of 1.5 TR with stabilizer, Inverter type AC units including copper piping, drain piping and 4 KVA stabilizer with 25 A modular socket & 25 A SP MCB.
- viii. Supply and laying of 2 pair/20 pair 0.5 mm dia FRLS PVC annealed copper conductor , telephone cables and Krone box with connectors(20 pair/100 pair)and end termination.
- ix. SITC of 20/25 mm PVC conduit along with accessories as required.
- x. Supply and Laying of cat 6 E LAN cables with termination with RJ 45 jack as required.
- xi. Dismantling of the Electrical fittings , old wiring materials, , Switch boards, Panels, fans, Telephone materials etc. and shifting to store/ dumping yard etc. as instructed by EIC
- xii. Dismantling of old AC units from the current location and shifting of the same to the new locations as instructed by EIC including complete installation, testing and commissioning.
- xiii. Providing Earthing for the entire installation.

1.2 The work has to be executed in a functioning office. So the work shall be meticulously planned in consultation with the departmental supervisory staff to ensure minimal inconvenience to the employees.

2. WORK SITE

The work has to be carried out at Wharf Superintendant Office at Ernakulam Wharf, Willingdon Island. Security rules and regulations including obtaining passes etc. if any for work are to be observed by the contractor. The work is to be carried out without disturbing the office functioning and Port Activities. The work site is easily accessible through road.

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 **6 Months**. This time schedule will form the basis for monitoring the progress of work.

4. MATERIALS / FACILITIES TO BE PROVIDED BY DEPARTMENT

4.1. CONTRACTOR'S WORK AREA

Space will be made available to the Contractor free of rent for storing materials and equipments etc., adjacent to the work site for the duration of the Contract. After the

work is over, Contractor shall at his cost, reinstate the area by clearing the temporary works, debris etc. as decided by the Engineer's Nominee.

5. CONTRACTOR'S RESPONSIBILITY

- 5.1 The tenderer shall visit the area before tendering. It will be deemed that the tenderer has visited the site and studied the site conditions before submitting the tender. The tenderer should get himself acquainted with the nature and extent of the work. No claim whatsoever will be entertained on the plea of ignorance of difficulties involved in execution of work or carriage of materials etc.
- 5.2 All materials, plants and equipments, required for the work shall be provided by the Contractor at his own cost, and shall conform to relevant I.S. Specification unless otherwise specified.
- 5.3 Samples of all materials, to be incorporated in the work shall be got approved by the Engineer's Nominee before procurement.
- 5.4 The Contractor shall thoroughly study the specifications and errors/ omissions/modifications if any shall be brought to the notice of the Engineer-in-Charge well in advance so that a final decision in the matter could be given in time.
- 5.5 All labour, skilled or unskilled shall be provided by the Contractor. Settling any dispute with the labour will be Contractor's responsibility. Insurance as per Indian Workmen's Compensation Act for the Contractor's workmen and Public Liability Policy shall be provided by the Contractor at his own cost.
- 5.6 The Contractor shall be solely responsible for any damage or injury to the persons or things caused or suffered during the execution of the work and shall be made good or compensated at his own cost.
- 5.7 The Contractor shall take all care and precautionary measures for avoiding any kind of damage/accidents in the work site due to any of his reasons. The Contractor shall indemnify the Port against any compensation whatsoever payable to the workmen for accident or loss arising out of and in the course of their employment under this Contract.
- 5.8 The work shall be arranged by the Contractor without causing any damage to Port structures. Any damage or accident caused by the Contractor's operation shall be compensated / made good at Contractor's risk and cost to the satisfaction of the Engineer's Nominee of the works, failing which department will do the rectification work and the cost incurred will be recovered from his bill or from security deposit.
- 5.9 The Contractor shall not construct any structure, even of temporary nature, for any purpose at site, except with the written permission of the Engineer's Nominee of the work and any construction so put up shall be removed by the Contractor whenever the Engineer's Nominee calls upon the Contractor to do so.
- 5.10 The Contractor shall remove all temporary works, clear and make good the site, at his cost to the satisfaction of the Engineer's Nominee before the site is returned to the Port 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 laborers 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 (1) 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. The number of days lost due to heavy rain shall be certified by the Engineer's Nominee. The Contract period shall be extended for such certified days also without imposing compensation for delayed performance.

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

10. WORKING TIME

The normal working time of the Port 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.

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, as certain 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. MODIFICATIONS TO GCC

The following clauses of GCC shall be replaced and modified as below:-

17.1 Definitions

Following definition stand replaced as:

Market Rate is the rate decided by the Engineer on the basis of the cost of materials and labour at the site where the work is to be executed plus 15% to cover all overheads and profits

17.2 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.

17.3 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 as per the prevailing rate 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.

GST -TDS Under GST Law Shall Be Deducted As Per Prevailing Rate

17.4 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.

17.5 Clause 21-Possession of Site

The clause stands ~~Deleted~~ and will not be considered under the purview of this contract.

18. Any disputes and differences between the parties shall be resolved in the Jurisdiction of Courts in Cochin alone.

19. 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 Portõs road for supplying the materials.

6.2 FINE AGGREGATE FOR MAKING MORTAR FOR MASONRY WORK / PLASTERING WORK

- 6.2.1 Fine Aggregate used for masonry mortar shall conform to IS:2116. Sand used for plastering shall conform to IS:1542-1992.

6.3 AGGREGATES FOR CONCRETE

- 6.3.1 Aggregates (fine and coarse) for concrete shall comply with the requirements of IS: 383 ñ õSpecifications for coarse and fine aggregate from natural sources for concreteõ 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.
- 6.3.2 The fine aggregate shall be clean, hard, durable, uncoated, dry and free from injurious, soft or flaky pieces and organic or other deleterious substances.
- 6.3.3 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.
- 6.3.4 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.

6.4 CEMENT

- 6.4.1 Quality of cement used for the work shall be 53 grade ordinary Portland cement conforming to IS:12269 or Pozzolona cement conforming to I.S. 1489 unless otherwise approved by the Engineer-in-Charge.
- 6.4.2 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.
- 6.4.3 Supply of cement shall be taken in 50kg bags bearing manufacturer's name and BIS 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.
- 6.4.4 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.
- 6.4.5 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.
- 6.4.6 The cement shall be stored in a weather proof building with facilities for inspection.
- 6.4.7 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.
- 6.4.8 For cement stored in silo, clauses 1.1.3.3 and 1.1.3.4 are not applicable.

6.5 WATER

- 6.5.1 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.
- 6.5.2 **Cochin Port Authority 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.

6.5.3 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.

6.6 ADMIXTURES IN CONCRETE

6.6.1 Admixture in concrete will be allowed only with prior approval of the Engineer in Charge. The contractor shall produce test certificates from recognized laboratories before use, if so desired by the Engineer in Charge.

6.7 VITRIFIED TILE

6.7.1 The tiles shall be of approved premium quality, Johnson or Simpolo or Asian or Somany or Orient Bell make or equivalent and of approved colour and shade. The tiles shall generally conform to IS 15622. They shall be flat, and true to shape and free from blisters crazing, chips, welts, crawling or other imperfections detracting from their appearance. The tiles shall be nominal size of 100cm x 100cm or 80cm x 160cm or 120cm x 240cm or 120cm x 180 cm or 60cm x 120cm or 320cm x 160 cm and of minimum thickness 9mm and as directed and approved by the Employer. The size, colour and shade shall be got approved from the Engineer-in-Charge before purchasing. The minimum rate of the tile to be used for the work is specified in the schedule. The contractor shall produce invoice for verifying the rate.

6.7.2 The tiles shall be sound, true to shape, flat and free from flaws and other manufacturing defects affecting their utility.

6.7.3 The top surface shall be free from welts, chips, craze, specks, crawling or other imperfections detracting from the appearance when viewed from a distance of one meter. The top surface shall be either polished or matt as specified.

6.7.4 Minimum 95% of tiles shall be free from visible defects that would impair the appearance of a major area of tiles.

6.7.5 The tiles shall conform to IS 15622 for dimensional tolerance, physical and chemical properties. Half tiles for use as full tiles shall have dimensions which shall be such as to make the half tiles when jointed together (with joints matching the pattern of floor tiles) match with dimensions of full tiles.

6.8 EPOXY GROUT

6.8.1 Grout is the material that is used to fill the space between adjacent tiles and support the joints.

6.8.2 The Epoxy grout consists of mix of 0.70 kg of organic coated filler of desired shade and mixing of 0.10kg of hardener and 0.20 kg of resin per kg. They have very low water absorption, higher compressive strength and are resistant to staining and easy to maintain. Epoxy grout is a waterless mix formed by mixing a base material

(part A) and a hardener (part B). These components are mixed at site just prior to grouting.

6.8.3 Generally, epoxy grouts require no additional sealer to protect the surface.

6.9 REINFORCEMENT STEEL

6.9.1 Material for reinforcement shall consist of Thermo Mechanically Treated (TMT) bars of grade Fe-500D conforming to IS:1786, or higher grade as approved by the Engineer-in-Charge. The reinforcement steel shall be of tested quality and free from loose mill scale, rust, oil, paint, mud, or any other coating that may impair the bond between concrete and steel. All reinforcement bars shall be cleaned thoroughly before being placed in position.

6.9.2 Bars shall be cut, bent, cranked, hooked, or welded (where necessary) to the required shapes and dimensions as shown in the structural drawings or as directed by the Engineer-in-Charge. Cutting, bending and fabrication shall be carried out using approved mechanical equipment to ensure accuracy. All laps, splices, bends, hooks, and anchorage lengths shall be provided in accordance with relevant IS codes and as specified in the drawings. Welding of reinforcement, if permitted, shall be carried out in accordance with IS:2751 and IS:9417, using approved electrodes and qualified welders.

6.9.3 The binding wire used for tying reinforcement shall be annealed mild steel wire of 16 gauge (1.6 mm diameter) conforming to IS:280, and shall be tied securely at every intersection and joint to prevent displacement of bars during concreting. Adequate cover blocks and supports made of cement mortar or non-corrosive material of the same grade of concrete shall be provided to maintain the specified cover to reinforcement. Reinforcement bars shall be properly supported and secured using chairs, spacers, and stools to maintain their correct position and alignment before and during concreting.

6.10 EPOXY PAINT

6.10.1 Epoxy paint has got excellent adhesion properties and offers a balanced aesthetic and corrosion protective surface. Epoxy offers good resistance to water and humidity. Epoxy coating are used because of their outstanding chemical resistance, durability, low porosity and strong bond strength and it provides dry tough and protective coatings. Epoxy coatings are created, by chemical reaction using an epoxide resin and polyamine hardener.

6.11 WATER-THINNABLE CEMENT PRIMER

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

6.12 ACRYLIC EMULSION PAINT EXTERIOR/INTERIOR

- 6.12.1 The weatherproof exterior acrylic emulsion paint and interior acrylic emulsion paint must be of approved premium quality and from a recognized manufacturer. The coverage of both paints shall adhere to the specifications provided by the manufacturer. The colour and shade of the paints shall be determined as per the directives of the Engineer-in-Charge.
- 6.12.2 The painting of internal walls shall consist of two coats of premium quality interior-grade acrylic emulsion paint, which contains a volatile organic compound (VOC) content of less than 50 grams per litre from an approved brand and manufacturer. Additional coats shall be applied as necessary to achieve a uniform shade and colour.
- 6.12.3 The painting of external walls shall be executed with two or more coats of 100% premium acrylic emulsion paint that complies with a VOC content of less than 50 grams per litre. This paint shall possess ultraviolet (UV) resistance as per IS 15489:2004, as well as resistance to alkali, fungi, and dirt. The exterior paint shall be of the required shade and shall include silicone additives. The application shall be conducted over and including a priming coat of approved exterior primer.
- 6.12.4 The weather proof exterior acrylic emulsion paint shall be of approved premium quality either "Apex Ultima" by Asian Paints, "Weather coat" by Berger or Nerolac Excel or "Weather shield" by ICI Dulux or Snowcrl XT-premium by Snowcem India Ltd. or Jotun Paints. The interior acrylic emulsion paint shall be of approved premium quality either manufactured by Asian Paint, Berger or Dulux or Nicholson or Jotun Paints. The coverage shall conform to the manufacturer's specification. The colour/ shade shall be as per direction of the Engineer-in-Charge.
- 6.12.5 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.
- 6.12.6 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.

6.13 SYNTHETIC ENAMEL PAINT

- 6.13.1 The Synthetic Enamel paint shall be of approved premium quality and shall conform to IS : 2932 (2003). The coverage shall conform to the Manufacturer's specification. The colour / shade shall be as per schedule or as per the directions 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.
- 6.13.2 The Contractor shall invariably produce the Test Certificates and Bills with batch number and date, signed by an authorized person of the Manufacturer / Dealer, while seeking final approval of the Engineer-in-Charge for use on the Work.

6.14 STRUCTURAL STEEL

- 6.14.1 The mild steel flats / plates used for the work shall conform to I.S. 2062. The material shall be free from visible as well as hidden defects such as pitting cracks, laminations, twists etc. and excessive rusting.
- 6.14.2 It is not necessary for the Contractor to obtain separate approval in case mild steel tube/pipe/plate is purchased from Steel Authority of India Ltd. or TATA Iron & Steel or Jindal Steel & Power Ltd. (JSPL). For purchase from other sources, the contractor shall apply sufficiently in advance and obtain written permission of the Engineer-in-Charge for making purchase from such sources.
- 6.14.3 Mild Steel Rectangular / Square Hollow Sections used shall be of Yst 310 grade conforming to IS : 4923. Pipes shall be designated by their outer dimension and weight per metre. It shall be free from visible as well as manufacturing defects such as pitting, cracks, laminations, twists etc. and excessive rusting.
- 6.14.4 Mild Steel tubular sections used shall be of Yst 320 grade conforming to IS 806 & 1161. Tubes shall be designated by their nominal bore and weight per metre. It shall be free from visible as well as manufacturing defects such as pitting, cracks, laminations, twists etc. and excessive rusting.

6.15 VITREOUS CHINA CISTERNS

- 6.15.1 The thickness of the body including cover shall be not less than 6 mm for vitreous China cisterns. The outlet of each syphon or stand pipe shall be securely connected to the cistern by means of lock nut. The cistern shall be free from manufacturing faults and other defects affecting their utility. All working parts shall be designed to operate smoothly and efficiently. Cistern shall be mosquito proof. A cistern shall be considered mosquito proof only if there is no clearance anywhere which would permit a 1.6 mm wire to pass through in the permanent position of the cistern i.e. in the flushing position or filling position. The breadth of a low level cistern, from

front to back shall be such that the cover or seat, or both, of water closet pan shall come to rest in a stable position when raised. The cistern shall be supported on two cast iron brackets of size as approved by the Engineer-in-Charge

6.15.2 All vitreous sanitary appliances (Vitreous China) shall conform to IS 2556 (Part-I) general requirements.

6.15.3 **Flushing Cisterns**

The flushing cisterns shall be automatic or manually operated high level or low level as specified, for water closets and urinals. A high level cistern is intended to operate with minimum height of 125cm and a low level cistern with a maximum height of 30 cm between the top of the pan and the underside of the cistern. Cisterns shall be of following type (i) Vitreous China (IS 774) for Flushing type (ii) Automatic Flushing Cistern (IS 2326) and (iii) Plastic cisterns (IS 7231).

6.15.4 **Wash Basins**

Wash basins shall be of white vitreous china conforming to IS 2556 (Part -I) and IS 2556 (Part-4). Wash basins either of flat back or angle back as specified shall be of one piece construction, including a combined overflow. All internal angles shall be designed so as to facilitate cleaning. Each basin shall have a rim on all sides, except sides in contact with the walls and shall have a skirting at the back. Basins shall be provided with single or double tap holes as specified. The tap holes shall be 28mm square or 30 mm round or 25 mm round for pop up hole. A suitable tap hole button shall be supplied if one tap hole is not required in installation. Each basin shall have circular waste hole to which the interior of basin shall drain. The waste hole shall be either rebated or beveled internally with diameter of 65 mm at top. Each basin shall be provided with a non-ferrous 32 mm waste fitting. Stud slots to receive the brackets on the underside of the wash basin shall be suitable for a bracket with stud not exceeding 13 mm diameter, 5 mm high and 305 mm from the back of basin to the centre of the stud. The stud slots shall be of depth sufficient to take 5 mm stud. Every basin shall have an integral soap holder recess or recesses, which shall fully drain into the bowl. A slot type of overflow having an area of not less than 5 sq. cm, shall be provided and shall be so designed as to facilitate cleaning of the overflow. Where oval shape or round shape wash basins are required to be fixed these shall be fixed preferably in RCC platform with local available stone topping either fully sunk in stone top or top flush with the stone topping as directed by Engineer-in-Charge.

The wash basins shall be one of the following patterns and sizes as specified

(a) Flat back: 660 x 460 mm (Surgeon's Basin)

630 x 450 mm

550 x 400 mm

450 x 300 mm

b). Angle back: 600 x 480 mm

400 x 400 mm

White glazed pedestals for wash basins, where specified shall be provided. The quality of the glazing of the pedestal shall be exactly the same as that of the basin along with which it is to be installed. It shall be completely recessed at the back to accommodate supply and waste pipes and fittings. It shall be capable of supporting the basin rigidly and adequately and shall be so designed as to make the height from the floor to top of the rim of basin 75 to 80 cm. All the waste fittings shall be brass chromium plated, or as specified.

6.15.5 Waste Fittings for Wash Basins and Sinks

The waste fittings shall be of nickel chromium plated brass, with thickness of plating not less than service grade 2 of IS 4827 which is capable of receiving polish and will not easily scale off. The fittings shall conform in all respects to IS 2963 and shall be sound, free from laps, blow holes and other manufacturing defects. External and internal surfaces shall be clean and smooth. They shall be neatly dressed and be truly machined so that the nut smoothly moves on the body. Waste fitting for wash basins shall be of nominal size of 32 mm. Waste fittings for sinks shall be of nominal size 50 mm.

6.16 P.T.M.T (Polytetra Methylene Tetraphthalate) Fittings

PTMT (Polytetra Methylene Tetraphthalate) is an engineering plastic (raw material imported) and have following physical properties:-

- | | |
|----------------------------------|--------------------------|
| (i) Tensile Strength: | 500 Kg/cm ² |
| (ii) Compressive Strength: | 900 Kg/cm ² |
| (iii) Rockwell hardness L-scale: | 75 |
| (iv) Working temperature: | -45° to 120°C. |
| (v) E Value: | 85000 Kg/cm ² |
| (vi) Density: | 1.3 gm/cc |
| (vii) Impact Strength : | No Break |

6.18 GATE VALVE - GUN METAL

These shall be of the gun metal fitted with wheel and shall be of gate valve type opening full way and of the size as specified. These shall generally conform to IS 778.

6.19 CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPES

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.

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

The fittings shall be as follows:

- (a) Plain CPVC solvent cement fittings from size 15 mm to 160 mm.

- (b) Brass threaded fittings.

- (c) Valve from size 15 mm to 160 mm

(d) *Brass Threaded Fittings*: All types of one end brass threaded male/female adaptors in various fittings like coupler, socket, elbow, tee are available for transition to other plastic/metal piping and for fixing of CP fittings. Ball, Gate valves in CPVC are available in all dimensions. All fittings shall carry the following information:

- (1) Manufacturer's name/trade mark.
- (2) Size of fitting

6.20 GLASS

The glass to be used on the work shall be of good quality conforming to IS:2835 and free from defects scratches etc. The thickness of glass shall be as specified in the Schedule of quantities.

6.21 paneled DOOR AND WINDOW SHUTTERS

- 6.21.1 The contractor shall provide and fix paneled or paneled and glazed shutters for doors, windows, and clerestory windows etc with thick shutter, secured with butt hinges of the required size and necessary screws as approved by Engineer-in-Charge.

6.22 FIBRE GLASS REINFORCED PLASTIC DOOR FRAMES

- 6.22.1 The FRP door frames shall be of cross-section 90mm x 45mm having single rebate of 32mm x 15mm to receive shutter of 30mm thickness. The laminate shall be moulded with fire resistant grade unsaturated polyester resin and chopped mat. Door frame laminate shall be 2 mm thick and shall be filled with suitable wooden block in all the three legs. The frame shall be covered with fiber glass from all sides. Stainless steel stay shall be provided at the bottom to steady the frame.
- 6.22.2 FRP door shall be manufactured as per specifications laid down in IS:14856, nomenclature of items & direction of Engineer-in-Charge. Tolerance of size of frame to be + 2 mm and on size of rebate to be + 1 mm. 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.

6.23 FIBRE GLASS REINFORCED PLASTIC (FRP) SHUTTERS

6.23.1 FRP Shutters shall be of factory made conforming to the specifications as per IS:14856 and nomenclature of item & direction of Engineer-in-Charge.

The shutter has to be 30 mm thick Glass Fibre Reinforced Plastic (FRP) panelled door shutter of required colour and approved brand and manufacture, made with fire - retardant grade unsaturated polyester resin, moulded to 3 mm thick FRP laminate for forming hollow rails and styles, with wooden frame and suitable blocks of seasoned wood inside at required places for fixing of fittings, cast monolithically with 5 mm thick FRP laminate for panels conforming to IS: 14856, including fixing to frames.

6.24 ALUMINIUM SECTIONS

Aluminium sections used for fixed/openable windows, ventilators, partitions, frame work & doors etc. shall be suitable for use to meet architectural designs to relevant works and shall be subject to approval of the Engineer-in-Charge for technical, structural, functional and visual considerations. The aluminium extruded sections shall conform to IS 733 and IS 1285 for chemical composition and mechanical properties. The stainless steel screws shall be of grade AISI 304. The permissible dimensional tolerances of the extruded sections shall be as per IS 6477 and shall be such as not to impair the proper and smooth functioning/operation and appearance of door and windows. Aluminium glazed doors, windows etc. shall be of sizes, sections and details as shown in the drawings.

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

Aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / panelling, C.P. brass /

stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing, panelling and dash fasteners to be paid for separately) For fixed portion- Anodised aluminium (anodised transparent or dyed to required shade according to IS: 1868, Minimum anodic coating of grade AC 15) shall be used.

Glazing in aluminium door, window, ventilator shutters and partitions etc. shall be done with float glass panes of 4.0 mm thickness with EPDM rubber / neoprene gasket etc. as per the architectural drawings and the directions of engineer-in-charge. (Cost of aluminium snap beading shall be paid in basic item).

6.24.1 Powder coating

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

It is mandatory that all aluminium members shall be wrapped with self adhesive non-staining PVC tape, approved by Engineer-in-Charge.

6.25. FIBRE REINFORCED ELASTOMERIC LIQUID WATER PROOFING MEMBRANE WITH RESILIENT ACRYLIC POLYMERS

6.25.1. Fibre reinforced elastomeric liquid water proofing membrane is a ready-to-use waterproofing, white product, with high solar reflectance and Sun Reflectivity Index (SRI) of 105, for external applications. This is made from resilient acrylic polymers and synthetic resins in water dispersion, and when dry forms a continuous, flexible waterproofing membrane. This is resistant to all atmospheric conditions and UV rays, and guarantees long lasting protection for the substrate.

6.25.2. Fibre reinforced elastomeric liquid water proofing membrane with fibers in water emulsion with high reflectance and emissivity with a solar reflectance index SRI of 105 should comply with the requirements of EN 1504-9 (Products and systems for protecting and repairing concrete structures: definitions, requirements, quality control and conformity assessment. General principles for the use of products and systems) EN 1504-2 coating (C) principles PI, MC and IR (Concrete surface protection systems).

6.26. RIGID PVC RAIN WATER PIPES

6.26.1. It shall conform to IS 13592 and the joint sealing ring shall be as per IS 5382.

6.26.2. Fixing shall be as per IS.2527 and as instructed by Engineer-in-Charge.

6.27. MATERIALS NOT SPECIFIED

6.27.1. 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

6.28. SAMPLING AND TESTING OF MATERIALS

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

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.I.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 deserves 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.

7.2 DISMANTLING AND DEMOLISHING

- 7.2.1 During demolition or dismantling, every precaution shall be taken by the contractor to prevent damage to any part of the structure and also to any adjacent structures which are to be left intact. Any damage caused to the structures, due to the carelessness and negligence of the contractor shall be made good by him at his own expense. Care must be taken by the contractor in such a way that debris shall not fall into water and if falls to be removed immediately.
- 7.2.2 All materials obtained from dismantling or demolition shall be the property of the CoPA unless otherwise specified and shall be kept in safe custody until they are handed over to the Engineer-in-Charge.
- 7.2.3 The demolition shall always be well planned before hand and shall generally be done in reverse order of the one in which the structure was constructed. The operations shall be got approved from the Engineer-in-Charge before starting the work. Due care shall be taken to maintain the safety measures prescribed in IS 4130 and construction and demolition waste management rules 2016 shall be followed.
- 7.2.4 Necessary propping, shoring and or under pinning shall be provided to ensure the safety of the adjoining work or property before dismantling and demolishing is taken up and the work shall be carried out in such a way that no damage is caused to the adjoining work or property. Wherever specified, temporary enclosures or partitions and necessary scaffolding with suitable double scaffolding and proper cloth covering shall also be provided, as directed by the Engineer-in-Charge. It shall be ensured that no dust is generated while demolishing. Barricading shall be provided wherever required.
- 7.2.5 Necessary steps shall be taken to keep noise and dust nuisance to the minimum. All work needs to be done under the direction of Engineer-in-Charge. Helmets, goggle, safety belts etc., should be used whenever required and as directed by the Engineer-in-Charge. The demolition work shall be proceeded with in such a way that it causes the least damage and nuisance to the adjoining building and the

public.

- 7.2.6 Dismantling shall be done in a systematic manner. All materials which are likely to be damaged by dropping from a height or by demolishing roofs, masonry etc. shall be carefully removed first. Chisels and cutters may be used carefully as directed. The dismantled articles shall be removed manually or otherwise, lowered to the ground (and not thrown) and then properly stacked as directed by the Engineer-in-Charge.
- 7.2.7 Any serviceable material, obtained during dismantling or demolition, shall be separated out and stacked properly as directed by the Engineer-in-Charge within a lead of 50 meters. All unserviceable materials, rubbish etc. shall be disposed off at authorized locations as directed by the Engineer-in-Charge.
- 7.2.8 Where existing fixing is done by nails, screws, bolts, rivets, etc., dismantling shall be done by taking out the fixing with proper tools and not by tearing or ripping off.
- 7.2.9 Appropriate screens shall be placed where necessary to prevent injuries due to falling pieces. Water spray shall be used to reduce dust while tearing down plaster from brick work. Safety belts shall be used by labourers while working at higher level to prevent falling from the structure. Wherever, possible mechanized working platform shall be used. First-aid equipment shall be made available at all demolition works of any magnitude.
- 7.2.10 The contractor shall maintain/disconnect existing services, whether temporary or permanent, wherever required by the Engineer-in-Charge.

7.3 CEMENT PLASTERING

- 7.3.1 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.
- 7.3.2 All the corners shall be rounded off to a radius of 25 mm unless otherwise specified.
- 7.3.3 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 meter immediately after the final coat of plastering and rate quoted for plastering shall include cost of this finishing work.
- 7.3.4 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.
- 7.3.5 The surface shall be cured for 7 days.
- 7.3.6 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.

7.4 REPAIR TO PLASTER (12 mm TO 20 mm THICKNESS)

- 7.4.1 The work includes cutting the patch and preparing the wall surface. Scaffolding as required for the proper execution of the work shall be erected. If work can be done safely with the ladder or jhoola these will be permitted in place of scaffolding.
- 7.4.2 The mortar of the patch, where the existing plaster has cracked, crumbled or

sounds hollow when gently tapped on the surface, shall be removed. The patch shall be cut out to a square or rectangular shape at position marked on the wall as directed by the Engineer-in-Charge or his authorized representative. The edges shall be slightly under cut to provide a neat joint.

7.4.3 The masonry joints which become exposed after removal of old plaster shall be raked out to a minimum depth of 10 mm in the case of brick work and 20 mm in the case of stone work. The raking shall be carried out uniformly with a raking tool and not with a basuli, and loose mortar dusted off. The surface shall then be thoroughly washed with water, and kept wet till plastering is commenced. In case of concrete surfaces, the same shall be thoroughly scrubbed with wire brushes after the plaster had been cut out and pock marked with a pointed tool, at spacings of not more than 5 cm. Centres, the pock being made not less than 3 mm deep. This is to ensure a proper key for the plaster. The surface shall be washed and cleaned and kept wet till plastering is commenced.

7.4.4 Mortar of specified mix with the specified sand shall be used. The surface shall be finished even and flush and matching with the old surrounding plaster. All roundings necessary at junctions of walls, ceilings etc. shall be carried out in a tidy manner.

7.4.5 All dismantled mortar & rubbish etc. shall be disposed off within 24 hours from its dismantling promptly as directed by the Engineer-in-Charge.

7.4.6 Doors, windows, floors, articles of furniture etc. and such other parts of the building shall be protected from being splashed upon. Splashing and droppings, if any, shall be removed by the contractor at his own cost and the surface cleaned. Damages, if any, to furniture or fittings and fixtures shall be recoverable from the contractor.

7.4.7 Curing shall be started as soon as the plaster has hardened sufficiently not to be damaged when watered. The plaster shall be kept wet for a period of at least 7 days.

7.4.8 **Cleaning of existing Reinforcement and passivating its surface**

7.4.8.1 The alkaline chemical rust remover as approved by the Engineer-in Charge and should be procured in sealed containers indicating the batch number and the date of manufacture etc.

7.4.8.2 The rust has to be removed from the surface of the reinforcement manually using chisels, wire brush, emery paper etc. as directed by Engineer-in-Charge at no extra cost, till the steel surface is cleared of all rust that could be removed manually or mechanically.

7.4.8.3 Then alkaline chemical rust remover, as approved by the Engineer-in Charge shall be applied with brush over the reinforcement surface thoroughly along the full length of rusted reinforcement. After 24 hours of its application the surface shall be cleaned with wire brush and all loose particles removed. It should then be washed clean, with water, thoroughly and allowed to dry. alkaline chemical rust remover should be applied to the reinforcement approximately one litre for 6 to 7 sqm. of the steel area (assuming the surface of the reinforcement of rough) the consumption of the alkaline chemical rust remover should be about 0.40 litres per

10 Sqm. area of RCC unit.

7.4.9 Application of Bonding Coat on RCC

7.4.9.1 Epoxy bonding adhesive shall be approved by the Engineer-in Charge. Bonding coat is required to be applied for adhesion of applied repair concrete or mortar to the parent concrete. For this, the surface should be thoroughly cleaned by brushes and by blowing air from hand operated pump. The surface shall then be saturated with water (but without excess water).

7.4.9.2 The components of bonding coat shall be weigh batched and mixed in specific proportions, in a clean container, as directed by the Engineer-in-Charge. They should then be blended to a uniform and homogeneous mixture, lump free and of creamy consistency.

7.4.9.3 The epoxy bonding adhesive, with a coverage rate of 2.20 sqm/kg, shall be applied by stiff nylon bristle brush. The bonding material should be worked well onto the concrete surface of the parent concrete including reinforcement surface ensuring that no pinholes are visible.

7.5 PROVIDING AND APPLYING SYNTHETIC ENAMEL PAINT

7.5.1 Paints/ primers of approved premium brand and manufacture shall be used. Only ready mixed Paint (Exterior grade) as received from the manufacturer without any admixture shall be used. If for any reason, thinning is necessary in case of ready mixed Paint, the brand of thinner recommended by the manufacturer or as instructed by the Engineer-in-Charge shall be used.

7.5.2 The surface shall be thoroughly cleaned off all dirt, rust, dust, grease etc. with wire brush, sand paper etc., and be made perfectly clean and dry while painting. For wood surfaces visible knots, holes etc. shall be filled with appropriate filling material with some shade as paint and rubbed smooth before applying paint.

7.5.3 The number of coats shall be as per schedule. Successive coats shall be applied only on the next day after rubbing with the finest grade of wet abrasive paper and dusting of the loose particles.

7.5.4 Measurements of the work under this head shall be made on the basis of the area of work done and rate quoted shall include the cost of surface preparation, materials, labour, scaffolding etc. required for the completion of works as detailed above.

7.6 APPLICATION OF EPOXY PAINT

7.6.1 Epoxy paint (two or more coats) shall be applied as per manufacturer's specifications after applying appropriate priming coat on exposed iron/steel surfaces.

7.6.2 All rust, scales and Old paint shall be removed by scrapping or by brushing with steel wire brushes. Hard skin of oxide formed on the surface of wrought iron during rolling which becomes loose by rusting, shall be removed. Surface must be dried, cleaned & made free from oil, grease, dirt, dust & all other contaminants that could interfere with adhesion of coating. If the surface is wet, it shall be dried before priming coat is undertaken. Before primer is applied, holes and undulations, shall be filled up and rubbed smooth.

- 7.6.3 The primer shall be applied with brushes, worked well into the surface and spread even and smooth. The painting shall be done by crossing and laying off. 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.
- 7.6.4 Epoxy paint is supplied in two parts i.e. (base and hardener). Stir the base and hardener separately. Mix hardener gradually into the base under continuous stirring as per mixing ratio as specified by the manufacturers.
- 7.6.5 The epoxy paint shall be consumed within the working pot life as specified by the manufacturers. Part mixing should be avoided. To achieve optimum performance of the product, minimum 2-3 coats by brushing would be required to get the desired dry film thickness (DFT) as specified by the manufacturer.
- 7.6.6 Rate shall include the cost of all labour and material involved in all operation including priming coat.

7.7 STRUCTURAL STEEL WORK

- 7.7.1 Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer. Workmanship of structural steel shall be in accordance with IS 800. The material shall be free from visible as well as hidden defects such as pitting cracks, laminations, twists etc. and excessive rusting.
- 7.7.2 All structural steel members and parts shall have straight edges and blunt surfaces. If necessary, they shall be straightened or flattened by pressure unless they are required to be of curvilinear forms. They shall also be free from twist. Pressure applied for straightening or flattening shall be such as would not injure the materials. Hammering shall not be permitted. Adjacent surfaces or edges shall be in close contact or at uniform distance throughout.

7.8 PLAIN & REINFORCED CEMENT CONCRETE

7.8.1 General

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

7.8.2 Concrete Mix

Mix used for Cement Concrete shall be as specified in the schedule.

7.8.3 Nominal Mix

For nominal mix concrete, proportion of fine aggregate to coarse aggregate shall be 1:2 by mass. The minimum cement content per cubic meter of nominal mix concrete shall be as per table 5 of IS: 456-2000.

7.8.4 Size of Coarse Aggregate

For all concrete, 20 mm size graded aggregate conforming to IS:383-2016 shall be used unless otherwise specified. If 20 mm graded aggregates as per IS:383 are not readily available, graded 20 mm aggregate shall be obtained by blending 20 mm

and 12.5/ 10 mm aggregates in the proportion arrived based on the combined sieving of aggregates.

7.8.5 Mixing of Concrete

7.8.5.1 Concrete shall be mixed in a drum or pan type batch mixer, the type and capacity of which is to be approved by the Engineer-in-Charge. Time allowed for mixing, after all ingredients have been placed in the mixers shall not be less than two minutes. If there is segregation after unloading from the mixer, the concrete should be remixed.

7.8.5.2 Ready mix concrete from outside source shall be allowed for use on the work subject to the conditions that: (i) written permission shall be obtained from the Engineer-in-Charge, (ii) all quality control measures as stipulated by the Engineer-in-Charge are strictly adhered to by the Contractor at his cost, (iii) all design mix calculations as per Clause 2.3.4 of Tender Document shall be submitted by the contractor for approval of the Engineer-in-Charge & approval obtained; and (iv) all expenses towards conveyance and incidentals of providing departmental supervision at the mixing plant shall be borne by the Contractor.

7.8.6 Transporting, placing, compacting and curing of concrete

7.8.6.1 Transporting placing, compacting and curing of concrete shall be as per clause 13 of IS:456-2000. Placement of concrete shall be done with concrete pumps and pipelines unless otherwise approved by the Engineer-in-Charge in special cases.

7.8.6.2 Concrete shall be transported from the mixer to the worksite as rapidly as possible which will prevent the segregation or loss of any ingredient, and for maintaining the workability.

7.8.6.3 The concrete shall be placed and compacted before setting commences and should not be subsequently disturbed. Care should be taken to avoid displacement of reinforcement or movement of formwork.

7.8.6.4 All concrete shall be vibrated unless otherwise specified or approved by the Engineer-in-Charge and such vibrating shall be as required by the Engineer-in-Charge. The mechanical vibrators complying with IS:2505, IS:2506 or IS:4656 shall be used for compacting concrete. All vibrations shall be carried out to a plan approved by the Engineer-in-Charge. No workman shall be allowed to operate the vibrator without having received instructions and training in its use. Care must be taken to avoid segregation and excessive vibration.

7.8.6.5 Concreting shall be carried out continuously upto construction joints, the positions and arrangement of which shall be as directed by the Engineer-in-Charge. When the work has to be resumed the construction joints shall be prepared in accordance with clause 13.4 of IS:456-2000.

7.8.6.6 Unless otherwise specified, all concrete shall be kept continuously in a damp condition by ponding or by covering with a layer of sacking, canvas, hessian or similar materials with fresh water for not less than 7 days after laying the concrete. If curing is not done properly the department will be at liberty to engage labour for curing and the expenditure incurred will be recovered from the contractor's bill. The decision of the Engineer-in-Charge will be final on this.

7.8.6.7 Stripping time for the form work shall be as stipulated in clause 11.3 of IS:456-

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

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

7.8.6.9 The unit rate quoted by the tenderer shall be for the finished work and deemed to include cost of all materials and labour, form work, provision of holes, recess, other contingent items etc. required for the completion of work as specified etc

7.10 REINFORCEMENT STEEL

General

Reinforcement bars, if supplies are arranged by contractor unless otherwise specified, shall be either plain round mild steel bars grade I as per IS 432 (Part I) or medium tensile steel bar as per IS 432 (Part I) or hot rolled mild steel and medium tensile steel deformed bars as per IS 1139 or cold twisted steel bars as per IS 1786, as shown and specified on the drawings. Wire mesh or fabric shall be in accordance with IS 1566. Substitution of reinforcement will not be permitted except upon written approval from Engineer.

Plain round mild steel bars grade II as per IS 432 (Part I) may be used with prior approval of Engineer in writing and with 10% increase in the reinforcement area but its use shall not be permitted in structures located in earthquake zones subjected to severe damage (as per IS 1895) and for structures subject to dynamic loading (other than wind loading), such as frames supporting rotary or reciprocating machinery, etc.

All reinforcement shall be clean, free from grease, oil, paint, loose mill scale, loose rust, dust, bituminous material or any other substances that will destroy or reduce the bond. All rods shall be thoroughly cleaned before being fabricated. Pitted and defective rods shall not be used.

All concrete in the works shall be of design mix as defined in IS 456, unless it is a nominal mix concrete such as 1:3:6, 1:4:8 or 1:5:10. Whether reinforced or otherwise, all design mix concrete works to be carried out under this specification shall be divided into the following classifications:

Providing, fabricating and placing in position reinforcement steel

The quality of the steel shall be as mentioned in the materials section. The bars shall be fabricated as per the drawings and binding with **16-gauge GI binding wire** etc. Laps and splices for reinforcement shall be as shown on the drawings. Splices in adjacent bars shall be approved by Engineer. The bars shall not be lapped unless the length required exceeds the maximum available lengths of bars at site.

Bending

Reinforcing bars supplied bent or in coils, shall be straightened before they are cut to size. Straightening of bars shall be done in cold and without damaging the bars. This is considered as a part of reinforcement binding fabricating work.

All bars shall be accurately bent according to the sizes and shapes shown on the detailed working drawings/bar bending schedules. They shall be bent gradually by machine or other approved means. Reinforcing bars shall not be straightened and re-bent in a manner that will injure the material, bars containing cracks or splits shall be rejected. They shall be bent cold, except bars of over 32 mm in diameter which may be bent hot if specifically approved by Engineer. Bars bent **hot** shall not be heated beyond cherry red colour (not exceeding 845°C) and after bending shall be allowed to cool slowly without quenching. Bars incorrectly bent shall be used only if the means used for straightening and rebinding shall not injure the material. No reinforcement shall be bent when in position in the work without approval whether or not it is partially embedded in hardened concrete. Bars having kink or bends other than those required by design shall not be used.

Fixing

Reinforcement shall be accurately fixed by any approved means and maintained in the correct position shown in the drawings by the use of cover blocks, spacers and chairs as per IS 2502 to prevent displacement during placing and compaction of concrete. Bars intended to be in contact at crossing points shall be strongly bound together at all such points with two no. 16 gauge annealed soft iron wire. The vertical distance required between successive layers of bar in beams or other members shall be maintained by providing of mild steel spacer bars at such intervals that the main bars do not perceptibly sag between adjacent spacer bars.

Cover

Unless indicated otherwise on the drawings, clear concrete cover for reinforcement (exclusive of plaster or other decorative finish) shall be as follows:

- a) At each end of reinforcing bar, not less than 25 mm nor less than twice the diameter of the bar whichever is less.
- b) For a longitudinal reinforcing bar in a column, not less than 40 mm, nor less than the diameter of the bar. In case of columns of minimum dimensions of 20 cm or under, with reinforcing bars of 12 mm and less in diameter, a cover of 25 mm may be used.
- c) For longitudinal reinforcing bars in a beam 25 mm nor less than the diameter of the bar.
- d) For tensile, compressive, shear, or other reinforcement in a slab or wall not less than 12 mm nor less than the diameter of such reinforcement.
- e) For any other reinforcement not less than 12 mm nor less than the diameter of such reinforcement.

- f) For footings and other principal structural members in which the concrete is deposited directly against the ground, cover to the bottom reinforcement shall be 75 mm. If concrete is poured on a layer of lean concrete the bottom cover may be reduced to 50 mm.
- g) For concrete surfaces exposed to the weather or the ground after removal of forms, such as retaining walls, footing sides and top, etc., not less than 50 mm for bars larger than 16 mm dia and not less than 40 mm for bars 16 mm dia or smaller.
- h) Increased cover thickness shall be provided, as indicated on the drawings, for surfaces exposed to the action of harmful chemicals (or exposed to earth contaminated by such chemical, acid, alkali, saline atmosphere, sulphurous smoke, etc.
- i) For reinforced concrete members, totally or periodically immersed in sea water or subject to sea water spray, the cover of concrete shall be 50 mm more than those specified in (i) to (v) above.
- j) For liquid retaining structures the minimum cover to all steel shall be 40 mm or the diameter of the main bars, whichever is greater. In the presence of sea water and soils and waters of a corrosive character the cover shall be increased by 10 mm.
- k) Protection to reinforcement in case of concrete exposed to harmful surroundings may also be given by providing a dense impermeable concrete with approved protective coatings, as specified by the Engineer.
- l) The correct cover shall be maintained by cement mortar cover blocks. Reinforcement for footings, beams and slabs on sub-grade shall be supported on precast concrete blocks as approved by Engineer. The use of pebbles or stones shall not be permitted.

Inspection

Erected and secured reinforcement shall be inspected, jointly measured and recorded and approved by Engineer prior to placement of concrete.

7.11 STRUCTURAL STEEL

Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer. Workmanship of structural steel shall be in accordance with IS 800. The material shall be free from visible as well as hidden defects such as pitting cracks, laminations, twists etc. and excessive rusting.

All structural steel members and parts shall have straight edges and blunt surfaces. If necessary, they shall be straightened or flattened by pressure unless they are required to be of curvilinear forms. They shall also be free from twist. Pressure applied for straightening or flattening shall be such as would not injure the materials. Hammering shall not be permitted. Adjacent surfaces or edges shall be in close contact or at uniform distance throughout.

7.12 PROVIDING FLOORING WITH VITRIFIED FLOOR TILES

The tiles shall be set in cement mortar 1:4 (1 cement : 4 sand) of average 20mm thick laid to required level/ slope. Before laying cement mortar, the concrete surface shall be scrubbed with wire brush, all loose particles, foreign matters etc. shall be removed and the surface shall be made clean. Any undulations in the concrete shall be chipped off or made good with additional concrete of the same grade used for the under layer. The surface thus prepared shall be wetted and smeared with a coat of cement slurry using cement at the rate of 2.2 kg/m² of area just before the application of the mortar, so as to get good bond between base course concrete and plastering. For fixing tiles to mortar, neat cement slurry of honey like consistency using cement at the rate of 3.3 kg/m² shall be smeared on top of mortar bed. The joints between the tiles shall be uniform and of 3mm width.

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 based grout, of approved make.

7.13 EPOXY BASED GROUTING FOR TILES

It shall be ensured that tiles are firmly set and adhesive or mortar is completely dry for 24 hours. All spacers, pegs, ropes and string shall be removed and joints be cleaned by removing free loose dirt particles.

The complete unit Part A (Base) and Part B (Hardener) shall be properly mixed in given ratio. The desired colour of grout shall be obtained by mixing required quantity of colour with base to ensure homogeneity. The grout shall be pressed firmly by using a hard rubber squeeze into joints ensuring that joints are completely filled. Excess grout material shall be removed from joints and surface by moving squeeze on grout line after 22 to 25 minutes. The damp sponge shall be used in circular motion on tile surface to achieve the flush joint. After completion of work the grout haze shall be cleaned with clean water or soap solution. The suitable rubber gloves shall be used to avoid skin contact during application.

Length and breadth of grouted tile area shall be measured correct to a cm and the area shall be calculated in sqm correct to two places of decimal.

The rate shall include the cost of all materials and labour involved in all operations described above. Nothing extra shall be paid.

7.14 PROVIDING AND APPLYING INTERIOR ACRYLIC EMULSION PAINT

The surface shall be thoroughly cleaned of dust and then be sand papered to give a smooth and even surface. Over the prepared surface one base coat of primer for

exterior/interior emulsion paint of same brand shall be applied with hand brush in horizontal stroke followed immediately by a vertical one which together shall constitute one coat. After the primer coat has dried for at least 48 hours, the surface shall be lightly sand papered to make it smooth. All loose particles shall be dusted off after rubbing and the surface cleaned well. The first finishing coat of exterior/interior emulsion paint shall then be applied with hand brush in horizontal stroke followed immediately by a vertical one which together shall constitute one coat. The second coat shall be applied in the same way of first coat to obtain an even surface, after the first finishing coat dried as per the directions of the Engineer-in-charge

Measurements of the work under this head shall be made on the basis of the area of work done and rate quoted shall include the cost of labour, materials, scaffolding etc. required for the completion of work

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 137 velvety smooth finish. If necessary more coats will be applied till the surface presents a uniform appearance.

Precautions

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.

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 scaffolding etc. required for the completion of the work.

7.15 WATER PROOFING AT ROOF TOP, PARAPET, STAIR ROOM etc.

7.15.1 Providing Seven Layer Water Proofing Coating with 15 GSM Fiber Glass Mesh over concrete roof after making the surface free from dirt, dust, algae, fungi & other contaminants by using suitable tools & equipment.

1. First Coating: Apply a single coat of modified styrene butadiene emulsion (Bonding Agent)

2. Second Coating: Fix fiber glass mesh above the first coating in wet condition

3. Third Coating: Apply one coat of single component acrylic based polymer for cement based waterproof composite coating membrane

4. Fourth Coating: Apply a single coat of primer for enhanced bonding-

5. Fifth & Sixth Coating: Apply two coats of High build fibre reinforced Acrylic based modified polyurethane-Elastomeric Solar Reflective cum water proofing coating by roller or brush on the primed surface

6. Seventh Coating: single coat of acrylic slip resistance surface coating, sealer and hardener (Transparent Water repellent coating)

The rate for waterproofing work shall include chemicals, manpower, tools, and supervision. Re-plastering, if any, required will be paid extra.

7.16 WATER PROOFING OF SUNKEN PORTION OF WC's, BATHROOMS etc.

7.16.1 Water proofing treatment in sunken portion of WCs, bathroom etc., shall be done by applying cement slurry mixed with water proofing cement compound consisting of applying :

(a) First layer of slurry of cement @ 0.488 kg/sqm mixed with water proofing cement compound @ 0.253 kg/ sqm. This layer will be allowed to air cure for 4 hours.

(b) Second layer of slurry of cement @ 0.242 kg/sqm mixed with water proofing cement compound @ 0.126 kg/sqm. This layer will be allowed to air cure for 4 hours followed with water curing for 48 hours. (The rate includes preparation of surface, treatment and sealing of all joints, corners, junctions of pipes and masonry with polymer mixed slurry.)

7.17 APPLYING FIBRE REINFORCED ELASTOMERIC LIQUID WATER PROOFING MEMBRANE WITH RESILIENT ACRYLIC POLYMERS FOR ROOFS

7.17.1 It is to be applied using a long-haired roller, brush or spray on any horizontal, sloping or vertical surfaces to form a string, flexible, tack-free dry surface, suitable for occasional light foot traffic. This can with stand normal expansion and contraction stresses caused by temperature variations due to its flexibility. This also helps lower the working temperature of roofs and guarantees good energy performance properties of all the layers of the roof.

7.17.2 Preparation of Surface - All the substrates, whether they are new or old, must be sound, clean, dry and free of all traces of oil, grease, old paint, rust, mould and any other material which could compromise the bond. Application temperature may be from 70C to 400C. Concrete and in general mineral substrates must be sound and dry with no rising damp. Any loose parts must be removed with wire brushes. All wax, water-repellent treatments, etc. must be removed from the surface of ceramic substrates with a suitable detergent and/ or by sanding. Any hollows and gaps in the surface must be repaired properly with appropriate material as described and instructed by the manufacturer of this product. The tools to be used must be properly cleaned.

7.17.3 Application procedure - All the area of operation shall be thoroughly cleaned as described in para above. Mix the content in such a manner that they are perfectly blended into a homogenous state of liquid which can be applied by long haired roller or airless spray. The fibre reinforced elastomeric liquid water proofing membrane with resilient acrylic polymers shall be applied on top of concrete roof in three coats @ 10.76 litre/10 sqm or more as recommended by manufacturer specification. One coat i.e. first coat of self priming elastomeric water proofing liquid. The material shall be diluted with water in the ratio of 3:1 (3 parts of elastomeric water proofing liquid and 1 part of water). Wait until the first coat is completely dry and becomes slightly darker in colour. After the first coat has dried completely apply second coat with undiluted elastomeric water proofing liquid in a cross direction to the previous coat. After the drying of second coat completely apply the final coat of undiluted elastomeric water proofing liquid in a direction perpendicular to previous coat. The overall dry film thickness should not be less than 500 microns or more as specified in manufacturer specification. Protect the membrane from rain unless it is completely dry. The overall consumption of the material should be as per nomenclature of the item and should also adhere to the specifications detailed in the approved schedule of the manufacturer.

7.18 WATER PROOFING TREATMENT IN SUNKEN PORTION OF WCs, BATHROOMS ETC.

7.18.1 Before the water proofing treatment, the internal plaster of ceiling and walls of WC block leaving the portion for dado/skirting should be completed. Grooving / chasing for doing the concealed work of GI/CI pipes/Electrical conduits should be completed. Cleaning the depressed/sunken portion of WC of all debris, extra mortar sticking to the vertical and horizontal surface etc. Necessary holes for P trap /Nhani trap/Water escape pipe etc should be completed.

7.18.2 Extra mortar sticking to the surface should be removed and the surface should be cleaned thoroughly. Fixing the P trap in position and all other pipes work including the water escape pipe shall be fixed properly and the holes should be plugged carefully before taking up the water proofing work.

7.18.3 Providing and Laying of Slurry for First Layer - The consistency of the slurry should be such as to cover the desired area by using 0.488 kg of blended cement per

sqm of area. On deciding the correct quantity of water required per sqm. area the required quantity of slurry should be prepared which can be applied over the desired surface within half an hour of mixing with 0.488 kg. of grey cement + 0.253 kg. water proofing compound as per manufacturer specifications + x litres of water per sqm. area and the required quantity of slurry thus prepared should only be used for first application. The first layer shall be applied with painting brushes over the specified and dampened area carefully including the corners, holes on the surfaces and joints of pipes in concrete etc. and the application should continue at least upto 150 mm height of fixtures of pipes from the surface. The surface on application shall be air cured for 4 hours.

- 7.18.4 Providing and Laying of Slurry for Second Layer - The quantity of slurry required for second application to be covered within an hour of mixing shall be prepared with 0.242 kg. cement + 0.126 kg. water proofing compound + y litres of water per sqm. area and the required quantity of slurry thus prepared should only be used for second application. The application of 2nd layer of slurry is same as for first layer as detailed in clause 1.2.18.3. The applied surface shall be allowed to air cure for 4 hours and thereafter water curing shall be done for full 48 hours.

7.19 RIDGES AND HIPS OF PLAIN GALVANISED STEEL SHEETS

- 7.19.1 Ridges and hips of C.G.S. roof shall be covered with ridge and hip sections of plain G.S. sheet with a minimum lap of 20 cm on either side over the C.G.S. sheets. The end laps of the ridges and hips and between ridges and hips shall also be not less than 20 cm. The ridges and hips shall be of 60 cm overall width plain G.S. sheet, 0.6 mm or 0.8 mm thick as given in the description of the item and shall be properly bent in shape.
- 7.19.2 Ridges shall be fixed to the purlins below with the same 8 mm dia G.I. hook bolts and nuts and bitumen and G.I. limpet washers which fix the sheets to the purlins.
- 7.19.3 Similarly, hips shall be fixed to the roof members below such as purlins, hip and valley rafters with the same 8 mm dia G.I. hook bolts and nuts and bitumen and G.I. limpet washers which fix the sheets to those roof members. At least one of the fixing bolts shall pass through the end laps of ridges and hips, on either side. If this is not possible extra hook bolts shall be provided.
- 7.19.4 The end laps of ridges and hips shall be joined together with C.G.S sheet by galvanised iron seam bolts 25 x 6 mm size each with a bitumen and G.I. washer or white lead as directed by the Engineer-in-Charge. There shall be at least two such bolts in each end lap.
- 7.19.5 Surface of C.G.I. sheets of ridge and hip sections and the roofing sheets which overlap each other shall be painted with a coat of approved primer and two coats of approved paint suitable for painting G.S. Sheets before they are fixed in place.
- 7.19.6 The edges of the ridges and hips shall be straight from end to end and their surfaces should be plane and parallel to the general plane of the roof. The ridges and hips shall fit in squarely on the sheets.

7.19.7 The measurements shall be taken for the finished work in length along the centre line of ridge or hip, as the case may be, correct to a cm. The laps in ridges and hips and between ridges and hips shall not be measured.

7.19.8 The rate shall include the cost of all labour and materials specified above, including painting, cost of seam bolts and any extra G.I. hook bolts, nuts and washers, required.

7.20 VALLEY AND FLASHING OF PLAIN GALVANISED STEEL SHEETS

7.20.1 Valley shall be 90 cm wide overall plain G.S. sheet 1.6 mm thick or other size as specified in the item bent to shape and fixed. They shall lap with the C.G.S. sheets not less than 25 cm width on other side. The end laps of valley shall also be not less than 25 cm.

7.20.2 Valley sheets shall be laid over 25 mm thick wooden boarding if so required. Flashing shall be of plain G.S. sheet of 40 cm overall width 1.25 mm thick or 1.00 mm thick as specified in the item bend to shape and fixed. They shall lap not less than 15 cm over the roofing sheets. The end laps between flashing pieces shall not be less than 25 cm.

7.20.3 Flashing and valley sheets shall be fixed to the roof members below, such as purlins and valley rafters with the same 8 mm dia G.I. hook bolts and nuts and bitumen and G.I. limpet washers which fix the sheets to those roof members. At least one of the fixing bolts shall pass through the end laps of the valley pieces on other side. If this is not possible extra hook bolts shall be provided. The free end of flashing shall be fixed at least 5 cm inside masonry with the mortar of mix 1: 3 (1 cement: 3 coarse sand).

7.20.4 Surface of G.S. sheets under overlaps shall be painted with a coat of approved primer and two coats of approved paint suitable for painting G.S. sheets.

7.20.5 The edges of valley and flashing should be straight from end to end. The surfaces should be true and without bulges and depressions.

7.20.6 The edges of valley and flashing should be straight from end to end. The surfaces should be true and without bulges and depressions.

7.20.7 The rate for valleys, shall be for all the labour and materials specified above, including painting, cost of seam bolts and the cost of requisite G.I. hook bolts, nuts and washers required over and above those needed for connecting the roof sheets to the roof members. The rate for valleys shall exclude the cost of boarding underneath which shall be paid for separately. The rate for flashing shall be for all the labour and materials specified above, and shall include the cost of painting and mortar for fixing in wall.

7.21 CALCIUM SILICATE TILES FALSE CEILING

- 7.21.1 8 mm thick fully perforated calcium silicate board made with Calcareous & Siliceous materials reinforced with cellulose fiber manufactured through autoclaving process to give stable crystalline structure with minimum compressive strength 225 kg/ sq. cm, bending strength 100 kg/sq. cm , of size 595x595 mm, having perforation of dia. 10 mm with minimum perforated area 18 % with non woven tissue on the back side, having an NRC (Noise Reduction Coefficient) of 0.85, with 50 mm thick rock wool of 48 kg /cum backing shall be used.
- 7.21.2 Frame is made up of interlocking metal grid of hot dipped galvanized steel sections (galvanized @ 120 grams/ sqm, both side inclusive) consisting of main óTô runner with suitably spaced joints to get required length and of size 24x38 mm made from 0.30 mm thick (minimum) sheet, spaced at 1200 mm center to center and cross óTô of size 24x25 mm made of 0.30 mm thick (minimum) sheet, 1200 mm long spaced between main óTô at 600 mm center to center to form a grid of 1200x600 mm and secondary cross óTô of length 600 mm and size 24x25 mm made of 0.30 mm thick (minimum) sheet to be interlocked at middle of the 1200x600 mm panel to form grids of 600x600 mm and wall angle of size 24x24x0.3 mm etc. complete.
- 7.21.3 Main óTô runners to be suspended from ceiling using GI slotted cleats of size 27 x 37 x 25 x1.6 mm fixed to ceiling with 12.5 mm dia and 50 mm long dash fasteners, 4 mm GI adjustable rods with galvanized butterfly level clips of size 85 x 30 x 0.8 mm spaced at 1200 mm center to center along main T, bottom exposed width of 24 mm of all T sections shall be pre-painted with polyester paint, all complete for all heights as per specifications, drawings and as directed by Engineer-in-charge. false ceiling tiles of approved texture shall be laid in the grid including, required cutting/making, opening for services like diffusers, grills, light fittings, fixtures, smoke detectors etc.
- 7.21.4 Manufacturers test certificate/ report of invoice shall be submitted for every delivery challan by suppliers.
- 7.21.5 All wet trades such as plastering, conduting and painting etc, be completed prior to start of false ceiling works. Air conditioning duct work is to be completed preferably even before the suspension of the grid section. Electrical chasing or drawing lines & cables, etc are to be in place before start of false ceiling work. No unauthorized weight is put on false ceiling. Lighting fixtures, diffusers are to be suspended independently with proper chain/wire & dash fasteners as directed by Engineer In Charge/manufacturer guide line. The area shall be made dry prior to ceiling installation work.
- 7.21.6 Care should be taken while placing Light Weight calcium silicate tiles into the grid so that there will be no displacement to grid and stains/ dirty marks put by the workers. (Worker should preferably wear clean soft cotton gloves while placing tile).
- 7.21.7 Length and breadth shall be measured correct to a cm. Areas shall be calculated nearest to 0.01sqm. No deduction in measurements shall be made for openings of

areas upto 0.36 Sqm. Nothing extra shall be payable either for any extra material or labour involved in forming such openings. For openings exceeding 0.36 sqm in area, deductions in measurements for the full opening in multiple of area of each tile (0.36 Sqm) will be made.

- 7.21.8 The rate shall include the cost of all materials and labour involved in all the operations described above.

7.22 CALCIUM SILICATE BOARD FALSE CEILING

- 7.22.1 8 mm thick Calcium Silicate Board made with Calcareous & Siliceous materials reinforced with cellulose fiber manufactured through autoclaving process shall be used.
- 7.22.2 Frame work is made of special section, power pressed from M.S. sheets and galvanized with zinc coating of 120 gms/ sqm (both side inclusive) as per IS : 277 and consisting of angle cleat of size 25mm wide x 1.6mm thick with flanges of 27mm and 37mm, at 1200mm c/c, one flange fixed to the ceiling with dash fastener 12.5mm dia x 50mm long with 6mm dia bolts, other flange of cleat fixed to the angle hangers of 25 x10 x0.50mm of required length with nuts & bolts of required size and other end of angle hanger fixed with intermediate G.I channels 45 x15 x 0.90mm running at the spacing of 1200 mm c/c, to which the ceiling section 0.5mm thick bottom wedge of 80mm with tapered flanges of 26 mm each having lips of 10.5mm, at 450mm c/c, shall be fixed in a direction perpendicular to G.I intermediate channel with connecting clip made out of 2.64mm dia x 230mm long G.I wire at every junction, including fixing perimeter channels 0.50mm thick 27mm high having flanges of 20mm and 30mm long.
- 7.22.3 The perimeter of ceiling fixed to wall/ partitions with the help of rawl plugs at 450mm centre, with 25mm long dry wall screws @ 230mm interval, including fixing of Calcium Silicate Board to ceiling section and perimeter channels with the help of dry wall screws of size 3.5 x25mm at 230mm c/c, including jointing & finishing to a flush finish of tapered and square edges of the board with recommended jointing compounds, jointing tapes, finishing with jointing compounds in three layers covering up to 150mm on both sides of joints and two coats of primer suitable for boards, all as per manufacture's specification and also including the cost of making opening for light fittings, grills, diffusers, cut outs made with frame of perimeter channels suitably fixed, all complete as per drawings, specification and direction of the Engineer in charge but excluding the cost of painting.
- 7.22.4 Manufacturers test certificate/ report of invoice shall be submitted for every delivery challan by suppliers.
- 7.22.5 All wet trades such as plastering, conduiting and painting etc, be completed prior to start of false ceiling works. Air conditioning duct work is to be completed preferably even before the suspension of the grid section. Electrical chasing or drawing lines & cables, etc are to be in place before start of false ceiling work. No

unauthorized weight is put on false ceiling. Lighting fixtures, diffusers are to be suspended independently with proper chain/wire & dash fasteners as directed by Engineer In Charge/manufacturer guide line. The area shall be made dry prior to ceiling installation work.

- 7.22.6 Care should be taken while placing Light Weight calcium silicate tiles into the grid so that there will be no displacement to grid and stains/ dirty marks put by the workers. (worker should preferably wear clean soft cotton gloves while placing tile).
- 7.22.7 Length and breadth shall be measured correct to a cm. Areas shall be calculated nearest to 0.01sqm. No deduction in measurements shall be made for openings of areas upto 0.36 Sqm. Nothing extra shall be payable either for any extra material or labour involved in forming such openings. For openings exceeding 0.36 sqm in area, deductions in measurements for the full opening in multiple of area of each tile (0.36 Sqm) will be made.
- 7.22.8 The rate shall include the cost of all materials and labour involved in all the operations described above.

7.23 ALUMINIUM DOORS, WINDOWS, VENTILATORS, PARTITIONS ETC

- 7.23.1 Aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / panelling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing, panelling and dash fasteners to be paid for separately) For fixed portion- Anodised aluminium (anodised transparent or dyed to required shade according to IS: 1868, Minimum anodic coating of grade AC 15) shall be used.
- 7.23.2 Glazing in aluminium door, window, ventilator shutters and partitions etc. shall be done with float glass panes of 4.0 mm thickness with EPDM rubber / neoprene gasket etc. as per the architectural drawings and the directions of Engineer-incharge. (Cost of aluminium snap beading shall be paid in basic item)

7.24 PANELING MATERIAL

7.24.1 Pre-laminated Particle Board

- 7.24.1.1 A particles board laminated on both surfaces by synthetic resin impregnated base papers under heat and pressure. Pre -laminated particle boards shall be of two grades, namely, Grade I and II corresponding to IS 3087 & 12823. Each of the grades specified shall be of four types, namely, Types-I, II, III, and IV classified

by the surface abrasion characteristics. The grade and types of pre-laminated particle board shall be as per cpwd specifications.

7.24.2 Particle Board

7.24.2.1 Synthetic resin bonded flat pressed three layers, multilayer and graded particle board defined in IS 3087 having superfine surface shall be used for production of prelaminated particle board. For ECO Marks the particle board shall also conform to the requirements of ECO Mark specified in IS 3087.

7.25 MELAMINE POLISH

7.25.1 Melamine is an organic compound that is often combined with formaldehyde to produce melamine resin, a synthetic polymer that is fire resistant and heat tolerant. The resin is a versatile material that has a highly stable structure. It is a closed pore polish i.e. it makes the wood non-breathable product that protects wood from mainly hot and cold surfaces placed over it.

7.25.2 The surface shall be thoroughly cleaned. All unevenness shall be rubbed down smooth with sand paper and shall be well dusted. Surface must be dry, free from dust, oil, wax, greases etc.

7.25.3 Mix melamine (matt or gloss) base with the catalyst in the specified ratio as per manufacturers specification. Add melamine thinner upto 30% (as specified by the manufacturer) by volume of mixture. Stir it and allow it to mature for 2-3 minutes. The melamine is sprayed, using spray gun pressure of 45-55 psi, from a distance of 7"-10" from substrate.

7.25.4 Precaution : Avoid eye contact, use of mask is mandatory during whole process.

7.26 PANELLED GLAZED OR PANELLED AND GLAZED SHUTTERS

7.26.1 Panelled or glazed shutters for doors, windows, ventilators and cupboards shall be constructed in the form of timber frame work of stiles and rails with panel inserts of timber, plywood, block board, veneered particle board, fibre board wire gauze or float glass. The shutters may be single or multipanelled, as shown in the drawings or as directed by the Engineer-in-Charge. Timber for frame work, material for panel inserts and thickness of shutters shall be as specified. All members of the shutters shall be straight without any warp or bow and shall have smooth well planed face at right angles to each other.

7.26.2 Any warp or bow shall not exceed 1.5 mm for door shutter and 1 mm for window and ventilator shutters The right angle for the shutter shall be checked by measuring the diagonals and the difference between the two diagonals should not be more than 3 mm. Generally panelled glazed or panelled and glazed shutter shall conform to IS 1003.

7.26.3 The panel inserts shall be either framed into the grooves or housed in the rebate of stiles and rails. It shall be fixed only with grooves. The depth of the groove shall be 12 mm and its width shall accommodate the panel inserts such that the faces are

closely fitted to the sides of the groove. Panel inserts shall be framed into the grooves of stiles and rails to the full depth of the groove leaving space of 1.5 mm. Width and depth of the rebate shall be equal to half the thickness of stiles and rails. Glass panels, asbestos panels wire gauze panels and panel inserts of cupboard shutters shall be housed in the rebates of stiles and rails.

7.27 BRICK MASONRY

- 7.27.1 Brick masonry shall conform to IS: 2212. All bricks shall be thoroughly soaked in water for at least 6 hours before use. Brickwork shall not be raised more than 14 courses per day.
- 7.27.2 The grade of mortar shall be as specified in the Schedule of Quantities.
- 7.27.3 Joints shall be restricted to a thickness of 10mm unless otherwise required and shall be squarely raked to a depth of 12mm while the mortar is still wet and brushed.
- 7.27.4 Curing shall be done for 7 days.
- 7.27.5 Payment for brick masonry shall be made on cubic metre basis irrespective of thickness. The rate shall include all labour and materials including scaffolding.

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8. ELECTRICAL WORKS TECHNICAL SPECIFICATION

8.1. SCOPE OF WORK

The subject work is for **“CIVIL RENOVATION WORKS, PROVIDING NEW ELECTRICAL FACILITIES & REWIRING AT WHARF SUPERINTENDANT OFFICE BUILDING AT ERNAKULAM WHARF”**.

8.2. Electrical Distribution System

GENERAL TECHNICAL PARTICULARS.

Fault level at W/Island at 11 KV	: 25 KA
Anticipated Max. fault level	: 50 KA
Rated system voltage	: 11 KV
Rated frequency	: 50 Hz
Neutral earthing	: effectively earthed.
Installation of cable	: Underground burial.
Rated short circuit current at 11 KV side	:25 KA
Proximity of extraneous heat source	: Nil
Max. Permissible operating temp. of conductor under normal Operation	: 90 ⁰ C
Under short circuit	: 250 ⁰ C
Ground temperature	: 40 ⁰ C
Type of installation	: Earthed
Maximum temperature of air	: 40 degree C
Minimum temperature of air	: 22 degree C
Maximum relative humidity	: 95%
Minimum relative humidity	: 10%
Average No. Of thunderstorm days	: 40 days
Average number of rainy days per annum	: 90 days

8.3. TYPE OF SOIL ALONG THE CABLE ROUTE

General condition of the earth is soft marshy. Some portions are tarred with rubble soling. However Contractor shall conduct route survey before submitting their quotes.

8.4. GENERAL CONDITIONS

In addition to the above, the scope intends to cover but not restrict to the following activities, services and works.

- i. Complete design and engineering of all the systems, sub-systems, equipment, material and services.
- ii. Providing engineering data, drawing and O&M manuals for Employer's review, approval and records.

- iii. Supply, testing, packing transportation and insurance the equipment's from the manufacturer's work to the site.
- iv. Receipt, storage, insurance, preservation and conservation of equipment at the site.
- v. Fabrication, pre-assembly (if any), erection, testing and putting into satisfactory operation of all the equipment/ material including statutory clearances & successful commissioning.
- vi. In addition to the requirements indicated in Technical Specifications, all the requirements as stated in relevant regulations stipulated for successful commissioning of the installation also be considered as a part of this specification and Contractor is bound for compliance the same.
- vii. Providing GFC and Final Electrical layout / Schematic drawings after the successful completion of the work. , warranty certificates etc.
- viii. The Contractor shall be responsible for providing all material, equipment and services specified or otherwise which are required to fulfill the intent of ensuring operability, maintainability and the reliability of the complete work covered under this specification.
- ix. For individual equipment specifications reference shall be made to the relevant Technical Specification of the equipment as per contract condition.
- x. Dismantling the Old Electrical items and handing over to Testing & Repairs section , scrape yard etc. as per EIC directions.
- xi. The Contractor shall be responsible for the overall management and supervision of works. He shall provide experienced, skilled, knowledgeable and competent personnel for all phases of the project, so as to provide the Employer with a high quality system.
- xii. A project execution schedule called Master Network (MNW) in the form of PERT / Gant chart/ network and based on "Work break down structure" shall be prepared by the Contractor for Employer's approval. The MNW shall identify milestones of key events for each work/ component in the areas of engineering, procurement, manufacture, dispatch, erection and commissioning.

8.5. PROJECT MANAGEMENT & SITE SUPERVISION

In case the contractor intends to subcontract the electrical works, the subcontractor who will be employed shall be a class B contractor or above / License holder issued by state electrical inspectorate/ central electricity authority. The contractor shall submit all the required credentials of the subcontractor to the employer for approval of the appointment of subcontractor.

8.5.1. TESTING AND COMMISSIONING

- i. The scope includes testing and commissioning of all equipment, sub-systems and systems of the project and putting them into successful commercial operation. The scope shall include but not limited to the requirements given elsewhere in the specification. The Contractor shall be responsible to provide all necessary testing and commissioning personal, tools and plant, test equipment, etc.
- ii. The Contractor shall identify all interface issues with Employer and other agencies, and shall be responsible for each interfacing, coordination and exchange

- of all necessary information.
- iii. The Contractor shall submit to the Employer all drawings for review. He shall list out the detailed requirements of interface between Contractor's work and the material and services to be supplied by Employer.
- iv. The interpretation of the Employer in respect of the scope, details and services to be performed by the Contractor shall be binding, unless specifically clarified otherwise by the Employer in writing before the award of the contract.
- v. The drawings (enclosed), forming a part of the specification shall supplement the requirements specified herein. These are preliminary/ tentative drawings for bidding purpose only and are subject to changes that may be necessary during detailed engineering after award keeping the basic parameters as specified.
- vi. Failure of any equipment to meet the specified requirements of tests carried out at works or at site shall be sufficient cause for rejection of the equipment. Rejection of any equipment will not be held as a valid reason for delay in the completion of the works as per schedule. Contractor shall be responsible for removing all deficiencies and supplying the equipment that meet the requirement after furnishing of necessary fresh type test report, as per relevant ISS Standard from NABL Accredited Laboratory.

8.5.2. COMPLIANCE OF ELECTRICITY ACT, REGULATIONS, ETC.

- i. Contractor is required to follow statutory regulations stipulated in Electricity Act 2003, Indian telegraph act 1889, Electricity (Supply) Act 1948, Indian Electricity Rules 1956, CEA (Regulation relating to safety of electrical installation) regulation 2010, with all amendments till date and other local rules and regulation referred in this specifications.
- ii. The Contractor shall comply with all the statutory rules and regulations prevailing in the state of Kerala including those related to safety of equipment and human beings.
- iii. The successful Contractor (individual) or any of the partner of joint venture who has qualified, should obtain 6B or above class electrical license from Electrical inspectorate of Govt. of Kerala/ GoI/ any other state/ Union territory etc, before award of contract and to be kept valid till such time all the erected work as per scope of the award is taken over by the Employer.
- iv. The Contractor shall do complete coordination with all local and statutory agencies for execution of complete works including obtaining clearance for energizing of the HT system upon completion of entire works.
- v. The Contractor shall obtain approvals & clearances and right of way from all agencies involved. All cable routes shall generally be routed through public land/ along the road.
- vi. The Contractor shall be responsible for transportation to site all the materials to be provided by the Contractor as well as proper storage and preservation of the same at his own cost, till such time the erected installation is taken over by the Employer.

8.6. METHODOLOGY OF PROCUREMENT

All equipments/material shall be sourced from reputed manufacturers only. All equipment/ material offered shall be of reputed manufacturers only as per the list of approved make mentioned in the tender document and who have designed, manufactured, completely tested for relevant Indian Standards and supplied the equipment/ material to various State Electricity Boards or other reputed utilities which are in trouble free services at least two different locations for a period of more than two (2) years as on the date of bid opening.

8.7. QUALITY ASSURANCE, INSPECTION AND TESTS

- i. The Contractor shall offer proven and type tested equipment for the project. The type test Certificates shall be complete as per the relevant I.S., carried out by NABL, CPRI or any other statutory bodies responsible for testing of equipment and it shall not be older than 5 years.
- ii. If required, Sub-vender's credentials, copies of valid BIS license, past supply & performance certificates as per requirement will also be required for sub-vender's approval, if not already approved for a specific item.
- iii. In case during post award detail engineering stage, if any equipment is found to be not type tested or partially type tested, as per I.S., the Contractor shall carry out complete type test for the items at his own cost.
- iv. The Contractor shall arrange all type, routine and acceptance tests at manufacturer's works as per approved Material Quality Programme with CoPT's officer. Any expenditure in connection with deputing the representative to the manufacturer's work site will be borne by CPT. The Contractor shall arrange the inspection program in consultation with engineer-in-charge to give sufficient advance intimation of the manufacturing and testing schedules to facilitate timely inspection of the equipments by CoPT. Fake inspection call will attract penalty as per the discretion of the employer.
- v. The Contractor shall provide one set of tests reports to Employer on successful completion of the tests.

8.8. GENERAL TECHNICAL SPECIFICATIONS

8.8.1. SUPPLY OF MATERIALS - GENERAL

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.

8.9. INSTALLATION OF EQUIPMENTS - GENERAL

8.9.1. 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.

- i. IS: 1255 - Code of practice for installation and maintenance of power cables upto and including 33 kV rating.
- ii. IS : 5216 - Guide for safety procedures and practices in Electrical work.
- iii. IS : 100118 - Code of practice for selection, installation and maintenance for Switchgear and control gear-Part-III Installation.
- iv. 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).
- v. IS: 3043/87 - Code of practice for installation and maintenance of earthing of installation.

8.9.2. Reference

- i. Following documents shall be read in conjunction with this specification
- ii. Scope of work and special requirements
- iii. Schedule of items of work
- iv. Engineering Specification and Data sheet of General requirements of Electrical system.

8.10. General Conditions For Installation Of Equipments

- i. 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.
- ii. The erection scope shall include supply of all hardwares 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.

- iii.** 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.
- iv.** 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.
- v.** 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.
- vi.** 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 owners 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.
- vii.** All equipment's 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.
- viii.** 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.

- ix. 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.
- x. 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.
- xi. All the relays and its settings after commissioning shall be furnished to 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. All relays, before installation, the rating, range and auxiliary supply voltages for the relay should be checked against drawings/ schematic/ schedule.

8.11. Civil and structural works

- i. 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.

- ii. Chipping, grouting, etc as recommended shall be done for completion and installation work on the finished floor, wall, roof, etc. 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.

8.12. Standard requirements for testing and commissioning

The standard requirements for testing and commissioning are furnished below.

- i. 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.
- ii. 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.
- iii. 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 leak proofness. Oil filling if found required shall be done with dry & clean oil. Gaskets shall be replaced if found required. The condition of oil shall be tested in accordance with IS-335.

8.13. DETAILED TECHNICAL SPECIFICATION-SUPPLY OF MATERIALS

8.13.1. MAIN AND 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. The DBs are to be fabricated out of 14 SWG CRCA sheet / IK09 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.

Accessories

Following accessories are to be provided:-

- i. Copper bus bars of rated current capacity per phase.

- ii. Special brass terminals to ensure perfect connections of incoming cable with the bus bars, colour coded interconnecting wire set.
- iii. 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.
- iv. Suitable gaskets to ensure weather proof conditions
- v. Sufficient number of blanking plates.
- vi. All MCB not specified otherwise shall be c curve with 10ka or above as per required breaking capacity.
 - a. The item shall be of powder coated CRCA sheet steel double door distribution board, IK 09 etc. and neutral link with all accessories as per annexure.
 - b. The exact location of DB shall be finalized in consultation with the engineer-in-charge.

Details

- i. 63 A TPN 4 way(8+12)VDB
 Incomer ñ 63 A4P MCB, 25KA
 Outgoing ñ 32A 3P MCB- 3nos.
 6 A to 32 A SP MCB-remaining as per requirement.

The installation includes connecting the existing cables if necessary with suitable materials and inter connection of the existing earth 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/ adapter 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 Distribution panel shall be finalized in consultation with the engineer-in-charge.

8.13.2. 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 copper 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.

8.14. GENERAL SPECIFICATIONS FOR WIRING AND ELECTRICAL INSTALLATIONS

- i. All the switches, plugs etc. shall be of modular type with plates, cover etc.

complete. All wiring cables shall be Fire Retardant 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. FRLSH PVC insulated multi stranded core cable etc as required All inter connections shall be provided as follows:

- ii. The outgoings of 6 A & 10A MCBs shall be connected to the light/ fan/ plug points with 1.5 Sq mm copper cable.
- iii. The outgoings 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.
- iv. 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).
- v. 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, Fiber 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.
 - h. 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.
 - i. In the case of plug points the point length shall be measured from the DB to individual plug socket.
 - j. 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.

- k. 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.
- l. 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.
- m. 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.
- n. 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.
- o. 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.
- p. 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
- q. 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.
- r. Refixing of old ceiling fans including wiring , fixing hooks, etc . as required.
- s. SITC of calling bell of superior quality including wiring, fixing etc as required.

8.15. LED Lamps

7/9/10/15/18/45 W LED light fittings as per the BOQ

LED ceiling lights white drive include all accessories

- **Office/Control Zones:** For the **Ship Controller Room** and **Booking** area, a higher Lux level (for eg.500 Lux) is recommended to support high-concentration tasks and documentation accuracy.
- **Porterage & DLD:** Given the large area (9.90* 6.38 sqm in the main section), a grid layout of 2*2 LED panels is the most efficient way to ensure uniform light distribution without dark corners.
- **Passage Lighting:** The 2.20 M wide passages should utilize center-aligned recessed downlights to maintain a clean aesthetic while providing safe transit lighting.
- **Emergency Lighting:** It is recommended to include at least one emergency battery-backup fixture in the **Lobby, Passage, and Ship Controller Room** for safety during power interruptions.

8.16. CEILING FAN

Porterage & DLD Layout: Due to the large size and "L" shape of the Porterage area 9.90* 6.38 m and 6.68 m *3.75 m, fans should be arranged in a grid. It is suggested to place 4 fans in the main rectangular section 2 * 2 and 2 fans in the smaller section for balanced airflow. The BOQ rate for fan shall include the supply of Remote with battery , Down Rod and fixing also with suitable clamp etc. as per requirements.

Mounting Height: Ensure the fan blades are mounted at least 8 to 9 feet above the floor for optimal air circulation. If the ceiling height is above 10\ feet, use appropriate down rods.

Clearance: Maintain a minimum distance of 18 to 24 text inches between the tip of the fan blades and the nearest wall or fixture to prevent "air buffeting" and ensure efficiency.

1200 mm sweep, BEE 5 star rated, ceiling fan with Brush Less Direct Current (BLDC) Motor, class of insulation: B, 3 nos. blades, 2nos. canopies, shackle kit, safety rope, copper winding, Power Factor not less than 0.9, Service Value (CM/M/W) minimum 6.00, Air delivery minimum 210 Cum/Min , 350 RPM (tolerance as per IS : 374-2019),THD less than 10%, remote or electronic regulator as per Department requirement unit 5 step speed control and all remaining accessories including safety pin, nut bolts, washers, temperature rise=75 degree C (max.), insulation resistance more than 2 mega ohm, suitable for 230 V, 50 Hz, single phase AC Supply, earthing etc. complete as required

8.17. LAYING OF CABLE

The cable shall be laid through the ground /wall by clamping as instructed by the EIC . If underground , cable shall be laid at a depth of approximately 60 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. The payment tiles etc. removed for laying the cables shall be replaced properly to the original condition. Pipes if any needed will be supplied by CoPA.

8.18. Providing End Terminations

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.

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 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.

8.18.1. General requirements of joints and terminations

The installed joints and terminations must provide the following:

- i. Complete external leakage insulation between the high voltage conductor and earth potential using anti-track heat shrink material.
- ii. Electrical stress control using semi-conducting heat shrinkable tubing over the cores and by the insertion of high dielectric strength insulating material into the crutch of the termination such that electrical discharge activity does not occur in the termination after it has been energised at its rated voltage.
- iii. Hermetic sealing of the interfaces between heat shrinkable materials and cable surfaces, bushings or cable lugs by use of track resistant hot melt adhesive which can accommodate the creep and relaxations that may occur with recovered heat shrink materials. This sealant shall be pre-coated inside the heat shrinkable components and activated by the heat applied to shrink the components which shall be in excess of 125 Deg.C.
- iv. Uniform adhesive flow from the adhered heat shrink component into the adjoining surfaces will be used as an indicator that shrinking is complete, and therefore, the adhesive must be suitable for this purpose.
- v. Outdoor terminations shall incorporate a design feature to prevent flexing of the terminated cores under short circuit conditions.

- vi. Joints and terminations must be insensitive to cable manufacturers tolerances allowed under BSS 6480-1969.
- vii. The length of core insulation required is 450 mm per phase.
- viii. Copper braid should be provided to connect the metal shield of XLPE cable and to make electrical contact with the outer screen of the joint for transition joints.

8.19. POLYCARBONATE KRONE JUNCTION BOXES

SITC of Polycarbonate krone box with 100 pair krone for telephone system including termination of cables as required. 100 pair.

SITC of Polycarbonate krone box with 20 pair krone for telephone system including termination of cables , glands etc. as required. 100 pair.

8.20. 1.5 TR Inverter type AC units

Non-Inverter type 3 star rated high wall mounting split air conditioner units shall be conforming to relevant latest IS suitable for operating on 230V, 50Hz single phase AC supply, filled with R-410A refrigerant gas, Copper coil, high energy efficient, RoHS complaint, capable of performing functions like cooling, dehumidifying, air circulating, filtering etc of following capacity including refrigerant copper piping insulation, control cable ,drain pipe, condenser stand, microprocessor control with cordless remote control, Stand for fixing the unit etc. in complete for SITC of same.

8.21. VOLTAGE STABILIZER

Supply, Conveyance & amp; Installation of Voltage stabilizer suitable for split type 2 TR/ 1.5 TR AC unit, capacity 15A with voltage range of 175-275V and out put range of 210 -240V (V Guard VG500) or its equivalent.*

8.22. EARTHING

8.22.1. Applicable Standards

Earthing Materials shall conform to latest applicable standards

- i. IS: 2062 Grade A Quality Specification for MS angles, MS channel & MS Flat
- ii. IS: 2062 Chemical & Physical composition of materials.
- iii. IS: 1852 Rolling & Cutting tolerances for Hot Rolled Steel products

8.23. DISMANTLING

Dismantling of old/ damaged existing electrical wiring materials, Panels and fuse units, distribution boards, etc.. The removed portions shall be made good with cement plaster etc. by the contractor at his own cost. The dismantled/removed items shall be handed over to the scrap yard or as directed by the Engineer-in-charge. The removed portions shall be made good with cement plaster etc. by the contractor at his own cost. The items removed shall be handed over to Testing & Repairs section , scrape yard etc. as per EIC directions.

Dismantling of old AC units from the current location and shifting of the same to the new locations as instructed by EIC including complete installation, testing and Commissioning. The removed portions shall be made good with cement plaster etc.

by the contractor at his own cost.

8.24. SPECIAL CONDITIONS FOR ELECTRICAL WORKS

- i. All current carrying components in all installation shall be of appropriate rating of voltage and frequency as required at respective areas.
- ii. All equipments to be supplied and works to be executed shall conform to the CEA standards including protection and metering accessories. No extra amount will be paid in this regard.
- iii. All testing and calibration etc are to be carried out as per requirement of statutory authority concerned.
- iv. On completion of work the contractor has to obtain necessary safety/ energisation certificate from statutory agency concerned, by submitting necessary completion statement/ drawing, equipment details etc. before energisation.
- v. All costs incurred in obtaining such approval/certificate are to be borne by the contractor. Statutory fees paid shall be reimbursed on presentation of document.

8.25. APPROVED MAKES

1	1.1 KV XLPE CABLE/WIRES	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
7	MCB /RCBO/ISOLATOR	LEGRAND / MERLIN GERIN / MK / ABB/ L &T / SIEMENS /SCHNEIDER / HPL
10	PLUG SOCKETS -IP66	MENNEKES / HENSEL / MERLIN GERIN / L&T / ABB / WALTHER / CAPE
12	LED LIGHT FITTINGS	OSRAM / BAJAJ/ CG/ PHILIPS / WIPRO/ GE / LIGHTING TECHNOLOGIES
13	PVC CONDUIT PIPES / CASING & CAPPING	BALCO/ ATUL/ GEO/ CLIPSAL/ PRECISION/ AVONPLAST/ KONSEAL
15	WIRING CABLE	FINOLEX/ QFLEX/ RR KABEL/ RPG CABLES/ LAPP KABEL/ V-GUARD/ HAVELLS/ L&T/ RALLISON

27	INSTRUMENTATION / TELEPHONE CABLES	TRACO / HINDUSTAN CABLES / DELTON / FINOLEX / USHA BELTRON / PRIMECAB / VIDYA
28	MODULAR SWITCHES/ PLUG SOCKETS/ CEILING ROSE	ANCHOR/ MK/ LEADER / CRABTREE/ SIEMENS/ FINOLEX/LEGRAND/ABB
32	AIR-CONDITIONER	VOLTAS / BLUE STAR / CARRIER / LG / HITACHI / DAIKIN
33	VOLTAGE STABILIZER	V-GUARD
34	BLDC CEILING FAN	PHILIPS/CROMPTON/V-GUARD OR EQUIVALENT

SIGNATURE OF TENDERER

ANNEXURE-I

COCHIN PORT AUTHORITY

**CIVIL RENOVATION WORKS, PROVIDING NEW ELECTRICAL
FACILITIES & REWIRING AT WHARF SUPERINTENDANT OFFICE
BUILDING AT ERNAKULAM WHARF**

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 indemnify CoPA officials for any actions taken in this regard

SIGNATURE OF TENDERER

ANNEXURE II

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:T6/T-2100/2026-C (Civil Renovation Works, Providing New Electrical Facilities & Rewiring at Wharf Superintendant Office Building at Ernakulam Wharf)

Yours faithfully,

Signature :

Name & Designation:

PROFORMA OF POWER- OF-ATTORNEY/LETTER OF AUTHORITY

(To be submitted on Non-judicial Stamp Paper of appropriate value)

To

The Chief Engineer
Cochin Port Authority,
Cochin 682009.
Kerala, India.

Dear Sir,

We_____ do hereby confirm that Mr./Ms./Messrs_____ [***INSERT NAME AND ADDRESS***], whose signature is given below, is /are authorized to represent us to bid, negotiate and conclude the agreement on our behalf with you against Tender for **CIVIL RENOVATION WORKS, PROVIDING NEW ELECTRICAL FACILITIES & REWIRING AT WHARF SUPERINTENDANT OFFICE BUILDING AT ERNAKULAM WHARF**".

We confirm that we shall be bound by all and whatsoever our said agents shall commit.

Signature of the authorized person:

Name & Designation :

Yours faithfully,

Signature, name and seal of the certifying authority

FORMAT FOR FURNISHING BANK INFORMATION FOR e-PAYMENT

1	Name and full address of the beneficiary	
2	Credit Account No. (Should be full 14 digit)	
3	Account Type (SB or CA or OD)	
4	Name of the Bank	
5	Branch (Full address with telephone No.)	
6	MICR code (Should be 9 digit)	
7	Telephone/Mobile/Fax No. of the beneficiary	Telephone: Mobile : Fax :
8	Cancelled Cheque	

Signature with seal
(Authorized Signatory)

**PROFORMA OF BANK GUARANTEE FOR PERFORMANCE GUARANTEE/
SECURITY DEPOSIT**

(To be executed on non-judicial Stamp Paper of appropriate value)

[The bank, as requested by the successful Tenderer, shall fill in this form in accordance with the instructions indicated]

In consideration of the Board of Authorities Major Ports for the Port of **[insert name of Port]** incorporated by **The Board of Major Port Authority Act, 2021** as amended by Major Port Authority (hereinafter called 'The Board' which expression shall unless excluded by or repugnant to the context or meaning thereof be deemed to include the Board of Trustees of the Port of **[insert name of Port]**, its successors and assigns) having agreed to exempt _____ (hereinafter called the 'Contractor')

(Name of the Contractor/s)

from the demand under the terms and conditions of the Contract, vide _____ & letter No. _____

(Name of the Department)

date _____ made between the Contractors and the Board for execution of _____ covered under Tender No. _____ dated _____ (hereinafter called 'the said contract') for the payment of Security Deposit in cash or Lodgement of Government Promissory Loan Notes for the due fulfilment by the said Contractors of the terms and conditions of the said Contract, on production of a Bank Guarantee for Rs. _____ (Rupees _____) only we, the (Name of the Bank and _____ Address) _____

_____ (hereinafter referred to as 'the Bank') at the request of the Contractors do hereby undertake to pay to the Board an amount not exceeding Rs. _____ (Rupees _____) only against any loss or damage caused to or suffered or which would be caused to or suffered by the Board by reason of any breach by the Contractors of any of the terms and conditions of the said contract.

2. We, _____, _____, do hereby

(Name of Bank)

(Name of Branch)

undertake to pay the amounts due and payable under this guarantee without any demur merely on a demand from the Board stating that the amount claimed is due by way of loss or damage caused to or which would be caused to or suffered by the Board by reason of any breach by

the Contractors of any of the terms and conditions of the said contract or by reason of the Contractors failure to perform the said contract. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this guarantee shall be restricted to any amount not exceeding Rs. _____ (Rupees _____) only.

3. We, _____ (Name of Bank and Branch) _____, undertake to pay to the

Board any money so demanded notwithstanding any dispute or disputes raised by the Contractor(s) in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the Contractor(s) shall have no claim against us for making such payment.

4. We, _____ (Name of Bank and Branch) further agree with the Board that the guarantee herein contained shall remain in full force and effect during the period that would be taken for performance of the said contract and that it shall continue to be enforceable till all the dues of the Board under or by virtue of the said contract have been fully paid and its claims satisfied or discharged or till the

(Name of the user department)

of the said certifies that the terms and conditions of the said contract have been fully and properly carried out by the said Contractors and accordingly discharge this guarantee. PROVIDED HOWEVER that the Bank shall be the request of the Board but at the cost of the Contractors, renew or extend this guarantee for such further period or periods as the Board may require from time to time.

5. We, _____ further agree with the Board

(Name of Bank and Branch)

that the Board shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said contract or to extend the time of performance by the said contract or to extend the time of performance by the said Contractors from time to time or to postpone for any time or from time to time any of the powers exercisable by the Board against the said Contractors and to forbear or enforce any of the terms and conditions relating to the said contract and we shall not be relieved from our liability by reason of any such variation or extensions being granted to be Contractors or for any forbearance, act or omission on the part of the Board or any indulgence shown by the Board to the Contractors or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

7. It is also hereby agreed that the Courts in *[insert city]* would have exclusive jurisdiction in respect of claims, if any, under this Guarantee.

8. We, _____ Bank lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Board in writing.

9. Notwithstanding anything contained herein :

a) Our liability under this Bank Guarantee shall not exceed Rs. _____

(Rupees _____ only);

b) this Bank Guarantee shall be valid upto ____*____; and

c) we are liable to pay the guarantee amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before _____ (date of expiry of Guarantee).ô

Date _____ day of _____ 2026

For (Name of Bank)

(Name)

Signature

* The date will be sixty (60) days after the end of the period of Defect Liability as specified in the Contract.

WATER PROOFING GUARANTEE BOND

This Guarantee bond made this ____ day of Two thousand twenty-Six by....., a Company within the meaning of The Companies Act, 1956 having its registered office at _____ . (Hereinafter referred to as “**Guarantor**” which expression will, unless repugnant to the context or meaning thereof, include its successors and assign)s

In favour of **Cochin Port Authority** , a Company within the meaning of The Companies Act, 1956 having its registered office at Willingdon Island Cochin -9 (hereinafter referred to as “**Guaranteed**” which expression will, unless repugnant to the context or meaning thereof, include its successors and assign)s

Where as

- A. The **Guarantor** has been awarded a contract by **Guaranteed** to water proofing activity by virtue of Work order No: _____ . (Hereinafter referred to as “**Contract**”).
- B. The **Guarantor** agrees to give a **Guarantee** to the **Guaranteed** to the effect that the structures constructed under the contract will remain **Water-proof for TEN (10) years** to be reckoned from the date after the issue of **Completion certificate** to the **Guarantor** as per Tender Terms/Work order

Now in consideration of the above, the **Guarantor** hereby irrevocably undertakes to the **Guaranteed** as under:

- 1. During this period of **Guarantee**, the **Guarantor** shall make good all defects and for that matter, shall redo the work through the contractor or through third Parties at his risk and cost of such items as may be damaged by failure of water proofing, and in case of any other defect being found, he shall render the building **Water-proof** at his cost to the satisfaction of the **Guaranteed**, and shall commence the works of such rectification within **seven (07) working days** from date of issuing notice from the **Guaranteed** calling upon him to rectify the defects, failing which the work shall be got done by the **Guaranteed** of the second party by some other Contractor at the **Guarantor’s** cost and risk, and in the latter case, the decision of the **Guaranteed** as to the cost recoverable from the **Guarantor** shall be final and binding.
- 2. That if the **Guarantor** fails to execute the water proofing treatment or commits breaches hereinafter then the **Guarantor** will indemnify the **Guaranteed** and his successors against all loss, damage, cost, expense or otherwise which may be incurred by him by reason of any default on the part of the **Guarantor** in performance and observance of this obligation. As to the amount of loss and/or damage and/or cost

incurred by the **Guaranteed** of the second part, the decision of the **Guaranteed** will be final and binding on the parties.

In witness whereof these presents have been executed by the Obligorë ë ë ë ë ..and by, **Project Manager** for and on behalf of the on the day, month and year above written.

Signed, sealed and delivered by **Guarantor** in the presence of:

1.

2.

Signed for and on behalf of **Cochin Port Authority** By ë ë ë ëë ë ë ë ë ...in the presence of

SITE VISIT CONFIRMATION UNDERTAKING

I/We _____ hereby
certify that I/we have personally visited the site, or deputed my/our authorised
representative.....visited the site, in
connection with the Tender for work of **CIVIL RENOVATION WORKS,
PROVIDING NEW ELECTRICAL FACILITIES & REWIRING AT WHARF
SUPERINTENDANT OFFICE BUILDING AT ERNAKULAM WHARF**

ô after duly taking permission from concerned authority.

The site Visit was conducted on DayMonth of year 2026, and the existing
site conditions, accessibility, scope of work, local conditions, availability of resources,
constraints, and all other factors relevant for execution of the work were examined and
understood before submission of the Tender.

I/We further confirm that the rates quoted by us are after fully acquainting ourselves with the
nature and extent of the work and no claim on account of lack of knowledge of site conditions
shall be raised at a later stage, and shall abide by the decisions of CoPA on this behalf.

Details of Person who conducted the site visit are as follows:

Name:

Designation:

Contact Number:

Yours faithfully,

Signature :

Name & Designation: