COCHIN PORT AUTHORITY
COCHIN-682009, KERALA, INDIA
Tele: 91-0484-2666414, 2666871
Telefax: 91-0484-2666414
E-mail:coptce@gmail.com

TENDER DOCUMENT FOR RENOVATION OF PROPOSED GARAGE FOR GOI IN COCHIN PORT

TECHNICAL BID (e-Tendering Mode)

Website:www.tenderwizard.com/CPT

CHIEF ENGINEER'S OFFICE
COCHIN PORT AUTHORITY
COCHIN-682009

TENDER No.T6/T-1972/2022-C **Rs.840/- (Rs.750 + 12% GST)**

COCHIN PORT AUTHORITY

TENDER FOR 'RENOVATION OF PROPOSED GARAGE FOR GOI IN COCHIN PORT'.
(Tender No.T6/T-1972/2022-C)

CONTENTS

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-1972/2022-C **Date :25/10/2022**

NOTICE INVITING TENDER

Electronic Tenders **(e-tenders)** on percentage basis are invited by Cochin Port Authority on behalf of GoI from reputed contractors in Single Stage Two Cover bidding procedure [Technical Bid and Financial Bid], meeting the Minimum Eligibility Criteria specified below for the work of **"RENOVATION OF PROPOSED GARAGE FOR GOI IN COCHIN PORT".**

1. ***Minimum Eligibility Criteria:***

a) Experience

The tenderers should have experience of having successfully completed during the last 7 (seven) years ending **30th September, 2022,** at least either:

i) Three Similar Works each costing not less than **Rs.8.82 lakhs**

(OR)

ii) Two Similar Works each costing not less than **Rs.11.03lakhs**

(OR)

iii) One Similar Work costing not less than **Rs.17.64 lakhs**

b) Financial Turnover

Average Financial Turnover of the tenderer over the last three financial years ending 31st March 2021 *[2018-'19, 2019-'20& 2020-'21]* shall not be less than **Rs.6.62 lakhs.**

Explanatory Notes to a) & b) :

i. Similar work(s) means "***Civil Construction work/ Civil Repair & Maintenance Works*****".** The experience certificate of works executed in private sectors/ organisations shall be considered for qualification, only on submission of TDS certificate along with work order and completion certificate.

ii. Copy of completion certificates of each work issued by the owner/ responsible officer of the owner under whom he has executed such contract shall be attached. The certificate shall contain details of work involved specifying the nature of work, the completion cost of the work, date of commencement & date of completion of the work.

iii. The works reckoned for the above purpose are those executed by the tenderers as prime Contractor or proportionately as member of joint venture or Sub Contractor. The Sub-Contractor shall be an authorized and approved Sub-Contractor by the Employer of the work(s) against which the tenderer has claimed his experience. The tenderer shall attach attested copy(s) of approval issued by the Employer(s) authorizing as a Sub-Contractor; in proof of the claim of the tenderer as a sub-Contractor. The tenderer is also obliged to produce the original of the certified copy(s) on request by the department.

iv. Following enhancement factors will be used for the costs of works executed for bringing the financial figures to a common base value in respect of the works completed in the past years.

Table 1

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

v. <u>Financial Turnover:</u>

In proof of Financial Turnover Audited Annual Accounts Statements or IT returns duly acknowledged by the Income Tax department along with Computation Statement signed by the Auditor/ Chartered Accountant, for the last three years shall be produced by the tenderer**..**

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, black listing/ debarring by Govt. departments etc.

2.2 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.

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	***25-10-2022***
2	Download period of Bid Documents	***25-10-2022 to 16-11-2022***
3	Date of Pre-Bid meeting	***Not Applicable***
4	Last date for seeking clarification	***21-10-2022***
5	Last date and time of submission of Bid	***16-11-2022*** **up to 14.30 hrs**
6	Date and time of opening the Bid	***16-11-2022*** **after 15.00 hrs**

ii) Bid information :

Table 3

i)	Estimated Amount put to Tender	**: Rs.22,05,140/-.**
ii)	Earnest Money Deposit	: **Rs.22,060/-** 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.
iii)	Cost of Bid document	Rs.840/- (Rs.750/-+12% GST) (Non refundable) furnished either through Demand Draft/ Banker's Cheque drawn in favour of the Financial Adviser & Chief Accounts Officer, CoPA from any

		Nationalized Bank/ Scheduled Bank in India, 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	**4 (Four) months**

4. This work essentially comprises of the following:

i. Surface dressing of ground, dismantling works
ii. Providing AC Sheet roofing, Reinforced and plain Cement concrete work,
iii. Structural steel work,
iv. Cement plastering work
v. Supplying and fixing Rolling shutters.
vi. Painting with Synthetic enamel paint, Water thinnable cement primer, Acrylic emulsion paint etc.
vii. RR Masonry work.
viii. PVC Pipe work
ix. Providing and fixing wash basin, European Type water closet, Ferrocement Septic tank, HDPE water tank, Monoblock pump, FRP Door, Mirror, valves, etc..
x. Construction of masonry chamber,
xi. Providing heavy duty paver tiles.

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 shall be furnished in the form of Demand Draft/ Banker's Cheque drawn in favour of FA & CAO, CoPA. The bidder shall submit the Originals of (i) DD / Bankers Cheque towards the cost of tender and EMD and (ii) Power of Attorney in favour of signatory(s) to the tender, with letter of submission in a sealed cover to the **Suptdg. Engineer(CM), Cochin Port Authority, W/Island, Cochin-682009, Kerala,** within 3 (Three) working days from the date of opening**. Non submission of original financial documents towards cost of tender document and EMD within 3 (Three) working days from the date of opening, will make the tender liable for rejection.**

6. The bidders need to obtain the one time User ID & password for log-in to in **e-Tendering** system from the service provider **KEONICS** by paying registration

amount of **Rs.1124/-** by online Payment using Credit/Debit Card/Net banking or DD in favour of "KSEDCL, Bangalore".

7. The intending bidder must have valid Class-II or III digital signature certificate to submit the bid. For further details and to obtain the digital signature, please contact e-Tender Help Desk No.080-40482000 / 9746118529 / 9605557738.

8. Tenders shall be submitted "**online"** strictly in accordance with the Instructions to Tenderers and Terms & Conditions given in the tender document.

9. The bidder is responsible to download Addenda/ Amendments/ Errata/ Replies to the queries of the bidders etc., if any, issued by the Employer, from the website before submission of the bid. **Any shortfall in uploading the said Addenda/ Amendments/ Errata/ Replies to the queries of Tenderer etc. duly signed along with the downloaded documents while uploading the Tender will render the Tender incomplete and incomplete Tender Documents may be rejected**.

10. All Bids are to be submitted **online only** on the website www.tenderwizard.com/ COPT. No Bids shall be accepted off-line (Hard copy).

11. Original DD / Bankers Cheque towards the cost of tender and EMD, shall be submitted in a sealed cover to the **Suptdg. Engineer (CM), COCHIN PORT AUTHORITY, W/Island, Cochin-682009, KERALA, and these original documents shall be reached to the employer within 3 (THREE) working days from the Bid Due date. Non submission of original financial instruments towards the cost of tender document, EMD, within the above period leads to disqualification of Bids.**

12. The intending bidder must have valid Class-II or III digital signature certificate to submit the bid. **For further details, please contact e-Tender Help Desk No. 080-40482000/ 9746118529/9605557738.**

13. **EARNEST MONEY TO BE DEPOSITED**

13.1 Each tender should be accompanied by an Earnest Money amounting to **Rs.22,060/-**.

13.2 The Earnest Money can be deposited through Demand Draft or Banker's Cheque or Pay Order from a Scheduled Bank in India, drawn in favour of Financial Adviser & Chief Accounts Officer, COCHIN PORT AUTHORITY. The original DD/ Banker's Cheque/ Pay Order shall be submitted to the SE(CM), COCHIN PORT AUTHORITY, Cochin-9, **within 3 (THREE) working days from the Bid Due date.**. Scanned copy of the DD/ Banker's Cheque/ Pay Order shall be attached with the tender submitted "online". The Earnest Money deposited will not carry any interest.

13.3 EMD shall be refunded to the Contractor on acceptance of Performance Security and entering into agreement.

14. 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 failures.

15. The Bidder shall submit Originals of: (i) DD / Banker's Cheque towards the cost of Tender document and EMD; and (ii) Power of Attorney along with letter of submission in a sealed cover **to the Suptdg. Engineer(Tech), Cochin Port Authority, W/Island, Cochin – 682009, KERALA**, , **within 3 (THREE) working days from the Bid Due date**. **Non submission of original financial document towards cost of Tender document and EMD etc as above will be liable for rejection**.

16 Securities:

16.1 Security Deposit (SD) shall be 3% of the Contract value or value of the work done whichever is higher and it shall consist of the following:

a) **Performance Security** 3% of contract value payable on award of the work.

B) **Retention Money**: NIL

In case, where the value of work done exceeds Contract value, Additional Security Deposit @ 3% of the excess amount will be deducted from the RA Bills. While making payment, which will be released along with the Performance Security only

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.

16.2 **Performance Security:** The Performance Security retained till end of Defect Liability period (1 year from the date of completion of work) shall be 3% of Contract Value or Cost of Work Done, whichever is higher. So, initially 3% of the Contract value shall be furnished as Performance Security.

In case, whether the value of work done exceeds Contract value, Additional Security Deposit @ 3% of the excess amount will be deducted from the RA Bills, while making payment, which will be released along with the Performance Security only.

16.3 The Security Deposit/ Performance Security @ 3% of the value of the contract awarded, shall be furnished by the Contractor to the Employer, not later than **14 days** from the date of letter of acceptance or such extension of that period as may

be permitted by the Engineer in writing, and shall be furnished in one of the following forms:

i) Banker's Cheque/Demand Draft/Pay Order of a Scheduled Bank.

ii) An irrevocable Bank Guarantee(BG) enforceable and encashable at Cochin, drawn from any Scheduled Bank operating in India as per the prescribed proforma.

16.4 The Security Deposit/ Performance Security retained till end of Defects Liability Period **(1 year from the date of completion)** shall be 3% of Contract Value or Cost of Work Done, whichever is higher. So, initially 3% of the Contract value shall be furnished as Performance Security. **The BG furnished towards the Performance Security shall be valid until a date 30 days from the day of expiry of the Defect Liability Period stipulated as per the terms of the Contract**.

16.5 Unless Performance Security is furnished within the period as specified above or such extension of that period as may be permitted by the Engineer in writing, tenderer will be suspended and 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 suspension order**.

16.6 **Retention Money:** NIL. In case, where the value of work done exceeds Contract value, Additional Security Deposit @ 3% of the excess amount will be deducted from the RA Bills. While making payment, which will be released along with the Performance Security only.

16.7 **The Performance Security retained till end of Defect Liability Period (1 Year from the date of completion) shall be 3% of Contract Value or Cost of Work Done, whichever is higher.**

16.8 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 Additional Security Deposit recovered from the running account bills, shall amount to 3% of the Cost of Work done.

17 In the event of the tenderer, after the issue of the communication of acceptance of offer by the Board, 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, the Board shall have full right to claim damages therefore either together with or in addition to the forfeiture of Earnest Money Deposit.

19 **Signing of Agreement:**

19.1 The successful tenderer will be required to execute within **21 days** from the date of receipt of work order, 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.

19.2 The Contractor shall make 10 copies of the Agreement and submit to CoPT within 7 days following the date of signing of Agreement.

20 Till signing of agreement the tender together with the acceptance letter shall constitute a binding Contract between the Contractor and Cochin Port.

1.21 Failure to comply with conditions **3ii(iv), 16 and 19** above will entail forfeiture of the Earnest Money.

16. **MSME Bidders who are registered with District Industries Centre (DIC) or Khadi and Village Industries Commission (KVIC) or Khadi and Village Industries Board (KVIB) or Coir Board or National Small Industries Corporation (NSIC) or directorate of Handicrafts and Handlooms or Udyog Aadhaar Memorandum or any other body specified by Ministry of MSME for similar nature of Works shall be eligible for issue of Bid Document free of cost and exemption from payment for issue of tender document. 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**.

17. 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.

18 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.

19 Canvassing in connection with tender is strictly prohibited and tenders submitted by the Contractors who resort to canvassing will be liable to rejection.

20 **Taxes and Duties**:

20.1 Deductions towards statutory taxes as per the rules, prevailing in force at the time of payment of bills shall be made while releasing the bill amount.

20.2. GST for the work will be paid extra by the Port. The GST applicable as per law can be billed on the Port Authority, which will be paid to the Contractor by the Board along with the bills, for which the Contractor holds valid GST Registration number and the GST is being collected. The following are also to be considered while claiming payment towards GST:

i. Invoice in specific format should be provided by the Contractor for every payment.
ii. GST Registration Number of COCHIN PORT AUTHORITY and the Contractor is to be clearly mentioned with all the bills.
iii. Invoice should be attached along with the running bills.
iv. The Contractor shall comply all the GST regulations, viz.; timely uploading of invoices and issue of debit/ credit notes.

20.3. Any stipulation by a tenderer that taxes and duties deductable from these bills should be borne by the Port Authority will result in the summary rejection of his /their tender.

21 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.

22 This Tender Notice shall form part of the Contract.

Chief Engineer
COCHIN PORT AUTHORITY
FOR AND ON BEHALF OF THE BOARD OF MAJOUR PORT AUTHORITY FOR COCHIN PORT

2. TENDER FOR WORKS

To

The Board of
Majour 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	:	**Renovation of proposed garage for GOI in Cochin Port**
b)	Estimated cost	:	**Rs.22,05,140/-**
c)	Earnest Money	:	**Rs.22,060/-**
d)	Security Deposit	:	3% of the value of the Contract awarded or value of the work done whichever is higher. (Performance Security @ 3%)
e)	Percentage, if any, to be deducted from the bills	:	In case, Where the value of work done exceeds Contract value, Additional Security Deposit @ 3% of the excess amount will be deducted from the RA Bills, while making payment, which will be released along with the Performance Security only.
f)	Time allowed for commencement of work from the date of receipt of work order	:	**7 days**
g)	Time allowed for the work from the date of commencement of work	:	**4 (Four) Months**
h)	Schedule, specifications, conditions, drawings etc.	:	As per "Contents" sheet attached.

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

Dated the .....……..... day of …… 2022

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 …….....……2022.

Dated……

Chief Engineer

COCHIN PORT AUTHORITY

3. CONTRACT DATA

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

<table>
<tr><th>Sl. No.</th><th>Description</th><th>Reference Clause No. in GCC</th></tr>
<tr><td>1</td><td>The following documents are also part of the Contract</td><td></td></tr>
<tr><td></td><td>The Schedule of other Contractors</td><td>(8.2)</td></tr>
<tr><td></td><td>The Schedule of Key personnel – As per Tender
<table>
<tr><th>Qualification of Staff</th><th>No.</th><th>Min. Experience (Years)</th><th>Rate of recovery in case of non-compliance</th></tr>
<tr><td>Graduate Engineer

or

Diploma Engineer</td><td>1

1</td><td>2

5</td><td>Rs.15,000/- p.m

Rs.15,000/- p.m</td></tr>
</table></td><td>(9)</td></tr>
<tr><td>2</td><td>The Employer is:</td><td>(1)</td></tr>
<tr><td></td><td>The Board of Majour Port Authority for Cochin Port,
COCHIN PORT AUTHORITY,
Cochin -9.</td><td></td></tr>
<tr><td></td><td>Name of Authorized Representative:</td><td></td></tr>
<tr><td></td><td>Name : Dr. M. Beena,
Chairperson,
Cochin Port Authority,
Cochin -9.</td><td></td></tr>
<tr><td>3</td><td>The Engineer is</td><td></td></tr>
<tr><td></td><td>Name : Shri. Paritosh Bala,
Chief Engineer,
Cochin Port Authority,
Cochin-9.</td><td></td></tr>
<tr><td></td><td>Name of Nominee/Engineer-in-Charge:
Name: Sri. Sathyan.A.G, Suptdg. Engineer(CM)</td><td></td></tr>
</table>

<table>
<tr><th>Sl. No.</th><th>Description</th><th>Reference Clause No. in GCC</th></tr>
<tr><td>4</td><td>Name of Contract- Renovation of proposed garage for GOI in Cochin Port.
Tender No. T6/T-1972/2022-C</td><td>(1)</td></tr>
<tr><td>5</td><td>10 copies of Contract Agreement shall be furnished by the Contractor</td><td>(7.1)</td></tr>
<tr><td>6</td><td>Tender document and other data are available at Cochin Port web site, Government of India CPP Portal and e – tendering portal.

www.cochinport.gov.in
www.eprocure.gov.in
www.tenderwizard.com/CPT</td><td>(7.2)</td></tr>
<tr><td>7</td><td>The Intended completion date for the whole of the Work is 3 months with the following milestones:</td><td>(17,28)</td></tr>
<tr><td>8</td><td>Milestone dates:<table><tr><th>Physical works to be completed</th><th>Period from the date of receipt of LoA to proceed with the work</th></tr><tr><td>4 months</td><td>7 days</td></tr></table></td><td></td></tr>
<tr><td>9</td><td>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</td><td>(2.3)</td></tr>
</table>

Sl. No.	Description	Reference Clause No. in GCC
	(11) Any other documents listed in the Contract Data as forming part of the Contract.	
10	The Contractor shall submit a Program for the Works within 21 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.	(21)
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 W/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. Also refer Clause 4 of Special Conditions of Contract – Section III of this tender document.	(13)
16	The following events shall also be Compensation Events: **NIL**	(44)
17	The period between Programme updates shall be 30 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 3% from each bill subject to a maximum of 3% of the contract price. - **NA**	(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)

Sl. No.	Description	Reference Clause No. in GCC
	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	(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: CPWD DSR 2018 + 55% Cost Index x 0.8768 for deducting 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)

4. INSTRUCTIONS TO TENDERERS

4.1 Electronic Tenders (e-tenders) on percentage basis under "Two Cover system" are invited for **"Renovation of proposed garage for GOI in Cochin Port"**

4.2 The tenderer shall submit the tender Cover-A (Hard Copy of EMD & Cost of Tender form) **within 3 (THREE) working days from the Bid Due date**. All the Technical Bid documents & Price Bid shall be submitted **"online".**

4.3 The Tender Document will be available as three separate files in the e-tendering Portal:

i. A. Technical Bid Documents (as per Sl. No 1 to 7 of the Contents sheet)
ii. B. Price Bid: Schedule of quantities of Work- Schedule-A and
iii. C. General Conditions of Contract-2016

4.4 The tenderer shall upload the documents indicated in 4.3 (i) & (iii) above and also the Schedule of Quantities(Percentage) [as per Cl.4.3(ii), duly filled in, **"online".**

4.5 SUBMISSION OF TENDERS

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

4.5.2 Technical Bid (Online mode)

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

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

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

4.5.2.4 Departmental Tender Document (except Schedule of Quantities), along with scanned copies of Cost of Tender form, EMD and other documents as per Clause 4.5.2 shall be submitted **'online'** before 14.30 hrs of opening date of the Tender.

In no case shall filled in Price Bid - Schedule of Quantities be submitted in hard copy, as it shall result in rejection of the tender.

4.5.3 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:

a) Experience

The tenderers should have experience of having successfully completed during the last 7 (seven) years ending **31st July, 2022,** at least either:

i) Three Similar Works each costing not less than **Rs.8.82 lakhs**

(OR)

ii) Two Similar Works each costing not less than **Rs.11.03lakhs**

(OR)

iii) One Similar Work costing not less than **Rs.17.64 lakhs**

b) Financial Turnover

Average Financial Turnover of the tenderer over the last three financial years ending 31st March 2021 *[2018-'19, 2019-'20& 2020-'21]* shall not be less than **Rs.6.62 lakhs.**

Explanatory Notes to a) & b) :

i. Similar work(s) means "***Civil Construction work/ Civil Repair & Maintenance Works*****".** The experience certificate of works executed in private sectors/ organisations shall be considered for qualification, only on submission of TDS certificate along with work order and completion certificate.

ii. Copy of completion certificates of each work issued by the owner/ responsible officer of the owner under whom he has executed such contract shall be attached. The certificate shall contain details of work involved specifying the nature of work, the completion cost of the work, date of commencement & date of completion of the work.

iii. The works reckoned for the above purpose are those executed by the tenderers as prime Contractor or proportionately as member of joint venture or Sub Contractor. The Sub-Contractor shall be an authorized and approved Sub-Contractor by the Employer of the work(s) against which the tenderer has claimed his experience. The tenderer shall attach attested copy(s) of approval issued by the Employer(s) authorizing as a Sub-Contractor; in proof of the claim of the tenderer as a sub-Contractor. The tenderer is also obliged to produce the original of the certified copy(s) on request by the department.

iv. Following enhancement factors will be used for the costs of works executed for bringing the financial figures to a common base value in respect of the works completed in the past years.

Table 1

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

v. <u>Financial Turnover:</u>

In proof of Financial Turnover Audited Annual Accounts Statements or IT returns duly acknowledged by the Income Tax department along with Computation Statement signed by the Auditor/ Chartered Accountant, for the last three years shall be produced by the tenderer**..**

c) Other Eligibility Considerations

i. Even though the bidders meet the above qualifying criteria, they are subject to be disqualified if they have:
made misleading or false representations in the forms, statements and attachments submitted in proof of the qualification requirements; and/or
record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures, black listing/ debarring by Govt. departments etc.

d) 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.

4.7. OPENING AND EVALUATION OF TENDERS

4.7.1 Technical Bids of the tenders received shall be opened at 15.00 hrs. on **16/11/2022,** the last date fixed for receiving the bid, in the SE's chamber in the presence of the tenderers or their representatives as may be present.

4.7.2 After opening the Technical Bid documents, it shall be thoroughly checked for completeness with respect to the details stipulated to be submitted as Technical Bid by the tenderer. The Price Bid of those tenderers satisfying the tender requirements shall only be opened. The Price Bid of those tenderers who are found responsive and satisfactory on evaluation of Technical Bid documents, will be opened after bringing all tenderers to the same footing and giving notice to the short listed tenderers, on a date to be decided and intimated later.

4.8 GENERAL INSTRUCTIONS TO TENDERERS

4.8.1 The submission of a tender by the tenderer implies that he has read the whole tender Documents including GCC-2016.

4.8.2 The tenderer is advised to visit and examine the site of work and its Surroundings, discuss with connected agencies and collect all necessary information on his own responsibility for preparing the tender.

4.8.3 The tenderer is expected to examine the Tender Documents including all conditions, specifications, forms etc and also conditions in the G.C.C. Failure to furnish the information required in the Tender Documents/ G.C.C. or submission of a tender not conforming to the requirements in every respect, is likely to result in the rejection of the tender.

4.8.4 The tenderer shall quote for the work on percentage basis. The departmental rate for each item of work is given in the Schedule of Quantities. The tenderer shall fill the percentage above or below the Departmental rate, in the column provided for the purpose in the Schedule.

4.8.5 In case of discrepancy between the specifications and the drawings, the following order of preference shall be observed:

a. Conditions & Specifications of tender
b. Drawings.
c. B.I.S Specifications.
d. Sound Engineering Practice.

4.8.6. If there are varying or conflicting provisions made in any document forming part of the Contract, the Chief Engineer, Cochin Port Authority, Cochin-682009 shall be the deciding authority with regard to the intention of the document which will be binding on the tenderer/ Contractor.

4.8.7 Any error in description, any omissions there shall not vitiate the Contract or release the Contractor from the execution of whole or any part of the works comprised therein according to specifications or from any of his obligation under the Contract.

4.8.8 The Chief Engineer, Cochin Port Authority shall have the right to omit or Suspend certain items of work or revise or amend the Tender. Documents at any time prior to the due date of submission of the tender. Such revisions or amendments or extensions if any, shall be communicated to all the bidders who have downloaded the Tender Documents, in the form of an addendum by telefax /e- mail / writing. In order to afford the Bidders with reasonable time to take addendum into account, or for any other reason, the Port Authority may, at its discretion, extend the due date for submission of tender.

4.8.9 All payments due to the Contractor under this Contract will be made in Indian Rupees only.

4.8.10 Tenders received after the date specified for submission shall not be opened.

4.8.11 The Bank Guarantees (BGs) to be furnished by the Contractors in connection with the tender shall be sent to by the Chief Engineer, Cochin Port Authority directly by the issuing bank under registered post with AD. The Contractor shall take the responsibility of sending BGs directly to the Port Authority by the issuing bank.

SIGNATURE OF TENDERER.

5. GENERAL DESCRIPTION AND SPECIAL CONDITIONS OF CONTRACT

1. SCOPE OF WORK

1.1 The proposed work is for "**Renovation of proposed garage for GOI in Cochin Port**". The work consists of the following:

i. Surface dressing of ground, dismantling works
ii. Providing AC Sheet roofing, Reinforced and plain Cement concrete work,
iii. Structural steel work,
iv. Cement plastering work
v. Supplying and fixing Rolling shutters.
vi. Painting with Synthetic enamel paint, Water thinnable cement primer, Acrylic emulsion paint etc.
vii. RR Masonry work.
viii. PVC Pipe work
ix. Providing and fixing wash basin, European Type water closet, Ferrocement Septic tank, HDPE water tank, Monoblock pump, FRP Door, Mirror, valves, etc..
x. Construction of masonry chamber,
xi. Providing heavy duty paver tiles..

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

2. WORK SITE

The work has to be carried out is at Willingdon island near DLD Junction. The site is accessible through road. Security rules and regulations including obtaining passes etc. for work are to be observed by the contractor. The work is to be carried out without disturbing the normal Port operations.

3. TIME SCHEDULE AND MONITORING OF PROGRESS

3.1 The tenderer shall prepare and attach with the tender a detailed work schedule indicating key activities and critical items for completing the work within the stipulated Contract period of 4 (**Four)** months. This time schedule will form the basis for monitoring the progress of work.

4. MATERIALS / FACILITIES TO BE PROVIDED BY DEPARTMENT

4.1. CONTRACTOR'S WORK AREA

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

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

5. CONTRACTOR'S RESPONSIBILITY

5.1 The tenderer shall visit the area before tendering. It will be deemed that the tenderer has visited the site and studied the site conditions before submitting the tender. The tenderer should get himself acquainted with the nature and extent of the work. No claim whatsoever will be entertained on the plea of ignorance of difficulties involved in execution of work or carriage of materials etc.

5.2 All materials, plants and equipments, required for the work shall be provided by the Contractor at his own cost, and shall conform to relevant I.S. Specification unless otherwise specified.

5.3 Samples of all materials, to be incorporated in the work shall be got approved by the Engineer's Nominee before procurement.

5.4 The Contractor shall thoroughly study the specifications and errors / omissions/modifications if any shall be brought to the notice of the Engineer – in-Charge well in advance so that a final decision in the matter could be given in time.

5.5 All labour, skilled or unskilled shall be provided by the Contractor. Settling any dispute with the labour will be Contractor's responsibility. Insurance as per Indian Workmen's Compensation Act for the Contractors' workmen and Public Liability Policy shall be provided by the Contractor at his own cost.

5.6 The Contractor shall be solely responsible for any damage or injury to the persons or things caused or suffered during the execution of the work and shall be made good or compensated at his own cost.

5.7 The Contractor shall take all care and precautionary measures for avoiding any kind of damage/accidents in the work site due to any of his reasons. The Contractor shall indemnify the Port against any compensation whatsoever payable to the workmen for accident or loss arising out of and in the course of their employment under this Contract.

5.8 The work shall be arranged by the Contractor without causing any damage to Port structures. Any damage or accident caused by the Contractor's operation shall be compensated / made good at Contractor's risk and cost to the satisfaction of the Engineer's Nominee of the works, failing which department will do the rectification work and the cost incurred will be recovered from his bill or from security deposit.

5.9 The Contractor shall not construct any structure, even of temporary nature, for any purpose at site, except with the written permission of the Engineer's Nominee of the work and any construction so put up shall be removed by the Contractor

whenever the Engineer's Nominee calls upon the Contractor to do so.

5.10 The Contractor shall remove all temporary works, clear and make good the site, at his cost to the satisfaction of the Engineer's Nominee before the site is returned to the Port Authority. All materials shall be disposed to any place as pointed out by the Engineer's Nominee of the work and site shall be cleared in every respect at no extra cost after completion of work.

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

5.12 The Contractor shall observe all safety regulations during the execution of the work. Safety measures, precautions, warning signals etc. shall be taken/provided at the Contractor's cost, as directed by the Engineer-in-Charge of the work. The Contractor shall provide all necessary personnel protection equipments such as helmet, lifeguard, goggles, boots, safety belts etc. to the workmen at his own cost and it shall be the Contractor's responsibility to ensure that they use it while on the work site.

5.13 The Contractor shall ensure that no labourers with criminal background are engaged for the work.

5.14 The contractor shall take all precautions for not to damage any cables, pipelines etc. passing through the area of work.

5.15 The Contractor shall comply with all the provisions of the Indian Workmen's Compensations Act, Public Liability Policy, Provident Fund Regulations, Employees Provident Fund and ESI Act etc. amended from time to time and rules

framed there under and other laws affecting the Contract labour that may be brought in to force from time to time.

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

5.17 The Contractor shall provide, at every work place, at which 20 or more women workers are ordinarily employed, crèches of reasonable size and with adequate facility for the use of their children under the age of six years at his risk and cost.

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

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

6. POWER AND WATER

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

6.2 Water required for the work shall be arranged by the Contractor at his own cost.

7. WORKMANSHIP

7.1 All the works shall be done strictly according to relevant B.I.S. specifications unless otherwise specified. Whenever special conditions and other specifications deviate from the B.I.S. the former shall prevail.

7.2 The whole work shall be completed in a diligent manner within the Contract period and defect or imperfection if any, observed during the Defect Liability Period/ guarantee period the same shall be rectified at Contractor's cost to the full satisfaction of the Engineer's Nominee within the time allowed.

7.3 Precautions shall be taken for not to damage cables/ pipe lines etc.

7.4 The work shall be arranged in the order of preference and as directed by the Engineer's Nominee of work.

8. TEMPORARY WORKS

8.1 All scaffolding, staging, bracing and other temporary works required for proper execution of the works, shall be provided by the Contractor at his own cost, unless

stated otherwise and that should be inclusive of all materials, labour, supervision and other facilities. The layout and details of such temporary works shall have prior approval of the Engineer's Nominee, but the Contractor shall be responsible for proper strength and safety of the same. All temporary works shall be so constructed as not to interfere with any permanent work or with the work of other agencies. If it is necessary to remove any of the temporary works at any time to facilitate execution of works or work by other agencies, such removal and re erection, if required, shall be carried out by the Contractor at the direction of Engineer's Nominee without any delay and any extra cost on this account shall be borne by the Contractor.

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

9. TIME FOR COMPLETION

9.1 The time allowed for carrying out the work as mentioned in the memorandum shall be strictly observed by the Contractor. The work shall throughout the time period be proceeded with diligence, time being deemed to be the essence of the Contract. 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. Clause 45 and Clause 80 of GCC shall be modified as below;

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

Contractor should include the GST Registration Number of the Contractor as well as the Employer.

Clause 80-Taxes and Duties Income Tax The Contractor and his staff shall be responsible for payment of all personal income taxes to the concerned authorities as per the law in force from time to time. Deduction of Income Tax shall be made by the Employer from each certificate of payment to the Contractor at the rate of 2% plus surcharge or such other rates as may be specified by the Central Government from time to time, on the gross amount of the Contractor's bill for payment. The Contractor shall comply all the GST Regulations viz. timely uploading of bills, issue of debit/ credit notes etc.

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

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

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

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

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

43.2.4 However, on request by the Contractor, 75% of the bill amount shall be paid within 7 days of submission of the bill. Balance amount of

the verified bill shall be paid within 21 days of the submission of the bill, on completion of all contractual requirements as brought out at sub clause 43.2.3. above.

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

43.2.6 The Contractor shall submit the Final bill to the Engineer / Nominee within 20 days of issue of Taking Over Certificate by the Engineer / Nominee. The bill shall be checked and all clarifications/corrections required on the bill submitted, shall be sought from the Contractor within 15 days thereafter. The Contractor shall submit the clarifications including carrying out corrections in the bill, if required, within the next 10 days. The clarified / corrected bill shall be verified and forwarded to Finance Department within the next 15 days. Thereafter, clarifications if any required by the Finance Department shall be sought within 10 days and the Engineer/Nominee shall clear it on top priority within the next 10 days and, finally, the bill shall be paid to the Contractor within 10 days thereafter, i.e., within a total 3 months of issue of Taking Over Certificate by the Engineer / Nominee, as indicated above.

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

SIGNATURE OF TENDERER

6. DETAILED SPECIFICATIONS FOR MATERIALS TO BE USED ON WORK

6.1 GENERAL

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

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

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

6.1.4 Payment for the materials supplied, shall be given only after they are used on the work.

6.1.5 Tolls are payable by the Contractor as per rules for vehicles using the Port's road for supplying the materials.

6.2 SYNTHETIC ENAMEL PAINT

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

6.2.2 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.

6.3 GRANITE STONE FOR RANDOM RUBBLE MASONRY.

6.3.1 Stone shall be hard, sond, free from decay, weathering and defects like cavities, cracks, flaws, sand holes, veins, patches of soft or loose materials etc. Stones with round surface shall not be used. It shall be obtained from approved quarry. Unless otherwise approved stones from a single quarry shall be used in any single work. Granite stone shall not contain crypst crystalline silica or ohert, mica and other deleterious materials like iron oxide, organic impurities etc. The percentage of

water absorption shall not be more than 5% when tested in accordance with IS 1124.

6.3.2 The strength of building stone shall be adequate to carry the loads imposed.

6.4 AGGREGATES FOR CONCRETE

6.4.1 Aggregates (fine and coarse) for concrete shall comply with the requirements of IS:383 – 'Specifications for coarse and fine aggregate from natural sources for concrete'. Aggregate shall be obtained from sources approved by the Engineer-in-Charge. Aggregates, which are not perfectly clean, shall be washed in clean water to the entire satisfaction of the Engineer-in-Charge.

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

6.4.3 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.

6.4.4 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.

6.5 CEMENT

6.5.1 Quality of cement used for the Work shall be 43 grade ordinary Portland cement conforming to IS:8112 or 53 grade ordinary Portland cement conforming to IS:12269 or Pozzolona cement conforming to IS:1489 unless otherwise approved by the Engineer-in-Charge.

6.5.2 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.

6.5.3 Supply of cement shall be taken in 50kg bags bearing manufacture's name and ISI marking. Samples of cement arranged by the Contractor shall be taken by the Engineer-in-Charge and got tested in accordance with provisions of relevant BIS codes. In case, test results indicate that the cement arranged by the Contractor does not conform to the relevant BIS codes, the same shall stand rejected and shall be removed from the site by the Contractor at his own cost within a week's time of written order from the Engineer-in-Charge to do so.

6.5.4 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.

6.5.5 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.

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

6.5.7 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.

6.6 STEEL REINFORCEMENT

6.6.1 The reinforcement steel used for the Work will have to be procured by the Contractor and shall be HYSD bars of Fe 500 / Fe415 grade conforming to IS:1786 unless otherwise approved by the Engineer-in-Charge.

6.6.2 The reinforcement steel required for the Work will have to be procured by the Contractor and shall comply with the relevant IS. The Contractor shall obtain approval from the Engineer-in-Charge well in advance for purchase of steel.

6.6.3 The Contractor shall have to obtain and furnish test certificates to the Engineer-in-Charge in respect of all supplies of steel brought by him to the site of Work. Samples shall also be taken and got tested by the Engineer-in-Charge as per provisions in this regard in relevant BIS codes. In case the test results indicate that the steel arranged by the Contractor does not conform to BIS codes, the same shall stand rejected and shall be removed from the site of Work by the Contractor at his cost within a week's time of written orders from the Engineer-in-Charge to do so.

6.6.4 The steel reinforcement shall be brought to the site in bulk supply of 10 tonnes or more or as decided by the Engineer-in-Charge.

6.6.5 The steel reinforcement shall be stored by the Contractor at site of Work in such a way as to prevent distortion and corrosion and nothing extra shall be paid on this account. Bars of different sizes and lengths shall be stored separately to facilitate easy counting and checking.

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

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

Over 16 mm dia	One sample for each 45 tonnes or part thereof	One sample for each 50 tonnes or part thereof

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

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

6.7 WATER

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

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

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

6.8 STRUCTURAL STEEL

6.8.1 Angles, ISMB and plates used for the work shall conform to IS: 2062. It shall be free from visible as well as manufacturing defects such as pitting , cracks, laminations, twists etc and excessive rusting.

6.8.2 Structural steel used shall be of TATA make. It shall be free from visible as well as manufacturing defects such as pitting, cracks, laminations, twists etc. and excessive rusting.MS angles shall conform to IS. The plates shall conform to IS 226. The angles & plates shall be free from visible as well as manufacturing defects such as pitting, cracks, laminations, twists etc. and excessive rusting.

6.9 PRECAST CEMENT CONCRETE BLOCKS

6.9.1 Factory made precast solid concrete blocks shall be of size 300 mm x 200 mm x 150 mm or nearest available size conforming to IS : 2185 – Part I - 1979 in plain cement concrete of 1:1.5:3 grade with 20mm /12mm graded metal. However, the length and shape of blocks to be provided at junctions shall be suitably modified to fit into the general configuration. These blocks are to be cast in appropriate moulds preferably steel moulds, which shall provide a smooth surface. The finished blocks shall be cured properly for a minimum period of 14 days. Blocks damaged during the removal of forms and handling will be rejected.

6.9.2 Blocks shall be unloaded one at a time and stacked in regular tiers to minimize breakage and defacement. These shall not be dumped at site. The height of the stack shall not be more than 1.2 m.

6.9.3 The length of the stack shall not be more than 3.0 m, as far as possible and the width shall be of two or three blocks.

6.9.4 Normally blocks cured for 28 days only should be received at site. In case blocks cured for less than 28 days are received, these shall be stacked separately. All blocks should be water cured for 10 to 14 days and air cured for another 15 days; thus no blocks with less than 28 days curing shall be used in building construction.

6.9.5 Blocks shall be placed close to the site of work so that least effort is required for their transportation.

6.9.6 Blocks manufactured at site shall be stacked at least for required minimum curing period as given above.

6.10 SAND FOR MAKING MORTAR FOR MASONRY WORK/ PLASTERING WORK

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

6.11 UNPLASTICISED RIGID PVC RAIN WATER PIPES

6.11.1 UPVC rain water pipes shall be of the dia, specified in the description of the item and shall be in nominal lengths of 2,3,4 or 6 metres either plain or with sliding/grooved socket unless shorter lengths are required at junctions with fittings. Tolerances on specified length shall be + 10 mm and – 0 mm.

6.12 WATER THINNABLE CEMENT PRIMER

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

6.13 ACRYLIC EMULSION PAINT EXTERIOR / INTERIOR

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

6.13.2 The Weather Proof Exterior Acrylic Emulsion paint shall be of approved premium quality manufactured by either Asian Paints/ Berger Paints/Nerolac Excel Paints or its equivalent. The coverage shall conform to the Manufacturer’s specification. The colour / shade shall be as per schedule or as per the direction of Engineer-in-Charge. . The paint shall be brought to the site of work by the Contractor in its original containers in sealed condition. The material shall be brought in at a time in adequate quantities to suffice for the whole work or at least a week’s work. The materials shall be kept in the joint custody of the Contractor and the Engineer-in-Charge. The empty containers shall not be removed from the site of work till the relevant item of the work has been completed and permission obtained from the Engineer-in-Charge.

6.13.3 The Contractor shall invariably produce the Test Certificates and Bills with batch

number and date, signed by an authorised person of the Manufacturer / Dealer, while seeking final approval of the Engineer-in-Charge for use on the Work.

6.14 CERAMIC TILES FOR FLOORING

6.14.1 Ceramic tiles shall be of approved make, premium quality, Johnson/ Khajaria/ Asian make or its equivalent and of approved colour and shade. The tiles shall generally conform to IS 15622 and shall be conforming to Group B II. The abrasion resistance of the tiles shall be of Class IV and above. They shall be flat, true to shape and free from cracks, crazing spots, clipped edged and corners. The flooring tiles shall be of antiskid type tiles and shall be of 300mm x 300mm size or nearest available higher size and thickness as specified by the manufacturer.

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

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

6.15 CERAMIC TILES FOR SKIRTING/ DADOOING

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

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

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

6.16 UNPLASTICIZED PVC PIPES (FOR WATER LINE)

6.16.1 All unplasticized PVC pipes shall conform to IS: 4985 and shall be of Class-5 (10kg / cm2) for water supply system unless specified otherwise and shall be designated by external diameter.

6.16.2 The pipes shall be supplied in random length from 4 to 7m and shall have ISI certification marks.

6.16.3 The internal and external surface of the pipe shall be smooth and clean, free from grooving and other defects. The end shall be cleanly cut and shall be square with the axis of the pipe. Slight shallow longitudinal grooves or irregulations in the wall thickness shall be permissible provided the wall thickness remains within the permissible limits.

6.17 PVC FITTINGS (FOR WATER LINE)

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

6.18 WASH BASIN

6.18.1 Wash basin of 400 x 400 mm size shall be of white glazed vitreous china of "Hindware" make or equivalent approved conforming to IS: 2556 Part I & IV with flat back with single tap hole to suit the pillar tap conforming to IS: 1795. The inside surface of the basin shall have uniform slope towards the waste hole.

6.18.2 Galvanized rag bolts with nut having suitable diameter and length as approved by the Engineer charge shall be used.

6.18.3 Waste fittings for wash basin shall be of brass Chromium Plated and shall conform to IS: 2963. The fitting shall be chromium plated. An outlet pipe (P.V.C flexible) shall be connected to the waste fitting so as to take waste water to the sewage line.

6.19 FIBRE GLASS REINFORCED PLASTIC (FRP) DOOR FRAMES

6.19.1 Door Frames shall be three legged of cross section 90 mm x 45 mm having single rebate of size 32 mm x 15 mm to receive shutter of 30 mm thickness. The frame shall be made of laminate of thickness of 2 mm and shall be filled with wooden blocks of exterior grade MDF or seasoned and treated hard wood inside the laminate in all the three legs of the frame. The frame to be moulded by either hand lay up or resin transfer moulding process. The process shall consist of laying gelcoat at 1000 gms./m2and laid over with layer of FRP Mat (CSM mat) gelcoat and FRP (CSM Mat) are defined in IS 14856. The CSM mat shall be bonded with Isophatholic resin in the ratio not less than 1:2 (One part of Mat to two parts of Isopathlic resin and fillers & additives) by weight. The edge shall be sealed with gelcoat and FRP mat to obtain smooth finish. Sufficient roving shall be laid in the corner to have smooth curve while laying the CSM mat.

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

6.19.3 Tolerance

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

6.19.4 Finish

The surface of the moulded frame shall be free from any visible defects such as small pores, crazing, blistering, wrinkling, impurities, defective impregration, 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.

6.19.5 Fixing of Frame

The frames are to be fixed in prepared openings in the walls. All civil work and tiling should be completed before the fixing of the frames. The frames are to be

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

6.19.6 Measurements

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

6.19.7 Rate

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

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

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

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

6.20.3 Location of Fittings and Accessories

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

6.20.4 Finish

The surface of the moulded frame shall be free from any visible defects such as small pores, crazing, blistering, wrinkling, impurities, defective impregration, 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.

6.20.5 Fixing of Shutters

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

6.20.6 Tolerance

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

6.20.7 Fittings

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

6.20.8 Measurements

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

6.20.9 Rate

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

6.21 MIRROR

The mirror shall be of superior glass with edges rounded off or beveled, as specified. It shall be free from flaws, specks or bubbles. The size of the mirror shall be as specified and its thickness shall not be less than 5.5 mm. It shall be uniformly silver plated at the back and shall be free from silvering defects.

Silvering shall have a protective uniform covering of red lead paint. Where beveled edge mirrors of 5.5 mm thickness are not available, fancy looking mirrors with PVC beading/border or aluminium beading or stainless steel beading/border based on manufacture's specifications be provided nothing extra shall be paid on this account. Backing of mirrors shall be provided with environmentally friendly material other than asbestos cement sheet.

6.22 CP BRASS STOP COCK, CP BRASS ANGLE VALVE, CP WASTE COUPLING, CP BRASS LONG BODY BIB COCK, HEALTH FAUCET, CP BRASS SHOWER ROSE.

All the above materials shall be of good quality approved quality and make.

6.23 CEMENT CONCRETE INTERLOCKING PAVER BLOCKS 100mm THICK

The paver blocks shall be 100 mm high density cement concrete interlocking paver blocks of M40 grade as per IS : 15658-2006. The paver blocks shall be made by block making machine with strong vibratory compaction, of approved size, design, shape, colour and pattern.

6.5 MATERIALS NOT SPECIFIED

6.13.1 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.

6.6 SAMPLING AND TESTING OF MATERIALS

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

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

SIGNATURE OF TENDERER

7. DETAILED SPECIFICATIONS FOR ITEMS OF WORKS

7.1 GENERAL

7.1.1 Except where otherwise specified or authorized by the Engineer-in-Charge, all items of works executed by the contractor shall conform to the latest edition of the Bureau of Indian Standard Specifications and code of practices published by the B.I.S. Where no such specifications or code of practice exists the latest B.S.S. codes of practice or any other equivalent / standard code of practice shall also be considered for adoption. The tenderer while indicating any such specifications shall enclose the full set of the publication so referred and not in extracts. Photostats / Xerox copies in duplicate shall be forwarded which shall not be returned to the contractor. In absence of any specification, the department 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 SURFACE DRESSING

7.2.1 Surface dressing shall include cutting and filling upto a depth of 15 cm and clearing of shrubs, rank vegetation, grass, brushwood, trees and saplings of girth upto 30 cm measured at a height of one metre above the ground level and removal of rubbish and other excavated material upto a distance of 50 metres outside the periphery of the area under surface dressing. High portions of the ground shall be cut down and hollows depression filled upto the required level with the excavated earth so as to give an even, neat and tidy look.

7.2.2 Measurements

Length and breadth of the dressed ground shall be measured correct to the nearest cm and the area worked out in square metres correct to two places of decimal.

7.2.3 Rates

The rates shall include cost of labour involved in all the operations described above.

7.3 DISMANTLING/ DEMOLISHING WORKS

7.3.1 The tenderer shall inspect the site and carry out the required investigation by himself about the present position and condition of the existing structures and assess the difficulties and the work involved in its dismantling and removal. It will be deemed that the tenderer has satisfied himself the condition of the structure and the nature of the work involved for the dismantling and removal and estimated its cost accordingly and port will be in no way responsible for the lack of such knowledge and also consequences thereof to the tenderer. The dismantling shall be done carefully without causing any damage to the remaining portions / structure.

7.3.2 Existing old sanitary fittings, Reinforced/ Plain Cement Concrete work, brick masonry work, Asbestose cement sheet roofing, old plaster, existing rolling shutter, etc. are to be dismantled as per the direction of Engineer-in-charge. All the dismantled usable materials shall be stacked at the area pointed out by the Engineer–in–charge and all unusable materials shall be disposed by the contractor.

7.3.3 All the dismantling works shall be done carefully without causing any damage to the adjacent portion/ existing structure. The unserviceable dismantled/ cut materials shall be disposed off within 6kms of the work site and levelled as directed by the Engineer-in-Charge.

7.4 APPLYING SYNTHETIC ENAMEL PAINT

7.4.1 The surface shall be thoroughly cleaned off all dirt, rust, dust, grease etc. with wire brush, sand paper etc., and be made perfectly clean and dry while painting.

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

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

7.5 RANDOM RUBBLE MASONRY

7.5.1 Rubble Stone Masonry shall conform to IS 1597(PART I).

7.5.2 All stone shall be wetted before use. The wall shall be carried up truly plumb or to the specified batter. All connected walls in a structure shall normally be raised up uniformly and regularly. If for any reason, one part of the masonry is required to be lifted behind, the wall shall be raked back at an angle not steeper than 45^0. Toothed joints in masonry shall not be allowed.

7.5.3 The work shall be carried up regularly and masonry will not be raised by more than 1m in height in a day.

7.5.4 Face stones shall be arranged suitably to stagger the vertical joints and long vertical joints shall be avoided. The hearting or interior filling of the wall shall consist of rubble stones which may be of any shape but shall not pass through a circular ring of 15cm diameter. The thickness of the stones in any direction shall not be less than 10cm. Stones for hearting or interior filling shall be hammered down with wooden mallet into the position firmly bedded in mortar. Chips of sprawls of stones may be used for filling of interstices between the adjacent stones in hearting and these shall not exceed 20% of the quantity of stone masonry. To

form a bond between successive courses, plum stones, projecting vertically by about 15 to 20cm shall be firmly embedded in the hearting at the interval of about one meter in every source. No hollow space shall be left anywhere in the masonry.

7.5.5 Bond shall be obtained by fitting in closely the adjacent stones and by using bond stones. Bond or through stones running right through the thickness of the wall shall be provided in walls upto 60cm thick and in case of walls with thickness more than 60cm, a set of two or more bond stones overlapping each other by atleast 15cm shall be provided for every 0.5sqm of the wall surface. Where bond stones of suitable length are not available cement concrete of M10 grade shall be used. All bond stones in stone masonry shall be marked suitably as directed by the Engineer-in-charge.

7.5.6 The quoins shall be selected stones., neatly dressed with the hammer or chisel to form the required angle and laid header and stretcher alternatively. Quoin stones shall not be less than 0.01 cu,m in volume. Height of quoin and jamb stones shall not be less than 15cm.

7.5.7 Stones shall be so laid that all joints are fully packed with mortar and chips. Face joints shall not be more than 20mm thick. When plastering or pointing is not required to be done, the joints shall be struck flush and finished at the time of laying. Otherwise, the joints shall be raked to a minimum depth of 20mm, by raking tool, during the progress of work, when the mortar is still green.

7.5.8 Green work shall be protected from rain by suitable covering. The work shall be suitably protected from damage, mortar dropping and rain during construction.

7.5.9 Masonry work shall be kept constantly moist on all faces for a minimum period of seven days.

7.6 EARTHWORK EXCAVATION

7.6.1 Contractor shall be responsible for the true and proper setting out of the work in relation to original points, lines and levels of reference and for corrections of the level dimension and alignment of all parts of work.

7.6.2 All excavations shall be carried out to give exact length, width and depth as per profiles indicated in the drawings or as directed by the Engineer-in-Charge. The phasing and method of excavation shall be to the approval of Engineer-in-Charge. The contractor shall provide suitable arrangements to prevent water from any source entering into excavated pits at his cost.

7.6.3 Necessary shoring and timbering shall be provided as per IS:3764 for preventing slipping of the soil in trenches and for protecting the safety and stability of the existing structures. Dewatering, if required shall also be carried out to keep the excavated surface dry for construction. The cost for pumping or bailing out water

by using pump set will be paid separately. Excavation taken wider or deeper than required shall be filled back with crusher run screening or selected materials approved by the Engineer-in-Charge, thoroughly compacted in layers of thickness not more than 20 cm or as decided by the Engineer-in-Charge.

7.7 PLAIN AND REINFORCED CEMENT CONCRETE

7.7.1 General

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

7.7.2 Concrete Mix

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

7.7.3 Nominal Mix

For nominal mix concrete, proportion of fine aggregate to coarse aggregate shall be 1:2 by volume. The minimum cement content per cubic metre of nominal mix concrete shall be as given below.

Sl. No	Type of concrete	Cement content per Cu. M
1	Cement concrete 1:3:6 (1 cement: 3 sand: 6, 20 mm size graded metal)	220 Kg.
2	1:1.5:3 with 20mm size graded metal	400 Kg.

7.7.4 Design Mix

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

Sl. No	Grade of Concrete	Minimum cement content in Kg / m^3	Maximum free Water cement ratio
1	M25	330	0.55

7.7.4.2 For design mix concrete, the Contractor shall make calculations jointly with Engineer-in-Charge and carryout all necessary tests at Contractor's cost to determine the proportion by weight of cement, aggregates (coarse and fine), admixture if required and water necessary to produce concrete of required grade having the desired Workability and, water cement ratio not exceeding the

allowable limit, prior to commencement of Work. The Contractor shall submit the following for the approval of Engineer-in-Charge.

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

7.7.4.3 When the proportions are submitted to the Engineer-in-Charge which he considers will produce concrete having the required properties, it shall become the declared proportions to be used for the Work. The Agreement by the Engineer-in-Charge to such declared proportions shall not relieve the Contractor of any of his responsibilities to use in the Work at all times concrete having the required properties. No deviation from the declared proportions shall be allowed unless and until the Engineer-in-Charge shall have given his written authorisation for the adoption of revised proportions for the concrete.

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

7.7.5 Size of Coarse Aggregate

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

7.7.6 Mixing of Concrete

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

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

7.7.7 Assembly of reinforcement for Reinforced Cement Concrete.

7.7.7.1 The steel bars used for reinforcement Works shall be either mild steel bars conforming to IS:432 (Part I) or HYSD bars, conforming to IS:1786 (Grade Fe 500 / Fe 415) or both.

7.7.7.2 The Contractor shall, when ordered, submit to the Engineer-in-Charge the detailed bar bending schedule for his scrutiny and approval sufficiently in advance (about four weeks) of the due date of commencement of the relevant items of Works. While Working out the bar bending schedule, the Contractor shall ascertain the length of bars likely to be made available to him and the schedule shall be so made, keeping the wastage/ cut bits of bars to bare minimum without hampering technical requirements. If the size of the steel bars specified in the drawing or schedule is not available, the nearest size available shall be used. Revised drawing shall be issued to the Contractor substituting the new size of reinforcement and bar bending schedule shall be prepared by the Contractor accordingly. No extra payment shall be made to the Contractor for making this substitution. The fabrication of reinforcement shall commence only after the bar bending schedule is approved by the Engineer-in-Charge.

7.7.7.3 Reinforcement shall be cut to the exact length and made truly straight and then bent to the exact shape and dimensions as indicated in the drawings. The bending and fixing of bars shall be done in accordance with IS:2502 unless otherwise specified.

7.7.7.4 All cut bits of steel are the property of the Contractor. However, the Contractor can dispose them off only with the permission in writing of the Engineer-in-Charge. If the department requires the cut lengths, they are to be handed over to the department and will be paid for at the rates at which they were purchased by the Contractor.

7.7.7.5 The reinforcement shall be cleaned by wire brush etc. to remove oil, grease, loose mill scale, loose rust or other deleterious matter that may reduce or destroy bond etc. before tying in position and also immediately before placing the concrete.

7.7.7.6 All reinforcement shall be placed and maintained in accordance with the drawings. Tolerance on placing of reinforcement shall be in accordance with clause 12.3 of IS:456-2000. Bolts, nuts, washers and rivets etc. required for complete erection of reinforcement and keeping in position shall be supplied by the Contractor at his own cost.

7.7.8 Form Work

7.7.8.1 The steel/ marine plywood formwork shall be used for concrete work. The form work shall be designed and constructed to the shape, lines and dimensions shown in the drawings within the tolerance limit and specified in clause 11.1 of IS:456-2000. Joints of the form works shall be made water tight by providing suitable beadings / gasket as approved by the Engineer-in-Charge. All rubbish,

particularly chippings, shall be removed from the interior of the forms before the concrete is placed and the form work in contact with the concrete shall be cleaned and thoroughly wetted or treated with an approved composition. Care shall be taken that such approved composition is kept out of contact with the reinforcement.

7.7.8.2 Before reuse, all forms shall be thoroughly scraped, cleaned, nails removed, holes that may leak suitably plugged and joints examined and when necessary, repaired and the inside retreated to prevent adhesion, to the satisfaction of Engineer. Warped timber shall be resized. Contractor shall equip himself with enough shuttering material to complete the job in the stipulated time.

7.7.8.3 Forms for sloped surfaces shall be built so that the formwork can be placed board -by- board immediately ahead of concrete placement so as to enable ready access for placement, vibration inspection and repair of the concrete. The formwork shall also be built so that the boards can be removed one by one from the bottom up as soon as the concrete has attained sufficient stiffness to prevent sagging. Surfaces of construction joints and finished surfaces with slopes steeper than 4 horizontal: 1 vertical shall be formed as required herein.

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

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

7.7.9 Cover to Reinforcement

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

7.7.10 Transporting, placing, compacting and curing of concrete

7.7.10.1 Transporting, placing, compacting and curing of concrete shall be as per clause 13 of IS:456-2000.

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

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

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

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

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

7.7.10.7 Stripping time for the form Work shall be as stipulated in clause 11.3 of IS:456-2000. Any impression, fins etc. that may occur from the form Work shall be removed and treated with cement mortar 1:1.5 (1 cement: 1.5 sand).

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

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

7.8 STEEL FABRICATION WORK

7.8.1 The steel sections as specified shall be cut square accurately to correct lengths. The cut edges should be dressed to a neat and workmanship finish and be free from distortion where parts are to be in contact metal to metal. All materials shall be straight and if necessary, before being worked shall be straightened and/ or flattened and shall be free from twists.

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

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

7.8.4 All bolts shall be provided with washers of sufficient thickness. The threaded portion of each bolt shall project through the nuts at least one thread.

7.8.5 Welding shall be done in accordance with the specifications laid down in IS 816 and as per detailed working drawing or as directed by the Engineer in charge. Welding edges and the adjacent areas of the members (extending up to 20mm) shall be thoroughly cleaned of all oil, grease, scale and rust and made completely dry. Gaps between the members to be welded shall be kept free from all foreign matters. The welding procedure adopted and consumables used shall be got specifically approved by the Engineer-in-charge. Excessive convexity, shrinkage, cracks, under cutting, improperly fitted / misaligned parts, members distorted by the heat of welding etc. due to faulty welds shall be corrected- whole or portion- as directed by the Engineer-in-charge.

7.8.6 The steel sections as specified shall be straightened and cut square to correct lengths. The steel work shall be hoisted and placed in position carefully without any damage to itself and other structures and injury to workmen.

7.8.7 The suitability and capacity of all plants and equipments used for the work shall be to the complete satisfaction of the Engineer-in-charge.

7.8.8 Proper safety arrangements shall be provided for working and inspection at no extra cost wherever required.

7.8.9 If the fabrication is done outside the worksite premises the structural and fabrication should be subject to the inspection by the departmental officials. Suitable transport facilities shall be provided for the inspection staff.

7.8.10 The electrodes required for the welding work shall be got approved before use. The electrodes should be stored properly without exposing them to atmospheric action. Proper protection should be given for site fabrication. The welding must be carried out under a covered roof.

7.8.11 The contractor should possess plant and equipments, derricks. Lifting tackles, wire ropes, chain pulleys, jacks, welding sets etc. that may be required for fabrication and erection. The equipment being used shall be kept in good condition throughout.

7.8.12 Fabrication and erection of steel work shall be in accordance with the provision of IS 800.

7.8.13 All damages to steel works caused during the transit or otherwise at the time of fabrication or erection and after erection shall be made good at no extra cost.

7.8.14 All steel work shall be provided with one coat of iron primer Red Oxide/ Zinc Chromate paint. Before applying primer, all rust & scale shall be removed by scrapping or brushing with steel wire brushes. All dust & dirt shall be thoroughly wiped away from the surface. If the surface is wet, it shall be dried before priming coat is applied.

7.8.15 After completion of the required fabrication of members, the surface shall be well cleaned with wire brush and sandpapering as directed by the Engineer-in-charge and one coat of Zinc Chromate primer shall be applied. Before application of the primer coat all the welded joints shall be got inspected and approved by the Engineer in charge. All painting work shall be done after the erection of steel members in position. Any damage to the painted surface during the course of erection shall be rectified as directed by the Engineer In charge after fixing the members in position. The fasteners like bolts, nuts etc. used during erection shall also be painted with a coat of primer and two coats of bituminastic paint

7.8.16 Sequence of erection of grillage/ angle members shall be so arranged that the structural stability is fully ensured.

7.8.17 Prior to the positioning of the members all laitance and loose materials shall be removed by wire brushing and chipping and bearing surfaces cleaned as directed by the Engineer in charge.

7.8.18 The rates given shall be for the finished items of work including fabricating, erecting and alignment with appropriate materials, all connections, welding, rectification wherever necessary, transporting and handling charges, all accessories, equipments, scaffolding, all lifts etc. including cost of all labour, and materials.

7.8.19 The finished work including erection shall be measured in Kilogram inclusive of the weight of posts, members, M.S plate stiffeners, M.S base plates, bolts, nuts, washers but no allowance shall be made for the welded material. The measurement for plates used on the work shall be made for the actual quantity used in work. The rate quoted per Kilogram shall be inclusive of cost of all materials & labour applying iron primer, erection in position, scaffolding, all transportation, lifts etc.

7.9 PECAST CEMENT CONCRETE BLOCK MASONRY

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

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

7.10 CEMENT PLASTERING

7.10.1 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.

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

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

7.10.4 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.

7.10.5 The surface shall be cured for 7 days.

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.

7.11 SUPPLYING AND FIXING ROLLING SHUTTERS

7.11.1 Rolling shutters shall conform to IS 6248. These shall include necessary locking arrangement and handles etc. These shall be suitable for fixing in the position as specified i.e. outside or inside on or below lintel or between jambs of the opening. The door shall be either push and pull type or operated with mechanical device supplied by the firm. Shutters upto 10 sq. metre shall be of push and pull type and shutters with an area of over 10 sq. metre shall generally be provided with reduction gear operated by mechanical device with chain or handle, if bearings are specified for each of operation, these shall be paid for separately.

7.11.2 Shutter : The shutter be built up of inter locking lath section formed from cold rolled steel strips. The thickness of the sheets from which the lath sections have been rolled shall be not less than 1.25 mm. The lath section shall be rolled so as to have interlocking curls at both edges and a deep corrugation at the centre with a bridge depth of not less than 12 mm to provide sufficient curtain of stiffness for resisting manual pressures and normal wind pressure. Each lath section shall be continuous single piece without any welded joint. When interlocked, the lath sections shall have a distance of 75 mm rolling centers. Each alternate lath section shall be fitted with malleable cast iron or mild steel clips securely riveted at either ends, thus locking in the lath section at both ends preventing lateral movement of the individual lath sections. The clips shall be so designed as to fit the contour of the lath sections.

7.11.3 Spring : The spring shall be of coiled type. The spring shall be manufactured from high tensile spring steel wire or strips of adequate strength conforming to IS 4454-Part I.

7.11.4 Roller and Brackets : The suspension shaft of the roller shall be made of steel pipe conforming to heavy duty as per IS 1161. The suspension shaft clamped to the brackets shall be fitted with rotatable cast iron pulleys to which the shutter is attached. The pulleys and pipe shaft shall connected by means of pretensioned helical springs to counter balance the weight of the shutter and to keep the shutter in equilibrium in any partly open position.

7.11.5 When the width of the opening is greater than 3.5 mtr. The cast iron pulleys shall be interconnected with a cage formed out of mild steel flats of at least 32 x 6 mm and mild steel dummy rings made of similar flats to distribute the torque uniformly. Self aligning two row ball bearing with special cast iron casings shall be provided at the extreme pulley and caging rings shall have a minimum spacing of 15mm and at least 4 number flats running throughout length of roller shall be provided.

7.11.6 Guide Channel : The width of guide channel shall be 25 mm the minimum depth of guide channels shall be as follows:

Clear width of shutters	*Depth of guide channel*
Upto 3.5 m	1 65 mm
3.5 m upto 8 m	75 mm
8 m and above	100 mm

7.11.7 The gap between the two legs of the guide channels shall be sufficient to allow the free movement of the shutter and at the same time close enough to prevent rattling of the shutter due to wind.

7.11.8 Each guide channel shall be provided with a minimum of three fixing cleats or supports for attachment to the wall or column by means of bolts or screws. The spacing of cleats shall not exceed 0.75 m. Alternatively, the guide channels may also be provided with suitable dowels, hooks or pins for embedding in the walls.

7.11.9 The guide channels shall be attached to the jambs, plumb and true either in the overlapping fashion or embedded in grooves, depending on the method of fixing.

7.11.10 ***Cover :*** Top cover shall be of mild steel sheets not less than 1.25 mm thick and stiffened with angle or flat stiffeners at top and bottom edges to retain shape.

7.11.11 Lock plates with sliding bolts, handles and anchoring rods shall be as per IS 6248.

7.11.12 Fixing

7.11.12.1 The arrangement for fixing in different situations in the opening shall be as per IS 6248.

7.11.12.2 Brackets shall be fixed on the lintel or under the lintel as specified with

rawl. Plugs and screws bolts etc. The shaft along with the spring shall then be fixed on the brackets.

7.11.12.3 The lath portion (shutter) shall be laid on ground and the side guide channels shall be bound with ropes etc. The shutter shall then be placed in position and top fixed with pipe shaft with bolts and nuts. The side guide channels and cover frames shall then be fixed to the walls through the plate welded to the guides. These plates and bracket shall be fixed by means of steel screws bolts, and rawl plugs concealed in plaster to make their location invisible. Fixing shall be done accurately in a workmen like manner that the operation of the shutter is easy and smooth.

7.11.13 Measurements

7.11.13.1 Clear width and clear height of the opening for rolling shutter shall be measured correct to a mm. The clear distance between the two jambs of the opening shall be clear width and the clear distance between the sill and the soffit (bottom of lintel) of the opening shall be the clear height. The area shall be calculated in square metres correct to two places of decimal.

7.11.14 Rate

The rate shall include the cost of materials and labour involved in all the operations described above including cost of top cover and spring except ball bearing and mechanical device of chain and crank operation, which shall be paid for separately.

7.12 SCRAPPING & CLEANING OLD PAINTED SURFACE

7.12.1 All loose particles and scales shall be scrapped off and holes in plaster as well as patches of less than 50 cm area shall be filled up with mortar of same mix. The surface shall then be cleaned with water jetting if required and allowed to dry for at least 48 hours before painting.

7.12.2 Whenever scaffolding is necessary, it shall be erected on double supports tied together by horizontal pieces, over which scaffolding planks shall be fixed.

7.13 PAINTING-GENERAL

7.13.1 Commencing Work

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

7.13.2 Preparation of Surface

The surface shall be thoroughly cleaned and dusted off. All rust, dirt, scales, smoke splashes, mortar droppings and grease shall be thoroughly removed before

painting is started. The prepared surface shall have received the approval of the Engineer-in-Charge after inspection, before painting is commenced.

7.13.3 Application

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

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

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

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

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

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

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

7.13.3.8 Brushes and Containers

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

7.14 CEMENT PRIMER COAT

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

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

7.14.3 Preparation of the Surface

The surface shall be thoroughly cleaned of dust, old white or colour wash by washing and scrubbing. The surface shall then be allowed to dry for at least 48 hours. It shall then be sand papered to give a smooth and even surface. Any uneveness shall be made good by applying putty, made of plaster of paris mixed with water on the entire surface including filling up the undulations and then sand papering the same after it is dry.

7.14.4 Application

The cement primer shall be applied with a brush on the clean dry and smooth surface. Horizontal strokes shall be given first and vertical strokes shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush marks. It shall be allowed to dry for at least 48 hours, before oil emulsion Paint is applied.

7.15 EXTERIOR PAINTING ON WALL

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

7.15.2 Preparation of Surface

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

7.15.3 Before pouring into smaller containers for use, the paint shall be stirred thoroughly in its container, when applying also the paint shall be continuously stirred in

smaller containers so that its consistency is kept uniform. Dilution ratio of paint with potable water can be altered taking into consideration the nature of surface climate and as per the recommended dilution given by manufacturer. In all cases, the manufacturer's instructions & directions of the Engineer-in-Charge shall be followed meticulously. The lids of paint drums shall be kept tightly closed when not in use, as by exposure to atmosphere, the paint may thicken and also dust may accumulate.

7.15.4 Paint shall be applied with a brush on the cleaned and smooth surface. Horizontal strokes shall be given, First and vertical strokes shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush marks.

7.15.5 5The specifications in respect of scaffolding, protective measures, measurements and rate shall be as described under 2.4 above.

7.16 WALL PAINTING WITH PREMIUM ACRYLIC INTERIOR EMULSION PAINT

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

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

7.16.3 Precautions

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

7.16.4 Measurements

The length and breadth shall be measured correct to a cm. Measurements of the work under this head shall be made on the basis of the area of work done and the

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

7.17 **PROVIDING FLOORING WITH RECTIFIED GLAZED CERAMIC TILES**

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

7.17.2 For fixing tiles to the cement mortar, neat cement slurry of honey like consistency using cement at the rate of 3.30 kg/m2 shall be smeared on top of the mortar bed. The joints between the tiles shall be uniform and minimum thickness.

7.17.3 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 coloured tile jointing powder.

7.17.4 When the floor is ready to use, the same shall be washed clean and dried with soft cloth or linen. If any tile is disturbed or damaged, it shall be re-fitted or replaced and properly jointed and pointed.

7.17.5 Measurement 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 all labour, materials, scaffolding etc. required for completion of the work including bed plastering 20mm thick.

7.18 **PROVIDING AND FIXING GLAZED WALL TILES**

7.18.1 Dadooing with glazed tiles shall be done using tiles of approved quality set in plastered and scarified surface. Glazed tiles shall be chamfered at all edges / corners.

7.18.2 The plastered and scarified surface shall be wetted and neat cement Slurry of honey like consistency-using cement at the rate of 3.30kg/m2 shall be smeared on the surface just before fixing the tiles. The tiles shall be laid over the slurry to the correct level and alignment with Minimum joint thickness. The joints shall be

raked and pointed with tile jointing powder of same colour as tiles. Finally the surface shall be cleaned with oxalic acid.

7.18.3 All the exterior corners of columns, walls etc. to be provided with PVC corner beading of approved quality and colour of tiles.

7.18.4 The unit rate is inclusive of providing bed plastering with cement mortar 1:3,12mm thick and fixing glazed tiles over it and jointing with grey cement slurry @ 3.3kg per sqm, including pointing.

7.19 PROVIDING AND LAYING WATER SUPPLY LINES FOR EXTERNAL WORKS

7.19.1 General

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

7.19.2 Trenching for laying pipe lines

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

7.19.3 Transporting, laying, jointing and testing of pipes

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

7.19.4 Transporting

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

7.19.5 Other materials to be made available by the contractor

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

7.19.6 Jointing of PVC pipes

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

7.19.7 Testing of pipelines for leakage test

The leakage test shall be conducted at a test pressure of 10 kg./cm^2. No pipe installation shall be accepted until the leakage per hour in cubic centimeter is less than the quantity (Q) determined by the formula

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

Where Q = Allowable leakage in cm^3 / hour,

N = No. of joints in the length of the pipeline tested,
D = Diameter of pipe in mm, and
P = Test pressure during the leakage test in kg/cm^2.

7.19.8 Fixing of valves and fittings

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

7.19.9 Payment

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

7.19.10 Back filling

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

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

7.20 **PROVIDING AND WATER SUPPLY LINES FOR INTERNAL WORKS**

7.20.1 The pipes shall be laid and properly clamped to wooden plugs embedded on the wall. Alternatively, plastic or aluminum clamps of suitable design with steel screws shall be used. Horizontal pipes shall be supported with clamps at spacing not more than1mcenter to center. For vertical pipes spacing may be increased by 50%. The pipes shall be aligned properly before fixing them on wooden plugs with clamps. Even if the wooden plugs are fixed using a plump line the pipe shall also be checked for alignment before clamping.

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

7.20.3 Payment

Payment shall be done on running meter basis measured centerline length including all the fittings, valves, bolts, nuts, etc. No separate payment shall be made for fixing fittings valves etc. for completing the work to the full satisfaction. The rate quoted shall include the cost of fittings like tees, bends reducer etc. and materials like solvent cement / bolts/nits/rubble gasket etc, to be made available by the Contractor for jointing pipes etc. and cost incurred for cutting the existing walls slabs, sunshade etc, and making good the same using concrete, mortar paint etc, as per the direction of Engineer-in-charge.

7.21 PROVIDING AND FIXING WASH HAND BASIN

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

Measurement of the work under this head shall be made on the basis of the area of work done and rate shown in the schedule shall include the cost of all labour, materials, etc. including mortar bed, required for completion of work.

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

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

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

7.23 FIBRE GLASS REINFORCED PLASTIC (FRP) DOOR FRAMES

7.23.1 Door Frames shall be three legged of cross section 90 mm x 45 mm having single rebate of size 32 mm x 15 mm to receive shutter of 30 mm thickness. The frame shall be made of laminate of thickness of 2 mm and shall be filled with wooden blocks of exterior grade MDF or seasoned and treated hard wood inside the

laminate in all the three legs of the frame. The frame to be moulded by either hand lay up or resin transfer moulding process. The process shall consist of laying gelcoat at 1000 gms./m2and laid over with layer of FRP Mat (CSM mat) gelcoat and FRP (CSM Mat) are defined in IS 14856. The CSM mat shall be bonded with Isophatholic resin in the ratio not less than 1:2 (One part of Mat to two parts of Isopathlic resin and fillers & additives) by weight. The edge shall be sealed with gelcoat and FRP mat to obtain smooth finish. Sufficient roving shall be laid in the corner to have smooth curve while laying the CSM mat.

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

7.23.3 Tolerance

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

7.23.4 Finish

The surface of the moulded frame shall be free from any visible defects such as small pores, crazing, blistering, wrinkling, impurities, defective impregration, 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.

7.23.5 Fixing of Frame

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

7.23.6 Measurements

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

7.23.7 Rate

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

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

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

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

7.24.3 Location of Fittings and Accessories

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

7.24.4 Finish

The surface of the moulded frame shall be free from any visible defects such as small pores, crazing, blistering, wrinkling, impurities, defective impregration, 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.

7.24.5 Fixing of Shutters

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

7.24.6 Tolerance

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

7.24.7 Fittings

Fittings shall be provided as per schedule of fittings decided by Engineer-in-Charge. In moisture prone areas M.S. fittings and screws should not be used.

Hardware such as handles, tower bolt, stopper, buffer etc. should be directly screwed (not pre-drilled) and fitted on the door.

7.24.8 Measurements

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

7.24.9 Rate

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

7.25 **PROVIDING AND LAYING 100mm THICK CEMENT CONCRETE INTERLOCKING PAVER BLOCKS**

7.25.1 The paver blocks shall be neatly stacked as per standard practice and as directed by the Engineer - in - Charge.

7.25.2 The bed of 6mm metal shall be spread over the above prepared surface to an average thickness not less than 50mm and it shall be rammed and compacted as directed by the Engineer-in-Charge. The blocks shall be set hand tight and the surface shall be rammed and vibrated properly to bring out joints not more than 2to 3mmwide between blocks. After compacting, the coarse sand shall be brushed in to joints.

7.25.3 The top surface of the paved area shall be in uniform level and no protrusions shall be seen at the top.

7.25.4 Measurement shall be made in square meters for the gross quantity of work done including providing compact bed. The rate quoted shall include cost of all materials, labour etc. required for completion of work.

7.26 **PROVIDING G.I. CHAIN LINK FABRIC FENCING**

7.26.1 Material

G.I. Chain link fabric fencing of required width in mesh size 50 x 50 mm or specified otherwise of approved brand and made of specified dia GI wire as specified in item of required colour or shade to be used.

7.26.2 **Fixing *:*** GI chain link shall be stretched and fixed in specified width, strengthening with 2 mm dia wire or nuts bolts & washers as required to be done complete as per the direction of Engineer-in-Charge.

7.26.3 ***Measurements :*** The length and width shall be measured correct to a cm. The area shall be calculated in square metre, correct to two places of decimal.

7.26.4 The rate shall include the cost of material and labour involved in all the operations described as above.

SIGNATURE OF TENDERER

ANNEXURE-I

COCHIN PORT AUTHORITY

RENOVATION OF BUILDING TO BE ALLOTTED TO NTRO NEAR DLD JUNCTION

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