MILITARY ENGINEER SERVICES

INDEX SHEET

PROVN OF WOMEN BARRACK AT OLD AMRITSAR CANTT

Total Drawings: ____ Sheets

(Signature of Contractor)

DCWE(Contracts)
For Accepting Officer

Tele : 0183-2401146

Headquarters
Commander Works Engineer
Amritsar Cantt
PIN – 900257
C/o 56 APO

82425/CWE/ASR-31/ /E8 Jun 2024

M/s_____

_____

_____

NAME OF WORK : PROVN OF WOMEN BARRACK AT OLD AMRITSAR CANTT

Dear Sir(s),

1. Tender documents for the above work have been uploaded on the site **https://defproc.gov.in.** The tender is on single stage two cover e-tendering system. The contents of Cover-1 & Cover-2 are specified in NOTICE OF TENDER..

2. Bids will be received online by ACCEPTING OFFICER upto the date and time mentioned in the **NOTICE INVITING TENDER (NIT)**. No tender/ bid will be received in physical form and any tender/ bid received in such manner will be treated as non bonafide tender/ bid.

3. Bid will be opened on due date and time fixed for opening in the presence of tenders/bidders or their authorised representatives, who have uploaded their quotation bid and who wish to be present at the time of opening the bids.

4. Your attention is also drawn to instructions on filling and submission of tender attached herewith. You may forward your points on tender documents and/ or depute your technical representative for discussion on tender/ drawings and to clarify doubts, if any, at least 7 days before bid submission end date/ revised bid submission end date. You are requested not to write piece meal points and forward your points duly consolidated upto seven days before bid submission start date.

5. Un-enlisted contractors are required to submit the scanned copies (in pdf file) of documents required as per eligibility criteria mentioned in instructions for filing the tender documents and Appendix 'A' to **NIT** alongwith EARNEST MONEY DEPOSIT (EMD) and tender fee on Defence eProcurement portal and submit the physical documents in the office of HQ Chief Engineer Jalandhar Zone Jalandhar Cantt within time limit specified in **NIT**. Inadequacy/ deficiency of documents shall make the bid liable for rejection resulting in disqualification for opening of finance bid.

6. Contractor having not executed standing security bond and standing security deposit in any MES formation shall upload scanned copy of EARNEST MONEY DEPOSIT (EMD) mentioned in Notice of Tender and shall ensure receipt of hard copy of EMD in the office of tender issuing authority before date and time fixed for this purpose. In case of failure to abide by any these two requirements, the finance bid will not be opened.

7. Enlisted contractors of MES shall submit the scanned copies (pdf file) of enlistment letter, tender fee and such other documents as mentioned in Appx 'A' to **NIT** on Defence eProcurement portal and submit physical documents in the office of **HQ Commander Works Engineer Amritsar** before date and time fixed for this purpose.

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8. The contractor must ensure that the tender/ bid on the proper form is uploaded in time as the Accepting Officer will take no cognizance of any quotations/ offer received in any other electronic or physical form like email/ fax/ by hand/ through post from tenderer/ bidder even if they are received in time.

9. In view of delays due to system failure or other communication related failures, it is suggested that the tender/ bid be uploaded, if necessary, sufficiently in advance of the last due date and time fixed.

10. General Conditions of Contracts (IAFW-2249) (1989 Print) and errata and amendments thereto, Schedule of minimum fair wages and MES SSR (Part-I and Part-II) are not enclosed with these documents. These are available for perusal in the Office of GE concerned and this office. The tenderers are deemed to have made themselves acquainted and fully conversant with contents of the aforesaid documents before submission of tender and no claim whatsoever on this account shall be entertained.

11. ANY TENDERER/BIDDER, WHICH PROPOSES ALTERATIONS TO ANY OF THE CONDITION, SPECIFICATIONS LAID DOWN IN THE TENDER DOCUMENTS OR ANY NEW CONDITION, WHATSOEVER IS LAIBLE TO BE REJECTED.

12. Tenderer shall note that information technology Act, cyber Act along with other Act as relevant shall be applicable.

13. Instruction for participating & filling of tender and all documents referred along with this letter shall be forming part of tender documents and shall be complied with.

Yours' faithfully,

(Signature of Contractor)

DCWE(CONTRACTS)
for Accepting Officer

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INSTRUCTIONS ON FILLING AND SUBMISSION OF TENDER

1. **EARNEST MONEY DEPOSIT (EMD)**

Contractor(s) who are not enlisted with MES/ who are enlisted but have not executed the Standing Security Bond shall submit Earnest Money Deposit as detailed in Notice of Tender in any one of the following forms alongwith their tender/ bid:-

(a) Deposit at Call Receipt from a Scheduled Bank in favour of Garrison Engineer concerned.

(b) Receipted Treasury challan, the amount being credited to the Revenue Deposit of Garrison Engineer concerned.

It is advisable that Earnest Money is deposited in the form of deposit call receipt from an approved Scheduled Bank for easy refund. In case the tenderer/ bidder wants to lodge 'EARNEST MONEY DEPOSTI' in any other form allowed by MES, a confirmation about its acceptability will be obtained from the Accepting Officer well in advance of the bid submission end date and time. Earnest Money Deposit shall be submitted in the name of concerned Garrison Engineer.

NOTES: - Earnest Money Deposit (EMD) in the form of Cheque/ Bank Guarantee etc. will not be accepted. NON-SUBMISSIOM OF EARNEST MONEY DEPOSIT (EMD) (Scanned copy alongwith Technical Bid and hard copy before the date & time fixed for opening of BOQ) WILL RENDER THE BID DISQUALIFIED FOR OPENING OF COVER-II (FINANCE BID).

2. **PERFORMANCE SECURITY**

In case the tender/ bid submitted by any contractor whether enlisted or not-enlisted with MES is accepted, the contractor will be required to lodge with the Accepting Officer the PERFORMANCE SECURITY DEPOSIT calculated @ 5% (Five Percent) of the contract amount of the contract as notified by the Accepting Officer. The amount is required to be lodged within 28 (Twenty Eight) days of the receipt by the letter of the acceptance (See Condition 19 of General Conditions of Contracts (IAFW-2249)). The condition-19 of IAFW-2249 is reproduced here for ready reference.

*"19 **Performance Security***

19.1 Within 28 days of receipt of the Letter of Acceptance, the successful contractor shall deliver to the Accepting Officer a Performance Security in any of the forms given below for an amount equivalent to 5% of the contract sum :-

(a) A Bank Guarantee in the prescribed form.

(b) Government Securities, FDR or any other Government Instruments stipulated by the Accepting Officer.

19.2. If the performance security is provided by the successful Contractor in the form of a Bank Guarantee, it shall be issued by Nationalized/ Scheduled Indian Bank but its confirmation shall be done only from the Head Office of the Bank.

19.3. Failure of the successful contractor to comply with the requirements of sub clause 19.1 shall constitute sufficient grounds for cancellation of the award of work and forfeiture of the Earnest Money. In case of MES enlisted contractor, amount equal to the Earnest Money stipulated in the Notice Inviting Tender, shall be notified to the tenderer for depositing the amount through MRO. Issue of tender to such tenderers shall remain

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suspended till the aforesaid amount equal to the Earnest Money is deposited in Government Treasury.

19.4. All compensation or other sums of money payable by the contractor to the Government under the terms of this contract or under any other contract with Government may be deducted from, or paid by the sale of a sufficient part of the Performance Security or from the interest arising there from or from any sums which may be due or become due to the contractor by the Government on any account whatsoever and in the event of his Performance Security being reduced by reason of any such deduction, or sale as aforesaid, the contractor shall within ten days thereafter made good in cash or securities, endorsed as aforesaid, any sum or sums which may have been deducted from or realized by the sale of his Performance Security or any part thereof.

Government shall not be responsible for any loss of securities or any depreciation in the value of securities while in their charge nor for loss of interest thereon.

19.5. In the event of contract being cancelled, under Condition-52, 53 & 54 of General Conditions of Contract, the Performance Security shall be forfeited in full and shall be credited into Consolidated Fund of India."

3 **GENERAL INSTRUCTIONS FOR COMPLIANCE**

3.1 The bids received only in the electronic form will be considered. All bids shall be submitted on '**https://defproc.gov.in**' portal. Documents should be scanned and forwarded in 'pdf' form and 'xls' form as indicated.

3.2 Bids shall be uploaded on **'https://defproc.gov.in'** on or before the bid closing date mentioned in the tender. No tender/ bid in any other electronic or physical form like email/ fax/ by hand/ through post will be considered.

3.3 Bid should be DIGITALLY signed using valid DSC. All pages of tender documents, corrections/ alterations shall be signed/ initially by the lowest bidder after acceptance.

3.4 Drawings, if issued in physical form, must be returned duly initialed by the tenderer/ bidder in separate envelope indicating his name and address.

3.5 The tender shall be signed, dated and witnessed at all places provided for in the documents after acceptance. All corrections shall be initialed. The contractor shall initial every page of tender and shall sign all drawings forming part of the tender. Any tender/ bid, which proposes alterations to any of the conditions whatsoever, is liable to be rejected.

3.6 In the technical bid, a scanned copy of Power of Attorney in favour of the person uploading the bid using his/ her DSC shall be uploaded. In case the digital signatory himself is the sole proprietor, scanned copy of an affidavit on stamp paper of appropriate value to this effect stating that he has authority to bind the firm in all matters pertaining to contract including the Arbitration Clause, shall be attached in 'pdf' form. In case of partnership concern or a limited company, digital signatory of the bid/ tender shall ensure that he is competent to bind the contractor (through partnership deed, general power of attorney or Memorandum and Articles of Association of the Company) in all the matters pertaining to the contracts with Union of India including Arbitration Clause. A scanned copy of the documents confirming of

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INSTRUCTIONS ON FILLING AND SUBMISSION OF TENDER (Contd)

such authority shall be attached with the tender/ bid in 'pdf' form, if not submitted earlier. The person uploading the bid on behalf of another partner(s) or on behalf of a firm or company using his DSC shall upload with the tender/ bid a scanned copy (in 'pdf' form) of Power of Attorney duly executed in his favour by such other or all of the Partner(s) or in accordance with constitution of the company in case of Company, stating that he has authority to bind such other person of the firm or the Company, as the case may be, in all matters pertaining to the contract including the Arbitration Clause.

3.7 Even in case of Firms or Companies which have already given Power of Attorney to an individual authorizing him to sign tender in pursuance of which bids are being uploaded by such person as a routine, fresh Power of Attorney duly executed in his favour stating specifically that the said person has authority to bind such partners of the firm, or the Company as the case may be, including the condition relating to Arbitration Clause, should be uploaded in 'pdf' form with the tender/ bid; unless such authority has already been given to him by the Firm or the Company. It shall be ensured that power of attorney shall be executed in accordance with the constitution of the company as laid down in its Memorandum & Article of Association.

3.8 Hard copies of all above documents should be sent by the contractor to the tender issuing authority well in advance to be received before the date & time fixed for the same.

3.9 Bid (Cover 1& 2) shall be uploaded online well in time.

3.10 The contractor shall employ Indian Nationals after verifying their antecedents and loyalty. Attention is also drawn to special condition 3 referred hereinafter and also condition 24 & 25 of IAFW-2249 (General Conditions of Contracts).

3.11 Tenderers/ bidders who uploaded their priced tenders/ bids and are desirous of being present at the time of opening of the tenders /bids, may do so at the appointed time.

3.12 The tenderer/ bidder shall quote his rate on the BOQ file only. No alteration to the format will be accepted; else the bid will be disqualified and summarily rejected.

3.13 In case the tenderer/ bidder has to revise/ modify the rates quoted in the BOQ (excel sheet), he can do so only in the BOQ, through **https://defproc.gov.in** site only before the bid closing time and date.

4. **REVOCATION/ REVISION OF OFFER UPWARD/ OFFERING VOLUNTARY REDUCTION AFTER CLOSING OF BID SUBMISSION DATE & TIME**

In the event of lowest tenderer/ bidder revoking his offer or revising his rates upward/ offering voluntary reduction after closing of bid submission date & time, his offer will be treated as revoked and the Earnest Money deposited by him shall be forfeited. In case of MES enlisted contractors, the amount equal to the earnest money stipulated in the Notice of tender shall be notified to the tenderer/ bidder for depositing the amount through MRO. Bids of such contractors/ bidders shall not be opened till the aforesaid amount equal to the earnest money is deposited by him in Govt. Treasury. In addition, bids of such tenderer/ bidder and his related firm(s) shall not be opened in second call or subsequent calls. Reduction offered by the tenderer/ bidder on the freak high rates referred for review shall not be treated as voluntary reduction.

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INSTRUCTIONS ON FILLING AND SUBMISSION OF TENDER (Contd)

5. **CPM (Critical Path Method)**

5.1 The project planning for work covered in the scope of tender is based on CPM.

5.2 The tenderer/ bidder is expected to be fully conversant with the CPM technique and employ technical staff who can use the technique in sufficient details. Sufficient books and other literature on the subject are widely available in the market which the tenderer/ bidder may make use of.

5.3 The tender's/ bidder's attention is drawn to special condition of the tender regarding preparation of the detailed network analysis and time schedule for the work and his liability for employing sufficient resources to adhere to this schedule. Any inability on the part of the tenderer/ bidder in using the technique will be taken as his technical inefficiency and will affect his class of enlistment and future prospect/ invitation to tenders for future works.

5.4 Department may issue amendments/ errata in form of **CORRIGENDUM** to tender/ revised BOQ to the tender documents. The tenderer/ bidder is requested to read the tender documents in conjunction with all the errata/ amendments/ corrigendum, if any, issued by the department

6. A tenderer is supposed to check if any revised BOQ has been uploaded, and quote in revised BOQ only. Thus, uploading quotation in pre-revised BOQ shall be considered as a willful negligence by the bidder and his quotation shall be considered non bonafide.

7. These instructions shall form part of the tender documents.

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Signature of Contractor

DCWE (CONTRACTS)
for Accepting Officer

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MILITARY ENGINEER SERVICES
NOTICE INVITING TENDER (NIT)

1. A tender is invited for the work as mentioned in Appendix 'A' to this NOTICE INVITING TENDER (NIT).

2. The work is estimated to cost as indicated in aforesaid Appendix 'A'. This estimate, however, is not a guarantee and is merely given as a rough guide and if the work costs more or less, a tenderer/bidder will have no claim on that account.

3. The work is to be completed within the period as indicated in aforesaid Appendix 'A' in accordance with the phasing, if any, indicated in the tender from the date of handing over site, which will be on or about two weeks after the date of acceptance of tender.

4. Contractors whose names are on the MES approved list and within whose financial category the estimated amount would fall and un enlisted contractors may submit tender/bid subject to other criteria mentioned in Appendix A. However in case of term contracts, enlisted contractors of Class SS to E may submit tender. Not more than one tender shall be submitted/uploaded by one contractor/ firm. Under no circumstances will a father and his son(s) or other close relations who have business dealing with one another be allowed to tender/bid for the same contract as separate competitors. Two firms shall be deemed to have business dealing if any of the partners/proprietor/director is common among both of them. A breach of this condition will render the tenders/bids of both the parties liable for rejection.

5. The Office of **HQ CWE Amritsar Cantt** will be the Accepting Officer here-in-after referred to as such for the purpose of this contract.

6. Not more than one tender/bid shall be submitted/uploaded by one bidder firm. Under no circumstances will a father and his son(s) or other close relations who have business dealing with one another be allowed to tender/bid for the same tender as separate competitors. A breach of this condition will render the tenders/bids of both the parties liable for rejection.

7. The Technical Bid and Financial Bid (Cover-1 and Cover-2) shall be uploaded by the contractor on or before the date & time mentioned in NIT. A scanned copy of DD with enlistment details and other documents as specified in Appendix A shall be uploaded as Cover-1 (Technical bid) of the tender on e-tendering portal. DD is refundable in case the contractor is not considered eligible in technical evaluation of Cover 1 resulting in non-opening of Cover1. The applicant contractor shall bear the cost of bank charges for procuring and encashing the DD including revalidation of DDs and shall not have any claim from Government whatsoever on this account.

8. Tender form and conditions of contract and other necessary documents shall be available on website defproc.gov.in for download and shall form part of contract agreement in case the tender/bid is accepted.

9. In case of MES enlisted contractor who has not executed the Standing Security Bond and un enlisted contractor, the Cover-I shall be accompanied by Earnest Money for the amount mentioned in Appendix 'A' in the form of deposit at call receipt in favour of concerned CCE/GE/GE (I)/AGE (I) (see Appendix 'A') by a Scheduled Bank or in received treasury Challan the amount being credited to the revenue deposit of the concerned CCE/GE/GE(I)/AGE(I) (see Appendix 'A'). The CCE/GE/GE (I)/AGE (I) will return the Earnest Money, wherever applicable, to all unsuccessful tenderers/bidders by endorsing an authority on the deposit at call receipt for its refund, on receipt of intimation from the Accepting Officer to do that.

10. In case of successful contractor i e the lowest contractor having submitted EMD, he shall have the option of converting the EMD instrument into part of the Performance Security to be

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deposited by him within 28 days from the receipt of intimation of acceptance of tender from Accepting Officer.

11. Sample of materials and stores to be supplied by the contractor will also be available for inspection by the bidder at the office of concerned GE/GE (I)/AGE (I)/Project Manager during working hours. The bidder is advised to visit the site of work by making prior appointment with GE/GE (I)/AGE (I)/CCE/Project Manager, who is the Executing Agency of the work (see Appendix 'A'). The bidder shall be deemed to have full knowledge of all relevant documents, samples, site etc whether he has inspected them or not.

12. Any bid which proposes any alteration to any of the conditions laid down or proposes any other new condition whatsoever, is liable to be rejected.

13. The uploading of bid by a bidder implies that bidder has read this notice and the conditions of contract and has made himself aware of the scope and specification of work to be done and of the conditions and rates at which stores (as applicable) etc will be issued to him and local conditions and other factors having bearing on the execution of the work.

14. The bidder must be in possession of a copy of the MES Schedule (SSR) (Part-I & Part-II of latest edition) including amendments and errata thereto.

15. Accepting Officer does not bind himself to accept the lowest or any tender/bid or to give any reason for not doing so.

16. The Accepting Officer reserves the right to accept a tender submitted by a Public Undertaking/Small & Medium Enterprises (SMEs), giving a price preference/purchase preference over other tender(s)/bids which may be lower, as are admissible under the Government Policy. No claim for any compensation or otherwise shall be admissible for such tenderer/bidder whose tender/bid is rejected.

17. The Notice Inviting Tender (NIT) including Appendix 'A' and Annexures thereto, if any, shall form part of the contract agreement.

(Signature of Contractor)

DCWE (Contracts)
For Accepting officer

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APPENDIX 'A' TO NOTICE INVITING TENDER (NIT)

1.	Name Of Work	**PROVN OF WOMEN BARRACK AT OLD AMRITSAR CANTT**
2.	Estimated Cost	**Rs 40.00 Lakhs**
3.	Period Of Completion	**06 Months.**
4.	Cost of tender document	**Rs 500** in the form of DD/Bankers cheque from any Scheduled Bank in favour of GE Amritsar and payable at Amritsar **(Note :** In case of retendering the contractor who had quoted in the previous call is not required to submit the cost of tender).
5.	Website/portal address	www.defproc.gov.in
6.	Type of contract	The tender shall be based on drawings and specifications (IAFW-2159) and General Conditions of Contracts (IAFW-2249) with Schedule "A" (list of items of work) to be pre-priced by MES. The Contractor is required to quote the lump sum amount for parts of Schedule "A" and quote rates against items of other parts of Schedule "A".
7.	Timeline details :	
	(a) Bid submission start date	Refer critical dates on the website.
	(b) Bid submission end date	
	(c) Date of bid opening	
8.	Eligibility Criteria	
	(a) For MES enlisted contractors.	Contractor shall be enlisted with MES in **class 'D'** and above and **category 'a(i)'** subject to satisfactory remarks wrt performance in respect of works in hand as reflected in Work Load return (WLR) or any other report circulated by competent engineer authority.
	(b) For contractors not enlisted with MES.	(i) Contractor not enlisted with MES should meet the enlisted criteria of **'D' Class & 'a(i)'** category contractor with regard to satisfactory completion of requisite value works with Central/State Government/ Central/State PSUs/ AWHO/ AFNHB/ CGEWHO/ DGMAP, annual turnover, bank solvency, working capital and other requirements given in Para 1.4 & 1.5 of Section 1 of MES Manual of Contracts 2020 as available in all MES formations as well as MES website (www.mes.gov.in) (ii) Not carrying adverse remarks in Work Load Report (WLR) or any other similar report circulated by any competent authority, if already working in MES. (iii) Not suspended/debarred/blacklisted (either permanently or temporarily) from participating In any bid or for business dealings by any Central/State Government Department or any Central/State Government PSU or any Autonomous Body under Central/State Government or any Local Body as on the bid submission end date.

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APPENDIX 'A' TO NOTICE INVITING TENDER (NIT)

<table>
<tr><td></td><td></td><td>(iv) Details of works completed and under progress in MES be submitted in the following format :-</td></tr>
<tr><td></td><td></td><td>
<table>
<tr><th>Srl No</th><th>CA No & Name of Work</th><th>Value of CA</th><th>Date of commencement</th><th>Date of completion</th><th>Extended date of completion</th></tr>
</table>

(v) Un-enlisted contractor who have secured two works in MES should get themselves registered in the appropriate designated class with any registering authority, else the firm will not be eligible for participation in the tender unless until the firm is enlisted with the MES.
</td></tr>
<tr><td>9.</td><td>Tender issuing and Accepting Officer</td><td>Name : CWE Amritsar
Address : Gulat Road, Old Cantt, Amritsar
Contact Detail (Phone no.& Email Id) of concerned officer :
Email: cweasr@gmail.com
Ph : 0183-2923308</td></tr>
<tr><td>10.</td><td>Executing agency</td><td>GE Amritsar.</td></tr>
<tr><td>11.</td><td>Earnest Money</td><td>Rs 80,000.00 in favour of GE Amritsar in the form of Deposit at call receipt, FDR not acceptable.</td></tr>
</table>

NOTES :-

1. In case after opening of Cover 1, the number of MES enlisted contractors of eligible class as well as eligible un-enlisted contractors, if any, fulfilling the other eligibility criteria given in NIT is less than 7 (Seven), applications in respect of MES contractors of one class below the eligible class shall also be considered subject to fulfillment of other eligibility criteria given in the NIT. Therefore MES contractor's one class below may also bid for this tender. Such contractors (contractors of one classes below the eligible class) shall not be considered in case their present residual work in hand is more than five times their present tendering limit. However in case such contractor fulfill the criteria of upgradation to the stipulated eligible class based on past experience of completed works (individual work experience and/or average annual turnover, as applicable) and financial soundness (solvency/financial soundness and working capital), the ceiling of present residual work will not apply and they will be considered for issue of tender. Such bidders shall upload in their Cover-1 bid details related to residual work in hand like details of work in hand showing names of work, names of Accepting Officer, Contract amounts, dates of commencement and completion (stipulated) and progress as on bid submission date. Such contractors, if claim to fulfil the criteria of upgradation shall also upload the requisite information/documents in support of upgradation. These details shall be verified by the Tender Issuing Authority from concerned formations in case bids of such contractors are considered for evaluation.

2. In case after opening of Cover 1, the number of MES enlisted contractors of eligible class as well as un-enlisted contractors, if any, fulfilling the other eligibility criteria given in NIT, are 7 (Seven) or more, applications of only those one class below the eligible class bidders shall be considered, who have previously completed similar works satisfactory and are meeting the criteria of upgradation in respect of past experience of completed works (individual work experience and/or average annual turnover as applicable) and financial soundness (solvency/financial soundness and working capital) as per details given in Manual on Contracts. Therefore such contractors shall upload the requisite information/documents in the Cover-1.

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APPENDIX 'A' TO NOTICE INVITING TENDER (NIT)

3. Unenlisted contractor shall be considered provided he meets the criteria. Foreign firms shall not be eligible for this tender. However Indian firms having foreign national / Indian nationals staying abroad / Indian national having taken foreign citizenship, as directors(s) shall be considered subject to security clearance from the concerned authorities.

4. Contractors enlisted with MES will upload following documents in Cover I for checking eligibility:-

(a) Application for tender on Firm's letterhead.
(b) Enlistment letter issued by the Registering Authority duly renewed for the cycle period in vogue.
(c) Scanned copy of DD/Bankers Cheque toward cost of tender EMD instrument in case SSD bond is not signed at the time of registration.
(d) Copy of GST registration certificate, EPF Code allotment letter no and all other document required as described in this Appendix.

5. Contractors not enlisted with MES will be required to upload following document in Cover 1 for checking eligibility.

(a) Application for tender on Firm's letterhead.
(b) Scanned copy of DD/Bankers cheque toward cost of tender and Earnest Money Deposit (EMD) instrument.
(c) Copy of Police Verification Report/Police Clearance Certificate/ Character Certificate from the Police Authority of the area where the registered office of the firm is located/notarized copy of valid passport of Proprietor/each Partner/each Director.
(d) All document required for enlistment in MES for the class mentioned in Para8(b) above as per Para 1.5 of Section 1 of MES Manual on Contracts 2020.
(e) Details of works being executed in MES, if any.
(f) Copy of GST registration certificate, EPF Code allotment letter no and all other document required as described in this Appendix.

6. Tenders not accompanied by scanned copies of requisite DD/Bankers Cheque towards cost of tender and earnest money (as applicable) in Cover I shall not be considered for validation of 'T' bid and their Financial Bids will not be opened.

7. Contractors should ensure that their original physical DDs and Earnest Money Deposit (EMD) instruments (as applicable) reach the office of Accepting Officer of within 07 days of bid submission end date failing which following action shall be taken.

(a) In case of tenders from an enlisted contractor of MES, Where scanned copies of requisite DD/Bankers Cheque towards cost of tender have been upload in Cover-1 but physical copies are not received within the stipulated period, their financial bids (Cover 2) will be opened. However non-submission of physical copies of cost of tender shall be considered as willful negligence of the tenderer with ulterior motives and such tenderer shall be banned from bidding for a period of six months commencing from the date of opening of financial Bid (Cover 2).

(b) In case of tenders from un enlisted contractor, where scanned copies of requisite DD/Bankers Cheque towards cost of tender have been uploaded Cover-1 but physical copies are not received within the stipulated period, their financial bids (Cover-2) will not be opened. Name of such contractors along with complete address shall be circulated for not opening of their bids for a period of six months commencing from the date of opening Financial bid (Cover 2).

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(c) In case of tenders from enlisted and un enlisted contractors, where scanned copies of instructions for Earnest Money Deposit (as applicable) have been upload in Cover 1 but the same are not received in physical form within stipulated period, such tenders shall not qualify for opening of financial bid (Cover 2).

8. Contractor will not be allowed to execute the work by subletting or through power of attorney to a third party/another firm on his behalf. However a contractor can execute the work through power of attorney to sons/daughter/spouse of Proprietor/Partner/Director and firm's own employees, director, project manager provided they are not having a separate enlisted firm in MES in their names as Proprietor/Partner/Director.

9. After opening of Cover-1 and during its technical evaluation, in case any deficiency is noticed in the documents required to be upload by the tenderers as per NIT, a communication in the form of e-mail/SMS/Speed Post etc shall be sent to the contractor to rectify the deficiency within a period of seven days from date of communication failing which their financial bid (Cover 2) shall not be opened and contractor shall not have any claim on the same.

10. Invitation for e-tender does not constitute any guarantee for validation of Technical bid and subsequent opening of financial bid of any applicant/bidder merely by virtue of enclosing DD. Accepting Officers reserves the right to reject the Technical bid and not to open the financial bid of any applicant/bidder. Technical bid validation shall be decided by the Accepting Officer based on eligibility of the firm as per criteria given in this Appendix. Tenderer/bidder will be informed regarding non-validation of his Technical bid assigning reasons therefore through tender evaluation report which shall be upload on the website. Such tenderer, if desires, may appeal to the next higher Engineer Authority (NHEA) viz Chief Engineer Jalandhar zone on email id sswcezjr2-mes@nic.in / cezjr2-mes@nic.in with copy to accepting officer (dcwecontamtsrjz3-mes@gov.in / cweasr@gmail.com) here concerned before due date of opening of Cover 2. NHEA shall decide the matter within a period of seven working days from the date of receipt of appeal. The decision of the NHEA shall be final and binding. The tenderer/bidder shall not be entitled for any compensation whatsoever for rejection of his bid.

11. In case an un enlisted contractor is already executing works in MES, he shall not be considered eligible for the subject tender if the total value of such works is more than twice the tendering limit of the MES Class of contractor for which it is eligible .For this purpose ,details of the works being executed by such a contractor shall be uploaded in the Cover 1 of the bid and shall be checked/verified by the Accepting Officer.

12. In case the BOQ is revised through the corrigendum and the bidder has failed to quote on revised BOQ (ie he has quoted on pre revised BOQ), such bid shall be treated as willful negligence by the bidder and his quotation shall be considered non-bonafide. In such case the lowest tender shall be determined from amongst the valid/bonafide bids only. Accepting Officer may decide whether to re-tender or consider the lowest bonafide tender for acceptance.

13. Revoking the offer or revising the rates upward or offering voluntary reduction by the lowest tenderer after opening of Cover II shall be considered as a willful default. For this default a penalty of an amount equal to Earnest Money shall be levied. In case of an un enlisted tenderer, earnest money deposited by him shall be forfeited In case of MES enlisted tenderer having deposited the Standing Security Bond, an amount equal to the earnest money stipulated in the NIT, shall be notified to the tenderer for depositing

Contd…

APPENDIX 'A' TO NOTICE INVITING TENDER (NIT)

through MRO and consideration of such tenderer in tender evaluation for future works shall remain suspended till the aforementioned amount is deposited in the Government Treasury. No other disciplinary/administrative action shall be taken against such tenderers. In such a situation, the next lowest offer shall not be considered for acceptance. Instead, retendering shall be resorted to in a transparent and fair manner and the defaulting tenderer and his related firm if any, shall not be eligible for this tender in second call or subsequent call.

14. Tender to related firms shall not be issued simultaneously. Firm shall be termed as related if Proprietor/one or more Partners/Directors are common. Decision of Accepting Officer on issue/deny the tender to any one of the related firms shall be final and binding.

Signature Of Contractor
File No _____

(----sdx-----)
EE (QS&C)
DCWE (Contracts)
For CWE ASR

File No : 82425/CWE/ASR-31/ /E8
Dated : Jun 2024
Headquarters
Commander Works Engineer
Amritsar Cantt
Email: cweasr@gmail.com
Ph : 0183-2923308

Distribution:-

1.	Builders Association of India G-1/G-20 Commerce Centre 7th Floor Tardeo Bombay-400034	9.	Cantonment Board Jalandhar Cantt General Post office Amritsar Cantt State Bank of India, Amritsar Cantt
2.	MES Builders Association of India 807, Sahyog, 58 Nehru Place, New Delhi-110019	10	General Post office Amritsar Cantt
3.	MES Builders Association of India Chandigarh Branch, 706, Sector 8-D Chandigarh	11.	State Bank of India, Amritsar Cantt
4.	MES Builders Association of India, C/O 13 Sadar Bazar Jalandhar Cantt	12.	Municipal Committee Jalandhar
5.	MES Builders Association of India, Shivaji Nagar-1, Dhanguj Road Pathankot-145001.	13.	SE CPWD Jalandhar Cantt
6.	HQ Chief Engineer Jalandhar Zone Jalandhar Cantt	14.	Executive Engineer, CPWD Jalandhar
7.	HQ CWE Jalandahar Cantt	15.	Station Master, Station Amritsar
8.	All GEs under HQ CEJZ	16.	HQ CEWC Chandimandir

Internal
E-2, E-4, E-6 Section.
Website folder Computer E8 Sec - for uploading in MES website https://defproc.gov.in

Contd…

IN LIEU OF IAFW- 2159

TO BE USED IN CONJUNCTION WITH GENERAL CONDITIONS OF CONTRACTS

Headquarters
Commander works Engineer
Amritsar Cantt

82425/CWE/ASR-31/ /E 8 Jun 2024

LUMPSUM E-TENDER AND CONTRACT FOR WORKS REQUIRED IN THE EXECUTION FOR "PROVN OF WOMEN BARRACK AT OLD AMRITSAR CANTT"

Dear Sir(s),

1. Shri/ Smt…… of …… is/ are hereby authorised to tender for the above work. The bids i.e. Cover-1 & 2 shall be submitted/ uploaded on website **"http://defproc.gov.in" as per the dates given in uploaded tender.**

2. Any correspondence concerning this tender shall be addressed as indicated at the top of this sheet, quoting the reference as given.

THE PRESIDENT OF INDIA DOES NOT BIND HIMSELF TO ACCEPT THE LOWEST OR ANY TENDER

(Signature of contractor)

Signature of the Officer uploading tender
Appointment: DCWE (CONTRACTS)

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SCHEDULE `A'

LIST OF WORKS AND PRICES

(A) NOTES (GENERAL) APPLICABLE TO ALL SECTIONS

1. This BOQ (Schedule) is divided into various parts as detailed below:-

(a)	Part –I	-	Building Work	Lump Sum Amount to be quoted by the contractor in BOQ
(b)	Part –II	-	Internal electrification	-do-
(c)	Part –III	-	Internal water supply	-do-
(d)	Part –IV	-	Sewage disposal	-do-
(e)	Part –V	-	Road, Path & Culvert	-do-
(f)	Part –VI	-	View cutter	-do-
(g)	Part –VII	-	External water supply	-do-
(h)	Part –VIII	-	Electric Supply	-do-
(j)	Part –IX	-	Cooling appliances	-do-
(k)	Part –X	-	Excavation and earth work	-do-
(l)	Part-XI	-	Miscellaneous Items	Rates to be quoted by the Contractor in BOQ.

2. Period of Completion

(a) The entire work under this contract shall be completed within 06 (Six months) from date of handing over of site and commencement of work as stated in work order No 1 to be issued by GE for the purpose.

(b) Site for execution of work will be available as soon as the work is awarded. In case it is not possible to make the entire site available on the award of work, the contractor will have to arrange his working program accordingly. No claim whatsoever, for not giving entire site on award of work and for giving site gradually, will be tenable.

3. This contract covers all works described in various Sections of schedule 'A', General Summary, Special Conditions, particular Specifications and all as shown on drawings.

4. Description of building works given in Schedule `A' are in brief. These are deemed to be amplified and read in conjunction with special condition, particular specifications, specification for material and workmanship and conditions and preambles in relevant trade sections of MES Standard Schedule of Rates Part-I (2009) & Part-II (2020) & Contract drawings (including notes thereon).

5. Performance Security

In terms of condition 19 of IAFW-2249, within 28 days of receipt of the letter of Acceptance, the successful contractor shall deliver to the Accepting Officer a Performance Security in any of the forms given below for an amount equivalent to 5% of the contract sum.

(a) A Bank Guarantee in the prescribed form.

(b) Government Securities, FDR, Insurance Surety bond or any other Government Instruments stipulated by the Accepting Officer.

Failure of the successful contractor to deliver the Performance security within the time period as mentioned above shall constitute sufficient grounds for cancellation of the award of work and forfeiture of the Earnest Money/equal amount from security deposit in case of enlisted contractor.

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In case contractor has opted to submit performance security in the form of the bank guarantee bond ie BGB, the validity of BGB should be up to the expiry of defect liability period. Further, in case defect liability period of the contract is extended due to delay in completion of work, contractor shall got the validity of BGB extended from the bank without waiting the notice from the department.

The performance security deposit shall be refunded to the contractor after expiry of defect liability period as certified by the GE provided contractor shall first been paid the final bill and have rendered a "No demand certificate".

6. Tentative distribution of various items of internal and external services is indicated on drawings .These may be varied where necessary at the discretion of the Engineer-in-charge. The contractor shall not be entitled for any claim on account of such variation.

7. Layout of buildings indicated in the site plan is tentative. Final layout of buildings/ structures and relative infrastructure will be approved by GE. No adjustment in price shall be done on account of final layout within the site plan area.

8. Unless specified/ indicated otherwise, the items of works in of schedule 'A' shall be deemed to include material and labour or supplying and fixing, jointing, connecting, testing etc. complete in all respects.

9. In case details in respect of items shown on main drawings are not given in the drawing referred to in the main drawings, then the same shall be followed from any other drawings listed in the list of drawings. Any drawings referred in the contract and/ or details of works shown on drawings but drawings in such case is/ are inadvertently not included in the list of drawings, the same shall also be deemed to form part of the contract.

10. Rates quoted against all items shall be deemed to include all taxes, **Goods & Services Tax** (CGST, IGST & SGST) on works contracts, levies, duties, Octroi, entry tax, labour welfare cess and shall also include all other local taxes as levied by the State Government, local bodies payable under respective statutes etc directly related to contract value, employees provident fund as EPF & MP Act 1952 and all taxes applicable to contracts. In this connection clause 26 of Special Conditions shall also be referred. No claim whatsoever shall be entertained by the department on account of any misunderstanding in the regard. Any other condition stipulated by the tenderer regarding any other taxes/ duties will not be considered and such tender shall be liable for rejection.

11. In case during execution of work, any deviation is required at site, the same shall not be executed/ implemented without prior written approval of the Accepting Officer. Rate and mode of measurement for the deviation involved also be finalised before approval. No payment shall be made in RAR/ final bill for the works carried out without appropriate approval.

12. Tenderers to note that the pre-priced cost against Schedule 'A' are given as guidance only and their correctness is not guaranteed. Tenderers are required to work out their amount against respective part of Schedule 'A' based upon their own estimate/ pricing and quote the tender accordingly. No claim whatsoever on account of any in accuracy in pre-pricing shall be admissible.

13. The testing instruments/ equipments, material and labour required for testing shall be provided by the contractor without any extra cost to the government. If the test(s) result of any item(s) is/ are found unsatisfactory, such item(s) shall be removed from the site and replaced with proper item(s)/ material by the contractor without any extra cost to Govt.

14. Blank

15. The rates inserted by MES or quoted by the contractor for items of works in various sections of Schedule 'A' shall be deemed to include 'Material and Labour' or 'Supplying and fixing',

Contd…

Jointing, commissioning and testing etc complete in all respects, unless mentioned specifically 'laying only', 'fixing only' or 'hanging only'.

16. The under mentioned remarks shall be deemed to have been inserted in Sch 'A' Part-II

(a)	Under Column 3	-	Refer list of drawings.
(b)	Under Column 7	-	Refer Note No. 3 of Sch 'A' (Period of Completion)
(c)	Under Column 8	-	Refer Schedule "A" notes, PS-I & II for all items of this Schedule

17. Makes of various items to be incorporated in the work have been specified in various documents viz. Schedule 'A', Particular Specifications, Appendix 'B' to the particular specifications which may be at variance with each other. In case of such variance, makes of the items shall be preferred in following order:-

(i) Make(s) specified in schedule 'A'.

(ii) Makes specified in Appendix to Particular Specifications.

18. All the workers deployed by the contractor in connection with execution of work shall be enrolled as members of Provident Fund Organization and should be given the Universal account Number (UAN). While clearing the bills of contractor, certificate be obtained by the GE from the contractor that all workers employed directly or indirectly by him are registered for EPF and due contributions have been credited into their accounts

19. The Contractor shall meet the requirement of minimum T&P and Machinery etc as per site requirements during execution of the work and GE will ensure that minimum T&P and Machinery etc required as per subject provisions of the contract are held by the contractor during execution of work.

20. **STAGE-WISE PHOTOGRAPHS** : Contractor shall maintain an album containing photos of each stage (stage wise) photograph at different angle per stage and album shall be kept at site. On completion of work, same will be deposited in GE office. The cost of the same is deemed to be included in the quoted rate by contractor. In case of prohibited area for photograph no minus price adjustment shall be made.

(B) NOTES APPLICABLE TO SCHEDULE `A' PART-I

21. The unit rate for work under Schedule `A' Part-I shall be deemed to include for all relevant items of work all as specified and shown on drawings, notes thereon and/or specified in particular specifications complete for entire completion of works.

22. The unit rate of buildings of Schedule `A' Part-I shall also be deemed to include the cost of the following items of works in addition to all works shown on drawings whether specifically specified and shown on drawings or not :-

(a) Preparatory works/ Cuttings/ leaving/ forming chases, holes etc, through/ in walls, floors and ceiling as required and making good to match with the adjoining surfaces required in connection with the work included in Schedule `A' to Part-I. No adjustment shall however be made on the quoted price on this account while pricing of any deviation for items in respect of Schedule `A' Part-I and also due to any variation in quantities indicated as 'PROVISIONAL' in the tender documents.

(b) Water proofing treatment for accessible/ non accessible roof as specified here-in-after shall be provided on roof slab of all buildings (having RCC roof) as catered in Sch 'A'/BoQ1 Part-I.

(c) Pre-construction anti-termite treatment to building as specified at **Serial No 1 of Schedule 'A' Part-I**.

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(d) All sanitary apparatus, appliances, accessories, toilet fittings, plumbing works and soil, waste, vent pipes, drain pipes etc (as shown in drawings) upto first manhole (including 1st manhole) located at upto 1.8 metre from the outer edge of plinth protection complete. Pipe from gully trap to 1st manhole shall be all as shown on drawings and if not indicated then it shall be 110mm dia UPVC (SWR) conforming to IS 13592.

(e) UPVC outlet pipes to drain out rain water from the building(s) wherever shown in the drawing shall be 110 mm bore pressure should not less n 4 kg/ sqm and shall be provided upto 3 metre from external face of wall. The pipes shall be of single length to prevent possible undermining of the foundations.

(f) Rotational moulded HDPE water tanks triple layered shall be provided over roof slab all as shown on drawings. The tanks shall be provided with 20mm bore brass float valve with PVC ball and fixing arrangement (inlet & outlet connection), overflow and washout pipe including staging and arrangement for inlet & outlet connections as shown on drawing. If the capacity of the tank is not indicated on drawings, the same shall be considered as 500 litres for each toilet block.

(g) Damp proof treatment as shown on Drawings. The bitumen coating of VG-10 shall be applied @ 1.70 Kg/Sq M.

(h) Measures for arresting efflorescence shall be carried out as under :-

(i) Bricks and brick tiles with excessive percentage of soluble salts i.e. Magnesium Sulphate, Calcium sulphate, sodium and potassium sulphate shall not be used in the work.

(ii) Before application of plaster/ pointing, efflorescence on the brick work will be removed by scrubbing, application of hydrochloric (Muriatic) acid and water solution and rubbing down as specified in clause 13.5 of IS-2212: 1991.

(iii) The efflorescence treatment shall be carried out as per TD irrespective of the fact whether walls are provided with DPC or plinth beam/ plinth band. The treatment shall also be carried out on sides of plinth beams/ plinth band including independent plinth beams/ band.

(j) Fan hooks including mild steel fan box all as specified.

(k) Seismic provision as shown in drawing for buildings in Seismic Zone-IV.

(l) Number plates (with engraved numbers) including painting thereof as shown on drawing .

(m) Plinth protection, steps, dwarf walls, platform and ramp wherever shown in the drawings connected with the building.

(n) Apron/ ramp and saucer drain connected with garages.

(o) Preparation of PSMBs of bldgs listed at **Srl No. 1** of Schedule 'A' Part-I alongwith completion drawings of each bldg before completion of work by the contractor & submitted to **GE Amritsar.**

(p) MS rungs of 16mm dia round bars @ 30cm c/c or steel ladder shall be provided to all buildings where roof is not accessible. Location of such rungs shall be as decided by Engineer-in-Charge.

(q) Excavation in soft/loose soil shall be considered in lump sum quoted cost of item of schedule `A' Part-II all as specified. The unit rate of bldgs of Sch 'A' Part-I shall be deemed to include surface dressing n.exc 15cm in soft/ loose soil of bldg area upto 3m from the plinth protection of the bldg and removing of soil exceeding 50m but n.exc 500m from outer perimeter of plinth protection, where any other type of excavation is not involved.

(r) Writing MES No with synthetic enamel paint of suitable letter size on ceiling fans, exhaust fans meters etc as directed by Engineer-in-Charge.

Contd…

(s) Built-in-furniture items such as boards, counters etc. all as specified and shown on drawings.

(t) Stainless steel railings for staircase, balconies and other places all as specified and shown on drawings.

(u) Provn of gusset plates alongwith welding as structurally required at all locations whether specifically shown or not on drgs

(v) The contractor shall provided an inscribed plate of appropriate size for numbering buildings in cement mortar (1:3) 15mm thick by engraving and painting (black) with requisite letters and number as directed by Engineer-in-Charge. The following details shall be mentioned on the plate :-

i. CA No and name of work
ii. Name of contractor
iii. Date of completion
iv. Validity of guarantee of ATT treatment
v. Validity of guarantee of roof treatment

23. All drawings forming part of the contract shall be read as mutually explanatory to each other. Details shown in architectural drawings but not shown in structural drawings and vice versa shall also be deemed to be applicable for execution of work and the tenderers while quoting their lump sum shall include cost thereof.

24. In case details in respect of items shown on main drawings are not given in the drawing referred to in the main drawings, then the same shall be followed from any other drawings listed in the list of drawings. Any drawings referred in the contract and/ or details of works shown on drawings but drawings in such case is/ are in-advertently not included in the list of drawings the same shall also be deemed to form part of the contract.

25. Rates quoted for a particular item and/ or lump sum quoted by the tenderer shall be deemed to include for any minor details/ items of work or constructions which are obviously and fairly intended and which may not have been included in these documents but which are essential for the execution and entire completion of the work. Decision of the Accepting Officer as to whether any minor details of work and/ or construction is obviously and fairly intended to be included in the contract or not shall be final, conclusive and binding. Some of the minor details/ items which are deemed essential for execution and entire completion of work are detailed below for guidance:-

(i) Reinforcement for any RCC member not indicated in the drawings but required due to codal requirement.
(ii) Dwarf wall in situations like verandah, passage, ramp etc not indicated in drawings.
(iii) Lintels over doors, windows, openings and electric meter box not shown in drawings.
(iv) In all the above and other similar cases, the details indicated elsewhere in the drawings which are similar or near similar to the missed out items of work shall be followed. In the absence of any other similar or near similar details, minimum essential requirement for completion of the work from structural and utility point of view shall be deemed to be included in the lump sum quoted. In the event of any dispute, decision of the Accepting Officer shall be final, conclusive and binding.

26. Foundation details given in various drawings shall be followed and where foundation details are not indicated on the drawings, the same shall be followed from the typical foundation details drawings based on safe bearing capacity of soil indicated on structural drawings. Building under Schedule ‘A’ Part-II shall have the foundation for safe bearing capacity as specified/ shown on drawings. Variation in safe bearing capacity of soil if found at site and require redesigning of the foundation, the same shall be referred to Accepting Officer before execution at site. In case safe bearing capacity is not mentioned in drgs, matter shall be referred to AO for necessary clarification/ decision.

Contd…

27. Brick work shall be with fly ash bricks all as specified.

28. Blank

29. In case any particular door/ window/ ventilator is not marked for the door opening on drg but the same is required from functional point of view in that case the same shall be provided from door details of other similar locations. Decision of GE in this regard shall be final and binding.

(C) GENERAL NOTES APPLICABLE TO SCHEDULE "A"

30. All quantities are "PROVISIONAL".

31. Special Condition in MES schedule and preambles in items given in MES Schedule (Part-II) under respective trades shall be applicable. If any provision in the description of items of Schedule "A" and/ or in particulars specification is/ are at variance with the provision in special condition in MES Schedule Part-II and/ or preambles to MES Schedule items, the provision in Schedule "A" and particular specifications shall take precedence thereon. However, condition 6A of IAFW- 2249 shall also be referred in this regard.

32. Wherever any damage is caused to the existing road for taking sewage line/ water supply lines across the road, the same shall be made good to match with the original surface by the contractor under his own arrangement and without extra cost to Govt.

33. In case details in respect of items shown on main drawings are not given in the drawing specifically referred to in these notes /clarifications to drawings or in the main drawings, the same shall be followed from any other drawings listed in the list of drawings. Any drawings referred in the contract and/ or details of works shown on drawings but drawings in such case is/ are inadvertently not included in the list of drawings, the same shall also be deemed to form part of the contract.

34. B/R & E/M services marked on site plan are tentative and may be changed as per requirement. The tenderer shall not be entitled for any extra on account of such variation.

35. On completion of work a schematic diagram showing internal services in each building shall be prepared by the contractor shall be submitted to the Garrison Engineer duly signed by both parties i.e. Contractor and Engineer-in-Charge without any extra cost to the Govt. Necessary certificate in this regard shall be attached alongwith final bill duly signed by the GE.

36. BREAK DOWN DETAILS FOR PAYMENT

36.1 The yard sticks for Sch A Part-I Serial Item No. 1 is not given. It will be responsibility of the contractor to submit detailed estimate alongwith yard sticks in CD form to Engineer-in-Charge within 30 days of acceptance of tender. After through scrutiny, Enigneer-in-Charge will forward the same to GE for technical check by AGE (C). After technical check, GE will recommend the same to CWE for approval.

(SIGNATURE OF CONTRACTOR)
DATED: _____

DCWE (CONTRACTS)
FOR ACCEPTING OFFICER

Contd…

37. PRICING OF DEVIATION

(a) Condition 62 of IAFW-2249 : General Condition of Contract shall be referred.

(b) Deviation for Additional items (if required), under Sch A Part XI shall be priced at (-) 20% (minus twenty percent) below the rates in SSR Part-II (2020), the rates which are not available in SSR Part-II (2020), the same shall be regularized as per condition 62 (G) of IAFW-2249.

(SIGNATURE OF CONTRACTOR)
DATED: _____

DCWE (CONTRACTS)
FOR ACCEPTING OFFICER

Contd…

SCHEDULE 'A' PART-I

LIST OF ITEMS OF WORKS AND PRICES FOR "BUILDING WORK"

Srl No	Description of item of work	Drg No	Rate Unit	No of Units required	Amount (Rs)	Period of completion of indl item after date of handing over of site	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	M&L for construction of new building women barrack complete all as specified and shown on drawings	Refer list of drawings	28,00,000.00 Each	1	28,00,000.00		
	Total amount of Sch 'A' Part-I carried over to BOQ under Srl item No. 1.01				**28,00,000.00**		

Signature of Contractor
Dated:

DCWE (Contracts)
For Accepting Officer

Contd…

SCHEDULE 'A' PART-II
LIST OF ITEMS OF WORKS AND PRICES FOR "INTERNAL ELECTRIFICATION"

Srl No	Description of item of work	Drg No	Rate Unit	Qty	Amount (Rs)	Period of completion of indl item after date of handing over of site	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Material & Labour for point wiring complete with 1.5 Sqmm single core PVC insulated sheathed multi-stranded, copper conductor FRLS grade cable of 1100 volts grade conforming to IS:694 drawn through and including non metalic rigid PVC conduit, medium grade, ISI marked, not less than 20mm bore with conduit accessories concealed on wall and ceiling/roof etc, with provision for fixing modular metal flush boxes not less than 1.0 mm thick of suitable modules, concealed in walls with modular white plated cover as top cover fixed with screws for housing switches, socket outlets, fan regulators etc, including provision of 1.5 sqmm nominal cross sectional area, PVC insulated, FRLS, sheathed, 1100 volt grade, multistranded single core green colour copper conductor for earth continuity connected to earth dolly complete all as specified and directed as following:- **NOTE: (i)** Modular metal flush boxes concealed in wall with suitable cover plate for mounting switch, sockets, regulator etc. and cost of cutting chases & making good as existing to disturbed surface with cement mortar, if required any shall be deemed to included in the quoted rates. **(ii)** Modular fittings/fixtures such as switch, socket, regulator, etc., shall be measured and paid separately as under relevant item.						
2	One light point controlled by one switch		992.75 Per Point	21	20847.75		
3	One Fan point controlled by one switch & regulator		992.75 Per Point	5	4963.75		
4	One 5 Amps outlet point on same board with other switches/sockets		284.10 Per Point	2	568.20		
5	One 3 pin 5 Amps socket outlet on independent board.		1070.40 Per Point	10	10704.00		
6	All as per ser item No. 1 here in above but point wiring with 2.5 Sqmm FRLS cable and 2.5 sqmm cable earth continuity wire for one 3 pin socket outlet,15 Amps on independent board.		1131.39 Per Point	6	6788.34		

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SCHEDULE 'A' PART-II
LIST OF ITEMS OF WORKS AND PRICES FOR "INTERNAL ELECTRIFICATION"

Srl No	Description of item of work	Drg No	Rate Unit	Qty	Amount (Rs)	Period of completion of indl item after date of handing over of site	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
7	All as per ser item No. 1 here in above but point wiring with 4.0 Sqmm FRLS cable and 4.0 Sqmm cable earth continuity wire for one 3 pin socket outlet,15 Amps on independent board.		1930.50 Per Point	1	1930.50		
8	Supply and fixing modular switch 1 way 6A, 240 volts, 1 module complete all as specified and directed		260.50 Each	38	9899.00		
9	Supply and fixing modular switch 1 way 16A, 240 volts, 1 module complete all as specified and directed		343.70 Each	6	2062.20		
10	Supply and fixing modular socket, 6A, 240 volts, 2/3 pin combined 2 module, flush type all as specified and directed		340.54 Each	12	4086.48		
11	Supply and fixing modular socket, 6A/16A, 240 volts, 2/3 pin combined 2 module flush type all as specified and directed		528.40 Each	06	3170.40		
12	Supply and fixing ceiling rose surface PVC/Polycarbonate, isolated body with face Bakelite 65 x 50 mm three terminal, 240 volts, AC single phase complete all as specified		65.70 Each	22	1445.40		
13	Supply and fixing sheet steel metal enclosure single pole & neutral with a 2 pin and earth plug and socket complete with one single pole MCB SP 20 Amp, 240 volts complete all as specified and directed.		1689.70 Each	1	1689.70		
14	Material & Labour for distribution board made out of sheet metal enclosure (CRCA sheet) dust and vermin proof, double door, TPN 4 way, 415 volts grade with 200 Amps insulated rated bus bar, earth bar IP- 43 & IK-09, door earthing flush to wall, including testing suitable for fixing MCB SPN, SP etc, complete all as directed.		2642.70 Each	01	2642.70		
15	Material & Labour for distribution board made out of sheet metal enclosure (CRCA sheet) dust and vermin proof, double door, TPN 4 way, 415 volts grade with 200 Amps insulated rated bus bar, earth bar IP- 43 & IK-09, door earthing flush to wall, including testing suitable for fixing MCB SPN, SP etc, complete all as directed.		2360.74 Each	1	2360.74		
16	Supply and fixing amp rating SP 6 To 32 AMP, 240V, 10KA 'C' curve miniature circuit breaker (MCB) of following poles and current carrying capacity in the MCB DB complete with connection testing and commissioning.		294.00 Each	12	3528.00		

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SCHEDULE 'A' PART-II
LIST OF ITEMS OF WORKS AND PRICES FOR "INTERNAL ELECTRIFICATION"

Srl No	Description of item of work	Drg No	Rate Unit	Qty	Amount (Rs)	Period of completion of indl item after date of handing over of site	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
17	Supply and fixing TPN 63 Amps, 415V 10KA 'C' curve miniature circuit breaker (MCB) current carrying capacity in the DB complete with connection testing and commissioning.		2360.74 Each	1	2360.74		
18	Supply and fixing sub main wiring with 2 runs of 4.0 Sqmm single core, multi-stranded PVC insulated, FRLS sheathed cable 1100 Volts grade with copper conductor drawn through and including non metallic PVC conduit, medium grade, not less than 25mm dia, ISI marked, with conduit fittings and accessories not less than 25mm dia **concealed** in wall/ceiling/floor including 1 runs run of 4.0 Sqmm multistranded PVC insulated FRLS, copper conductor cable as earth continuity conductor and connecting to common earth dolly complete. **NOTE:** Two runs of 4.0 sqmm copper cable and One run of 4.0 sq mm copper cable alongwith non metallic PVC conduit/conduit accessories not less than 25mm dia will be measured as one unit.		215.00 RM	20	4300.00		
19	Supply and fixing LED lights fitting 1x 20W, 220V, AC, 5700K, decorative box type with driver, double sided connection, CRI> 80, PF>95%, THD<10%, Lumen>2100 lm including LED tube light connecting up with 3 core flexible copper conductor cable (1.0 mm² size/core) from ceiling rose complete all as specified and directed.		1305.40 Each	13	16970.20		
20	Supply and fixing Dusk & dawn roadway luminaries 45 Watt, 230 V AC, 5700K outdoor type with epoxy black powder coated sheet, high pressure die-cast aluminum hosing and heat resistant complete with impact and corrosion resistant including thermal management in multiple optics, PF>95%, THD<10%, Lumen>4500 lm with IP 65/66 protection complete incl connecting wire with flexible PVC insulated copper cables from ceiling rose to fitting including driver, lamp bracket made of 32mm bore galvanised iron light grade pipe made to shape having overall length not exceeding 1.5 mtr, through mild steel clamp of 25mm width and four Nos. nuts, bolts & washers of 12mm dia, 100mm long fixed to wall with all other fittings complete and testing all as specified and directed.		2966.25 Each	4	11865.00		

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SCHEDULE 'A' PART-II
LIST OF ITEMS OF WORKS AND PRICES FOR "INTERNAL ELECTRIFICATION"

Srl No	Description of item of work	Drg No	Rate Unit	Qty	Amount (Rs)	Period of completion of indl item after date of handing over of site	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
21	Supply and fixing ceiling fan 1200mm sweep complete with blades, down rod, electronic regulator & accessories (i.e. PVC canopy, rubber bush, split pin, hanging clamp, hold fasteners etc.) 230 Volts, white colour, with min air delivery 210 CFM, BEE 5 star rated with brushless direct current motor (BLDC) technology and connecting up with & including 3 core flexible copper conductor cable (1.0 mm² size/core) from ceiling rose to ceiling fan and writing MES No. complete all as specified and directed		2649.47 Each	3	7948.41		
22	Supply, install & testing exhaust fan made of sturdy Engineering plastic complete with louvers shutter, voltage 230V, 50 Hz, single phase, 1200 RPM, Copper winding of sweep 300mm complete fixed/grouted to wall with suitable bolts, nuts etc., and connecting up with & including 3 core flexible copper conductor cable (1.0 mm² size/core) from ceiling rose to exhaust fan and writing MES No. including cutting hole suitable for fixing exhaust fan complete all as specified and directed		2535.38 Each	2	5070.76		
23	Supply and fixing for storage electric heater (Geyser), flexible mounting of capacity 25 ltrs, single phase, 240 volts, AC, white colour, with incoloy heating element and PUF insulation, ISI marked BEE 5 star rated complete with high precision & externally adustable capillary thermostat for temp regulation, backup safety overheating capillary thermal cut out at 95ºC, temperature display, etc., including provn of suitable holding clamp, MS bolts, grouted to wall and connecting up including 3 core sheathed multi-stranded flexible copper conductor cable connected with 15/16 Amp plug top and provn of water connections with new PVC steel braided inlet/outlet connection pipe 15mm dia, 450mm long with two numbers union, NRV of suitable size, check/end nuts with washers, 15mm dia 100mm long nipples (02 Nos) for hot water and cold water connections and making good to the disturbed surface in cement morter as required and testing complete all as specified and directed NOTE: Cost of flexible copper cable of 3 core, PVC steel braided inlet/outlet pipe of 15mm dia, 450mm long with brass union, NRV, check/end nuts, nipples, MS bolts, etc., and minor parts, if any, other than those are not specified in the schedule and required for smooth functioning of geyser will be deemed to be included in the quoted rate		10029.54 Each	1	10029.54		

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SCHEDULE 'A' PART-II
LIST OF ITEMS OF WORKS AND PRICES FOR "INTERNAL ELECTRIFICATION"

Srl No	Description of item of work	Drg No	Rate Unit	Qty	Amount (Rs)	Period of completion of indl item after date of handing over of site	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
24	Material & Labour in repairs earthing complete with galvanized earth plate electrode 600mm X 600mm X 6 mm thick buried directly in ground (earth pit not less than 2.25 metres below ground level) with top edge of earth plate not less than 1.5metres below normal ground level, connected to **GI Wire of size 4mm dia** by means of nuts, bolts, check nuts & washers of galvanized iron or steel all as shown on electrical plate No.3 of MES SSR 2009, Part – I (Specifications) and connected to main switch board/LT feeder panel including all necessary excavation and earth work in any type of soil, adequate quantity of charcoal dust & common salt all around the earth plate minimum 150 mm in alternate layers with & including watering pipe 20 mm dia GI medium grade, GI funnel made out of 0.63 mm thick GI sheet, wire gauge, 50mm thick RCC cover in PCC 1:2:4, type B-1, duly reinforced with 6 mm dia mild steel round bars @ 150mm both ways center to center with suitable lifting handle to cover, earth pit made of PCC 1:3:6 type C-1, GI protection pipe light grade 20 mm bore up to 7.5metres length from earth electrode including testing complete all as specified and directed **NOTE:** (i) Earth lead and protection pipe beyond 7.5 m shall be measured and Paid separately. (ii) On testing after completion of job, if desired earth resistance is not obtained, the earthing shall be redone by the contractor without any extra cost to Govt. (iii) Rate quoted shall be inclusive of excavation and earth work and PCC all as specified in the item (iv) Earthing work will be carried out in the presence of MES representative		6688.40 Each Set	2	13376.80		
	Total amount of Sch 'A' Part-II carried over to BOQ under Srl item No. 1.02				**1,48,608.60**		

Signature of Contractor
Dated:

DCWE (Contracts)
For Accepting Officer

Contd…

SCHEDULE 'A' PART-III
LIST OF ITEMS OF WORKS AND PRICES FOR "INTERNAL WATER SUPPLY"

Srl No	Description of item of work	Drg No	Rate Unit	Qty	Amount (Rs)	Period of completion of indl item after date of handing over of site	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
01	Supply and fixing of GI tubing 15mm bore medium grade, fixed to wall / ceiling or floor etc with all fittings ISI marked complete, all as specified and directed.		143.00 RM	50	7150.00		
02	Supply and fixing of GI tubing 20mm bore medium grade, fixed to wall / ceiling or floor etc with all fittings ISI marked complete, all as specified and directed.		169.00 RM	20	3380.00		
03	Supply and fixing of stop valve 15mm bore cast copper alloy with butterfly handle ,fancy type chromium plated, screwed down for high pressure, screed on bath ends, fixed with iron pipe etc complete, all as specified and directed.		682.03 Each	12	8184.36		
04	Supply and fixing of bib taps 15mm dia chromium plated fancy type with capstan head screwed down screwed for iron pipe or for brass ferrule complete, all as specified and directed.		607.57 Each	10	6075.70		
05	Supply and fixing of pillar taps cast copper alloy with capstan head chromium plated screwed down high pressure with or without lettered,' Hot or Cold 'with long screwed shanks and fly nuts screwed iron pipe 15 mm bore fancy complete, all as specified and directed.		676.44 Each	3	2029.32		
06	Supply and fixing of angel valves 15mm bore, fancy type chromium plated alloy with butterfly handle screwed down for high pressure, screed on bath ends, fixed with pipe etc complete, all as specified and directed.		682.03 Each	10	6820.30		
07	Supply and fixing of gun metal globe or gate valves with iron wheel head screwed both ends for iron pipe and fixed of size 20mm dia complete, all as specified and directed.		540.11 Each	3	1620.33		
08	Supply and fixing of PVC connections 15 mm size with PTMT nuts of length 600 mm complete, all as specified and directed.		200.00 Each	15	3000.00		
09	Supply and fixing of 600mm x 450 mm bevelled edge mirror of selected quality glass, mounted on 6 mm thick AC building board or commercial plywood and fixed to wooden plugs with chromium plated brass screws and cup washers complete, all as specified and		554.60 Each	3	1663.80		

Contd…

	directed.						
10	Supply and fixing of cast copper alloy chromium plated shower rose fancy type fixed to 15 mm bore pipe complete, all as specified and directed.		409.25 Each	3	1227.75		
11	Supply and fixing of brass CP WHB mixture for mixing hot & cold water screwed down for GI pipe of 15mm bore and fixed complete, all as specified and directed		1743.41 Each	3	5230.23		
12	Supply and fixing of Brass chromium plated wall mixer with bend pipe suitable for mixing Hot & Cold water and making leakage free connection with wall tiles & GI pipes complete, all as specified and directed.		1743.41 Each	3	5230.23		
	Total amount of Sch 'A' Part-III carried over to BOQ under Srl item No. 1.03				**51,612.02**		

Signature of Contractor
Dated:

DCWE (Contracts)
For Accepting Officer

Contd…

SCHEDULE 'A' PART-IV

LIST OF ITEMS OF WORKS AND PRICES FOR "SEWAGE DISPOSAL"

Srl No	Description of item of work	Drg No	Rate Unit	Qty	Amount (Rs)	Period of completion of indl item after date of handing over of site	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Material and labour for Salt-glazed stoneware(SGSW) pipe 200mm bore/internal diameter of pipe laid in trenches and jointed complete, all as specified and directed.		448.53 RM	68	30500.04		
2	Material and labour for Salt-glazed stoneware(SGSW) pipe150mm bore/internal diameter of pipe laid in trenches and jointed complete, all as specified and directed.		550.00 RM	19	10450.00		
3	M&L for PCC 1:3:6 type C2 (using 40mm graded stone aggregate) as concrete bed, laid to falls in trenches in any depth including packing under and hunching against the sides of SGSW pipes 150 mm , after the pipes have been laid and tested including complete all as specified and directed		466.89 RM	70.00	32682.30		
4	M&L for PCC 1:3:6 type C2 (using 40mm graded stone aggregate) as concrete bed, laid to falls in trenches in any depth including packing under and hunching against the sides of SGSW pipes) 200 mm , after the pipes have been laid and tested including complete, all as specified and directed		647.79 RM	20.00	12955.80		
5	M&L Brick work with sub class 'B' old size brick straight or curved on plan exc 6m mean radius built in cement mortar 1:4 complete, all as specified and directed.		5370.50 Cum	06	32223.00		
6	M&L rendering 15mm thick on fair/unfair face of brick or concrete surface in CM 1:4 to be finished even and fair without using extra cement complete all as specified.		304.24 Sqm	32	9735.68		
7	M&L for precast RCC 1:2:4 type B-1 using 20mm graded stone aggregate as cover slab for manhole and similar work etc complete all as specified and directed.		11053.80 Cum	0.3	3316.14		

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8	M&L TMT bars 8mm to 10mm dia and over cut to length bent to shape required including cranking spirally for hooking ends and binding with and including MS wire annealed n.less than 0.9mm dia complete all as specified.		82.60 Kg	45	3717.00		
9	M&L for Cutting into existing manholes for connecting new drains, making good to pipe and rendering ,cutting out existing benching for and forming branch channel (1/2 round or 3/4 section) in cement concrete 1:2:4 type B1 smooth finished , and reforming benching as required for 150mm/200mm bore of pipe complete all as specified and directed.		1120.00 Each	1.00	1120.00		
10	M&L for PCC 1:2:4 type B-1 using 20mm graded stone aggregates as in benching for manholes, bands, coping, bed plate etc including slightly chamfered or rounded angles including including necessary form work, if any, and finishing exposed surface even and smooth using extra cement complete all as specified and directed.		9259.40 Cum	0.25	2314.85		
11	S&F mild steel in framed work as in doors or gates of angle or other section with gusset plates, rails, braces, etc., complete, drilled for fixing of steel sheeting or other covering. Doors, etc., to be prepared for hanging or sliding with and including either hooks and hinges or steel hanging door fittings (exclusive of steel sheeting or other covering, running rails and guides) and hanging; also fastening and fixing Gde Fe-410-W complete all as specified and directed.		119.16 Kg	125	14895.00		
	Total amount of Sch 'A' Part-IV carried over to BOQ under Srl item No. 1.04				**1,53,909.80**		

Signature of Contractor
Dated:

DCWE (Contracts)
For Accepting Officer

Contd…

SCHEDULE 'A' PART-V

LIST OF ITEMS OF WORKS AND PRICES FOR "ROAD, PATH & CULVERT"

Srl No	Description of item of work	Drg No	Rate / Unit	Qty	Amount (Rs)	Period of completion of indl item after date of handing over of site	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Material and labour for for hard core of gauge n exc 63 mm broken bricks spread and leveled in layers not exc 15 cm thickness watered and rammed to a true surfaces complete all as specified and directed.		1215.8 Cum	9	10942.20		
2	Material and labour for 75 mm thick plain Cement concrete, 1:4:8 type D-2(40 mm graded aggregate) as in sub base complete all as specified and directed.		412.1 Sqm	6.75	2781.68		
3	Material and labour for sand filling under floors or in foundations including watering and consolidation complete all as specified and directed.		1974.30 Cum	4.5	8884.35		
4	Material and labour for machine pressed precast concrete interlocking paver block any shape and size confirming to IS 15658-2006 of 60 mm thickness M-35 Grade with gray cement and pigment complete all as specified and directed.		774.40 Sqm	90	69696.00		
5	Material and labour for PCC 1:2:4 type B0 using 12.5mm graded stone aggregates as in benching for manholes, bands, coping, bed plate etc including slightly chamfered or rounded angles including including necessary form work, if any, and finishing exposed surface even and smooth using extra cement complete all as specified and directed.		8509.90 Cum	1.4	11913.86		
	Total amount of Sch 'A' Part-V carried over to BOQ under Srl item No. 1.05				**1,04,218.10**		

Signature of Contractor
Dated:

DCWE (Contracts)
For Accepting Officer

Contd…

SCHEDULE 'A' PART-VI

LIST OF ITEMS OF WORKS AND PRICES FOR "VIEW CUTTER 1.5M"

Srl No	Description of item of work	Drg No	Rate Unit	Qty	Amount (Rs)	Period of completion of indl item after date of handing over of site	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Material and labour for Plain cement concrete (1:4:8) type D-2 using 40mm graded stone aggregate as in foundation filling as mass concrete or in sub base of floors etc complete, all as specified and directed.		5483.10 Cum	10.20	55927.62		
2	Material and labour for brickwork with subclass `B' bricks, straight or curved on plan exc 6m mean radius, built in CM (1:6) as in boundary wall, drain etc complete all as specified and directed.		4875.00 Cum	21.60	105300.00		
3	Material and labour for rendering 15mm thick on other than fair face of brick works or concrete surfaces of walls with CM (1:4) finished the surface for even and smooth using WPC complete, all as specified and directed. Note:-WPC shall be paid and measured extra		304.24 Sqm	96.00	29207.04		
4	Supply only water proofing compound liquid type (ISI Marked) complete, all as specified and directed.		46.10 Kg	17.82	821.50		
5	Supply and fixing of 2mm thick Fibre glass reinforced translucent corrugated sheeting with two corrugations side lap fixed with coach screw and washer in roof, wall etc complete, all as specified and directed..		1100.30 Sqm	216	237664.80		
6	Supply and fixing of Steel work in tubular trusses including special shaped washer etc. complete using ERW or induction butt welded tubes including distance pieces , cleats etc. including necessary cutting, welding etc complete conforming to IS 1161-1979 grade st-240 complete, all as specified and directed.		124.11 Kg	780	96805.80		

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SCHEDULE 'A' PART-VI (Contd…)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
7	Material and labour for applying two coats of synthetic enamel paints to steel surfaces over a coat of red oxide primer over 10 cm width or girth complete, all as specified and directed.		141.30 Sqm	72	10173.60		
8	Material and labour for applying two coats of cement base paint on wall including preparation of new surfaces etc., all as specified and directed.		70.50 Sqm	96	6768.00		
	Total amount of Sch 'A' Part-VI carried over to BOQ under Srl item No. 1.06				**5,42,668.36**		

Signature of Contractor
Dated:

DCWE (Contracts)
For Accepting Officer

Contd…

SCHEDULE 'A' PART-VII							
LIST OF ITEMS OF WORKS AND PRICES FOR "EXTERNAL WATER SUPPLY"							
Srl No	Description of item of work	Drg No	Rate Unit	Qty	Amount (Rs)	Period of completion of indl item after date of handing	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Supply and Fixing galvanized steel water tubes medium grade with screwed socket joint together with and including all GI fittings such as bends, elbows, short piece connections, back nuts, caps plugs and unions etc laid in tranches/fixed on walls/laid on floors of 40mm dia including testing complete, all as directed and specified.		396.50 RM	30	11895.00		
2	Supply and Fixing galvanized steel water tubes medium grade with screwed socket joint together with and including all GI fittings such as bends, elbows, short piece connections, back nuts, caps plugs and unions etc laid in tranches/fixed on walls/laid on floors of 25mm dia including testing complete, all as directed and specified.		184.60 RM	120	22152.00		
3	Supply and Fixing galvanized steel water tubes medium grade with screwed socket joint together with and including all GI fittings such as bends, elbows, short piece connections, back nuts, caps plugs and unions etc laid in tranches/fixed on walls/laid on floors of 20mm dia including testing complete, all as directed and specified.		158.60 RM	20	3172.00		
4	Supply and fixing gun-metal, globe or gate valves conforming to IS:781-1984 of size 40mm with iron wheel head, screwed both ends for iron/UPVC pipe and fixed complete all as specified and directed.		784.97 Each	01	784.97		
5	Supply and fixing gun-metal, globe or gate valves conforming to IS:781-1984 of size 20mm with iron wheel head, screwed both ends for iron/UPVC pipe and fixed complete, all as specified and directed.		540.11 Each	02	1080.22		
6	Material and labour for drilling and tapping CI/DI water mains of 100/150 mm dia (in position) for branch connections of the internal dia 40 mm include for turning water off and on and draining and refilling complete, all as specified and directed.		696.55 Each	01	696.55		
	Total amount of Sch 'A' Part-VII carried over to BOQ under Srl item No. 1.07				**39,780.74**		

Signature of Contractor Dated:				DCWE (Contracts) For Accepting Officer	

Contd…

SCHEDULE 'A' PART-VIII

LIST OF ITEMS OF WORKS AND PRICES FOR "EXTERNAL ELECTRIC SUPPLY"

Srl No	Description of item of wok	Drg No	Rate Unit	Qty	Amount (Rs)	Period of completion of indl item after date of handing over of site	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Supply, laying and testing cable XLPE Insulated, PVC bedded, galvanized steel strip or wire armoured, electric power cables (heavy duty) 1100 Volts grade with stranded aluminum conductor of size 95 sqmm 3½ core cross sectional areas including connecting up using suitable size aluminum lugs, double compression copper stainless steel gland etc., testing and commissioning complete all as specified and directed. **Note** : The cost of lugs, gland etc shall be deemed to be included in the quoted rate.		526.72 RM	25	13168.00		
2	Supply, laying and testing cable XLPE Insulated, PVC bedded, galvanized steel strip or wire armoured, electric power cables (heavy duty) 1100 Volts grade with stranded aluminium conductor of size 35 sqmm 3½ core complete all as specified and directed. **Note** : The cost of lugs, gland etc shall be deemed to be included in the quoted rate.		269.75 RM	70	18882.50		
3	Supply and laying of double wall corrugated (DWC) high density poly ethylene (HDPE) of size 80mm dia including all necessary fittinigs, PN-4 rating, pressure 6 Kgf/cm, conforming to IS-16205 (Part-24) with high ring stiffness & cursh resistance capacity, etc., laid in trench for protection of cable complete, all as specified and directed		476.28 RM	90	42865.20		

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4	M&L in repairs to earthing complete with galvanized steel earth plate electrode 60cmX60cmX6.0 mm thick buried directly in ground (earth pit not less than 2.25m deep below normal ground level) normal with top edge of plate not less than 1.5m below normal ground level, earth plate connected to GI strip of size 25 x 4mm by means of bolts, nuts, check nuts and washers of galvanised iron or steel all as shown in electrical plate No.3 of MES SSR part I and connected to LT feeder panel all as specified or indicated including testing on completion with and including 40mm bore light grade GI protection pipe 7.5 meter long for earth wire including PCC (1:2:4) pit with precast RCC (1:2:4) type B -1 cover, 40mm thick reinforced with 6mm dia MS bars @ 100 mm both ways with lifting hooks made out of 6mm dia MS bars, watering pipe 20mm dia GI medium grade, GI funnel, wire mesh, adequate quantity of charcoal dust & common salt all around earth plate minimum 150mm thick in alternate layers including necessary excavation and earth work in any type of soil complete, all as specified and directed. Note :- (i) Earth lead and protection pipe beyond 7.5m shall be measured and paid separately. (ii) On testing after completion of job, if desired earth resistance is not obtained, the earthing shall be redone by the contractor without any extra cost to Govt. (iii) Rate quoted shall be inclusive of excavation and earth work and PCC all as specified in this item. (iv) Earthing work will be carried out in the presence of MES representative.		7164.70 Each Set	02	14329.40		
	Total amount of Sch 'A' Part-VIII carried over to BOQ under Srl item No. 1.08				**89,245.10**		

Signature of Contractor
Dated:

DCWE (Contracts)
For Accepting Officer

Contd…

SCHEDULE 'A' PART-IX

LIST OF ITEMS OF WORKS AND PRICES FOR "COOLING APPLIANCES"

Srl No	Description of item of work	Drg No	Rate Unit	Qty	Amount (Rs)	Period of completion of indl item after date of handing over of site	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Supply and fixing water cooler electric driven, Single phase, 230 volt AC, 50 Hz having approx storage capacity of 80 litres and nominal cooling capacity of 40 litres/hour, double faucets, fully stainless steel body and tank, Hermetic type compressor, propeller type fan condenser, automatically control thermostat, aesthetic & compact design, with auto shut off, ISI mark, suitable for eco friendly refrigerant R-32/R-134a/R-407, PUF insulation for longer cooling period, complete including provision of suitable fixing arrangements such as angle iron, nut, bolts, mounting stand suitable for water cooler etc., complete all as specified and as directed Make: Blue Star or techno-equivalent make of Voltas/Samsung		01 Each	43410.39	43410.39		
	Total amount of Sch 'A' Part-IX carried over to BOQ under Srl item No. 1.09				**43,410.39**		

Signature of Contractor
Dated:

DCWE (Contracts)
For Accepting Officer

Contd…

SCHEDULE 'A' PART-X
LIST OF ITEMS OF WORKS AND PRICES FOR "EXCAVATION AND EARTH WORK"

Srl No	Description of item of work	Drg No	Rate / Unit	Qty	Amount (Rs)	Period of completion of indl item after date of handing over of site	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Excavating in trenches, n exc 1.5 m wide and n exc 1.5 m in depth; for foundation, etc. or for shafts, wells, cesspits, manholes, pier holes, etc. n exc 10 sq m on plan and n exc 1.5 m in depth and getting out complete all as specified and directed.		383.70 CUM	120.00	46044.00		
2	Excavating in trenches, exc 1.5 m wide and n exc 3.00 m in depth; for foundation, etc. and getting out complete all as specified and directed.		542.40 CUM	10.00	5424.00		
3	Returning, filling in, including spreading, levelling, watering and well ramming in layers not exc 25 cm thick each layer complete, all as specified and directed.		139.10 CUM	90.60	12602.46		
4	Material and labour for Removing excavated material n exc. 50m and depositing where directed at a level n exc. 1.5 m above the starting point complete, all as specified and directed.		320.40 CUM	52.90	16949.16		
5	Surface excavation n.exc (not exceeding) 30 cm deep and averaging 15cm deep and getting out complete, all as specified and directed.		53.10 SQM	90.00	4779.00		
	Total amount of Sch 'A' Part-X carried over to BOQ under Srl item No. 1.10				**85,798.62**		

Signature of Contractor
Dated:

DCWE (Contracts)
For Accepting Officer

Contd…

SCHEDULE 'A' PART-XI

LIST OF ITEMS OF WORKS AND PRICES FOR "MISCELLANEOUS ITEMS "PROVN OF WOMEN BARRACK AT OLD AMRITSAR CANTT"

REFER BOQ UPLOADED

Signature of Contractor
Dated:

DCWE (Contracts)
For Accepting Officer

Contd…

SCHEDULE 'A' SECTION –II
(SCHEDULE OF CREDIT)

NIL

(Signature of Contractor)

DCWE (Contracts)
For Accepting Officer

SCHEDULE 'B' STORE

(ISSUED OF MATERIALS ETC TO CONTRACTOR)
SEE CONDITION 10 OF IAFW-2249

Ser No	Particulars of materials	**Unit**	Rate at which material is Issued	Place of issue by name	Remarks
1	2	**3**	4	5	6

NIL

SCHEDULE 'C'

ITEMS OF TOOLS AND PLANTS (OTHER THAN TRANSPORT) WHICH WILL BE ISSUED TO THE CONTRACTOR

(See Condition 15, 34 & 35 of IAFW-2249)

Ser No	Quantity	Particulars	Details of Crew	Hire Charges per unit Per working Day in Rs.	Standby charges per unit per off day Rs.	Place of issue	Remarks
1	2	3	4	5	6	7	8
N I L							

SCHEDULE 'D'
TRANSPORT TO BE HIRED TO THE CONTRACTOR

(See conditions 16 and 35 of IAFW-2249)

Ser No	Particulars	Rate per unit per working day	Place of issue (by Name)	Remarks
1	2	3	4	6
N I L				

Signature of the Contractor

DCWE (Contracts)
For Accepting Officer

Contd…

TENDER

THE PRESIDENT OF INDIA

Having examined and perused the following documents:-

1. Specification signed by ACWE (Contracts).

2. Drawing detailed in list of drawings.

3. Schedule 'A', 'B', 'C' and 'D' attached hereto.

4. MES standard schedule of Rates 2009 (Part-I) (Specifications) & 2020 (Part-II) (Rates) together with Errata/Amendments as under :-

(a)	SSR Part-I (2009) :	Amendment	1 to 3
		Errata	Nil
(b)	SSR Part-II(2020) :	Errata	NIL
		Amendment	1 to 122

5. General conditions of contract IAFW-2249 (1989 Print) together with Amendment No 1 to 49 and Errata 1 to 20.

6. **Water will not be supplied by the MES**.

7. Should this tender be accepted :-

I/We agree

*(a) That the sum of Rs._____ Rupees_____ _____) forwarded as earnest money shall either be retained as a part of Security Deposit or be refunded by the Department on receipt of an appropriate amount as Security deposit within the time specified in condition 22 of IAFW-2249.

(b) To execute all the works referred to in the said documents upon the terms and conditions contained or referred to therein and as detailed in the General Summary and to Carry out such deviations as may be ordered vide condition 7 of IAFW-2249, upto a maximum of **10% (TEN PERCENT)** percent and further agree to refer all the disputes as required vide condition 70 to Sole Arbitration of serving officer having degree in Engineering or equivalent or having passed final/direct final examination of sub Div-II from institution of surveyors (India) recognised by the Govt. of India to be appointed by **Chief Engineer Western Command, Chandimandir**, or in his absence, the officer officiating as Chief Engineer Western Command, Chandimandir, whose decision shall be final, conclusive and binding.

*To be deleted where-ever not applicable.

Contd…

Total amount brought forward from serial page No : ____ Rs _____
(Rupees._____
_____for the contract sum.

Signature_____(Name _____) in the capacity of _____ duly authorized to sign the tender for and on behalf of M/S _____ (In block letters).

Dated:

Postal Address:

_____

Witness _____ _____

Address _____ _____

_____ _____

_____ Telephone No :_____

ACCEPTANCE

_____ Alternations have been made in these documents and as evidence that these alterations were made before the execution of the contract agreement, these have been initialed by the contractor and **Shri** _____**, DCWE (Contracts)**. The said officer is hereby authorised to sign and initial on my behalf the documents forming part of this contract.

The above tender was accepted by me on behalf of the president of India for the contract sum of Rs _____

(Rupees_____
_____)

on the _____ day of _____2024)

Signature _____dated this _____ day of _____2024

Appointment: Accepting Officer
Commander works Engineer
Amritsar Cantt
(For and on behalf of the President of India)

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SPECIAL CONDITIONS

1. **GENERAL**

The following Special Conditions shall be read in conjunction with the General Conditions of Contracts, IAFW-2249 and IAFW-2159 including errata/ amendments thereto. If any provision in these special conditions is at variance with that of the aforesaid documents, the former shall be deemed to take precedence there over.

2. **INSPECTION OF SITE BY CONTRACTOR & RESPONSIBILITY TO ASCERTAIN HIS OWN INFORMATION**

(a) The tenderers are advised to contact the Garrison Engineer for the purpose of inspection of site(s) and relevant documents other than those sent herewith, who will give reasonable facilities for this purpose. The tenderers shall also make themselves familiar with working conditions, accessibility of site(s), availability of materials and other cogent conditions, which may affect the entire completion of work under this contract.

(b) The tenderers shall be deemed to have inspected the site(s) and made themselves familiar with the working conditions, whether they actually inspect the site (s) or not.

3. **EMPLOYMENT OF PERSONEL, SECURITY AND PASSES**

3.1 Refer Condition 25 of IAFW-2249. The contractor shall employ only Indian Nationals as his representatives, servants and workmen after verifying their antecedents and loyalty. He shall ensure that no person of doubtful antecedents and nationality is, in any way, associated with work. If for reasons of technical collaboration or other consideration, the employment of any foreign national(s) is unavoidable, the contractor shall furnish full particulars to this effect to the Accepting Officer at the time of submission of his tender. As a proof that the contractor has employed only Indian Nationals he shall render a certificate to GE within one month from the date of acceptance of tender to this effect. In case the GE desires, contractor will have the police verification done of the personnel employed by him.

3.2 The GE shall have full powers and without giving any reasons to order the contractor immediately to cease to employ, in connection with his contract, any agent, servant or employee whose continued employment is, in his opinion undesirable. The contractor shall not be allowed any compensation on this account.

3.3 Contractor’s attention is drawn to condition 25 of IAFW-2249 in this connection.

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4. **CONDITIONS FOR WORKING: ALL WORKS LIE IN UNRESTRICTED AREA**

(a) The contractor, his agents, servants, workmen and vehicles may pass through the unit lines in which case the Competent Authority on recommendation of Engineer in charge/GE shall, at his discretion, has the right to issue passes, control their admission to the site of work or any part thereof. The contractor shall on demand by the Engineer-in-Charge submit a list of personnel, etc. concerned and other information's called for by the Engineer-in-Charge and shall satisfy the Engineer-in-Charge as to the bonafides of such people. Passes shall be returned at any time on demand by the Engineer-in-Charge and in any case on completion of work.

(b) The contractor and his work people shall observe all the rules promulgated from time to time by the authority controlling the area where the work is to be carried out e.g. prohibition of smoking, keeping to specified routes, etc. Any person found violating the security rules laid down by the authority, shall be immediately expelled from the area without assigning any reasons what-so-ever and the contractor shall have no claim on this account. Nothing shall be admissible for any man-hours lost on this account.

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5. **MINIMUM WAGES PAYABLE**

5.1 Refer Condition 58 of IAFW-2249. The contractor shall not pay wages lower than minimum wages for labour as fixed by the Govt. of India/ State Govt./ Union Territory, whichever is higher.

5.2 Contractor's attention is also drawn amongst other things to the explanation to the Schedule of minimum wages referred to above.

5.3 The fair wage referred to in condition 58 of IAFW-2249 will be deemed to be the same as the minimum wages payable as referred to above as upto date from time to time.

5.4 Schedule of minimum wages are not enclosed alongwith tender documents. However contractor shall be deemed to have verified the minimum fair wages payable as on the last due date of receipt of tender.

5.5 The contractor shall have no claim whatsoever, if on account of local factors and or regulations, he is required to pay the wages in excess of minimum wages as described above during the execution of work.

6 **FACILITY TO CONTRACTORS (QUARRIES ON DEFENCE LAND)**

Reference Condition 14 of General Conditions of Contracts (IAFW-2249). No quarries on Defence land are available.

7. **LAND FOR TEMPORARY WORKSHOPS, STORES ETC. (REFERENCE CONDITION 24 OF GENERAL CONDITIONS OF CONTRACTS (IAFW-2249)**

(a) The contractor shall be permitted to store his materials including erection of temporary sheds for stores and workshops with chowkidar at the area decided by the GE in consultation with the user. The contractor shall pay licence fee of Rupee one per year or part thereof in respect of each and every separate area of land allotted to him.

(b) The Contractor shall be not be permitted to erect his labour camp and the like on the Defence land. He shall make his own arrangement for this purpose outside the Defence land.

8. **WATER**:

8.1 **Water shall not be supplied by the MES. Water shall be arranged by the Contractor under his own arrangement without any extra cost to the Govt.**

(a) Water will not be supplied by the MES. The tenderers are advised to visit the site of works to ascertain availability of water from civil sources or from nearby natural sources outside ministry of defence land. The contractor shall be allowed, if he so desires, to install hand pumps, tube wells at site of work at places as approved by Engineer-in-Charge and nothing shall be charged from the contractor. The contractor shall remove the hand pumps, tube wells as and when asked to do so by Engineer-in-Charge/GE after plugging the base holes. and in any case on completion of the work and before issue of completion certificate, unless GE desires that these hand pumps, tube wells be left in position and the contractor agrees to do so without claiming cost thereof from department.

(b) No compensation whatsoever shall be admissible to the contractor, if he is required to remove the pump(s) tube well before completion of work. Use of water from such sources shall only be permitted, if found after testing, potable and fit for use in the work. The water from such sources shall be got tested by the contractor from laboratory approved by the GE, who shall after satisfying himself permit the contractor to use the water from such sources. Testing charges shall be borne by the contractor.

9. **CO-ORDINATION WITH OTHER AGENCIES**

The contractor shall permit free access and afford normal facilities and usual conveniences to other agencies or departmental workmen to carryout connected works of services under separate arrangements. The contractor will not be allowed any extra payment on this account.

10. **ELECTRIC SUPPLY**: Electric supply will be provided by the MES**.**

Conditions for providing electric supply by the MES:

In case the contractor desires to buy electricity from the MES. The contractor will be charged for the electric energy consumed for execution of works at the following rates: -

(a) At Rs. Rs 11.79 per unit for lighting

Contd…

(b) At Rs. Rs 11.79 per unit for power.

10.1 Electric supply required for the works up to max 05 KVA shall be made available by the MES at the incoming terminal of the main switch marked on the site plan. The exact location of the electric point, if not marked will be shown by the GE. The main switch and KWh meters to register the electric energy supplied shall be provided and installed by the MES. The contractor shall provide all necessary cables, fittings etc. from the main switch in order to ensure a proper and suitable supply of electricity for execution of work

10.2 The MES do not guarantee continuity of supply and no compensation whatsoever shall be allowed for supply becoming intermittent or for breakdown in the system.

10.3 GE or his representative shall be free to inspect all the power consuming devices or any electric lines provided by the contractor. Any devices or electric lines provided by the contractor, which are not to the satisfaction of the GE, shall be disconnected from the supply, if so directed by him.

11. NET WORK ANALYSIS

11.1 The time and progress chart to be prepared as per condition 11 of General Conditions of Contracts (IAFW-2249) shall consist of detailed network analysis and a time schedule. The critical path network will be drawn jointly by the GE and the contractor soon after acceptance of tender. The time scheduling of the activities will be done by the contractor so as to finish the work within the stipulated time. On completion of the time schedule a firm calendar date Schedule will be prepared and submitted by the contractor to the GE who will approve it after due scrutiny. The schedule will be submitted in four copies within two weeks from the date of handing over the site.

11.2 During the currency of the work, the contractor is expected to adhere to the time schedule and this adherence will be part of his performance under the contract. During the execution of the work, the contractor is expected to participate in the reviews and updating of the network undertaken by the GE. These reviews may be undertaken at the discretion of the GE, either as a periodical appraisal measure or when the quantum of work ordered on the contractor is substantially changed through deviation orders or amendments. Any revision of the time schedule as a result of the review will be submitted by the contractor to the GE within a week for his approval after due scrutiny.

11.3 The contractor will adhere to the revised time schedule thereafter. In case of contractor disagreeing with revised schedule, the same will be referred to the Accepting Officer, whose decision shall be final, conclusive and binding. GE's approval to the revised schedule resulting in a completion date beyond the stipulated date of completion shall not automatically amount to a grant of extension of time. Extension of time shall be considered and decided by the appropriate authority mentioned in condition 11 of IAFW-2249 and separately regulated.

11.4 Contractor shall mobilize and employ sufficient resources to achieve the detailed schedule within the broad framework of the accepted method of working and safety.

11.5 No additional payment will be made to contractor for any multiple shift work or other intensive methods contemplated by him in his schedule, even though the time schedule is approved by the department.

12. MATERIALS AND SAMPLES

12.1 Refer condition 10 of IAFW-2249.

12.2 The materials and articles, which have been specified from certain makers/manufactures, shall be of makes/manufacturers as specified. If the manufacturer specified in tender documents makes both ISI marked and conforming to ISI, the materials/articles shall be provided only of ISI marked.

12.3 The materials and articles, which have not been specified in tender documents by makes/manufactures shall be as under: -

(i) If ISI marked materials are being manufactured the same shall be ISI marked. For list of ISI marked manufactures refer website of BIS i.e www.bis.org.in.

Contd…

(ii) If ISI marked materials are not being manufactured the same shall be confirming to IS specifications.

12.4 Materials of local origin shall be as specified and conforming to samples kept in GE's office. The tenderer is advised to inspect sample of materials, which are displayed in the office of GE, before submitting his tender. The tenderer shall be deemed to have inspected the samples and satisfied himself as to the nature and quality of materials, he is required to incorporate in the work irrespective of whether he has actually inspected them or not.

12.5 The contractor shall not procure materials and articles unless the samples are first got approved by GE.

13. **TESTING OF MATERIALS** .

13.1 A LEVELS TESTS FOR WORKS COSTING 100 LAKHS AND ABOVE: -The contractor shall set up site laboratory for testing of materials (except Sch 'B' materials) for 'A' level tests as listed in Appendix 'D' to PS II here in after. The contractor shall arrange all equipment/ machines for the tests specified in Appendix 'D' to PS II here in after as 'A' level tests at his own cost with prior approval of CE. This cost shall be included in the lump-sum costs quoted by the contractor. The contractor shall employ a competent technical representative as approved by the GE for the purpose of testing and all such tests shall be carried out in the presence of Engineer-in-charge. The successful tests result thereof shall be recorded and singed jointly by the contractor and the Engineer-in-charge. Charges for these tests i.e. 'A' level tests carried out in site laboratory of the contractor shall not be recovered. In case, the contractor has not set up the site laboratory and the test are carried out in zonal or any other laboratory setup/ approved by GE, the recovery shall be made at rates applicable i.e. as given in Appendix 'D' to Particular Specifications here-in-after.

13.2 'A' LEVEL TESTS FOR WORKS COSTING UPTO 100 LAKHS:-The contractor may set up site laboratory at his option for works costing upto 100 lakhs. The other stipulations will be same as specified in preceding para 13.1. However in case the contractor has not set up the site laboratory and tests are carried out in zonal or any other laboratory approved/ setup by the GE, the recovery shall be made at rates applicable i.e as given in Appendix 'D' to PS here in after.

13.3 The recoveries on account of testing charges wherever applicable shall be effected from the running account payments due to the contractor payable after completion of the respective tests or whenever the test is due whichever is earlier.

14. **PRE-CONSTRUCTION ANTI TERMITE TREATMENT**: Please refer clause 3 of Particular Specifications. The contractor's particular attention is invited to "Guarantee" and "Security Deposit" provision.

15. **GUARANTEE OF WATER PROOFING TREATMENT TO BUILDINGS IN CONTRACTS INCLUDING SPECIAL WATER PROOFING TREATMENT**

15.1 Provision should be made in tenders under Special Condition to cater for the following:-

(i) The period of guarantee shall be 10 years (TEN YEARS) from the date of actual date of completion of work. The contractor shall furnish guarantee in favour of the Garrison Engineer for the effectiveness of the water-proofing treatment during the guarantee period. If the work is executed through a Sub Contract, the guarantee furnished by the Sub Contractor should be in favour of the Garrison Engineer and not in favour of the main Contractor.

(ii) An appropriate sum, equal to the amount of security deposit calculated as per scales laid down for individual securities deposit on the amount of water proofing treatment at the contract rates under the contract, should be retained out of the final bill amount as Security Deposit for the water-proofing work, an it should be released to the Contractor only after the expiry of the guarantee period. The facility of furnishing fixed deposit receipt/BGB in lieu of the sum to be retained as security may be accepted.

16. **PERIOD FOR KEEPING THE OFFER OF TENDER OPEN**

The tender shall remain open for acceptance for a period of **60 (Sixty)** days from the bid submission end date commencing from the date next to bid submission end date.

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17. **ADVANCE ON ACCOUNT AGAINST MATERIALS WHICH DOES NOT LOSE IDENTITY (APPLICABLE ONLY FOR CONTRACTS EXCEEDING RS 50 LAKHS)**

17.1 Condition 64 Of IAFW-2249 Advances On Account: - Add the following in continuation of para 8 "Provided further, the contractor may be paid advance on account of the full value of the under mentioned materials only, brought on the site, on his furnishing guarantee Bond(s) from a Schedule Bank for the amount of retention money which should otherwise be recoverable from him under the contract:-

(i) Aluminium door/ windows. (ii) Ceramic, Vitrified Tiles & Paver Blocks

(iii) APP membrane (iv) Paints, distempers and cement base paint and like

(v) Pipes Viz GI, CI/DI, SGSW etc

(vi) Fibre Glass Sheets (vii) Electrical Cables/ wires/ fittings/ fixture.

(viii) Cooler/ Geysers/ Voltage stabilizers/

(ix) All other non-perishable materials as decided by GE.

17.2 Bank Guarantee bonds shall be executed for a period on the form appended as Annexure- I to these special conditions. The contractor shall further arrange to extend the period of Guarantee Bond(s) if and when necessary as directed by the Accepting Officer on a format appended as Annexure-II to these special conditions or shall furnish fresh guarantee bond(s) of similar value in lieu. It will be noted that advance on account to the full value of materials brought on the site is permissible only in respect of fittings and fixtures and other manufactured items which do not lose their identity. Materials like bricks, aggregate, pre-cast concrete and similar items shall not be taken in the list.

17.3 Procedure for Acceptance of Bank Guarantee Bond(s) in Lieu of security deposit / retention money

(a) Bank guarantee bonds will be sent by the manager of the banks under registered post to the Accepting Officer of the contract under the covering letter has been endorsed to their superior office.

(b) A Guarantee Bond received as mentioned above may be accepted by the competent authority if found otherwise in order. The office receiving the bond from the bank will acknowledge the same to the Bank concerned and enclose a certificate or a Photostat copy of the Bond for their record. A copy of this letter alongwith a copy of the bond will also be endorsed to the superior office of the bank as aforesaid for their information and record. Both the above communications to the banks shall be sent under registered post.

(c) The above instructions will also be applicable to extension of validity to Bank Guarantee Bonds.

18. **BLANK**

19. **OFFICIAL SECRETS ACT**

Contractor shall be bound by the Official Secrets Act-1923.

20. **SECURITY OF CLASSIFIED DOCUMENTS**

Contractor's special attention is drawn to conditions 2-A and 3 of General Conditions of Contracts (IAFW-2249). The contractor shall not communicate any classified information regarding works either to sub - contractors or others without prior approval of the Engineer-in-Charge. The contractor shall also not make copies of the design/ drawings and other documents furnished to him in respect of works, and shall return all documents on completion of the works or earlier on determination of the Contract. The contractor shall along-with the final bill, attach a receipt of his having returned the classified documents as per condition 3 of General Conditions of Contracts (IAFW-2249).

21. **RECORD OF MATERIALS AND PURCHASE VOUCHERS**

21.1 The quantity of materials such as cement, steel, paints, water proofing compound, chemicals for anti-termite treatment and the like, as directed by the Engineer-in-Charge (the quantity of which cannot be checked after incorporation in the works), shall be recorded in measurement books and signed by

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the contractor and the Engineer-in-Charge as a check to ensure that the required quantity has been brought to site for incorporation in the work.

21.2 Materials brought to site shall be stored as directed by the Engineer-in-Charge and those already recorded in measurement book shall be suitably marked for identification.

21.3 Contractor shall produce vouchers/ invoices from the manufacturers and/ or their authorized agents for the full quantity of the following materials, as applicable as a pre-requisite before submitting claims for payment for advances on account of the work done and/or materials collected in accordance with Condition 64 of General Conditions of Contracts - IAFW-2249: -

(a) Water proofing compound.

(b) Chemicals for anti-termite treatment.

(c) Paints, distempers and cement base paint and like.

(d) Cast/DI iron pipes and fittings.

(e) Sanitary fittings.

(f) Steel windows/ ventilators/ Aluminium doors/ Windows.

(g) Factory made door shutters/ PVC frames/ PVC doors.

(h) Floor/ Wall tiles.

(i) Iron Mongry

(j) Tarfelt/ bituminous products/ admixtures/ plasticizers/ APP membrane.

(k) Salt glazed stone ware pipes

(l) Electrical and Water Supply fittings/ fixtures where names of manufacturers/ brands are specified or approved.

(m) Cables/ wires.

(n) Cement.

(o) Steel/ structural steel.

(p) HDPE water tanks.

(q) GI sheets.

(r) CI sluice valves, GI pipes, butterfly valves, XLPE cables, MCB's, flame proof light fittings, MS casing pipes, low carbon galvanised strainers, , LT panels, MCCB's, voltmeters, ammeters, , and all other materials as applicable as per CA.

21.4 The contractor shall on demand produce to the GE; original receipted vouchers/ invoices in respect of the supplies. The vouchers/ invoices shall be defaced and stamped by Engineer-in-Charge indicating contract number, name of work, under his dated signature. The contractor shall ensure that the materials are brought to site, in original sealed containers/ packing, bearing manufacturer's marking except in the case of the requirement of material(s) being less than smallest packing.

21.5 The vouchers/ invoice will clearly indicate the contract number and IS No., specific alternative to which the material conforms in case of various alternative in IS.

22. **DAILY RETURNS TOOLS & PLANTS, MACHINERY AND TRANSPORT DEPLOYED AT SITE**

(a) The contractor shall furnish to the Engineer-in-Charge every morning distribution return of his plants/equipments on the site of work stating the following particulars: -

(i) Particulars of plants/ equipments, their make, manufacturers Model No if any, Registration No if any, capacity, year of manufacture and year of purchase etc.

(ii) Total No (Quantity) on site of work.

(iii) Location, indicating No., (quantity) at each location on the site of work.

Contd…

(iv) Purchase value on the date of purchase. For the purpose of this condition, plant/ equipment, vehicle No., i.e. of trucks and lorries but neither the workman's tools or any manually operated tools/equipment shall be given. Engineer-in-Charge shall record the particulars supplied by the contractor in the works diary and send the return to the GE for record in his office.

(b) Loss Or Damages on account of Enemy Action

If as a result of enemy action, the Contractor suffers any loss or damage, the Government shall reimburse to the Contractor such loss or damage to the extent and in the manner hereinafter provided: -

(i) The loss suffered by him on account of any damage or destruction of his plant/ equipment (as defined in special condition (a) above) or materials or any part or parts thereof. (The amount of loss assessed by the Accepting Officer of the Contract or the CWE in case of contracts accepted by GE, on this account shall be final and binding).

(ii) The compensation paid by him under any law for the time being in force to any workman employed by him for any injury caused to him or to the workman's legal successors for loss of the workman's life.

(iii) Payment of compensation for loss or damage to any work or part of work carried out (The amount of compensation shall be determined in accordance with condition 48 of General Conditions of Contracts IAFW-2249).

(iv) No reimbursement shall be made nor shall any compensation be payable under the above provision unless the contractor had taken air defence precautions ordered in writing by the GE/ OC concerned or in the absence of such orders, reasonable precautions. No reimbursement shall be payable nor shall any compensation be payable for any plant/ equipment or materials not lying on site of work at the time of enemy action.

(c) The contractor must ensure that all Tools & Plants, Machinery and Transport deployed at site are entered in the Work's Diary and signed by Engineer-in Charge and contractor.

23. **PERFORMANCE SECURITY DEPOSIT**

23.1 Refer Conditions 19 of IAFW-2249.The contractor has to deposit performance security for this contract as per condition 19 of IAFW-2249 as notified by the Accepting Officer.

23.2 Performance security by the successful contractor shall be given in the form of Bank Guarantee Bonds or Govt Securities or FDR in terms of Condition-19.1 of IAFW-2249. No other form of performance security will be accepted.

23.3 The full amount of Performance security for the contract shall be given by contactor in any one of the forms stipulated in Clause- 23.2 here-in-before. Mix of performance security for the contracts shall not be allowed.

23.4 Performance security will be released in accordance with Condition-68 of IAFW-2249.

24. **CLEANING DOWN (Refer Condition 49 of IAFW-2249, General Conditions of Contracts)**

The contractor shall clean all floors, walls, remove cement/ lime/ paint marks/ drops, etc., clean the joinery, glass panes etc., touch up all paint work and carryout all other necessary items of work in connection therewith and leave the whole premises clean and tidy to the entire satisfaction of Engineer-in-Charge before handing over the items/works. No extra payment shall be admissible to the contractor for this operation.

25**.** **WATCH/ LIGHTING**

The Contractor shall at his own cost take all possible precautions to ensure safety of life and property by providing necessary fencing, barrier, light, watchmen etc., during the progress of work and as directed by the Engineer-in-Charge.

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26. **RE-IMBURSEMENT/ REFUND ON VARIATION IN "TAXES DIRECTLY RELATED TO CONTRACT VALUE" : -**

(a) Rates quoted against all items shall be deemed to include all taxes, **Goods & Services Tax** (CGST, IGST & SGST) on works contracts, levies, duties, Octroi, entry tax, labour welfare cess and shall also include all other local taxes as levied by the State Government, local bodies payable under respective statutes etc directly related to contract value, employees provident fund as EPF & MP Act 1952 and all taxes applicable to contracts. No reimbursement/ refund for variation in rates of taxes, duties, royalties, octroi & other levies and/ or imposition/abolition of any new/ existing taxes, duties, royalties, octroi & other levies shall be made except as provided in sub para (b) here-in-below.

(b) (i) The taxes which are levied by Govt. at certain percentage rates of Contract Sum/ Amount shall be termed as "taxes directly related to Contract value" such as **Goods & Services Tax** (CGST, IGST & SGST) as applicable, Turnover Tax, Labour Welfare Cess/ Tax and like but excluding Income Tax. The tendered rates shall be deemed to be inclusive of all "taxes directly related to Contract value" with existing percentage rates as prevailing on bid submission end date. Any increase in percentage rates of "taxes directly related to Contract value" with reference to prevailing rates on bid submission end date shall be reimbursed to the Contractor and any decrease in percentage rates of "taxes directly related to Contract value" with reference to prevailing rates on bid submission end date shall be refunded by the Contractor to the Govt./ deducted by the Govt from any payments due to the Contractor. Similarly imposition of any new "taxes directly related to Contract value" after the bid submission end date shall be reimbursed to the Contractor and abolition of any "taxes directly related to Contract value" prevailing on bid submission end date shall be refunded by the Contractor to the Govt./ deducted by the Govt. from the payments due to the Contractor.

(ii) The Contractor shall, within a reasonable time of his becoming aware of variation in percentage rates and/or imposition of any further "taxes directly related to Contract value", give written notice thereof to the GE stating that the same is given pursuant to this Special Condition, together with all information relating there to which he may be in a position to supply. Contractor shall submit the other documentary proof/ information as the GE may require.

(iii) The Contractor shall, for the purpose of this condition keep such books of account and other documents as are necessary and shall allow inspection of the same by a duly authorized representative of Govt, and shall further, at the request of the GE furnish, verified in such a manner as the GE may require, any documents so kept and such other information as the GE may require.

(iv) Reimbursement for increase in percentage rates/imposition of "taxes directly related to Contract value" shall be made only if the Contractor necessarily & properly pays additional "taxes directly related to Contract value" to the Govt, without getting the same adjusted against any other tax liability or without getting the same refunded from the concerned Govt Authority and submits documentary proof for the same as the GE may require.

27. **DEFECT LIABILITY PERIOD :-** Refer Condition-46 of IAFW-2249 (General Condition of Contracts). Defect liability period shall be 24 (Twenty four) calendar months after the works have been handed over to Government.

28. **CURING AND STRIKING OFF FORM WORK :**The following specifications with regard to curing and striking off form work will be adopted in case of various type of cement issued:-

A	Curing period for structural RCC/PCC Work/Plastering/ pointing/brick work etc for ordinary Portland cement	**:**	As per IS 456 of 2000
B	Form work (Striking period) for ordinary Portland cement	**:**	As per IS 456 - 2000.

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C **REMOVAL OF PROPS TO SLABS**

(a)	Spanning up to 4.5 metre	:	9 days
(b)	Spanning over 4.5 metre	:	16 days
(c)	Spanning over 6 metre	:	23 days

D REMOVAL OF PROPS TO BEAMS AND ARCHES

Spanning up to 6 metre	:	16 days
Spanning over 6 metre	:	23 days

29. **LABOUR REGULATION AND ABOLITION ACT**

Contract labour (Regulation and Abolition) Act 1970 is applicable to MES contracts. Rates quoted by the contractor shall be deemed to take into account the cost etc, required to comply with the provisions contained in the said act and the rules framed under the said act.

30. **OUT OF POCKET EXPENSES**

No out of pocket expenses incurred by the tenderer in submitting this tender will be reimbursed whether his tender is accepted or not.

31. **DAMAGE TO EXISTING STRUCTURES, ROADS AND DRAINS ETC**

Any damage to the existing structure/and existing roads etc during the execution of work shall be made good by the contractor at his own expense. Rectification/replacement, making good and touching up etc. shall be carried out, conforming to the materials and workmanship originally provided and to the satisfaction of the Engineer-in-Charge. In case of any dispute on this account, the matter shall be referred to the GE whose decision shall be final, binding and conclusive.

32. **CONDITIONS OF CONTRACT AND EXECUTION OF WORK**

The material and workmanship shall satisfy the job specifications contained in latest relevant Indian Standard Codes as applicable as on the date of issue of tender by the accepting 0fficer where the job specifications stipulate requirement in addition to those contained in the Indian standard Codes of practice, these additional requirements shall also be satisfied by the contractor.

33. **INDEMINITY BOND FOR PAYMENT OF LABOUR, WORKMEN EMPLOYED ON WORKS OR OTHER MONEYS OF TENDER PAYMENTS**

The contractor shall execute indemnity bond with the GE for enforcement of various enactments like wages Act 1936, Minimum wages Act 1948, employees liability Act 1938 workmen's compensation Act 1923 or any other Act or enactment's related to indirectly and directly labour employed on works and rules framed there under from time to time for the time being enforce. In case of non compliance of any of the enactment's by the contractor, the GE shall be empowered to exercise the powers vested in him as the principal employer and the amount so not paid to the labour/workman to be deducted from the sum become due under this Contract or from other Contracts in terms of condition 67 of IAFW-2249, General Condition of Contracts.

34. **HANDING OVER SITES**

Site for execution of work will be available as soon as the work is awarded. In case it is not possible to make the entire site available on the award of work the contractor will have to arrange his working programme accordingly. No claim whatsoever, for not giving entire site on award of work and for giving site gradually, will be tenable.

35. **APPROACHES**

The Contractor shall make arrangements for and provide at his own cost all temporary approaches, if required to the site(s), after obtaining approval in writing of the GE to the layout of such approaches.

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36. **LOCATION OF BUILDINGS AND WORKS**

There may be some changes in location/ siting of building shown in site (Layout) plan(s) to suit local conditions and/or departmental requirements. The contractor shall have no claim what-so-ever consequent to such changes in the location/ siting of works.

37. **BLANK**

38. Method of Measurement: Measurement of measurable work executed under this contract shall be taken in accordance with the rules as laid down in SSR pertaining to various items of work as applicable unless otherwise indicated in the respective parts of Schedule “A”. In case the method of measurement of particular item of work is not given in SSR, a reference will be made to the relevant provision in the latest edition of IS-1200.

(SIGNATURE OF CONTRACTOR)
DATED: _____

DCWE (CONTRACTS)
FOR ACCEPTING OFFICER

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PARTICULAR SPECIFICATIONS

1. **GENERAL**

1.1 (a) Work under this contract shall be carried out in accordance with schedule 'A', particular specification, drawings, general specifications and other provisions in MES Standard Schedule of Rates here-in-after called as MES Schedule read in conjunction with each other. In case of variation in specification and make given in various parts of tender documents, the order of precedence to be followed as under:-

(i) Schedule 'A'.

(ii) Particular specification

(iii) Appendix 'B' Particular Specification

(iv) Drawings.

(v) IS (Appendix-A).

(b) Terms "General specifications" referred to here-in-after as well as referred to in IAFW-2249 (General conditions of Contracts) shall mean the specifications contained in the MES Schedule (Part-I).

(c) General rules, specifications, special conditions and preambles in the MES Schedule shall be deemed to be applicable to the work under this contract unless specifically stated otherwise in these documents in which case the provision in these documents shall take precedence over the aforesaid provision in the MES Schedule. The terms "as specified" wherever appears in tender documents and drawings relates to relevant particular specifications and in its absence general specifications.

(d) Where specifications for any item of work are not given in MES Schedule or in these particular specifications, specifications as given in relevant Indian Standard (IS with all upto date amendments at the date of receipt of tender) or code of practice shall be followed.

(e) Any drawing which is mentioned or further referred on the drawings forming part of the tender and tender documents itself but not specifically mentioned in the list of drawings shall be deemed to be forming part of the tender. The tenderers shall refer such drawings/details in the office of Accepting Officer/GE.

1.2 Reference to some Paragraphs of MES Schedule has been made in these particular specifications but other Paragraphs and provisions as applicable are also to be followed.

1.3 Where specifications/ provisions given in these particular specifications are at variance with the provisions/ specifications given in MES Schedule, specifications/ provision given in these particular specifications shall be followed.

2. **EXCAVATIONS AND EARTH WORK**

2.1 **Preparatory works**: - Before setting out the building and commencing the construction, the contractor shall carry out the preparatory works, such as removal of grass, vegetation etc. trimming/surface dressing of the area as directed by Engineer-in-charge. The 'Area' referred to implies, the entire area occupied by the buildings as mentioned in Sch A part-I including hardstanding/ ramp/ apron, platform, steps, plinth protection, shaft and the like and upto a width of 3 metre beyond outer edge of plinth protection or toe wall of earth traverse. The cost of such work as may be necessary shall be deemed to be included in the contractor's quoted lump-sum/item rates. Layout of buildings shall be carried out by total survey station.

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2.2 **Excavation General**

(a) Excavation and earthwork under this contract shall be considered as excavation in soft/ loose soil as detailed in MES Schedule (Part-I).

(b) Quoted lump sum of buildings in Schedule 'A' Part-I shall deemed to include cost of excavation and earthwork in soft/ loose soil. Any deviation involving excavation and earthwork will be priced on the basis of soft/ loose soil.

(c) Boulder and stone obtained from excavation shall be sorted out and neatly stacked as directed by Engineer-in-charge without extra cost to the Govt. These shall be taken over by the Engineer-in-charge.

(d) In case timbering to excavation is required and specifically ordered by the GE in writing, it shall be deemed included in quoted lump sum. Timbering/ planking shall be carried out as per para 3.24 of MES Schedule (Part-I).

(e) Since the water table of the area is high and water may be met at any depth during excavation work due to variable water table during rainy season etc. as such bailing/ pumping out of water where required shall be carried out as described in clause 3.17 of MES Schedule (Part-I). The cost of such work as may be necessary shall be deemed to be included in the contractor's lump sum. No additional payment as stipulated in para 3.17 of MES Schedule (Part-I) will be admissible. In the event of deviation no price adjustment shall be made for cost of bailing/ pumping out etc.

(f) All rubbish obtained from site clearance and all spoil obtained from surface dressing shall be removed, outside MOD land.

(g) Contractor shall ensure all safety measures in construction as per para 1.16 of MES Schedule (Part-I).

2.3 **Filling in trenches, plinth and under floors etc.**

2.3.1 Filling of excavated earth in foundation of trench, plinth and under floors shall be carried out as per para 3.19.1 to 3.19.3.1 of MES Schedule (Part-I). Earth obtained from excavation and not approved for filling or surplus to the requirement shall be removed to a distance not exceeding 100 metre from outer periphery of buildings, spread and leveled.

2.3.2 Surplus soil obtained from excavation under Schedule 'A' Part-I and other sections (Provisional Items) as approved for filling shall be used for filling in trenches, plinth and under etc. Cost of the transportation and other operations will be deemed to be included in unit rate of Schedule 'A' Part-I.

2.3.3 All filling of earth will be spread in layers not exceeding 25cm thick (each layer) watered and well rammed. Thickness of filling shown in drawing is after consolidation.

2.3.4 The filling in plinth and under floors of garages, repair bays & the like structures shall be compacted by mechanical means to achieve 95% of the standard Procter density for each layer.

2.4 Hard core: Hard core shall be of quartzite stones/ boulders (broken to gauge) not exceeding 63mm. Hard core shall be deposited, spread and leveled in layers n. exc. 15 cm thick and watered and well rammed to a true surface and compacted. The thickness of the hard core specified or as indicated in the drawings is the thickness after consolidation and where not specifically mentioned, it shall be 150mm consolidated thickness.

3. **ANTI-TERMITE TREATMENT: PRE-CONSTRUCTION SOIL TREATMENT IN FOUNDATION AND FLOORS**.

3.1 Pre-construction anti–termite chemical treatment which includes bottom and sides of foundation trenches/ pits filling/ trenches/ pits and below floors, junction of wall and floors, external perimeter of building (s) and surrounding of conduits/ pipes of all buildings, as per Schedule 'A' **Note (B) 22 (c)** shall be carried out all as specified in clause 3.26 of MES Schedule (Part-I). Extent of this treatment shall be restricted upto and including external perimeter of sheds including loading/ platforms with ramps and steps.

3.2 Anti-termite treatment shall be got done through approved specialized agency, holding valid license as per clause 13 of **Insecticides Act 1968**. Persons employed to do the anti-termite treatment shall be qualified as per rule 10 of the rules promulgated under the insecticides rule 1971. The specialized agency may be any one from list available as per Appendix 'B' to these particular specifications,

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which is located and active in the area with prior approval of CWE. During their inspection of the work, CWE/GE shall specifically examine the anti-termite treatment. A copy of IS 6313 (Part-II) should be available at site with every Engineer-in-Charge who gets anti-termite treatment works executed.

3.3 Anti-termite treatment in the work shall be carried out by using Chloropyriphos (20% EC)/ imidacloprid 30:50 SC conforming to IS 16131..The rates quoted by the contractor are deemed to cater for use of Chloropyriphos (20% EC)/ imidacloprid 30:50 SConly. For the purpose of deviation however the rates given in MES Schedule (Part-I) shall only be applicable.

3.4 The chemical for use in anti-termite treatment shall bear ISI certification mark.

3.5 Chemical should be brought in original sealed container and should be purchased from approved manufacturer or their authorised agents/ dealers only. The chemical shall be recorded in the measurement book duly signed by the Engineer-in-Charge and contractor before permitted to be used.

3.6 Tests may be carried out in a recognized laboratory or test house at the discretion of the GE, of the chemical brought by the agency executing the work with regard to composition of chemical and to satisfy that spurious materials are not being used. The cost of test shall be born by the Contractor.

3.7 Chemicals shall be stored carefully at site. Seals of containers should be broken only in the presence of the Engineer-in-Charge (EIC). Empty containers should be got removed off the site promptly. If on any particular day the contents of one full container could not be used in the work, the container should be got sealed at the end of the day in the presence of the EIC and opened when required, also in the presence of the EIC.

3.8 The Engineer-in-Charge (EIC) should ensure that paid vouchers are produced by the agency executing the work, for the full quantity of the chemical required and brought to site and a record of such vouchers should be kept by the EIC.

3.9 The EIC should work out the total requirements of chemicals required for the work as per specifications and ensure that full quantity is brought to site and used in the work. For the purpose, entries should be made in the Measurement Book (not for payment/ not to be abstracted) indicating the brand name, quantity brought, etc and singed by EIC as well as representative of the agency executing the work.

3.10 **Guarantee:** The defects liability period of anti-termite treatment shall be 10 years and the contractor shall be responsible to keep the entire buildings free from termite infestation for a period of 10 years from the certified date of completion. The contractor may obtain a similar guarantee from the specialized firm engaged by him for the purpose.

3.11 **Security deposit:** Security deposit to be held from the contractor against the guarantee period for anti-termite treatment shall be 2.5% in lieu the amount of anti-termite treatment priced at contract rates for the buildings for which treatment is to be done and the amount shall be withheld from the contractor's final bill. Alternatively, the contractor may give a separate fixed deposit receipt/ BGB in lieu of the sum to be retained as security to GE valid for 10 years for this amount. The security deposit shall be refunded to him after the period of ten years from the certified date of completion by the GE, provided always that the contractor shall first have been paid the final bill and have rendered a No-demand certificate (IAFW-451). Condition 10, 46 & 68 of the General Conditions of Contracts (IAFW-2249) shall be deemed to be amended to the extent mentioned above.

3.12 Should the GE any time during construction or reconstruction or prior to the expiry of defects liability period of ten years after the anti-termite treatment has been completed as per contract, finds that the buildings have been infected with termites, the contractor shall, on demand in writing by the GE specifying the buildings (s) complained of, notwithstanding that the same may have been inadvertently passed, certified and paid for, forthwith undertake to carry out such treatment as may be necessary to render the said building(s) free form termite infestation at his own expenses for a period of ten years from certified date of completion and in the event of his failing to do so within a period to be specified by the GE in his aforesaid demand, the GE may undertake such treatment at

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the risk and expense in all respects of the contractor. The liability of the contractor under this condition shall not extend beyond the period of ten years from the certified date of completion unless the GE had previously given notice to the contractor.

3.13 The contractor shall provide a plaster plate of requisite size in situation as decided by the Engineer-in-charge on the wall of the each of the building. The plate shall be 10mm thick in cement mortar (1:4) to indicate the contract agreement number, name of the contractor, the date of completion of work and the probable date of expiry of 10 years guarantee for anti-termite treatment by engraving and painting (black). The cost of plaster plates, engraving and painting etc is deemed to be included in the unit rates of the buildings.

4. **CEMENT**

4.1 Type of cement: The details of various types and grade of cement are enumerated below:-

(i) Ordinary Portland cement, grade 43(IS: 8112-1989).

(ii) Portland Pozzolana Cement, IS-1489 (Part-I) subject to certain conditions given in clause 4.2.4 here-in-after.

4.2 Procurement of cement: Cement shall be procured from the main producers/ manufacturers of the cement as specified in appendix 'B' to these particular specifications.

4.2.1 The particulars of the manufacturer of cement alongwith the date of manufacture shall be produced by the contractor for every lot of cement separately. The cement so brought shall be fresh and in no case older than 60 days from the date of manufacturing. The documents in support of the purchases of cement such as purchase voucher shall be verified by the site staff and GE. Before placing the order for supply of cement by the contractor, he shall obtain written approval from the GE regarding name of manufacturer, quantity of cement etc. Cement shall be procured for minimum requirement of one month and not exceeding the requirement of the same for more than two months at a time. The cement shall be consumed in the work within three months after receipt but for structural member, the cement shall not be older than 3 months from the date of manufacture. Cement shall conform to the requirements of Indian Standard Specification and each bag of cement shall bear relevant ISI mark. Weight of each consignment shall be verified by the GE and recorded.

4.2.2 The cement shall be procured by the contractor preferably in paper polythelene bags. Average weight of each bag shall not be less than 50 Kg. The average weight shall be tested by taking the weight of 50 Kg bags selected at random by GE per lot. In case the weight found is less than 50 Kg, whole lot shall be rejected. In case weight is more than 50 Kg it shall be deemed to contain 50 Kg only and nothing extra shall be admissible to contractor on account of extra cement used in the work.

4.2.3 Purchase vouchers as mentioned here-in-before shall bear machine number from the manufacturers.

4.2.4 Use of Portland Pozzolana Cement (PPC)

While using PPC, the following requirement shall be met with:-

(a) PPC shall meet the strength criteria as laid down in IS-1489 (Part I)-2015 [Latest Edition].

(b) Minimum period before striking the form work given in clause 11.3.1 of IS 456:2000 and (MES Schedule (Part-I) vide clause 4.11.6.3 shall be 14 days.

(c) Extra curing shall be carried out as required.

(d) PPC shall not be used for overhead Reservoirs, underground sumps, buildings with span more than 10 metre and in concrete of M-30 (Design Mix). In such cases only OPC shall be used.

(e) Mixing of OPC and PPC shall not be allowed in a work and separate record shall be maintained showing location and types of cement used.

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(f) While procuring PPC, the following requirements are to be ensured and certificate to that effect shall be obtained by Contractor for each batch from the manufacturer:-

(i) The quality of fly ash is strictly as per IS 1489 Part-I (Latest Edition).

(ii) Fly ash is inter-ground with clinker and not mixed with clinker.

(iii) Dry fly ash is transported in closed containers and stored in silos. Only pneumatic pumping shall be used.

(iv) Fly ash shall be procured from thermal plants using high temperature combustion above 1000° C.

(v) Ensure strict compliance of clause 4.1.3 and clause 9.2 of IS-1489 Part-I (Latest edition) by getting fly ash and cement tested at National Council of Cement and Building materials, Ballabhgarh, Haryana, PIN-121004 or any other laboratories as mentioned in clause 4.3.4 here-in-after.

(g) Both OPC and PPC shall not be permitted for use in the same building.

4.3 **Testing of Cement:**

4.3.1 The manufacturer is required to carryout inspection and testing of cement in accordance with relevant BIS provisions. The contractor shall submit the manufacturer's test certificate in original alongwith test sheets giving the results of each physical test as applicable in accordance with relevant IS provision and the chemical composition of cement or authenticated copy thereof, duly signed by the manufacturer with each consignment, as per the following IS provisions:-

(a) Method of sampling for hydraulic cement as per IS-3535-1986.

(b) Method of physical test for hydraulic cements as per IS-4031.

(c) Method of chemical analysis of hydraulic cement as per IS-4032-1985.

4.3.2 The test certificate and test sheet shall be furnished with each lot of cement procured. The Engineer-in-Charge shall record these details in Cement Acceptance Register to be maintained by him, after due verification, which will be signed by JE (Civil), Engineer-in-Charge, Garrison Engineer and Contractor as per Appx 'E' here-in-after.

4.3.3 The contractor shall however, organize setting time, fineness, soundness and compressive strength test of cement through designated laboratory on samples collected from each lot brought at site before incorporation in work. The contractor will be allowed to use the cement only after satisfactory compressive strength of seven days. To meet this requirement contractor is required to keep minimum 10 days stock before any new lot is brought at site which can be used in the work. The contractor shall be required to remove the cement not meeting the requirement from site within 24 hours. Seven days strength test will be relied upon to accept the lot of cement to commence the work. 28 days compressive strength test will be the final criteria to accept/reject the lot.

4.3.4 The GE shall also organize independent physical testing as per the tests mentioned in the 'CEMENT SUPPLY/ ACCEPTANCE FORM' of random samples of cement drawn from various lots. The random samples of cement to be tested shall be drawn as per Quality Assurance Manual. The testing shall be carried out from NABL laboratories as National Test House/ SEMT Wing CME Pune/ Regional Research Laboratories IITs/ The Laboratories approved by the Chief Engineer Jalandhar Zone Jalandhar Cantt or MES Zonal Laboratories, Govt. Engg Colleges and National Institutes of technology as per the relevant BIS and shall be recorded in the respective portion of Appendix "E". The decision as to where the testing of cement is to be done shall be taken by GE. In case the cement is not of requisite standard despite manufacturer's test certificate, the contractor shall remove the total consignment from the site at his own cost after written rejection order of the consignment by the GE.

4.3.5 The random samples as per relevant IS shall be selected by GE before carrying out testing. The record of such samples selected by the GE for testing shall be properly maintained in the 'Cement

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Testing Register' giving cross reference to relevant consignment of cement and quantity received etc.

4.3.6 Cost of transportation of samples to the approved laboratory/test house and all testing charges including cost of sample shall be borne by the contractor.

4.3.7 Notwithstanding the submission of purchase vouchers/test certificates, following tests shall be mandatory to be carried out as per IS-4031:-

(a) Initial and final setting time.

(b) Soundness test.

(c) Compressive strength test at 3 days, 7 days & 28 days as specified in the relevant para of the Indian Standard.

(d) Consistency test

(e) Fineness.

Other tests need not to be carried out for cement procured with BIS certification mark unless specifically asked by GE or Accepting Officer and the contractor shall not have any claim on this account.

4.3.8 The cement shall conform to chemical requirements and physical requirements as specified in the respective clauses of the Indian Standard. The tests carried out as per provisions of IS codes specified here-in-before, shall be the criteria for acceptance of cement by Engineer-in-Charge. If samples from a lot/ lots are not within the acceptable limits of Indian Standard, the lot/lots shall be rejected without any claims or compensation to the contractor for the lot/lots purchased. The contractor shall replace the lot/ lots with the fresh one which shall be tested again for acceptance.

4.3.9 The cost of all tests carried out on cement before acceptance for incorporation in the work shall be borne by the contractor whether the results are acceptable or not. No claim or compensation shall be entertained on this account and clause of IAFW-2249 deemed to be amended accordingly. Any cement lot/lots on being tested found not to be conforming to relevant clauses of Indian Standard shall not be paid as material at site.

4.4 Storage of cement

4.4.1 Refer clause 4.3.1 of MES Schedule (Part-I) for storage and precaution in storage of cement. The cement shall be stored over dry platform at least 20cm high from floor in such a manner as to prevent deterioration due to moisture or intrusion of foreign matters. The stacking of cement shall be at least 20cm high from floors and 20cm away from walls of store rooms. Stacking of cement shall not be more than 10 bags high. Joint inspection of storage of cement shall be carried out by Engineer-in-charge and contractor once in a day. The cement fully set or partially set shall not be used in the work and shall be removed by the Contractor immediately without any extra cost.

4.4.2 Tested and untested cement shall be segregated and stored separately with distinct identification.

4.4.3 The cement godown shall be provided with two locks on each door. The key of one lock of each door shall remain with the Engineer-in-charge or his representative and that of other lock with the contractor or his authorised agent at site of work so that cement is removed from the godown only according to the daily requirement with the knowledge of both the parties. During the period of storage, if any cement bag(s) found to be in damaged condition due to whatsoever reason, the same shall be removed from the cement godown on written order of the GE and suitable replacement for the cement bag(s) as removed shall be made and no claim whatsoever shall be admissible on this account.

4.5 Documentation

4.5.1 The Contractor shall submit original purchase vouchers from the manufacturer for the total quantity of cement supplied under each consignment to be incorporated in the work. All consignments received at the work site shall be inspected by the GE alongwith the relevant documents before

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acceptance. The original Vouchers and the Test Certificate shall be defaced by the Engineer-in-charge, signed by contractor and kept on record in the office of GE duly authenticated and with cross reference to the consignment number/control number recorded in the cement acceptance register clearly mentioning 'Batch No.' and 'Date of manufacture'. The cement acceptance register will be signed by JE (Civil), Engineer-in-charge, GE and the contractor. The Accepting Officer may order a Board of Officers for random check of cement and verification of connected documents.

4.5.2 The entire quantity of all cement shall suitably be recorded in the measurement Book (Not to be abstracted) for record purpose before incorporation in the work and shall be signed by the Engineer-in-charge and the contractor.

4.5.3 In addition to the cement Acceptance Register, the cement consumption register shall be maintained as given below: -

(a) The contractor shall maintain a pucca bound register with serially numbered pages with all pages initialed by Engineer-in-Charge against numbering showing quantities of cement received, used in work and balance at the end of each day. The form of record shall be as approved by Engineer-in-Charge. The register shall be signed daily by representatives of MES and the contractor in token of verification of its correctness and will be checked by Engineer-in-Charge, at least once a week and on the days cement is brought by the contractor.

(b) The register shall be kept at site in safe custody of the contractor's representative during the progress of the work and shall on demand be produced for verification to the inspecting officer(s).

(c) On completion of the work the contractor shall deposit the cement register with the Engineer-in-Charge for record.

4.6.1 **Schedule and Supply**

4.6.2 Schedule of supply of cement shall be finalised by contractor with the GE and shall be incorporated in CPM chart so that supply of cement is monitored in a way to avoid any delay in completion of the work. The supply shall be regulated in such a way that cement is consumed in work within three months of its manufacture.

4.6.2 The complete requirement of cement will be worked out before making any RAR payment. Procurement of cement by the contractor shall be completed sufficiently in advance of the date of completion. The contractor will forfeit his right to demand extension of time if the supply of cement got delayed due to his failure in placing order in time to the manufacturer.

4.7 **General**: The payment shall only be allowed after production of original purchase vouchers, certified copies of test certificates from manufacturer for each consignment and results of testing carried out in laboratory on receipt of cement (7 days compressive test) are found satisfactory after testing as specified here-in-before. Payment for cement shall be made as material lying at site as per condition 64 of IAFW-2249. Rate of cement given in MES Schedule shall be applicable for cement irrespective of type and grade of cement specified for use in the work.

4.8 **Curing: -** Curing shall be carried out all as specified in relevant clauses of MES Schedule (Part-I) and relevant IS for all the works where the cement is to be used for brick masonry, reinforced or plain cement concrete, lime concrete, plastering, pointing etc.

5. **CEMENT CONCRETE**

5.1 **Materials**

5.1.1 **Cement**: Refer clause 4 here-in-before.

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5.1.2 **WATER**: Water shall comply with the requirement of clause 4.9 of MES Schedule (Part-I) and as per IS: 456-2000. Irrespective of water being supplied by department or brought under the own arrangement of contractor, it shall be tested to confirm its suitability for construction purposes. The record of testing obtained shall be carefully preserved. The testing charges including cost of material and transportation charges shall be borne by the contractor.

5.1.3 **Water proofing compound powder/ liquid**: Water proofing compound shall be added as per manufacturer's instructions where waterproof plaster/ concrete have been indicated to be provided. However, for pricing deviations the quantity of water proofing compound shall be 3% by weight of cement.

5.1.4 **Blank.**

5.1.5 Coarse and fine aggregate for cement concrete (PCC and RCC): Refer para 4.4.1 to 4.4.7, of MES Schedule (Part-I). Fine aggregate shall be sand obtained from the sources given here-in-after.

5.1.6 Coarse and fine aggregate for lime concrete: Coarse aggregate shall be broken bricks as per paras 4.5, 4.5.1, 4.5.2 of MES Schedule (Part-I). Fine aggregate shall be natural sand as for cement concrete.

5.1.6.1 Coarse aggregate for plain and reinforced cement concrete shall be crushed stone. Grading of coarse aggregate unless otherwise specified shall be as follow: -

(i)	For all plain & reinforced cement concrete thickness upto 25mm	-	12.5mm graded
(ii)	For all reinforced cement concrete over 25mm thickness	-	20mm graded
(iii)	For plain cement concrete over 25mm thick upto 75mm thick.	-	20mm graded
(iv)	-ditto- but 75mm thickness and over	-	40mm graded

5.1.6.2 Grading of coarse aggregate for plain and reinforced concrete i.e. crushed stone aggregate shall be as per Para 4.4.7.1 of MES Schedule (Part-I). Grading of broken brick aggregates for lime concrete shall be as per Para 4.5.3 of MES Schedule (Part-I).

5.1.6.3 Grading of fine aggregate (sand) shall be as per para 4.4.7.2 of MES Schedule (Part-I) for grading Zone-III.

5.2 **Mix of cement concrete**: Refer para 4.11.1, 4.11.2, 4.11.2.1 to 4.11.2.4 of MES Schedule (Part-I).

(a) **Plain concrete**: Unless otherwise specified elsewhere or shown in drawings mix of concrete in various situations shall be as under: -

(i)	In foundation for brick walls, dwarf walls, toe walls, steps, ramps and lean concrete under column/portals footings.	-	1:5:10 (Type E-2)
(ii)	PCC benching at junction of slab/ parapet walls/ fascia, PCC filling around concealed rain water pipes, drains, PCC block for fixing hold fasts, cills, blocks for bolts, straps, plinth protection and similar locations.	-	1:3:6 (Type C-1)
(iii)	Cement concrete in situations other than covered by (i) & (ii) above.	-	1:2:4 (Type B-1)

(b) **Reinforced concrete**: Against Schedule 'A' Part-I, unless otherwise superior/ higher grade of concrete shown in structural drawings and specifically specified, the RCC work shall be M-25 (Design Mix). If in any drawing M-15/ M-20 or other lower grade of concrete has been shown against RCC work, the same shall be amended to M-15 (Design Mix) with reinforcement and size of members remaining same without any price adjustment. (For reinforcement also refer Clause 10.2. here-in-after). For other parts of Schedule 'A', the mix of RCC shall be as indicated against respective items.

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5.3 **Form Work**: Refer Paras 4.11.6.1 to 4.11.6.5 of MES Schedule (Part-I). Irrespective of type of formwork mentioned elsewhere or indicated in the drawings, formwork shall be of steel only. Steel formwork (both verticals props and surfaces) shall be properly designed. However, for deviation if any, rates in MES Standard Schedule of Rates, for timber formwork (Rough finished surfaces) shall only be applicable.

5.4 **Important requirement of reinforced cement concrete and plain cement concrete**: The contractor shall provide all facilities such as material and labour, tools/equipment for moulding, casting and conveyance of test cubes to Command Test Laboratory, Chandigarh. In case the facility is not available in Command Test Laboratory, Chandigarh for testing, contractor shall provide all facilities for testing in National Institute of Technology/Govt Engineering College/ other Govt laboratories/ any other laboratories as approved by HQ Chief Engineer Jalandhar Zone Jalandhar Cantt. Charges of testing including materials & conveyance shall be borne by the contractor and his quoted lump sum shall be deemed to include for the same.

5.5 **Design Mix**

5.5.1 **General**: Design mix cement concrete shall be as per IS-456-2000. The provisions of this IS are further amplified as described here-in-after.

5.5.2 Design mix of concrete shall be got done by the Contractor as per IS-10262 from any Govt Engineering College or Command Test Laboratory, Chandigarh or any other lab approved by HQ Chief Engineer Jalandhar Zone, Jalandhar Cantt. The design mix shall be done with cement, aggregate and Admixture/ Plasticizers to provide the grade of concrete at desired workability. The mix design calculation for trial and approved design mix shall be kept on record for future record. The expenditure incurred for testing shall be born by the Contractor.

5.5.3 The CWE shall be the final authority for approval the mix design.

5.5.4 **Batching**: In proportioning concrete, the quantity of both cement and aggregate shall be determined by mass and all in accordance with clause 10.2 and sub clauses thereon of IS:456-2000 as applicable.

5.5.5 **Trial Mixes**: The actual mix proportion will be arrived at by means of number of trial mixes by changing the water cement ratio, proportions of fine and coarse aggregate, fineness moduli of aggregate by changing their grading and proportions etc. Attempt shall be made to make the mix design as economical as possible. The mix design shall be carried out again whenever there is change in the source of material of coarse/ fine aggregate or cement.

5.5.6 **Sampling:** The sampling procedure and the frequency of sampling shall be as per clause 15 of IS: 456-2000.

5.5.7 Test Specimens: All test specimens shall be 150mm cubes. For each sample, nine cubes shall be casted, out of which, three cubes shall be tested for 7 days, three for 28 days compressive strength and trhee cubes shall be preserved at site for inspection as and when required. The specimens shall be tested as described in IS: 516-1959.

5.5.8 Test strength of sample: Refer clause 15.4 of IS: 456-2000.

5.5.9 **Accepting criteria**: The acceptance criteria of the test result shall be as laid down in clause 16 of IS: 456-2000.

5.5.10 **Workability**: The workability of the concrete for different location shall be conforming to para 7.1 of IS-456-2000.

5.5.11 **Compaction of concrete**: Refer to para 4.11.11 of MES Schedule (Part-I). Consolidation/ compaction of all RCC work such as footings, columns, beams, slabs, walls, bands, lintels, chajjas, shelves etc and the flooring (exceeding 75mm thickness) shall be carried out with approved mechanical needle and plate vibrator of appropriate size. Where however the same is not feasible, manual compaction shall be carried out after obtaining permission from Engineer-in-Charge.

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5.5.12 **Packing and transportation of samples**: Refer clause 13 of IS: 456-2000. The contractor shall bear the cost of materials, packing and transportation of the samples required to be tested from site of work to the laboratory where it is to be tested.

5.5.13 Following documents shall be maintained at site:-

(a) Test reports and manufacturer's certificate for material.

(b) Concrete mix design details.

(c) Pour cards for site organization and clearance for concrete placement.

(d) Record of site inspection of workmanship, and field test.

(e) Non confirmation reports, change orders.

(f) Quality control charts and Statistical analysis.

(g) Statistical analysis.

5.5.14 RCC other than design mix shall be all as per relevant IS code and MES Schedule.

5.6 **Weighing & Mixing of Concrete**: - For mixing of all cement concrete, contractor shall install automatic batching mix plant (s) at site with the following specification/ batching procedure :-

(i) The capacity of these plants shall not be less than 20 cum/hr and should meet day to day requirement of mixing concrete.

(ii) The plant shall conform to the provisions of IS : 4925 -2004.

(iii) The batch mix plant for concrete shall be of minimum four bins, weighing hoppers and scale for fine aggregates and for each of coarse aggregates and for cement. The weighing hopper shall be properly sealed and vented to preclude dust during operation. Approved safetly devices shall be provided and maintained for the protection of all personnel engaged in plant operation, inspection and testing. The batch plant shall be equipped with a suitable non- resettable batch counter, which should correctly indicate the numbers of batches proportioned. The capacity of plant shall at least 25 percent higher than the proposed capacity of laying/ paving equipment.

(iv) Batch mix plant shall be equipped with automatic weighing devices using load cells for accurate proportions of aggregates and cement. All functions of the plant shall be from computerized controlled panel installed in air-conditioned control cabin.

(v) Mixers – Mixer shall be pan type, capable of combining the aggregates, cement admixtures and water into thoroughly mixed and uniform mass with in the specific mixing period and of discharging the mixture without segregation. Stationary mixer shall be equipped with an approved timing device which will automatically lock the discharge, lever, which the drum has been charged and released at the ends of the mixing period. The device shall be equipped with a bell or other suitable warning device adjusted to give a clearly audible signal each time the lock is release. In case of failure of the timing device, work will not be executed. However small quantity of emergent requirement can mixed in plant provided each batch is mixed for 90 seconds or as per the manufactures recommendation. The mixer shall be equipped with a suitable non–reset table batch counter, which correctly indicates the number of batches mixed.

(vi) Cleaning and maintenance of Mixer – The mixer shall be cleaned at suitable intervals. The pickup and throw aver blades in the drums shall be repaired or replaced when they are warn down 20mm or more. The contractor shall have available at the job site, a copy of the manufacturer's design, showing dimensions and arrangements of blades in reference to original height and depth.

(vii) Calibration of batching plant – Batching plant shall be calibrated in the beginning of work and thereafter at an interval of not exceeding one month.

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(viii) The contractor is required to use quality concrete produced by the batch mixing plant, complete quality assurance and control shall be maintained by the contractor in accordance to latest IS code and best modern Engineering practice. The record of quality assurance shall be submitted to the GE and shall be kept on record. Mixed concrete will be carried by the transit mixer which will also be arranged by the contractor at his own expenses.

(ix) Refer Special condition 10 of PS-I. MES shall supply electricity on payment through electric metre from the points as shown in the site plan. Arrangement for electricity from this point to run the above batch mixing plant(s) and other equipments shall be provided by the contractor under his own arrangement. In case of any failure of electric supply by MES, contractor shall arrange other alternative arrangement without additional cost to the Deptt. Further no extension of time shall be granted to the contractor for any break down of electric supply. However small Concrete shall be carried to site of work quantity of concrete may be mixed with mechanical mixture with prior written permission of GE.

(x) Admixtures/ plasticizers not more than 1% of weight of cement at no extra cost to the department may be used conforming to IS 9103-1999 (Revised) and shall be from any one of the following firms:-

a) MC Bauchemic (India) Pvt Ltd

b) Fosroc Chemical (India) Ltd

c) STP speciality Chemicals Ltd

d) CICO Technologies Ltd.

e) Fairmate Chemicals Pvt Ltd.

f) As pre list of makes attached as Appendix to the PS.

5.7 **Ready mix concrete (RMC)**

5.7.1 In case weighing and mixing plant as per PS clause 5.6 here-in-before is not installed, all reinforced cement work shall be ready mix concrete (RMC) from approved manufacturers. RMC shall confirm to the requirements as per IS-4926-2003 (amended upto date) and IS 456-2000.

5.7.2 RMC shall be procured by the contractor from any RMC as approved by CWE as per IS-4926-2003 (amended upto date) having fully automatic computerized batching plant of capacity min 20 cum/hr (or less as recommended by GE based on the quantum of work) with tested and calibrated water meter, control panel and provision for computer generated batch report all as per IS-4926-2003. RMC plant shall be approved by CWE after verification of the plant and various plant lab by GE.

5.7.3 The relevant details of Design Mix Concrete and minimum cement content for different grade as specified earlier shall be applicable alongwith the following specific details for ready mix concrete.

5.7.4 Initial mix design from RMC shall be submitted by the contractor in quadruplicate with complete data adopted for mix design along with test results of all materials and concrete. Initial mix design should take into account the aspects such as loss of workability and strength during transportation, till placement of concrete. Any change shall be only with prior approval of GE after necessary revision in design mix.

5.7.5 Specification for all materials/ ingredients, etc given here-in-before shall hold good for RMC also.

5.7.6 Admixtures/ plasticizers not more than 1% of weight of cement at no extra cost to the department may be used conforming to IS 9103-1999 (Revised) and shall be from any one of the following firms:-

(a) MC Bauchemic (India) Pvt Ltd

(b) Fosroc Chemical (India) Ltd

(c) STP speciality Chemicals Ltd

(d) CICO Technologies Ltd.

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PARTICULAR SPECIFICATIONS (CONTD…)

(e) Fairmate Chemicals Pvt Ltd.

(f) As pre list of makes attached as Appendix to the PS.

5.7.7 The contractor shall ensure that all facilities are made available at the site of RMC plant for the departmental officials to inspect the materials incorporated, test carried out for all materials, concrete etc. Copies of all tests carried out for materials used/concrete shall also be made available to the Department.

5.7.8 Concrete shall be transported in concrete transit agitators conforming to IS-5892.

5.7.9 Concrete shall be delivered and placed by pumping using BOOMER. Decision of GE as to whether RMC can be placed by pumping or not shall be shall be final and binding. The tenderer will have no extra claim on this account.

5.7.10 Pump and pumping arrangement shall be inspected and approved by CWE, while approving the RMC plant.

5.7.11 No water/ admixture shall be allowed after initial mixing of concrete at the plant. The use of Fly ash/ mineral based admixture in RMC shall not be permitted.

5.7.12 Slump test shall be carried out at site by the department in the presence of contractor. The concrete shall be placed in position within the designed initial setting time and at the end of initial setting time the remaining concrete shall be rejected.

5.7.13 **Transportation of Concrete:** The concrete shall be discharged from the truck mixer within two hrs of the time of loading. Time of loading shall start from adding the mixing water to the dry mix of cement and aggregate or of adding the cement to wet aggregate whichever is applicable.

5.7.14 Contractor should plan his arrangement in such a manner so as to enable a full load of concrete to be discharged within 30 minutes of arrival on site.

5.7.15 In addition to the tests carried out for RMC at the plant site, sampling and testing of concrete shall be carried out at the site before delivery as per IS- 456-2000 by the department along with the representative of the contractor. However, the cost of testing shall be borne by the contractor. The concrete, which does not meet the requirement of acceptance criteria as per IS-456-2000 shall be rejected and the contractor shall make good the same at his cost.

5.7.16 Following information will be added on site:-

(a) Time of arrival on site.

(b) Time when discharge was completed.

(c) Any water/ admixture added by the supplier to meet the specified workability.

(d) Any extra water/ admixture added at the request of the purchaser of the concrete, or his representative, and his signature.

(e) Pouring location

(f) Signature of the purchaser or his representative confirming discharge of the load.

5.7.17 **RECORDS** Record shall be maintained by the contractor to provide confirmation of the quality and quantity of cement procured. The Records shall be retained for the purposes of these requirements for a period of atleast One Year. This will also be made as part of agreement between contractor and deptt. They shall cover the following aspects:-

(a) Production and delivery :

(i) Batching instructions,

(ii) Batching records,

(iii) Delivery tickets, and

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(iv) Equipment calibration and plant maintenance.

(b) Materials and production control :

(i) Concrete production and materials purchase, usage and stocks, and

(ii) Certificates or test results for materials.

(c) Production quality control : Control test results

5.7.18 **Mixing of Small Quantity**

5.7.18.1 In case of small quantity of concrete (i.e. the quantity of concrete required being less than one half the batch of mix), the contractor may, after obtaining written permission of the Engineer-in-Charge, be allowed mechanical mixing. However, such concrete shall not be used for critical structural members such as shear walls, columns, beams, slabs, retaining walls etc.

5.7.18.2 Mixer performance checks shall be made at regular intervals to ensure uniformity of the concrete. Visual examination of the concrete shall be one of the aid for maintaining and checking mixer performance.

5.7.19 RMC manufacturer's shall meet all the above requirements and shall be **approved by GE**.

5.8 Finishing to Exposed Surfaces of Concrete: Refer to para 4.11.14, 4.11.15 and 4.11.16 of MES Schedule (Part-I).

5.8.1 Exposed soffits of RCC floors/ RCC slabs, soffits and sides of slab/beam, parapet and stair case, soffits and sides of shelves, RCC fascia, RCC parapet, chajjas and cantilevers etc which are not continuous with the adjoining plastered surfaces will be finished in accordance to para 4.11.16.2(a) of MES Schedule (Part-I) after removal of form work.

5.8.2 Exposed surfaces of columns, beams, lintels, bands and similar items which are continuous with plastered surfaces of walls shall be plastered as that for adjoining walls plastering.

5.8.3 Exposed surfaces of RCC columns, lintels beams bands etc. and similar items not covered under clause 5.6.1 & 5.6.2 above shall be finished in accordance to para 4.11.16.2(a) of MES Schedule (Part-I) after removal of form work.

5.8.4 Exposed surfaces of concrete shall be roughened with wire brushes and hacked out closely for making key for plaster before the application as described.

5.8.5 If thickness of plaster where specified, is required to be increased in excess to achieve fair and even surfaces, it shall be provided by the contractor without any extra cost to Government.

5.9 Concrete cover to reinforcement: Refer clause 26.4 of IS: 456-2000, unless otherwise shown on drawings.

5.10 **Damp proof course** : Damp proof course shall be 40mm thick PCC (1:2:4) type B-0 using 12.5mm graded crushed stone aggregates mixed with water proofing compound as per manufacturer's instructions and shall be provided on full width of all walls including door opening. DPC shall however not be provided over dwarf walls, compound wall and PCC/ RCC plinth beams. A coat of 85/25 bitumen @ 1.70 Kg per Sq metre shall be laid over DPC.

5.11 Provisions contained in clause 5.22.1 of MES Schedule (Part-I) shall not be applicable unless specially required due to site condition to make up levels etc. for which no price adjustment shall be made. Bed blocks shall rest over bearing plaster as specified here-in-after.

5.12 All RCC beam, lintel/ bands resting on masonry work which are independent (i.e. not continuous), shall be provided with PCC bed blocks cast in PCC (1:2:4) type B-1. Bed block shall be twice the width of beams/ lintels/ bands in length, covering the entire thickness of wall and thickness 150mm, if not indicated or shown on drawings otherwise. Lintels/ bands running over the masonry work (i.e. which are continuous) shall not be provided with bed blocks.

5.13 **Throating/ weathering**: Throating to projection of RCC/ PCC beyond external faces of the wall where shown on drawing and where RCC chajjas are not provided with down ward fascia shall be

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formed in concrete while casting by planting fillet/ bar of 12 mm dia. in the form work and finished smooth.

5.14 **Pre-cast concrete Articles**: Cement concrete shelves, bed blocks/ plates, covers slabs, PCC cills, fins and jalli and the like shall be pre-cast and shall be set in cement mortar (1:3). Deviation involving these items shall be done on the basis of appropriate rates in SSR for cast-in-situ work.

5.15 **RCC chajjas with fins**

5.15.1 RCC chajjas shall be provided as per details shown on drawings. Where fins are indicated with RCC chajjas the thickness of the finished fins including thickness of plaster on both sides shall be 50mm unless otherwise shown on drawings.

5.15.2 Top of RCC chajjas will be finished with 05mm thick plaster in cement mortar (1:4) using water proofing compound. At the junction of RCC chajja with wall, 80mm radius coving in PCC (1:2:4) type B-0 shall be provided on top of chajja.

5.16 Irrespective of whatever shown in drawings, green marble in one piece of 20 mm thick shall be provided as CILL for windows to the full width of brick wall/ beam over 20mm thick screed in CM(1:4).

5.17 **Bearing of RCC structural members**

5.17.1 Bearing of all roof/ floor slabs on load bearing masonry wall shall comprise of 20mm thick bearing plaster in cement mortar (1:3) finished even and smooth with one coat of white wash applied and two layers of laminated water proofing building paper type-I conforming to IS-1308 weighing not less than 100g/ sqm each layer, laid over it. However in case floor/ roof slab rests on RCC beams/ bands this provision does not apply.

5.17.2 The bearing of lintels shall comprise of a full brick with vertical joints in brickwork staggered.

5.18 No treatment shall be provided under bearing of RCC bands.

5.19 **RCC Shelves/ Platforms**

5.19.1 The finished thickness of RCC shelves and RCC platforms, if not indicated in drawings, shall be 60mm.

5.19.2 The number of tiers of RCC shelves shall be all as shown in the drawing. For locations where number of tiers is not shown /indicated, the RCC shelves shall be single tier.

5.19.3 The edge of RCC shelves/ RCC platforms shall be bull nosed to a radius of 5mm except where stone/ tile topping is to be provided over RCC shelves/ platforms.

5.19.4 10mm thick cement plaster in cement mortar (1:3) shall be provided on top where no finish over the RCC shelves has been indicated on the drawings.

5.20 **Concrete padding**: Where the required height of walls, opening is not obtained with adequate size of bricks the same shall be obtained by providing PCC (1:3:6) type C-1 concrete padding.

5.21 **Lime Concrete**

5.21.1 Lime shall be factory made hydrated lime powder conforming to IS-712.

5.21.2 Lime concrete filling shall be with lime mortar (1:2) mix using 40mm well burnt brick aggregates.

6. **BRICKWORK**

6.1. **FLY ASH BRICK MASONRY** : Brick masonry shall be of fly ash bricks (cement bonded) factory made. Visually the bricks shall be sound, compact & uniform in shape and free from visible cracks, warpage & organic matters. The bricks shall be solid with frog 10 to 20 mm deep on one of its flat side. The bricks shall have smooth rectangular faces with sharp corners & shall be uniform in shape & colour. Bricks shall be manufactured by using standard & latest technology with indigenous fly ash brick making machine and shall be of following specifications.

6.1.1 **Technical Specifications**

(a) **Size :** 230x110x75mm

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(b) **Compressive strength :** Avg 7.5 N/ Sqmm. Tolerance shall be as per clause 5.2 of IS: 12894:2002

(c) **Water Absorption :** Maximum 20%

(d) **Efflorescence :** Nil

(e) **Density :** Approx 1700 Kg/cubic metre

(f) **Composition by weight:-**

(i) **Cement** -10%

(ii) **Fly Ash :** Thermal station Fly ash (Gde-II) conforming to IS:3812 confirming to IS : 3812 : 1981 for physical & chemical properties to be tested in accordance with IS : 727 : 1967 – 40-45%.

(iii) **Crushed sand / Stone**: VSI machine make Grade-I containing round shape particles – 50 – 55%.

(iv) **Admixtures** : Construction chemicals as per manufacturer's instructions.

(g) **Thermal Conductivity**" 0.90 – 1.05 W/m² 0C (0.75 – 0.90 K Cal/ m² hr 0C).

(h) **Drying shrinkage** : Maximum average drying test shrinkage 0.035 – 0.04% to be tested as per IS : 4139.

(j) **Brick Colour** : Grey.

(k) Bricks shall be tested in accordance and as described in IS : 3495 (Part-I to IV). Sampling criteria for conformity of the bricks shall be as given in IS : 5454. Each brick shall be marked in a suitable manner with manufacturer's identification mark or initials.

(l) Bricks shall be procured from manufacturer of fly ash brick as per Appendix 'B-3' enclosed here-in-after.

6.1.2. **FLY ASH BRICK WORK** :-

(a) Brick masonry 230mm thick and above shall be built in CM (1:6) and that of 115 mm thick shall be built in CM (1:4) with 10 mm thick joints. 115 mm thick brick walls shall rest on PCC sub floor/ RCC slab unless otherwise specified. Irrespective what is shown on drawing, brick masonry shall be provided in the work.

(b) In case of pilasters, suitable construction of these bricks shall be used and duly got approved from GE. Necessary use of half bricks shall be made in the masonry work in the appropriate places to ensure break in joints. IF any gap is left which is less than 15 cm, same shall be filled in with cast-in-situ concrete (1:3:6) type C-1 in case of wall/ beam gap filling, the size of aggregate shall be decided to suit the thickness of filling.

(c) In case where the height is less than the height of bricks (i.e. space below lintel over door / windows. Ventilator cills and bottom of beam/ slab etc), the portion of the walls upto the nearest vertical joint of the adjoining course shall be filled with PCC (1:3:6) type C-1 cast-in-situ and care taken so that the volume of PCC fill is kept minimum.

(d) The sloping of walls below slab beam lintel etc shall be done with PCC (1:3:6) type C-1 cast-in-situ where required over and above full height of brick.

(e) As the brick masonry work progresses, joints in the masonry work should be raked properly with suitable tool

6.2 **Cement**: Refer clause 4 here-in-before.

6.3 **Sand:** Refer Para 5.4, 5.4.1 and 5.4.2 of MES Schedule (Part-I).

6.4 Unless otherwise specified here-in-after and/or shown on drawings, brickwork in various situations shall be built in cement mortar as under: -

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(i)	Brick work in half brick thick and under, brick work in independent pillars and reinforced brick work.	-	Cement mortar (1:4)
(ii)	Brick work in all other situations including foundation.	-	Cement mortar (1:6)

6.4.1 Half brick thick wall shall be reinforced with two No 8mm dia TMT bars horizontally at every fourth course starting from floor level and anchored in walls/column at junction. The anchorage length provided shall be not less than 100mm.

6.4.2 In framed structures RCC band shall be provided all as per details shown in Drgs and if not shown/mentioned on Drgs then RCC bands of size width equal to full width of wall and depth 100mm with four Nos 8mm dia high yield strength deformed TMT bars as longitudinal reinforcement and 8mm dia TMT bars links, stirrups/ spacers at 150mm centre to centre shall be provided at lintel or opening level through out the length of walls. Panel walls shall be bonded with RCC column with cement mortar (1:3).

6.5 In the event of deviations, brick work as specified above shall be priced at the applicable rates in MES Schedule (Part-II) for brick work with sub class 'B' bricks, subject to contractor's percentage as applicable.

6.6 Width of concrete lintels, beams, cills, columns and the like coming in conjunction with bricks walls/ pillars shall be kept to the actual width of brick work of that place unless off sets have been specifically shown in which case the width as shown on drawings shall be maintained.

6.7 Centre line dimension of rooms, verandahs, etc shown in drawings shall be maintained. Internal and overall dimension, if at variance from whatever shown in drawings, shall be deemed to have been amended accordingly as shown on drawings.

6.8 Mortar bed joints shall be such that four course of brickwork and three joints taken consecutively shall measure 3cm to 4cm in addition to the combined height of bricks themselves. The provision regarding above made in para 5.27 of MES Schedule (Part-I) shall be deemed to be modified accordingly and no price adjustment shall be done on this account.

6.9 **ARRESTING OF EFFLORESCENCE ON THE BRICK WORK SHALL BE CARRIED OUT AS PER IS-2212-1991**

6.9.1 **Laying and bonding**: Bricks shall be laid and bonded all as specified in MES Schedule (Part-I) as applicable to old size brick (FPS convention brick).

6.9.2 **Junction between brick wall and RCC column**: Flat iron 40 x 3mm, 40cm long dowel bar shall be provided at every fourth course of brickwork at the junction between brick wall and RCC columns.

6.9.3 **Stone masonry**: Stone to be used for stone masonry shall be trap stones, random rubble masonry built in cement mortar (1:6), unless otherwise specified/ mentioned/ shown in drawings.

7 ROOFING

7.1 RCC roof

7.1.1 RCC roof shall be provided all as shown on drawings and as specified hereinafter and in MES Schedule (Part-I). RCC roof slabs shall be casted to slopes as indicated in drawings. Where different slopes are indicated for same location, slopes as indicated in structural drawings shall be provided. If no slope is indicated, same shall be considered as (1:40).

7.1.2 After the RCC slabs are laid cured and fully set, ponding shall be done over RCC slab by filling water to a depth of minimum 75mm. It shall be kept for 48 hours and the process of water proofing treatment shall be started if no seepage or leakage is observed. In case of even slightest indication of seepage/ leakage, the same shall be rectified before application of further treatment by grouting and/ or plastering with cement mortar (1:3) after roughening the affected portion.

7.1.3 RCC slab shall be prepared as described in Para 11.37.3, 31.38.2 and 11.39.3 of MES Schedule (Part-I) before carrying out any treatment.

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7.2 ROOF TREATMENT/ WATER PROOFING TREATMENT TO ACCESSIBLE RCC ROOF SLAB

7.2.1 Water proofing treatment to accessible roof slabs (where staircase has been provided upto roof level) shall be carried out as described here-in-below:-

7.2.2 **MATERIALS**

(a) APP modified polymeric membrane: Refer para 11.43.2.2 of MES Schedule (Part-I). APP modified polymeric water proofing membrane shall be 3mm thick having weight not less than 3.6 kg/sqm. APP modified polymeric water proofing membrane shall be five layered with centre core of 100 micron HMHDPE film.

(b) Bitumen primer: Bitumen primer for water proofing treatment shall confirm to IS: 3384.

(c) PCC tiles shall be as described as per MES Schedule (Part-I). Size of PCC tiles shall be 250 x 250 x 22mm thick

7.2.3 **Application**

7.2.3.1 **On Accessible Roof**

(a) Cement plaster 10mm thick in cement mortar (1:4) mixed with WPC shall be applied on roof surface when concrete is green as per manufacturer's instructions.

(b) The surface of roof, parapet and gutters, drain mouths, etc over which waterproofing treatment is to be applied shall be cleaned of all foreign matter such as fungus, moss dust etc by wire brushing and dusting. For cast iron drain outlets a groove shall be cut around to tuck in the treatment. Concrete angle-fillets shall be provided at junctions between roofs and vertical faces of walls (parapet and other walls), around obstacles such as pipes, chimney/stacks etc and other similar situation to ease up about corners.

(c) Apply primer conforming to IS: 3384- 1965 @ 0.3 Kg/ Sqm to be applied on prepared surface till the surface is properly impregnated.

(d) Laying of polymeric water proofing membrane 3mm thick & jointed/ bonded with hot torched with blower and bonded completely to the substrate & the overlaps are then scaled/ fused by flame as per manufacturer's instructions.

(e) After application of APP membrane, PCC tiles shall be laid on 10mm thick screed in cement mortar (1:4) mixed with water proofing compound. Joints grouted and flush pointed in cement mortar (1: 3) mixed with 5 % of crude oil by weight of cement. Refer Para 11.7 and 11.7.1 of MES Schedule (Part-I). Flush pointing in cement mortar (1:3) shall be done as a separate process.

(f) Covet fillet in PCC (1:2:4) type B-0 with minimum radius of 75mm shall be provided at the junction of roof and parapet wall/ mumty wall/ chimney stack/ other vertical faces and surfaces painted with primer and hot blown grade bitumen.

7.2.3.2 **Laying Procedure**:-

(a) The membrane shall normally in length at right angles to direction of the run-off gradient, commencing at the lowest level and working up the crest. The membrane shall be first cut to required lengths, brushed clean of dusting material and laid out flat on the roof. Each length of membrane prepared for laying shall be laid in position and rolled up for a distance of half of its length. The hot binding material shall be laid on the roof across the full width of the rolled membrane as the latter is steadily rolling out and pressed. The excess bonding squeezed out at the ends shall be removed as laying proceeds.

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(b) When the first half of the membrane has been bonded to the roof, the other half shall be rolled up and then unrolled on to the hot bonding material in the same way as per para (a) above.

(c) The minimum overlaps of 100mm shall be allowed at the ends and sides of strips membrane. All overlaps shall be firmly bonded by heating and fusing the layer of asphalt and melting the protective plastic film, but taking care not to overheat this, as too much heat can harm the central polythene core, which is essential for water proofing function.

7.2.3.3 **Overlap Fusing Methodology**

(a) Keep the overlap opens with the help of trowel and the direct the flame uniformly inside and towards both membranes. Working with the flame shall be in opposite direction to the advance of the applicator.

(b) When the asphalt starts to flow, the applicator should press both membranes with his foot, on the opposite side to the hand holding the torch until a thin string of fluid asphalt appears, indicating correct fusing and bonding. During this phase, the trowel should be worked with back and forth, lengthwise motion, to homogenize the bonded area.

(c) Apply a layer of blown grade bitumen (confirming to IS: 702) 85/25 @ 1.2 Kg/Sqm.

(d) Dusting material, such as sand in dry condition @ 0.5 to 1.0 Kg/Sqm shall be dusted over the bitumen.

(e) All joints of pipes and traps within sunken slabs shall be scaled properly by epoxy sealant.

(f) All CI traps in sunken slabs are to be enclosed with PCC (1:1½:3) minimum 15cm all-round.

(g) The sunken portion shall be filled with PCC (1:5:10) with brick aggregate after carrying out the required tests for pipes/ joints/ water proofing treatment.

7.2.3.4 **TREATMENT AROUND RAIN WATER PIPE/ RAIN WATER PIPE**

The rain water pipe outlets (here after referred as drains) can be horizontal or vertical depending on whether they are situated in the flooring or in the parapet walls. In either cases the treatment is the same, although the difficulty of application may vary. The correct execution of a drain includes the following steps:-

(a) Cut a strip of polymeric membrane 25cm in width and length equal to the perimeter of the drain, adding 10cm for the overlapping. Flame bonds the part of the strip to be inserted into the drain i.e. approx 15cm.

(b) Cut the protruding end of the drain strip vertically upwards, with the aid of a heated trowel, into as many slits as are necessary to be able to press it downwards and flame bond it to the surrounding roof deck. Then, with the help of the trowel and torch, go over the exterior of the drain to obtain an even spread of the asphalt and fill in all the pores.

(c) Cut a square piece of polymer membrane about 15cm larger than the diameter of the drain. Flame bonds this square over the drain opening as centered as possible.

(d) Then, using the heated trowel cut the part that over the opening of the drain into the shape of a star with 8 peaks. Fold the peaks outwards and heat them one by one with the torch and then insert them into the drain.

(e) The last step to go over the inside of the drain, leveling of the surface. The drains shall be at least 15mm lower than the substrate, so that the extra thickness caused by various layers of the polymeric membrane does not cause un-necessary ponding of water.

7.2.3.5 **Water Proofing Treatment to Parapets**

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In vertical finished with polymeric membrane shall be cut in suitable length and width and should be adhered to the parapets and taking up and over the top of the parapet wall in case of RCC parapet. The lower portion of membrane shall be taken over wall/ RCC slab joint and taken upto a length 150mm horizontally and bonded effectively with polymeric membrane as explained above. The membrane shall be protected with 15mm thick cement mortar (1:4) plaster and PCC coping at top of the parapet.

7.3 **ROOF TREATMENT/ WATER PROOFING TREATMENT TO NON- ACCESSIBLE RCC ROOF SLABS**

7.3.1 Water proofing treatment to non-accessible roof slabs (where staircase has not been provided upto roof level) shall be carried out as described here-in-below.

7.3.2 **MATERIALS**

(a) APP modified polymeric membrane: Refer para 11.43.2.2 of MES Schedule (Part-I). APP modified polymeric water proofing membrane shall be 3mm thick having weight not less than 3.6 kg/sqm. APP modified polymeric water proofing membrane shall be five layered with centre core of 100 micron HMHDPE film.

(b) Bitumen primer: Bitumen primer for water proofing treatment shall confirm to IS: 3384.

7.3.3 **Application**

7.3.3.1 **On Non Accessible Roof**

(a) Cement plaster 10mm thick in cement mortar (1:4) mixed with WPC shall be applied on roof surface when concrete is green as per manufacturer's instructions.

(b) The surface of roof, parapet and gutters, drain mouths, etc over which waterproofing treatment is to be applied shall be cleaned of all foreign matter such as fungus, moss dust etc by wire brushing and dusting. For cast iron drain outlets a groove shall be cut around to tuck in the treatment. Concrete angle-fillets shall be provided at junctions between roofs and vertical faces of walls (parapet and other walls), around obstacles such as pipes, chimney/stacks etc and other similar situation to ease up about corners

(c) Apply primer conforming to IS: 3384- 1965 @ 0.3 Kg/ Sqm to be applied on prepared surface till the surface is properly impregnated.

(d) Laying of polymeric water proofing membrane 3mm thick & jointed/ bonded with hot torched with blower and bonded completely to the substrate & the overlaps are then scaled/ fused by flame as per manufacturer's instructions.

7.3.3.2 **Laying Procedure, Overlap Fusing Methodology, Treatment Around Rain Water Pipe/ Rain Water Pipe and water proofing treatment to parapets.**

The laying procedure, overlap fusing methodology, treatment around rain water pipe/ rain water pipe and water proofing treatment to parapets shall be followed as per clause No. 7.2.3.2, 7.2.3.3, 7.2.3.4 & 7.2.3.5 respectively.

7.3A **TESTING**:-

Frequency of test: At least one test of three sample specimen at random from each lot. The polymeric membrane shall be got tested from the test houses as mentioned here under:-

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(a) Chemical & Metallurgical Services, TS No 63, SIDCO Industrial Estate Ekkaduthangal, Chennai-600097 FAX No. 044-2312944

(b) Central Institute of Plastic Engineering & Technology (Ministry of Chemical and Fertilizers, Govt of India), Gundy, Chennai-600032

(c) National Test House, Alipore (Kolkata)

(d) Yamuna Test House, SCF-17, Kolidhar Enclave Zirakpur, Kalka Highway, Zirakpur

(e) M/s National Institute of Technical Teacher Training and Research, Sector-26, Chandigarh-160019

(f) Dr Uppal Testing Analytical Laboratory Pvt Ltd, 240, Industrial Area, Phase-IX, SAS Nagar, Mohali.

(g) Dr Ghuman and Gupta Geotec Consultants SCO 64-65 (Basement), Sector-17A, Chandigarh- 160017

7.3B **Execution of Work**

The work for water proofing treatment shall be got executed through authorized/ approved applicator of the manufacturer under strict supervision of Engineer-in-Charge.

7.3C APP modified polymeric water proofing membrane shall be of one of the makes specified in appendix 'B' here-in-after.

7.4 **GUARANTEE PERIOD FOR ROOF TREATMENT/ WATER PROOFING TREATMENT**

(i) The contractors shall be responsible for keeping the buildings leak proof/ water proof for a period of Ten years from the certified date of completion of work.

(ii) The contractor shall furnish guarantee in favour of the Garrison Engineer for the effectiveness of the water-proofing treatment during the guarantee period. If the work is executed through a Sub Contract, the guarantee furnished by the Sub Contractor should be in favour of the Garrison Engineer and not in favour of the main Contractor.

(iii) An appropriate sum, equal to the amount of security deposit calculated as per scales laid down for individual securities deposit on the amount of water proofing treatment at the contract rates under the contract, shall be retained out of the final bill amount as Security Deposit for the water-proofing work, and it shall be released to the Contractor only after the expiry of the guarantee period. The facility of furnishing fixed deposit receipt/ BGB in lieu of the sum to be retained as security may be accepted.

(iv) Should the GE at any time during the construction or prior to expiry of the said guarantee period of Ten years find that the building(s) are leaking, the contractor, on demand in writing from the GE will forthwith undertake to carryout such treatment which may be necessary to tender the water proofing/ leak proofing of the building (s) at his own cost/expense till expiry of the guarantee period.

(v) In the event of contractor's failure to comply with the GE's directions within the stipulated period. The work shall be carried out at the risk & cost of the contractor.

(vi) The contractor shall provide a plaster tablet of requisite size in situation as decided by the Engineer-in-charge on wall of each of the building. The tablet shall be 10mm thick in cement mortar (1:4) to indicate the contract agreement number, name of contractor, date of completion of work and date of expiry of ten years guarantee for water proofing treatment to RCC roof. The indication will be engraved pattern and painted with enameled paint. The cost of plaster plates, engraving and paint etc is deemed to be included in the unit rates of the bldg(s).

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7.5 **GALVALUME SHEETS, PITCHED ROOFING & TRUSS**

7.5.1 **GENERAL**: Various component of the steel structure such as steel trusses in roof where shown on drawings shall be fabricated, assembled and erected carefully by the contractor. The centerline dimensions shall be strictly achieved.

7.5.2 **TRUSS**:

7.5.2.1 MS angle iron/channel/pipes etc. and other steel members in rafters, purlins and false rafter shall be all as shown on drawings. If thickness of gusset plate not indicated on drawings, it shall be 12 mm thick. Base plate/sole plate and anchor plates etc shall be provided as indicated. Holding down bolts shall be made to shape and size as shown. Unless otherwise indicated on the drawings purlin & wind tie shall be provided as per drawings and where no. of purlins are not indicated on drawings, the same shall be as under:-

(a) For length of sheet not exceeding 1.52m – 2Nos.

(b) For length of sheet exceeding 1.52m but not exceeding 2.40m – 2 purlins at the ends and one additional purlin in the center of sheet.

(c) For length of sheet exceeding 2.40m – 2 purlins at the ends and minimum 02 Nos. purlins at equal spacing in between ends. One additional purlin shall be provided under the eave of roof sheeting supported over false rafters and projections.

7.5.2.2 Electrodes for welding shall be as per Clause-10.8 of SSR Part-I.

7.5.2.3 Workmanship of structural steel work shall be as per Clause-10.9 of SSR Part-I.

7.5.2.4 Assembly of structural members shall be done as per Clause-10.12 of SSR Part-I.

7.5.2.5 Welding work including testing shall be carried out as per Clause-10.15 of SSR part-I.

7.5.2.6 Erection of structural members shall be done as per Clause-10.16 of SSR Part-I.

7.5.3 **GALVALUME SHEETS** :

7.5.3.1 Irrespective of whatever is shown on drgs, pitched roof shall be galvalume sheet.

7.5.3.2 Galvalume sheet shall be coated with hot dip alloy of 55% Aluminium 43.5% Zinc 1.5% Silicon and finished with resin coat on both surfaces @ 150 gm per sq. m of coating (total both surfaces) having overall width and laid width as specified and shall be fixed using hot dip galvanized, self drilling and self tapping screws neoprene and EPDM washers. Unless otherwise indicated on drawings, Galvalume sheet shall be 0.50 mm thick (total coated thickness), 550 MPa minimum, yield strength. The painting system shall comprise 20 micron colour coating of super polyester/silicon modified polyester or fluro copolymer on exposed surface over a priming coat of 5 micron and on reverse side alkyd back coat of 5 micron over 5 micron primer. The profile shall confirm to IS: 513, 277 and 14246. The sheet shall be in profile depth of 28 mm to 32 mm at 195 at 195-200 mm pitch with steps. The fixing shall be carried out as per manufacturer's instructions. Make of Galvalume sheet shall be as mentioned in the Appendix 'B'.

7.5.4 **RIDGE**: Ridge shall be of section shown on drawings and shall be made of pre engineered galvalume sheet and shall be fixed to purlins with 8 mm dia GI hook bolts and nuts and bitumen and washers which fix the sheet to the purlin

7.5.5 The roof sheet lengths shown on drawings are tentative but the number of purlins as shown on the drawings is firm. Any variation in number of purlins shown in drawings shall be regularised through deviation order.

7.5.6 Roof slope shall be as shown in drawings, if no slope is shown on drawings, it shall be (1:3).

7.5.7 **WIND TIES**: Flat iron wind tie of size 40 x 6mm shall be fixed at eaves and ridges i.e. on bottom and top purlin of roof with an overlap of 75mm at joints and jointed with 2 Nos bolts of suitable dia.

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7.6 **Spouts**: Spouts shall be provided at locations where indicated in drawings. The type and dia of spouts if not indicated in drawings, the same shall be galvanised steel pipe light grade 50mm bore respectively. Where length of spouts are not indicated, it shall be taken as passing through one brick wall and projecting 15cm beyond face of the wall. In case less length is provided as per site requirement, adjustment shall be made through deviation order.

7.7 **Rain Water pipes & Fittings**:-

7.7.1 Refer clause 11.20, 11.20.5 to 11.20.6 of MES Schedule (Part-I). Rain water pipes shall be unplasticized polyvinyl chloride (UPVC) pipes confirming to IS-13592, type 'A'. Unless otherwise indicated in the drawings, rain water pipes shall be of 110mm bore. Pipes shall be ISI marked and shall have following marking:-

(a) Manufacturer's name or trade mark.

(b) Nominal outside dia

(c) Type 'A'

(d) Batch number.

7.7.2 Fixing & jointing of pipe shall be as specified in clause 11.20.4 of MES Schedule (Part-I). Fittings for pipes shall be of same make & having minimum wall thickness of 3.2mm.

7.7.3 Where rain water pipes from higher level are letting out over lower terrace and as well at ground floor, splash stones shall be provided under RWP splash stone shall be of size 750 x 450 x 75mm in PCC (1:3:6) type C-1.

7.7.4 Grating at the inlet of the pipe shall be of cast iron slotted type or dome type weighing not less than 1 kg each as approved by GE.

8 **JOINERY**

8.1 Seasoning and moisture contents: Refer Para 7.6 and 7.7 of MES Schedule (Part-I). Moisture contents shall be as specified for Zone-I.

8.2 Species of timber: Unless otherwise specified, timber to be used in various situations where timber work is shown on drawings shall be of following species: -

(a)	Timber frame for wooden doors, vents & windows	:	1st Class Hard Wood Shisham.
(b)	Brackets for curtain rods, cleats and stoppers of doors	:	1st Class Hard Wood Shisham
(c)	All other works unless otherwise specified	:	1st Class Hard Wood Shisham

8.3 Tolerance in the dimension shown on drawings for the wrought faces of carpenter's work, joinery etc. shall be permissible as specified in MES Schedule (Part-I). No tolerance on factory made shutter's thickness would be admissible.

8.4 Unless otherwise specified here-in-after, all woodwork shall be wrought except surface of timber in contact with or buried in brick work/concrete/plaster.

8.5 Counter sunk holes for bolts and the like on wrought faces shall be plugged with tightly fitted plugs and planed/finished to match with surrounding surfaces.

8.6 Use of nails in joinery and other timber built in items is prohibited. Wood screws of appropriate sizes shall be used.

8.7 **FACTORY MADE PANELLED DOOR SHUTTERS**

Factory made panelled door shutters shall be made of kiln seasoned as per IS 1141 and chemically treated as per IS-401 second-class hard wood (Non coniferous) Bonsum (Phoebe species)/ Chaplash (Artocarpus chaplasha)/ Hollock (Terminalia myriocarpa) for styles and rails. Panels shall be of 12 mm thick particle board veneered commercial (both faces) BWP grade bonded with liquid phenol formaldehyde synthetic resin adhesive conforming to IS-3097 (ISI

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marked) for all type of doors except in case of external doors directly exposed to weather. Panels for external doors directly exposed to weather shall be 9 mm thick BWP marine grade ply wood bonded with high quality liquid phenol formaldehyde conforming to IS : 710 (ISI marked).

8.7.1 Shutters shall be obtained from any one of the manufacturers given in Appendix 'B' to these particular specifications as approved by GE.

8.7.2 **FACTORY MADE FLY PROOF DOOR SHUTTERS**

Factory made fly proof door shutters shall be made of kiln seasoned as per IS-1141 and chemically treated as per IS-401 second class hard wood (Non coniferous) Bonsum (Phoebe species)/ Chaplash (Artocarpus chaplasha)/Hollock (Terminalia myriocarpa) fixed with stain less steel wire cloth as specified hereinafter as well as in MES SSR Part-1

8.8 **Flush door shutters**:

8.8.1 Flush door shutters shall be as per para 8.25 of MES Schedule (Part-I). Flush door shutters shall be solid core type with block board core conforming to IS-2202 Part-I. Battens for core shall be of 2nd class hard wood kiln seasoned glued each other and bonded with phenol formaldehyde synthetic resin BWR grade. Flush door shutters shall be non decorative (Commercial type). Rebate shall be made in double leaf shutters by providing rebating of teak wood 12mm thick at meeting style. Shutters shall be 35mm thick with vision/ without vision glazed as shown on drgs.

8.9 **Block Board Shutter**

8.9.1 Block board shutters shall be interior grade commercial type having commercial face veneers on both faces confirming to IS-1659. The block board shutters shall be bonded with BWR type adhesive. Thickness of the shutters shall be as shown on drgs.

8.9.2 Edging shall be 6mm thick of 1st class hard wood (Shisham) bonded with fevicol or movicol and nailed with head less nails to the shutters at 20cm centre to centre. However in double leaf shutters the edging in the meeting edge shall be 12mm thick instead of 6mm thick and rebates shall be made in the meeting edge.

8.9.3 Wooden surface embedded/ in contact with concrete/ brick work/ plaster etc. shall be clean sawn. All other surface of woodwork shall be wrought.

8.10 If thickness is not specified/ shown on drawings, shutters of cabinet, officers cup board and loft shall be 18/19mm thick one side decorative exterior grade PF bonded flat pressed 3 layered melamine faced pre-laminated wood based particle board BWR type with 6mm thick teak wood lipping, all round as per IS-3087 fixed with piano type hinges.

8.11 **Anti-termite preservative treatment to wood work before painting**: All natural timber surfaces except those in ply/ particle board and in factory made paneled/ glazed shutters which shall be internally treated in factory, shall be treated with two coats of any of the approved chemical such as modified hot and cold with copper chrome arsenic or with acid cupric chromate composition with minimum quantity of chemical impregnated per cubic metre of timber not less than 4 Kg as per IS-401 or ASCU etc. as directed by GE for protection against termite. The quantity and application of chemicals shall be as per manufacturer's instruction. Cost of anti-termite treatment to woodwork is deemed to be included in the cost of building work under Schedule 'A'. Woodwork shall be painted or polished as specified after second coat of anti-termite chemical has completely dried.

8.12 Rates given in MES Schedule (Part-II) for factory made shutters, particle board and plywood are deemed to include for the treatment of anti-termite of the timber.

8.13 Unless otherwise shown on drawings, pelmet boxes and shelves in cupboards/ cabinets shall be 19mm thick veneered one side decorative and other side commercial type finish exterior grade phenol formaldehyde bonded flat pressed 3 layered malamine faced pre-laminated wood based particle board BWR type with 6mm thick teak wood lipping all around as per IS-3087.

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8.14 Thickness of plywood, where not shown on drawings/ specified elsewhere shall be 4mm thick, 3 ply. The finish/ type of plywood, where not shown on drawings/ specified elsewhere shall be with commercial facing veneered on both sides BWR quality.

8.15 For pricing deviation, the rates of joinery as given in MES Schedule (Part-I) shall apply to glazed/gauged type of joinery including for factory made shutters of appropriate type of timber sizes, as shown on drawings. However the rate of factory made panelled shutters in MES Schedule (Part-I) for two panels shall be applicable for two or more panels.

8.16 **Pre-laminated Particle board**: - Pre-laminated particle board where ever shown on drawings shall be of exterior grade pre-laminated one side (exposed side) with decorative choice lamination and other side balancing white lamination. Where both the surfaces are exposed, particle board shall be with both sides decorative choice lamination.

8.17 **Veneered particle board**: - Veneered particle board where ever shown on drawings shall be of commercial type and as per clause 12.14 of MES Schedule (Part-I).

8.18 **Laminated sheets**: Laminated sheets where shown on drawings, shall be plastic laminated sheets of 1 to 1.5mm thick natural teak finish.

8.19 **PVC DOOR FRAME**: Unless otherwise shown on drawings, frame for PVC door shall be made out of extruded 5mm Rigid PVC pre-laminated foam sheet mitred cut at two corners and joined with 2 No 150mm long brackets of 15 x 15mm MS Square tube. The two vertical door profiles are to be reinforced with 19 x 19mm MS Square tube of 19 gauge. EPDM rubber gasket weather seal to be provided throughout the frame. The door frame shall be fixed to wall using 75mm long MS screws through the frame by using PVC fasteners. Minimum of 4 No screws shall be provided for each vertical member and minimum 2 No for horizontal member. PVC sheet and edges will be painted to match the pre-laminated sheet. Whether shown on drawing or not, the cost of PVC door frame for PVC shutter shall be deemed included in the lump sum cost of building.

8.20 **PVC DOOR SHUTTER** : Factory made pre-laminated PVC door shutter of wood grained (conforming to IS-4020) 30mm thick, consisting of frame made out of MS tubes of 19 gauge thickness and size of stiles, top rail, bottom rail and lock rail all as per shown on drawings MS frame shall have a coat of steel primers of approved make and manufacture. MS frame covered with 5mm thick heat moulded pre-laminated PVC 'C' channel of size 30mm thickness, 70mm width out of which 50mm shall be flat and 20mm shall be tapered in 45° angle on either side forming stiles and 5mm thick, 95mm wide pre-laminated PVC sheet out of which 75mm shall be flat and 20mm shall be tapered in 45° on the inner side to form top and bottom rail and 155mm pre-laminated PVC sheet out of which 75mm shall be flat and 20mm shall be tapered on both sides to form lock rail. Top, bottom and lock rail shall be provided either side of panel. 10mm (5mm x 2) thick 20mm wide cross PVC sheet shall be provided as gap insert for top rail and bottom rail. Panelling of 5mm thick prelam PVC sheet to be fitted with the MS frame welded/ sealed to the stiles and rails with 5mm + 2mm thick x 15mm wide PVC sheet beading on inner side and joined together with solvent cement adhesive etc. An additional 5mm thick PVC strip of 20mm width is to be stuck on the interior side of 'C' channel using PVC solvent adhesive complete all as per direction of Engineer-in-Charge, manufacturers' specification and drawings. PVC doors shall be of make given in appendix 'B' to these particular specifications as approved by GE.

9 BUILDER'S HARDWARE

9.1 Unless otherwise shown/indicated in drawings, the type of the following items of builder's hardware shall be as indicated against them:-

(a) Ball catch spring shall be of brass.

(b) Magic eye shall be of aluminium.

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(c) Handles for built in cupboards/wardrobes/wooden almirah etc shall be of aluminium alloy fabricated.

9.1.1 Irrespective of what is shown in drawings, aluminium anodised hardware shall be provided for single living officers accommodation, Admin building, education building, officers mess, JCO's Mess & Club, single JCO's living accn and to all aluminum doors and windows. Remaining buildings shall be provided with mild steel stove enameled fittings.

9.2 Type of other articles of builder's hardware shall be all as shown in the drawings/ specified elsewhere. At locations where the type is not indicated in the drawings/ specified elsewhere, these builders hardware articles shall be of mild steel stove enameled black Japan.

9.3 Size of builder's hardware articles, if not shown in the drawings/ specified elsewhere shall be as directed by GE.

9.4 **Butt Hinges**: These shall be mild steel medium weight, cold rolled, pin hinges need not be zinc coated. Butt hinges for cleats shall be 50mm.

9.5 **Aldrop sliding door bolts**: The sliding bolts shall be provided with 6 No of bolts & nuts. Aluminium aldrop sliding bolt shall be of aluminium alloy extruded section and shall be ISI marked. Dia of bolt shall be 16mm.

9.6 **Helical Door Spring**: Refer clause 9.7.8 of MES Schedule (Part-I). It shall be 150mm long of mild steel stove enameled.

9.7 **Hydraulic Door Closer**: Refer clause 9.16 of MES Schedule (Part-I). It shall be of designation 3 with anodized aluminium alloy body suitable for doors weighing 61 to 80 Kg, as indicated. Closers shall be universal type suitable for both anti clock wise and clock wise door, without any change in parts of the closer.

9.8 **Floor Door Stoppers**: Refer clause 9.15 of MES Schedule (Part-I). The same shall be aluminium alloy body and tongue with hard drawn steel spring. The overall length of cover plate shall be 140mm.

9.9 **Handles**: Mild steel handles to door shutters shall be pressed oval type and aluminium handles to door shutters shall be of aluminium alloy fabricated type and shall be ISI marked.

9.10 **Hasp and Staples**: Hasp and staples shall be of safety type.

9.11 **Continuous (Piano) Hinges**: Continuous (Piano) hinges of mild steel shall be galvanized with oxidized finish. Thickness of the flap shall be to suit the thickness of the style.

9.12 **Ball Catch Springs**: Ball catch springs shall be of brass and polished bright all as specified in clause 9.14 of MES Schedule (Part-I).

9.13 **Door Springs Rat Tail Type**: All wire gauge shutters shall be provided with door spring rat tail type made of mild steel all as specified in clause 9.7.8 MES Schedule (Part-I).

9.14 **Towel Rail**: Unless otherwise shown on drawings towel rail shall be of stainless steel tubular of 'D' shape with flanged ends for fixing. It shall be of 19mm dia and 60cm length in case where the length is not mentioned.

9.15 **Towel Ring**: This shall be standard stainless steel towel ring.

9.16 **Tie Hanger**: Tie hanger 'D' shaped 300mm long of aluminium-anodized tubular 15mm dia shall be provided as shown on drawings.

9.17 **Magic Eye**: Magic eye shall be provided to the entrance doors only of officer quarters at appropriate height. Magic eye shall be of aluminium as directed by the GE and shall be fixed with cadmium plated screws.

9.18 **Aluminium Sheet Lining**: Where wooden doors are specifically indicated to be provided in Bath, WC and toilet; 22 gauge aluminium sheet shall be provided to full width upto top of bottom

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rail on both sides of these wooden doors. Aluminium sheet shall be in single piece without joint and shall be fixed with cadmium plated steel screws at 20cm centre to centre.

9.19 **Tower bolts**: Refer clause 9.3 of MES Schedule (Part-I). Mild steel tower bolts shall comply with IS-204 (Part-I) and aluminum tower bolts shall comply with IS-204 (Part-II). Barrel and skeleton tower bolts shall have knob integral with bolts. The dia of bolts shall be 10mm for upto size 125mm and 12 mm for 150mm & above.

9.20 **Mortice lock**: Refer clause 9.2.2 of MES Schedule (Part-I). Where shown in drgs, in all aluminum doors, mortice lock of size as indicated in drgs shall be provided. Mortice locks shall confirm to IS-2209 and shall be of brass.

10 STEEL AND IRON WORK

10.1 GENERAL

All steel including structural steel, steel sheets etc for entire completion of work shall be procured by the contractor at his own cost.

10.2 MATERIALS:

Size type and Gde of steel shall be as shown on drawing (s) However, if Gde and type of steel are not shown on drawing (s) the same shall be TMT bars Gde Fe-500D/Fe-550D for reinforcement and MS Gde E-250 Fe-410 W (Quality 'A') for structural purposes. Various types of steel are given as under:-

(i) **Reinforcement Steel**: - High strength deformed steel bars produced by thermo mechanical treatment process of Gde Fe-500/ 500D and meeting all other requirements of IS-1786.

(ii) **Structural Steel**: -

(a) Specification of structural steel as given in clause 10.4 of MES Schedule (Part-I) shall be applicable. Standard quality Gde E-250 Fe-410 W (Quality 'A') conforming to IS-2062 for all types of steel structures including these subject to dynamic loading shall be used.

(b) Ordinary quality steel E-165 Gde Fe-290 conforming to IS-1977-1975 for all non structural use viz, doors, windows, guard bars, grills, steel gates, hand railing, fencing posts etc.

(iii) Galvanised steel sheets (plain and corrugated) shall be conforming to IS-277 of 1985 with medium coating of zinc, nominal 120 g/sqm.

(iv) Fabric reinforcement for concrete shall be conforming to IS-1566 of 1982.

10.2.1 PROCUREMENT

10.2.1.1 TMT steel bars irrespective of size shall be procured from main/ primary producer(s) i.e. SAIL/ RINL/ TISCO/ and as per Appx 'B-1" as mentioned here-in-after.

10.2.1.2 All structural steel shall be procured from main/ primary producer(s) i.e. SAIL/ RINL/ TISCO and as per Appx 'B-1" as mentioned here-in-after.

Note: - Steel section for railings, gates, fencing, guard bar, steel chowkhats and holdfasts etc, which do not constitute structural members, can be procured from main producers/secondary producers/BIS marked manufacturers or their authorized dealers at the option of contractor without any minus price adjustment. These should also conform to IS-1732 for general engineering purpose. However, tests will not be insisted upon for such steel sections.

10.2.1.3 The galvanized iron sheets & fabric reinforcement for concrete shall be ISI marked & shall be procured from main producers.

10.2.1.4 Main producers of steel and the approved primary producers/manufacturers are specified in Appendix 'B' to these particular specifications.

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10.2.1.5 Reinforcement shall be fabricated, placed in position all as shown on drawings and specified in clause 10.17 to 10.22 of MES Schedule (Part-I) without application of heat.

10.2.1.6 All laps and crossings shall be tied with mild steel wire (annealed) of size not less than 0.9mm dia and the cost thereof deemed included in the quoted amount of the contractor.

10.2.1.7 For the purpose of calculating the lump sum and making adjustment arising out of deviations involving reinforcement bars, the length of each bar shall be taken as 10 (Ten) metre for purpose of calculating lap length.

10.2.1.8 All finished steel shall be well and clearly rolled to the dimensions, section and weights specified. The finished material shall be reasonably free from cracks, surface flaws laminations, rough, jagged and imperfect edges and other harmful defects and shall be finished in a workman-like manner.

10.2.1.9 Tolerance on size and weight of reinforcement bars shall not be more than specified in clause 10.17.4 & 10.17.5 of MES Schedule (Part-I).

10.2.1.10 Steel shall be procured from the storage depots of the manufacturers and not from their authorized agents/ dealers.

10.2.2 **TESTING OF STEEL**

The manufacturer is to carry out inspection and testing of steel in accordance with relevant BIS provisions. The contractor shall submit the manufacturer's Test Certificate in original along with the test sheet giving the result of each mechanical test as applicable and the chemical composition of the steel or authenticated copy thereof duly signed by the manufacturer with each consignment. The site staff and GE shall verify the original documents in support of the purchase of steel .The Engineer-in-Charge shall record these details in a steel acceptance register, as given at Appendix 'F' after due verification and send a certified true copy of test sheet to GE for his records. The GE/CWE shall also organize independent testing of random samples of steel drawn from various lots from National Test House, SEMT wing, CME, Regional Research Labs, Govt. approved Lab, Zonal Labs etc for Normal, Mass, Tensile, Bend & Re bend test of steel as per the following minimum frequency:-

STEEL FOR CONCRETE REINFORCEMENT	QUALITY
1. Bars size less than 10mm	1 Sample; (3 Specimen) for each test for every 25 tonne or part thereof.
2. Bar size 10mm to 16mm	1 Sample (3 Specimen) for each test for every 35 tonnes or part thereof.
3. Bars size over 16 mm	1 Sample (3 Specimen) for each test for every 45 tonnes or part thereof.
STRUCTURAL STEEL	
4. Tensile test	1 Test for every 25 tonne of steel or part thereof
5. Bending test	1 Test for every 10 tonne of steel or part thereof

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Note:-

(i) Various tests, acceptance criteria, tolerance, etc. shall be as per Appendix 'F' and relevant BIS codes.

(ii) Independent testing of steel by the GE shall be optional at the discretion of the GE in case of procurement of steel from main producers and testing charges shall be borne in accordance with condition 10A of IAFW 2249 i.e. testing charges shall be borne by the Deptt if the test results are found in order otherwise these shall be borne by the contractor.

(iii) Independent testing of steel by the GE shall be mandatory in case of procurement of steel from secondary producers and testing charges shall be borne by the contractor irrespective of the outcome of test results.

(iv) In both the cases at sub para (ii) and (iii) above, the contractor at his cost shall provide all facilities required for the testing.

(v) Cost of materials used in testing including its transportation shall be borne by the contractor and no extra claim what so over shall be admissible irrespective of test results. Minimum numbers of tests shall be as mentioned here in before. Wherever same is not indicated, it shall be decided by GE.

(vi) For various tests, acceptance criteria, tolerance etc refer appendix 'F' and relevant BIS codes.

(vii) Sample from each lot shall be tested for quality and elongation. The elongation shall not be less than 18%.

10.2.3 **DOCUMENTATION**

Steel Acceptance Register and measurement Book for steel (for record purposes and as "not to be abstracted") shall be maintained by the Engineer-in-Charge. The contractor shall submit original machine numbered purchase vouchers from the main manufacturer for the total quantity of steel supplied under each consignment to be incorporated in the work. All consignments received at the work site shall be inspected by the GE alongwith the relevant documents before acceptance. The original purchase vouchers and the test certificates shall be defaced by the Engineer-in-Charge and kept on record in the office of the GE duly authenticated and with cross-reference to the control number recorded in the steel acceptance register. The steel acceptance register shall be signed by JE (Civil), Engineer-in-Charge, GE and contractor. The entire quantity of all steel items shall also be suitably recorded in the Measurement Book for record purposes as "not to be abstracted" before incorporation in the work and shall be signed by the Engineer-in-Charge and the contractor.

10.2.4 **STEEL IN COILS ETC**

Any bar of any diameter for reinforcement may be procured in round; bundles or coils and the cost of straightening the same shall be borne by the contractor. When bars are procured in bundles, the length of each bundle shall be worked out on the basis of unit weight pre determined by the GE by getting suitable length (not less than 3 metre) out of each consignment(s) received, getting it straightened, length measured and weighed in presence of contractor's accredited representative. The said length(s) and the weight (s) shall be recorded from which unit weight (Weight per unit length) shall be calculated. The length of bars worked out on the basis of unit weight determined as above shall form the basis for the purpose of calculating quantity of steel used/to be used in work and making payment of materials lying at site. However, if the unit weight works out more than the unit weight given in SSR then unit weight given in SSR shall be followed for computing weight of steel for the purpose of making payment of steel lying at site.

10.2.5 **STORAGE**

10.2.5.1 Steel of different sizes shall be stacked separately for each classification of steel. Separate area shall be earmarked. Steel shall be marked with distinct painting marks for easy identification.

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PARTICULAR SPECIFICATIONS (CONTD…)

10.2.5.2 All steel shall be stored at least 15cm above ground level Steel shall be stored in a manner so as to prevent distortion and corrosion. Any section that has deteriorated or corroded or if considered defective by Engineer-in-Charge shall not be used in the work and shall be removed by the contractor from the site of work without any extra cost. It shall be the responsibility of the contractor to make sure that all possible arrangements are made for the safe custody of the steel. In case of any loss of steel, contractor shall only be responsible and the loss shall be made good without any delay and no claim shall be admissible on this account.

10.2.6 **SCHEDULING OF SUPPLY**

Schedule of supply of steel shall be finalised by the contractor with GE and shall be incorporated in CPM chart as that supply of steel is monitored in a way to avoid any delay in the completion of work.

10.2.6.1 The complete requirement of steel of various sizes shall be worked out before making any RAR payment and procurement of steel by the contractor shall be completed sufficiently in advance of the date of completion.

10.2.6.2 **Payment of steel**: The payment of steel shall only be allowed after production of original purchase vouchers, test certificates by the contractor for each consignment of steel and results of testing if carried out by the department are found satisfactory after testing as specified here-in-before.

10.3 **Welding**: Welding of reinforcement if specifically allowed in writing by GE shall be by metal arc welding. Running welding shall be done unless otherwise specified. All welds should be 6mm fillet welds unless otherwise specified. The welding of frames of the doors shall be done by flush but welding, but permissible weld of MS square pipe with flat iron frames of railing where shown on drawings shall be with running welding.

10.4 **Holdfasts/Lugs**: Flat iron 25 x 3mm holdfasts/ lugs shall be provided by welding where shown on drawings except those to be provided to wooden chowkhats, which shall be fixed with bolts/nuts as per details shown on drawings. Holdfasts in wooden chowkhats shall be plugged with hard wood plugs. Hold fasts/lugs shall be embedded in PCC (1:3:6) bed blocks of size 230 x 230 x 75mm in one brick thick or equivalent walls and 115mm x 230mm x 75mm in half brick thick or equivalent walls.

10.5 **PRESSED STEEL FRAME FOR WOODEN DOOR SHUTTERS**

10.5.1 Irrespective whatsoever shown on drawing except PVC door, the chowkats/ frames for door shall be of machine pressed steel and shall be made out of mild steel (PBI) of 1.25mm thick and shall comply with requirement of IS-4351 of 1976 (Specification for steel doors frames). Exposed Steel surface shall be painted with 2 coats of synthetic enamel paint over a coat of red oxide primer over prepared surfaces and surfaces in contact with concrete/brick (except reinforcement) shall be tarred. The hollow portion of frame between wall & frame shall be filled with PCC (1:3:6) type C-0 using stone aggregate and shall be thoroughly compacted.

10.5.2 The following shall also be provided although not shown on drawings without any extra cost to the Government:-

(i) Door frame shall be embedded to a depth of 40mm in flooring.

(ii) Packing pieces of plywood of required thickness shall be provided under barrel bolt plate and aldrop bolt plate. GI pipe 20mm bore 50mm long shall be welded to back of door frame to facilitate the working of sliding door bolts.

(iii) FI 25 x 3mm base tie shall be welded at the bottom of door frame and embedded in the floor.

(iv) Lugs (hold fasts) should be flat iron 25 x 3mm of 20cm length made to shape irrespective of what is shown on drawings and should be embedded in PCC block 23 cm x 23 cm x 7.5cm for one brick thick walls and 23cm x 11.5 cm x 7.5cm for half brick thick walls.

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PARTICULAR SPECIFICATIONS (CONTD…)

10.5.3 Pressed steel frames shall be procured from any of the manufacturers specified in appendix 'B' to these particular specifications.

10.6 **STEEL WINDOWS/ VENTS**: Wherever steel windows are mentioned on the drawings, box type steel windows for overall sizes shall be provided to all buildings on the situation where steel window is shown therein. Minor variations in overall sizes to suit the standard practice of manufacture will however be accepted without any price adjustment.

10.6.1 **BOX WINDOWS (STEEL)**:- Box window shall be manufactured strictly as per drawing and shall be procured from any of the approved Firms/ Manufacturers specified in Appx 'B' to the specifications. Thickness of the sheet shall be of 18 gauge and all other details shall be strictly followed from the respective drawings.

10.6.2 **STEEL WINDOWS/ VENTS**

(a) Steel/ windows/ vents shall conform to sample kept in CE/ GE's office and shall be obtained from any of the approved firm/ manufactures specified in clause 10.6.5 here-in-after. Tenderer to note that only flush butt-welding shall be permitted for fabrication. Fixing of steel windows/ vents shall be done in accordance with IS-1081. However instead of mastic filling specified in IS, cement and sand mortar (1:1) mixed with 5% crude oil by weight of cement shall be used. Subdividing bars of the units shall be tenonned and riveted to the frames. Lugs to steel windows/ vents shall be provided as shown in drawings and as specified in IS. However, no lugs will be provided in lintels. The number of lugs per windows/vent shall be provided as shown on drawings.

(b) In the event of deviation the pricing shall be done at the applicable rates for MS steel windows 'z' section only in MES SSR subject to deviation percentage applicable to Schedule 'A'.

(c) Side hung shutters shall be provided with steel hinges as shown on drawings. Hardware fittings/ iron mongry for steel windows/ vents shall be provided as shown in drawings or in relevant IS and as directed by GE.

10.6.3 Samples for each type of windows/ vents with complete fittings shall be produced for approval of the GE. Manufacturer's certificate to the effect that their product conform to IS specification shall be produced by the contractor at the time of submitting samples for approval before procurement of bulk quantity of the materials for incorporation in the work. Samples shall be retained in the sample room of the GE until completion of the work. However the contractor shall produce manufacturer's certificate for entire quantity as specified above.

10.6.4 Steel windows/ vents shall be procured from any of the manufacturers specified in appendix 'B' to these particular specifications.

10.6.5 Steel windows/ vents shall be obtained from the firm of which the samples have been approved by the GE.

10.7 **MS grills/ guard bars**: MS grills/guard bars shall be provided at locations and as per details shown in drawings including the amendment sheet thereto. Where nothing is shown on drawings, guard bars type 'F' shall be provided to all windows and ventilators.

10.7.1 All MS grills/ guard bars (including frame work) shall be painted with two coats of synthetic enamel paint over a coat of red oxide primer.

10.8 **Wire cloth**: Refer clause 9.25 of MES Schedule (Part-I) and conforming to IS-1568, wire cloth shall be galvanized mild steel having 0.56mm as nominal dia of wire and average width of aperture as 1.18 mm. Wire cloth in wire gauged shutters of steel windows shall be fixed with fillets all as shown on drawings.

10.9 **Steel doors**: Steel doors shall be all as shown in the drawings. The steel sheets for the steel doors shall be MS 1.00mm thick unless otherwise indicated on the drawings. These shall be factory fabricated and spray painted with two coats of synthetic enamel paint over a coat of primer (factory painted).

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PARTICULAR SPECIFICATIONS (CONTD…)

10.10 **Rolling Shutter**: Rolling shutter shall be made of 1.25mm thick MS sheet and provided in situations where shown in drawing(s) including top box as specified in clause 10.23 of MES Schedule (Part-I). Other members like curtain, lock plate, guide channel, bracket plate shall be all as specified in clause 10.23.1 to 10.23.11 of MES Schedule (Part-I). Rolling shutter shall be push & pull type where the area of each shutter is upto 10 Sqm and shall be fitted with three ball bearings. Rolling shutter shall be gear operated type with bevel gear box where area of each shutter is exceeding 10 Sqm and shall be fitted with four ball bearings. The rolling shutter shall be painted with two coats of synthetic enamel paint over a coat of primer.

10.11 **Collapsible door/gate**: - Collapsible door/gate shall be provided in situation where shown in drawings complete as specified in clause 10.24 and 10.24.1 to 10.24.5 of MES Schedule (Part-I).

10.12 **Aluminium Doors, Windows & fixed glazing**

10.12.1 Aluminium doors, Windows & fixed glazing shall be provided to the openings as per drawings.

10.12.2 Unless otherwise indicated aluminium sections shall be extruded heavy duty anodised natural finish satin shade. Thickness of aluminium section shall be 3mm.

10.12.3 Standard aluminium beading shall be provided all around the aluminium windows/doors for fixing glazing.

10.12.4 Irrespective of whatever shown on drawings or specified elsewhere, the glass panes for aluminium doors and windows shall be of 5.5mm thick clear float glass. Glazing shall be fixed to aluminium doors, windows etc. with aluminium beading and standard rubber beading/lining.

10.12.5 Each door shall be provided with one standard mortice lock of approved make.

10.12.6 The aluminium sections shall be procured from approved manufacturers.

10.12.7 Each leaf of doors shall be provided with one double action floor spring duly ISI marked.

10.12.8 Aluminium handles shall be provided as shown in drawings.

10.12.9 All aluminium windows shall be provided with aluminium grills as shown on drawings.

10.13 **Fan hook with boxes**: Wherever fan hooks/fan points have been shown, cast iron or MS boxes with hooks as per details shown on drawings shall be provided. Exposed faces shall be given two coats of white paint over a coat of red oxide primer. The cost of the CI or MS boxes with hooks shall be deemed to be included in the lump sum cost of buildings in Schedule 'A' Sec-I.

10.14 **Expanded metal**: Expanded metal shall be provided as shown on drawings. The size of XPM where not shown on drawing shall be 20mm short way mesh by 50mm long way with nominal weight not less than 4.078 Kg/Sqm. However, where it is used for reinforcement as shown on drawings, it shall weigh exceeding 5 Kgs but not exceeding 8 Kgs per square metre. If used as partitions, the XPM shall be painted with two coats of aluminium paint over a coat of primer.

11 **FLOORING**

11.1 **General**

11.1.1 Floors of various types shall be provided as shown in schedule of finishes drawings for various buildings.

11.1.2 Floor shall be laid to levels or to falls as shown on drawings/directed by Engineer-in-Charge.

11.1.3 Floor finish shall be carried over through all openings, toe wall and dwarf walls.

11.1.4 Surface of PCC floors unless otherwise indicated in schedule of finishes shall be finished even and smooth using extra cement with steel trowels. Exposed edge of floors shall be finished to match with top surface finish. Top surface of ramp shall be finished chequered using extra cement.

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11.1.5 The dividing line between the floors of different type wherever they so meet between adjoining room shall be determined on the basis of finish visible when the doors are closed and the applicable finish shall accordingly be provided. Exposed edge of floors shall be finished to match with top surface finish.

11.1.6 Cement concrete in sub base or sub base floor and wearing coat shall be laid separately and not monolithically. Sub base or sub floor shall be laid at a stretch without forming panels and no adjustment shall be made for form work on this account.

11.1.7 Graded coarse aggregate shall be crushed stone aggregate.

11.1.8 The size of marbles chips in the terrazzo tiles shall be up to 12mm. No black coloured chips shall be used in pre-cast terrazzo tiles.

11.1.9 **Glass dividing strips**

(i) PCC floor topping shall be laid in bays/ panels not exceeding 1.2m x 1.2m or part thereof. Glass dividing strips shall be 4mm thick and of required width as per thickness of floor toping and shall be provided in all floors whether shown on drawing or not, except garages, aprons, sheds.

(ii) Bays shall be so formed that not more than 3 strips meet at one point i.e. only 'T' junction is formed.

(iii) Use of all temporary fillets/ side forms shall be dispensed with where glass dividing strips are used. No price adjustment will be made on account of non use of the temporary fillets/ side forms etc.

(iv) Where sunken floor is provided, plastic strips 2.5mm thick and 40mm deep shall be provided at the edge of sunken portion.

11.1.10 Where cast in situ terrazzo finish has been indicated in schedule of finishes drawing, terrazzo precast tiles flooring shall be provided as specified here in below.

11.1.11 Flooring indicated on drawings to be provided on RCC slab shall be laid after applying a coat of ement slurry at the rate of 2 Kg per square metre area.

11.1.12 Grinding and polishing of terrazzo shall be done by machine all as specified. In location where grinding and polishing cannot be done with machine, these shall be done by hand at the discretion of the Engineer-in-Charge. Wax polishing shall not be done to terrazzo floors of toilet WC's bath and kitchen etc.

11.1.13 In case of sunken floor the composition of flooring shall be provided over the concrete filling of mix (1:2).

11.1.14 Apron/ ramp of all building shall have flooring shown in schedule of finishes and as specified here-in-after. However, where no specific type of flooring has been indicated, floors shall be as that of adjoining floor to which ramp is connected and shall have in addition, chequered finish except where stone sett flooring indicated/ specified.

11.2 **TYPES AND COMPOSITION OF FLOORS**:

11.2.1 The flooring for all buildings shall be provided as shown on drawings for Schedule of finishes and specified hereinafter.

11.2.2 Base/ Sub base/ Sub floors for all types of floors shall be provided as per drawing for schedule of finishes and as specified below:-

Situation		**Composition**
(a) Ground floors	:	Unless specifically indicated otherwise, base/ sub base/ sub floor shall consist of following:- PCC (1:5:10) type E-2 (using 40mm graded stone aggregate) as indicated in drawings over rammed earth. In case thickness is not

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shown, it shall be 75mm thick (minimum) except in garages/repair bays, where it shall be 150mm thick.

(b) First floors : Topping layer as specified here-in-after on RCC slabs after applying neat cement slurry @ 2 Kgs of cement per Sqm of RCC slab.

11.2.3 Topping layer in different locations shall be provided over base/ sub base as indicated in Schedule of finishes to the following specification:-

(A)**CEMENT CONCRETE FLOORS (PCC FLOORING)**

(a) PCC (1:2:4) type B-1 (using 20mm graded stone aggregate) shall be provided where PCC floors are indicated in drawings. Thickness of PCC floors shall be as indicated therein. If thickness is not shown, it shall be 50mm thick finished even and smooth using extra cement except in garages & aprons where it shall be 100mm thick finished fair and even without using extra cement.

(b) Joints in PCC floor of garages, aprons shall be filled with bituminous sealing compound grade 'A'. Construction joints, expansion joints and dummy joints in buildings shall be provided all as shown in drawings No CEJZ/STD-6/2000 Sh1/1.

(B)**PRECAST TERRAZZO TILES FLOORING**

(a) The tiles shall be factory made of approved make. Size of terrazzo pre cast tiles shall be 250mm x 250mm x 20- 22 mm unless otherwise shown in drawings. In case of ramps/steps/stairs, terrazzo tiles shall be chequered.

(b) These shall be with white cement/ grey cement as indicated with or without pigment. Where indicated with white cement tiles shall be with 100% white cement and where indicated with grey cement it shall be with 100% grey cement. Tiles shall be jointed and pointed with the same cement. Where type of cement has not been indicated, it shall be with 100% grey cement. No pigment to be used unless otherwise indicated.

(c) Pre-cast terrazzo tiles shall be laid over a cement screed 15mm thick in cement mortar (1:3)

(C)**NON SKID CERAMIC TILES FLOORING**

(a) The ceramic tiles shall be of size as given in the schedule of finishes drawings, 7 to 9mm thick mat finish light coloured and printed pattern, nonskid of approved make. Ceramic tiles shall be joint less.

(b) Tiles shall be set and jointed in neat cement slurry and pointed in white cement with pigment to match with colour of tiles.

(c) The tiles shall be laid over a cement screed 10mm thick average in cement mortar (1:3) over 25mm thick PCC (1:2:4) type B-0 using 12.5mm graded stone aggregate. Ceramic tiles shall be joint less.

(D)**PCC Pavement (inter-locking) tiles flooring:** PCC pavement (interlocking) tiles flooring shall be provided all as per Sch of finishes drgs.

(E)**KOTA STONE FLOORING**

(a) The size of Kota stone slab shall be 560 x 560mm, 20-22mm thick, machine cut. In case of steps/ stair case, Kota stone shall be in one piece upto 1.50 metre length.

(b) Kota Stone slab shall be laid over 20mm thick screed in cement mortar (1:4), jointed and pointed with white Cement Mortar and pigment to match the colour of Kota stone and mirror polished.

(F)**MARBLE FLOORING**

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(a) The size of marble slab shall be 450mm x 600mm, 18-20mm thick, machine cut and wax polished. Marble shall be Makrana doogri Adanga white Marble.

(b) Marble slab shall be laid over 15mm thick screed in cement mortar (1:3), jointed and pointed with white Cement Mortar and pigment to match the colour of marble stone and polished as specified. In case of stairs/ steps marble used shall be in one piece upto 1.5mtr length.

(G) **PCC chequered tiles flooring**: The size of PCC chequered tiles shall be as indicated in Schedule of Finishes. In case the same is not indicated it shall be 300mm x 300mm x 25mm thick in PCC (1:2:4) type B-0 laid over 15mm thick screed in cement mortar (1:3), jointed and pointed with grey Cement Mortar as specified.

(H)**Vitrified Tile Flooring**

(a) The vitrified tiles shall be 9-10mm thick & of size as given in Schedule of finishes drawings. Tiles shall be light coloured printed pattern as approved by GE.

(b) Tiles shall be set and jointed in neat cement slurry and pointed in white cement with pigment to match with colour of tiles.

(c) The tiles shall be laid over a cement screed 15mm thick average in cement mortar (1:3) over 25mm thick PCC (1:2:4) type B-0 over 75mm thick PCC Nominal mix M-5 over earth work complete all as per Sch of finishes.

(J) **Baroda Green Marble:** Baroda Green Marble shall be provided to steps (risers, treads) & skirting of stair case and shall be of same lot and single piece shall be provided to each step. Marble shall be of uniform colour and laid over 20mm thick screed in cement mortar (1:4) jointed and pointed with white cement and pigment to match the colour of marble stone and polished as specified.

(K)**Acid proof tiles flooring**

(i) Where shown, acid proof tiles shall be of size 300 x 300mm, 20mm thick of approved manufacturers. Acid proof tiles shall be laid as per clause 5.49 of MES Schedule (Part-I) and shall be laid as per Drg No CEJZ/STD-322/16 sheet 1/1(R) and all as per manufacture instructions as indicated in Schedule of Finishes.

(ii) Shelves including sides and front edges in battery charging room shop shall be provided with acid proof tiles as specified above.

(L) **Machine Cut Machine polished Granite Stone Flooring/ Dado**

(i) Granite stone slab in flooring/ dado shall be single piece of selected quality, hard, sound dense & homogeneous in texture, free from defects & conforming to clause 13.12 of SSR Part-I. Thickness of slab shall be all as shown on drgs and if not it shall be 18 to 20 mm. Granite stone slab shall be machine cut machine polished (exposed surfaces only) and shall be provided as per locations shown in drawings. Colour of slab shall be 'Ruby Red' with 'Black' colour in border. Granite stone slab in flooring shall be set, jointed & pointed in neat cement slurry & shall be laid over 20mm thick bedding in CM 1:4 over concrete sub-base/ RCC slab. Joints shall be thin & nearly indistinguishable. In case of dado Granite stone slab shall be fixed over 10mm thick cement mortar (1:3), jointed & pointed in grey cement. The exposed surface shall be machine polished.

(ii) For platform Granite stone slab shall be in one piece of selected quality, hard, sound dense & homogeneous in texture, free from defects 7 conforming to clause 13.12 of SSR part-I and thickness 20 to 215 mm machine cut machine polished (exposed surfaces only) and shall be provided as per locations shown in drawings. Colour of slab shall be 'Ruby Red' or 'Black' as approved by GE. Slab shall be provided in a chase inside the wall at least 25mm deep and set, jointed & pointed in

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neat cement slurry to match with the colour of the slab. The edge exposed shall be bull nosed as directed by GE.

11.3 **SKIRTING AND DADO**

11.3.1 Skirting and dado shall be as shown in Sch of Finishes drawing for various buildings. Height of skirting and dado where not indicated in Sch of finishes shall generally be as under:-

(a)	Skirting in all location (except precast terrazzo tiles)	:	125mm
(b)	Dado in toilet with bath/ bathroom, toilet without bath, WHB/ Urinal, WC, Kitchen	:	2100mm

11.3.2 Skirting/ dado shall be returned in jambs, cills and over shelves etc.

11.3.3 Top of skirting/ dado junction with wall shall be finished to angle of 45^0 with cement mortar as that of the screed and finished smooth.

11.3.4 **Cement Skirting/ Dado**: Cement Skirting/ dado shall be provided in locations and specifications as indicated on drawings. Where not indicated in the drawings, 5mm thick setting coat 125mm high in cement mortar (1:2) over 15mm thick screed in cement mortar (1:3).

11.3.5 **Glazed/ Ceramic tile dado/ Skirting**: 7 to 8mm thick glazed (ceramic tiles) light coloured of size 200 x 300mm shall be provided on walls over 10mm thick screed in cement mortar (1:3) at locations shown in drawing. Tiles shall be set and jointed in neat cement slurry and pointed in white cement with pigment to match the colour of tiles. The size of tile shown in Schedule of Finishes if at variance shall be deemed to have been amended accordingly.

11.3.6 **Kota Stone skirting:** Kota stone skirting where shown in Schedule of Finishes shall be 15 to 16mm thick machine cut kota stone laid over 10mm cement mortar (1:3) screed on wall. It shall be set and jointed in neat cement slurry and pointed in white cement with pigment to match the colour of Kota stone and mirror polished.

11.3.7 **Marble skirting**: Marble stone skirting where shown in Schedule of Finishes shall be 15 to 16mm thick machine cut, polished and laid over 10mm cement mortar (1:3) screed on wall. Colour of marble shall be green. Marble stone shall be set and jointed in neat cement slurry and pointed in white cement with pigment to match the colour of marble stone.

11.3.8 **Acid proof tiles skirting/dado**: Where shown, acid proof tiles shall be of size 300 x 300mm, 8 to 9mm thick of approved manufacturers. Acid proof tiles shall be laid as per clause 5.48 of MES Schedule (Part-I) including bedding and jointing in chemical mortar as per manufacture instructions as indicated in Schedule of Finishes. Height of dado if not shown on drg shall be 1200mm.

11.3.9 **Vitrified Tile Skirting / dado** 9 to 10 mm thick vitrified tiles of coloured printed size 605 mm x605 mm pattern as appoved by GE and of size as given in schedule of finishes drawing shall be provided on walls over 10mm thick screed in cement mortar (1:3) at locations shown in drawing. Tiles shall be set and jointed in neat cement slurry and pointed in white cement with pigment to match the colour of tiles.

11.4 Irrespective of whatsoever has been shown on drawings, treads & risers of brick steps and stair case steps shall have the same finish as that of adjoining floor topping. In case of PCC topping laid over treads of brick steps, it shall be 30mm thick PCC (1:2:4) type B-1 and of chequered finish bull nosed. Angle iron nosing where shown shall be provided to treads of steps of stair case and verandah steps all as per shown on drawings. The size of angle iron shall be 35 x 35 x 5mm if not indicated in drawings.

11.5 Where floor topping in garages/ repair bays is not shown in schedule of finishes, this shall be considered as 100mm thick PCC (1:2:4) type B-1 with surface finished fair and even without using extra cement laid over 150mm thick PCC (1:5:10) type E-2 over well rammed earth filling including expansion, dummy and construction joints as specified. Joints shall be filled with bituminous sealing compound grade 'A'.

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11.6 **Plinth Protection**: Unless otherwise indicated, plinth protection where shown on drawings shall be 50mm thick PCC (1:3:6) type C-1 over 75mm thick (consolidated thickness) hard core of broken stone aggregate of not exceeding 63mm gauge over well rammed earth. Plinth protection shall be laid in (1:20) slope. The concrete shall be laid at a stretch not exceeding 3metre in length. Joint gap between adjoining slab, at corners and at junctions of walls shall not exceed 10mm in width and shall be sealed with mastic filling i.e. one part of bitumen 85/ 25 grade mixed with 3 part of sand. Top surface of concrete shall be finished even and smooth without using extra cement. Joints shall be provided at not more than 3 metre interval at corner and as junction of walls. The width of plinth protection shall be as shown on drawing for respective building/structure. Where width has not been indicated it shall be 75cm and toe of plinth protection shall be of size 50mm x 150mm.

11.7 **Water proofing treatment to sunken slabs**: Water proofing treatment to sunken floors of kitchen, toilets, laboratories, bath and WC's including adjacent portion in continuation of WC/Bath, kitchen such as lobby and the like shall be as under:-

(a) RCC Sunken Slabs

(i) The top surface of the sunken RCC slab shall be laid with cross slope as indicated in drgs towards the spouts. The min thickness of the RCC slab shall be as specified in the drg.

(ii) PCC (1:1½:3) fillets of 75mm radius at corners with 12.5mm graded agg shall be provided.

(iii) Plastering in cement mortar (1:3), 15mm thick with WPC on walls as well as on sunken floor finished even and smooth using extra cement.

(iv) GI pipe 40mm dia medium grade be inserted at the end of lateral slope projecting at least 15cm beyond the outer most projected part of the building below the drain pipe up to two storey construction and 25cm beyond two storey const.

(v) After doing the plaster, testing be carried out by ponding (for 72hours) the sunken portion before further treatment to the sunken slabs. Any leakage seepage observed shall be rectified.

(vi) All horizontal, vertical and slanted surfaces of sunken portion shall be provided with APP modified polymeric waterproofing membrane as under:-

(aa) Apply a coat of bitumen primer @ 0.30 lit per sqm.

(ab) Apply a coat of hot 85/25 penetration gde bitumen @ 1.20kg/Sqm.

(ac) Apply standard quality APP modified polymeric membrane 3mm thick over the bitumen coat. Joints to be touched hot and width of overlaps not to be less than 150mm. Other jointing details shall be same as specified in para 11.13 of MES SSR Part-I

(vii) All the joints of pipes and traps within the sunken portion shall be sealed properly by epoxy sealant.

(viii) All traps in sunken slabs to be enclosed with PCC (1:1½:3) minimum 15cm all around.

(ix) The sunken portion shall be filled with PCC (1:5:10) with brick aggregate after carrying out the required tests for CI pipes/ joints/ waterproofing treatment.

(b) **Guarantee for water proofing treatment**: - Refer clause 7.1.7 here-in-before.

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12 PLASTERING AND POINTING

12.1 General

12.1.1 External finish shall be taken 15cm below the ground level except where plinth protection/ramp and the like is provided in which case it shall be taken up to the bottom of the plinth protection/ramp.

12.1.2 Plaster/ pointing, skirting/ dado shall be returned to in jambs reveals and soffits of lintels/ windows cills etc.

12.1.3 All internal plastered /rendered surfaces shall be trowelled even and smooth with steel trowels without using extra cement. All plastered /rendered surfaces shall be finished fair and even.

12.1.4 Unless sand is specifically specified otherwise, sand for plastering shall be 50% fine sand and 50% coarse sand conforming to the samples approved by the GE except for sand faced plaster for which 100% coarse sand shall be used.

12.1.5 All corners, angles, junctions and risers shall be truly vertical or horizontal as the case may be and shall be carefully finished. Corners around jambs of opening and junction of walls shall be finished straight and square. 10mm wide groove at the junction of wall and RCC slabs internally and externally to entire thickness of wall plaster shall be provided. Also trowel groove of size 10mm x 6mm shall be provided at junction of wall and RCC columns or any other dissimilar materials e.g. wooden/steel chowkats etc.

12.1.6 Internal plaster wherever provided shall be above skirting/ dado. If skirting/ dado does not exist, then it shall be right from floor level.

12.2 Plastering

12.2.1 Mortar for dubbing out and rendering shall be of same type and mix. Dubbing out may be executed as separate coat or with the rendering coat. Lump sum quoted shall deem to include for any dubbing required and nothing extra shall be payable on this account.

12.2.2 The mix and thickness of cement plaster on internal and external surfaces shall be as shown in drawings/ specified elsewhere. If not shown in drawings/ specified elsewhere, the mix and thickness of plaster shall be as under:-

(a) Internal Plaster: Cement & sand mortar (1:6) -12mm thick in one coat.

(b) External Plaster: Cement & sand mortar (1:4) - 15mm thick in one coat.

(c) 5 mm thick cement plaster in CM 1:3 finished even and smooth without using extra cement over RCC ceiling/soffits of slab/RCC beam/ Chajja/ facia/ Roof Projection and other exposed surfaces of RCC/PCC all as specified

Notes:

(i) Thickness of plaster shall mean the thickness at the protrudest part.

(ii) Irrespective of whether indicated in drawing/ specified or not, mortar for external plaster shall be mixed with water proofing compound @ 3% by weight of cement or as per manufacturer's instructions whichever is higher. However, for the purpose of pricing the deviation, the quantity of water proofing compound shall be considered as 3% by weight of cement.

12.2.3 All exposed surfaces of beams columns, lintels, cills seismic bands and the like coming in conjunction with plastered surfaces shall be plastered in the same mortar as for adjoining wall and to the thickness required to bring them in the same plane as that of adjoining plaster.

12.2.4 The internal brick wall surfaces of cup boards and other built in fixture shall be plastered with 15mm thick cement sand mortar (1:4) mixed with water proofing compound as per manufacturer's instructions.

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PARTICULAR SPECIFICATIONS (CONTD…)

12.2.5 **Plaster groove at junction of wall/ beam/ column**: The details given in drawing No CEJZ/STD- 232/07 Sh 1/1 shall be followed.

12.3 **Pointing**: External surfaces wherever shown on drawing to be provided with pointing shall be faced with selected bricks. The pointing indicated on drawings shall be keyed pointing in cement and sand mortar (1:3) as specified in para 14.29.5.3 of MES Schedule (Part-I).

12.4 **Sand faced plaster**: Sand faced plaster where shown on drawings shall be provided over plastered surfaces (as specified for external plaster) all as per clause 14.21 of MES Schedule (Part-I). Plastered surfaces shall be kept rough to receive sand facing. Sand facing shall consist of one coat of cement and sand mortar (1:4), 5mm thick.

12.5 **Grit finish**: Grit finish where shown on drawings shall be provided all as per clause 14:23 (Dry Dash finish) of MES Schedule (Part-I) over a rough finish rendering coat of cement and sand mortar 1:3,15mm thick.

13. **WHITE/ COLOUR WASHING/ DISTEMPERING AND CEMENT BASE PAINT**

13.1 **White/ colour wash**: 3 coats of white wash or 2 coats of colour wash over a coat of white wash shall be provided on wall surfaces as indicated in drawings, all as specified in MES Schedule (Part-I). For white washing on ceiling adequate quantity of zinc oxide shall be added to lime wash for achieving white shade. Skirting and dado are not to be white/ colour washed.

13.2 Distemper in two coats over a coat of primer of clearcolle shall be provided as indicated on drawings all as specified in relevant clause of MES Schedule (Part-I) of make as given in Appendix 'B'.

13.3 **Cement base paint**: Where shown on drawings/schedule of finishes, external surfaces of walls shall be given two coats of cement base paint over a coat of primer in the manner as specified in relevant clause of MES Schedule (Part-I), of make as given in Appendix 'B'.

13.4 **Oil emulsion distemper**: Where indicated in schedule of finishes, two coats of oil emulsion distemper shall be applied on prepared surfaces over a coat of alkali resistance primer as specified in clause 15.14 of MES Schedule (Part-I).

13.5 **Plastic emulsion paint**: Where indicated in drawing(s), two coats of plastic emulsion paint over a coat of primer shall be applied on well prepared surfaces. Plastic emulsion paint shall conform to IS-5411 (Part-I)-1974 & (Part-II)-1972.

13.6 Before applying priming coat, under distemper, oil emulsion distemper and plastic emulsion paint, plastered surfaces shall be treated with chalk whitening.

14. **PAINTING**

14.1 All synthetic enamel paint, emulsion paint shall be of 1st quality manufactured by the standard firms of makes as per Appendix 'B'.

14.1.1 The contractor shall inform the GE within four weeks of the acceptance of the tender, the brand names of the manufacturers of paint proposed to be used in the works and submit sample thereof well in time and obtain prior written approval of the GE before their incorporation in the work.

14.1.2 The contractor shall when so required by GE produce certificate from the manufacturers or their representative to establish that the brands of paint purchased by the contractor from them satisfy the requirement of the relevant Indian Standard.

14.1.3 Paints for priming coat, under coat and finishing coat shall be of same manufacturer.

14.1.4 Tint of paint, if not mentioned in drawings/ Schedule of finishes, will be approved by the GE.

14.1.5 Where painting is indicated in schedule of finishes, it shall be done in 2 coats over one coat of appropriate primer unless otherwise specified here-in-after.

14.2 **Workmanship**

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PARTICULAR SPECIFICATIONS (CONTD…)

14.2.1 Irrespective of what is shown on the drawings or specified elsewhere, no treatment shall be given to reinforcement except the reinforcement to be used in overhead reservoir tank, galvanized steel work, aluminium work and PVC work, iron mongry, builders hardware and GI pipes etc. Steel reinforcement where found rusted shall, however, be given a coat of neat cement slurry.

14.2.2 All wood and wood based surfaces unless shown on drawings and specified elsewhere in the particular specification to be treated otherwise shall be prepared, knotted and given two coats (Under coat and finishing coat) of synthetic enamel paint over priming coat. However the bottom edges of door shutters need not be painted and shall be given a priming coat only. Laminated surfaces shall not be painted.

14.2.3 All surface of steel and iron work including exposed surfaces of pressed steel frames except reinforcement and galvanised surface or surfaces specified to be treated otherwise or specified to be left untreated shall be prepared and given two coats (under coat and finishing coat) of synthetic enamel paint over a priming coat. The primer shall be red oxide zinc chromate (ready mixed) conforming to IS-2074. Surface abutting with each other (Laps) shall have only priming coat before fixing.

14.2.4 All cast iron pipes and fittings other than those which are embedded in walls/ floors or underground shall be given two coats of black bituminous paint after erection in position. Where schedule of finishes shows black Japan/ black enamel paint on steel work, it shall be applied in two coats over a coat of primer.

14.2.5 Irrespective of what is indicated on drawings and specified else where, finishing coat and under coat shall be with synthetic enamel paint of one brand only.

14.3 **French polishing**: - French polish to wood work where ever shown on drawing shall be provided as per clause 17.7.4 of MES Schedule (Part-I).

14.4 **Aluminium paint**: - Where drawings show aluminium paint on surfaces of steel and iron work, the surfaces shall be prepared and given two coats of aluminium paint over a coat of primer (red oxide).

14.5 **Tarring**:

14.5.1 The backs of wooden and steel chowkats in contact with concrete/brick work/plaster etc and also wooden/ steel surfaces embedded in walls shall be given two coat of tar. Hold fast shall be given two coats of tar and sanded.

14.5.2 Unless otherwise specified in the particular specifications, portion of iron and steel members embedded in or in contact with brick work/ concrete and hold fasts/ lugs shall be treated with tar (One thick coat) and sanded before being built in. Surface of pressed steel frames and ends of steel windows in contact with PCC/ mastic filling shall also be tarred with two thick coats.

14.6 **Cement Slurry:** Portions of MS bolts, lugs, anchor bolts and anchoring other than anchor bolts etc embedded in concrete shall be treated with neat cement slurry.

14.7 **Plastic Emulsion Paint**

14.7.1 Plastic emulsion paint conforming to IS 5411 (Part-I)-latest verson in two coats over a coat of alkali resistant priming paint conforming to IS-109 – 1968 shall be provided where shown in schedule of finishes, all as specified in MES Schedule Part-I as per Clause 17.16. Skirting and dado are not to be painted.

14.8 **Acrylic Emulsion 100% exterior grade (Ante-fungal paint)**

APPLICATIONS

14.8.1 Old fungs/ moss/ algae affected surface on new or old surfaces, remove fungus growth if any antifungal treatment or with the help of available fungicide bleaching powder solution all as per Manufacturer's instruction. The surfaces shall be cleaned by wire brushing and washed with water before application of primer or paint.

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PARTICULAR SPECIFICATIONS (CONTD…)

14.8.2 Before application of primer for plastered surfaces, the surfaces shall be cleaned, made free of loose particles, dust, grease, chalk, fungs and mould. One coat of acrylic emulsion weather coat paint with water (1:1 by volume) as a self priming coat shall be applied as per manufacturer's instructions and as directed by Engineer-in-Charge.

14.8.3 The acrylic emulsion weather coat paint shall be applied by brush or roller. No stainer or colorants shall be used. The primer coat shall not be left without application of top coats for a long period of time.

14.8.4 Application of Acrylic emulsion weather coat paint. Two coats of acrylic emulsion weather coat paint thinned with 400 ml water per lit of paint shall be applied. The drying period between two coats shall be minimum 4 hours or as per manufacturer's instructions. The shade shall be as approved by GE. Finish of acrylic emulsion weather paint shall be smooth matt finish

14.8.5 The paint shall be as per manufacturer's original colour as available no mix of tint shall be made into original shades.

15. GLAZING TO DOORS/ WINDOWS AND VENTS (OTHER THAN ALUMINIUM DOORS AND WINDOWS)

15.1.1 The glazing shall be done with selected quality sheet glass conforming to IS 2835 unless otherwise specified in particular specifications here-in-after. All sheet glass shall be of good quality, free from sleeks, bubbles, smokiness, air holes and other defects.

15.1.2 Unless specified or shown in drawings, otherwise all glazing except for toilets shall be 3mm thick glass panes upto 0.5 square metre each pane and 4mm thick for panes exceeding 0.5 sqm each pane.

15.1.3 Glass mentioned here-in-after shall be fixed to door/ windows/ CSWs/ vents as shown in drawings. The provisions of glazing with beads shall be as specified in section 16 of MES Schedule (Part-I).

15.1.4 Pin head glass shall be 3mm thick and shall be provided in window, vents coming in lavatories, WC and in other locations indicated in drawings. Toilet glass shall be frosted.

15.1.5 The glass shall be fixed to wooden shutter with wooden beads shown on drawings and as specified in clause 16.9.2 of MES Schedule (Part-I).

15.1.6 The contractor shall produce voucher/certificates from suppliers/manufactures to the GE as proof that the putty conforms to IS-419.

15.1.7 The glass shall be fixed to steel windows/ventilator with glazing clip as specified in clause 16.10.1 of MES SSR 2009 (Part-I) unless otherwise specified.

16. BUILT IN FURNITURE, SUNDRY AND MISCELLANEOUS ITEMS OF BUILDINGS COVERED UNDER SCHEDULE 'A' SECTION-I

Cost of the following built in furniture such as cup boards, safe chest, notice/ display boards, locker steel and Writing table with book shelf and following sundry and miscellaneous items shall be deemed to be included in the lump sum quoted by the contractor for schedule 'A' Part-I.

16.1 **GENERAL**: All fittings and fixture shown on drawings shall be provided and their cost is deemed to be included in the lump sum cost of buildings in Schedule `A' Part-I.

16.2 **SOAP NICHE**: Niches shall be provided in accordance with the details as shown in the drawings. These shall be finished with white glazed tiles same as specified here in before for dado.

16.3 **Telephone Niche**: This shall be provided all as shown in drawings. Wooden surfaces other than prefabricated, shall be painted with two coats of synthetic enamel paint over a coat of primer.

16.4 **Crumple Joints**

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PARTICULAR SPECIFICATIONS (CONTD…)

(a) Metal cradle shall be made to shape as shown in drawings. It shall be made of 0.63mm PGI sheet class 3.

(b) Bituminous joints filler/ bituminous compound shall confirm to IS-1838 and shall be Grade 'A'.

(c) Unless otherwise shown on drawings, the gap width of crumple joint wherever shown on drawings shall be provided as under:-

(i)	Single storey building	-	25mm
(ii)	Double storey building	-	40mm
(iii)	Tripple storey building	-	60mm
(iv)	Four Storey building	-	80mm

The overall dimension of the building with increase in width of gap shall be amended accordingly.

16.5 **Pelmet boxes**: Pelmet boxes shall be provided in locations and to details as shown on drawings. The box shall be of 18 to 19mm thick pre-laminated particle board. Curtain rod shall be 19mm dia, 16 gauge wall thickness mild steel chromium plated pipe with steel bracket chromium plated. Stiffener shall be provided as shown on drawing @ 1.00 metre c/c to hold the curtain rod. All exposed surfaces of wooden members of pelmet box shall be finished with French polish.

16.6 **Drapery Rods:** Drapery rod shall be provided with PVC decorative finials of superior quality on both ends at locations all as mentioned in the relevant drawing. However, where no specific location has been specified, it shall be provided to all doors, windows and openings except in toilets, bath, WC, store, garage & repair bays as per typical drawings. Drapery rods shall be of high strength aluminium rod, powder coated having thickness 40-60 micron. For officers Mess & Adm block, outer dia of drapery rod shall be 28mm and inner dia shall be 24mm. In all other bldgs, the outer dia of drapery rod shall be 19-20mm & inner dia shall be 16mm with plastic rings made out of ABS plastic. Bracket for fixing of drapery rods shall be of GI sheet 1.6mm thick powder coated of same finish as of drapery rods. In case the length of drapery rods exceeds 1.80m, an additional bracket at middle of span be provided to avoid sagging.

16.7 **Stainless steel railing for stair case/ balconies/ lobby**: Where shown on drgs, stainless steel railing in stair case/balcony or in any other position shall be provided as per details given in drgs. Stainless steel sections for railing such as pipe, square bars & flats shall be jointed to each other as per manufacturer's instructions. Balusters of railing shall be grouted in cement mortar (1:2).

16.7.1 **RCC railing/ parapet**: RCC railing/ parapets where shown on drgs shall be provided with RCC M-25 (design mix) using 20mm graded stone aggregate. Reinforcement shall be provided all as shown in respective drg. All exposed surfaces of railing/ parapet shall be plastered with 5mm thick cement mortar (1:3) and plastered surface shall be finished to the specifications as that of adjoining wall surface or as per schedule of finish.

16.8 **Plate Rack**: Plate racks shall be provided as shown on drgs. The size of plate racks shall be 900 x 750 x 250mm. The thickness of stainless steel sheet shall be 1.00mm and grade of sheet shall be 304 AISI. The make of stainless steel plate rack shall be as given in Appendix 'B'.

16.9 **RCC jalli/ brick jalli:**

16.9.1 RCC jalli shall be provided where shown on drgs. RCC jalli shall be pre-cast RCC (1 cement: 2 coarse sand: 1 stone aggregate of 6mm nominal size). The thickness of jalli shall be as shown in drgs and reinforced with 6mm mild steel bars and 3mm dia MS wire around the hollow space of jalli. Pre-cast jalli shall be set and jointed in cement mortar (1:3). Exposed surfaces of jalli shall be finished fare & even. Surface shall be finished to the specifications as that of adjoining wall surface or as per schedule of finish.

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PARTICULAR SPECIFICATIONS (CONTD…)

16.9.2 **Brick jalli**: Brick jalli shall be provided where shown on drgs**.** Type of brick jalli if not indicated on drg, shall be type 'C'. Bricks shall be set & jointed in cement mortar (1:3)

16.10 **Cooler Rest:** Cooler rest for desert cooler, wherever indicated on drawings, shall be provided as shown on typical drawings. Size of cooler rest shall be 750mm x 600mm, 450mm high. All mild steel members shall be jointed with running welding. All exposed mild steel surfaces shall be painted with two coats of synthetic enamel paint over a coat of red oxide primer.

16.11 & 16.12 Blank

16.13 **Prelaminated Particle board**:- Prelaminated Particle board of grade BWP where ever shown on drawings shall be of exterior grade prelaminated one side with decorative choice lamination and other side balancing white lamination. Where both the surface are exposed, particle board shall be with both sides decorative choice lamination.

16.14 **Veneered particle board**:- Veneered particle board where ever shown on drawings shall be of commercial type and as per clause 12.14 of MES Schedule (Part-I).

16.15 Blank

16.16 **Wall Paneling & False Ceiling, Structural Glazing, Space frame, Ticket Counter, Main & Back Curtains, Stage Wings, Frills, Mandapi and Sign Board:** Wall Paneling, False Ceiling, structural Glazing, Space frame, Ticket Counter, main & back curtains, stage wings, frills, mandapi and sign board where shown on drgs, shall be provided as per details shown in drawings.

16.17 **Water storage tanks (service tanks)**

16.17.1 The type and capacity of water storage tanks (service tanks) shall be as indicated in drawings. In case the type and/ or capacity of these tanks are not indicated in the drawings, the same shall be HDPE tank and 500 litres capacity respectively.

16.17.2 **HDPE/ PVC Service tank**: These shall be (ISI marked) of standard makes listed in Appendix 'B-1' of cylindrical vertical type rotational moulded (conforming to IS-12701) with closed top. Following accessories shall be provided by the contractor to each tank, the cost of which shall be deemed to be included in the lump sum cost of the building:-

(a) 25mm dia GI washout pipe 300mm long (medium grade) with GI plug.

(b) 25mm dia overflow pipe upto a length to bring overflow water down to the finished roof level and then to the nearest sump on the roof, fitted with brass anti-mosquito rose coupling at the end.

(c) Ball brass valve to match with inlet pipe with brass rod and polythene float ball fly nut fixed to tanks. Ball valve shall be high pressure type and rod shall be of brass all as conforming to IS-1703 and clause 18.19 of SSR Part-I. Floats shall be PVC heavy duty.

(d) All inlet, outlet, overflow and washout pipes shall be fixed to tank as required and shown on drawing.

(e) Irrespective of whatever drawing has been referred in main/structural drawings the HDPE service tanks shall be provided on the roof slabs all as shown on drawing No. CE JZ-STD-270/09 Sheet 1/1 and as specified hereunder:-

(i) RCC slab type A-1 (M-25 design mix) of required thickness as shown on drawing.

(ii) PCC bed plate/bed block shall be provided all as shown on drawing.

(iii) Reinforcement all as shown on drawing.

(iv) Flat iron in vertical and rings shall be as shown on the drawings and shall be painted as specified for steel work.

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PARTICULAR SPECIFICATIONS (CONTD…)

(v) All brick work shall be built in cement mortar (1:4). Internal and external surfaces of wall shall be plastered in cement mortar (1:4), 10mm thick. Plastered surface shall be given two coats of cement base paint over a coat of primer after preparation of surface.

16.18 **RCC Water Storage Tank** : RCC water storage tank shall be constructed as shown in drawings and as per following specifications :-

(a)	Mix of concrete	-	RCC M-30 (Design Mix)
(b)	Finishes	-	Internal surfaces of tanks (except soffit of top slab and cover) shall be plastered with 15mm thick cement mortar (1:3) mixed with water proofing compound as per manufacturer's instructions. External faces of tanks shall be given 2 coats of cement based paint over one coat of as specified

Notes :

1. Suitable arrangement for water supply connections as decided by the Engineer-in-Charge shall be made at the time of casting of concrete.
2. Suitable arrangement for locking of manholes covers of RCC tanks shall be made as shown in drawings or as directed.
3. Water tank shall be leak proof.

16.18.1 The rates quoted by the contractor for a building provided with RCC water storage tank shall also be deemed to be included 20mm bore GI light grade over flow pipe upto the mouth of the nearest rain water pipe or nearest spout or 300mm in length beyond the outer face of RCC roof slab whichever is more.

16.19 to 16.22 - BLANK

16.23 **RCC platform/ preparation shelf/ working table/ cooking platform/ service counter in kitchen:** RCC platform/ preparation shelves/working table /cooking platform/service counter in kitchen in various buildings shall be provided as per details given in the drgs. Top finish to these platforms/shelves shall be of 18-20mm thick polished black granite stone (machine cut) laid over 10mm thick screed base of cement mortar (1:3), jointed with gray cement slurry with pigment to match the shade of slab. Front edging of RCC slab shall also be provided with 16mm thick black granite stone. 20mm dia hole shall be provided in cooking platform for gas pipe line.

16.24 **Mirror (Full size)**: This shall be provided all as shown on drawing with the details as per the Mirror with shelf. Unless otherwise shown on drawing, size of mirror full size shall be considered as 600mm x 1200mm. Mirror of size 450mm x 600mm shall be provided where single wash hand basin is shown on drawings. Where 02 or more wash hand basins shown on same wall in the drawings, the mirror shall be of height 600mm and of full span between the outer edges of 1st & last wash hand basin on the same wall.

16.25 **Key Box**:

(a) This shall be provided all as shown on drawing.

(b) All wood work shall be of 1st class hard wood (Teak) and surfaces exposed to view French polished.

16.26 **Saucer Drain**:- Saucer drain shall be as shown on the drawings. Mix of concrete for saucer drain shall be as of PCC topping layer of adjoining hard standing/ apron.

16.27 15mm jet connection alongwith PVC pipe shall to be provided to each EWC/ Anglo Indian WC and the cost is deemed to be included in the lump sum quoted for the respective buildings.

16.28 **Switch Boxes & Meter Boxes:** Irrespective of what is shown on drgs, switch boxes & meter boxes of sizes as given in drgs shall be provided in all buildings as per details given. Switch/ meter boxes shall be fabricated out of 16 gauge mild steel sheet and fixed in wall nitch. Fittings

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PARTICULAR SPECIFICATIONS (CONTD…)

& other items shall be as shown in the drgs. Meter box shall be provided with 4mm thick glass of size 250 x100mm glazing. Opening for inlet & outlet conduits shall be provided in the box. All steel surfaces shall be spray painted with two coats of synthetic paint over a coat of red oxide primer before fixing in the wall.

16.32 **Key Box**: Where shown key box shall be provided as per details given the drgs. All wood work shall be in 2nd class hard wood (hollock). Shutters for key box shall be of 25mm thick glazed shutter of 2nd class hard wood. Glass for glazing shall be 4 mm thick. Iron mongry & other fittings such as hinges, hasp & staple, wooden knob & hooks for keys shall be as given in drgs. All wooden surfaces shall be painted with two coats of synthetic enamel paint over a coat of pink primer.

16.33 **BLANK**

17. SANITARY AND TOILET FITTINGS

17.1. General

17.1.1 All the sanitary and toilet fittings and fixtures shall be of 1st quality.

17.1.2 Irrespective of whatever is shown on drawings, sanitary fittings in auditorium (Sch 'A' Part-I Item No 01) shall be provided here-in-after. In other bldgs normal sanitary fittings can be provided .

17.1.3 All waste pipes, except of sinks, and fitting upto floors/Nahani trap shall be galvanised steel tubing medium grade conforming to IS-1239 (Part-II).

17.1.4 Flush pipe and socket of flushing rim of WC shall be jointed with white and red led cement (White and red led in equal portion by weight) and linseed oil added to form paste.

17.1.5 'P' or 'S' trap shall be of cast iron and jointed to WC pan with cement joints as specified in clause 18.48.5 of MES Schedule.

17.1.6 The sizes given here-in-after are approximate sizes. The sizes of sanitary fittings to be provided shall be the nearest size as per manufacturers' catalogue as approved by the GE.

17.1.7 Where flushing cistern cannot be fixed in back wall due to window/ lintel as per sanitary plan, the same shall be fixed in the side wall with additional bend, the cost of which shall be deemed to be included in the lump sum cost of buildings given in Schedule 'A' section-I.

17.2. SANITARY FITTINGS

17.2.1 **WATER CLOSET (ORISSA PATTERN):** Unless otherwise shown on drawings Water closet (Orrisa pattern) shall conform to IS-2556 (Part-III) and shall be of pattern long pan, size 580mm x 440mm long, provided with 'P' or 'S' trap for ground floor and with long 'P' or 'S' trap for 1st floor and subsequent floor. Length of the arm of the trap will be sufficient to ensure that there is no other joint except the joint with WC and the joint outside the wall with soil waste pipe and also the following fittings :-

(a) PVC low level flushing cistern ISI marked 10 litres discharge capacity fixed over angle iron bracket/ with screws.

(b) PVC flush pipe 40 mm dia as per clause 18.35 of MES Schedule (Part-I).

(c) The pan shall be set in the cement concrete or lime concrete (1:2) at least 15cm around and finished just below the rim to receive the specified thickness of floor finish.

17.2.2 **WASH HAND BASIN**: The Wash Hand Basin shall be of size 55cm x 40cm vitreous glazed white (without pedestal). It shall be provided with 32mm dia CP waste fitting, 32mm dia CP bottle trap connected to 32mm dia medium grade GI waste pipe upto floor trap to be concealed in wall by cutting chase of suitable size. WHB to be supported on a pair of angle iron (40 x 40 x 6mm) brackets of suitable length, made to shape, painted white, embedded in walls in cement concrete (1:2:4) type B-1 of size 11.5cm x 11.5cm x 11.5cm. One 15mm pillar tap shall be provided with each WHB.

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PARTICULAR SPECIFICATIONS (CONTD…)

17.2.3 **Urinals**: Type of urinals shall be all as shown on drawings. In case not shown in the drawing, it shall be half stall type of vitreous China white fitted with brass chromium plated spreader. Irrespective of whatsoever has been specified elsewhere in these particular specifications or shown in drawings, each urinal shall be provided with 15mm bore brass chromium plated half turn valve.

17.2.4 **Urinal Partitions**: The type & size of urinal partitions shall be as shown in the drawings. In case it is not shown in the drawings, these shall be RCC Urinal Partitions with finish as per dado. The RCC partitions shall be made of RCC M-25 (design mix). Reinforcement shall be all as shown in the drawing of the RCC partition wall.

17.2.5 Waste pipe of urinals shall be extended upto floor trap. The waste pipe shall be HDPE 32mm bore complete.

17.2.6 **Toilet paper holder**: - Irrespective of whether indicated or not, one toilet paper holder vitreous china box type shall be provided with each wash down water closet (Pedestal pattern).

17.2.7 **GLASS TRAY**: Glass tray shall be provided on each WHB and shall consist of glass shelf placed on anodised aluminium angle frame fixed with brass CP screws to plugs in the wall. The size of glass shelf shall be 60 x 12cm and glass for shelf shall 5.5mm thick with edges round off.

17.2.8 **TOWEL RAIL**: Towel rails where shown on drgs shall be provided. It shall be of brass CP 20mm dia tubular rail 60cm long with end brackets. Wall thickness of towel rail shall be 1.6mm. It shall be fixed on wall with brass CP screws on PVC rawl plugs.

17.2.9 **MIRROR:** Unless otherwise shown of drgs mirror shall be provided over WHB all as shown on drgs.The mirror shall be swivel mirror. It shall be polished sheet glass of thickness 5.5mm. It shall be provided with anodized aluminium angle frame of size as required with 6 mm thick PVC sheet backing. Mirror shall be fixed to walls all as per directed by GE.

17.3 **Polycarbonate roofing sheets** : Supply and fixing 3.0 mm thick polycarbonate translucent corrugated roof sheets, matching with the profile of galvalume roof sheeting, highly resistant to corrosion, having a co-extruded UV protection layer on both side with Tensile strength 72MPA-ASTM D638, Flexural strength +92 MPA-ASTM D-790 and minimum light transmission percentage should be not less than 80%, maximum heat transmission should not be greater than 70%, clear in colour and all as specified, directed and approved by GE.

17.4 Structural glazing including fixing arrangement when shown or drgs shall be provided as per manufacturer's instructions.

18 **PLUMBING**

18.1 **GENERAL**

18.1 Irrespective of whatever mentioned elsewhere/shown on drgs, plumbing work shall be carried out as under and as specified in clauses 18.13 to 18.27A of MES Schedule 2009(Part I) Specifications.

18.2. **PVC(SWR) PIPES AND FITTINGS**

PVC(SWR) pipes and fittings shall be UPVC(SWR) and shall conform to IS 13592 as under:

For use in ventilation pipe work and rain water specification : Type 'A'

For use in soil and waste discharge systems : Type 'B'

18.3 **SOIL/WASTE/VENT PIPE/FITTINGS/ACCESSORIES:** These shall be UPVC conforming to IS. All the pipes and fittings shall have ISI certification mark.

Irrespective of what is shown on drawing size of soil pipe/waste pipe at different locations shall be as under:-

(a)	WC to vertical stack	110mm dia
(b)	Nahani trap to floor trap/nahani trap to gully trap	75mm dia

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PARTICULAR SPECIFICATIONS (CONTD…)

(c)	Soil pipe in vertical stack and upto first manhole	110mm dia (separate pipe for each toilet).
(d)	Waste pipe in vertical stack and upto gully tarp	75mm dia
(e)	Vent pipe with PVC (SWR) slotted cowl	110mm dia
(f)	Waste pipe gully trap to first manhole	110mm dia

18.4 **JOINTING:** All pipes and fittings shall be jointed as specified in clause 18.52 of MES Schedule 2009 Part-I Specifications.

18.5 **FIXING OF PIPES TO WALLS:** Pipes and fittings shall be fixed to wall all as specified in Clause No 18.67.7A.1 of MES Schedule 2009 Part-I Specifications.

18.5.1 Soil pipes in vertical stacks shall be extended above roof as vent pipe. Vent pipe shall be provided with slotted vent cowl on top with mosquito net. Vent pipe shall be extended above, such that top of vent cowl extended is 1200mm above RCC roof/sheet roof. Vent pipe shall be provided as specified above whether indicated on drawing or not.

18.6 **NAHANI/FLOOR TRAPS:** Nahani /floor traps shall be provided in situations as shown on drawings. These shall conform to IS. Floor traps shall be provided with CP steel grating. Nahani trap/floor traps shall be of UPVC.

Note: Where Nahani/floor traps of 22.5cms depth cannot be accommodated in sunken floor, a 300mmx300mm portion of the RCC slab or portion of size as indicated in drawings shall be sunken to the extent it accommodates the Nahani trap without any additional cost.

18.7 **SHORTER LENGTHS:** Except for WC connections, the contractor may use pipe pieces without sockets in shorter lengths (less than one pipe length) if approved by the GE and connect these to pipes fitting with double sockets/collars, including additional joints as specified above without extra cost to the Government.

18.8 **GULLY TRAPS**

(a) Where shown gully traps shall be of UPVC complying with the requirements of IS.

(b) Gully traps shall be square mouthed, 110mm size, type ‘P’ set in PCC (1:3:6) type C-2, block measuring 45cms square, thickness of bed concrete shall be 10cm. Jointing to drain pipe shall be done in cement solvent.

(c) Cast iron perforated grating shall be 110mmx110mm bituminous coated and fixed as directed by the Engineer-in-Charge.

(d) PCC (1:2:4) type B-1 Kerb and RCC cover slabs shall be provided all as directed by the Engineer-in-Charge.

18.9 **TESTING:** All soil waste and vent pipes shall be tested as specified in clauses 18.79.1 and 18.79.5 of MES Schedule 2009 Part-I Specifications. Record of testing shall be maintained separately for each building.

Note: The work of plumbing as specified herein before and as shown on drawings shall be for the complete plumbing stacks of all the buildings under this contract in all respects. Nothing extra shall be payable if any additional items, other than those shown on drawings are required to complete the stack. The lump sum quoted for Schedule ‘A’ Part-I is deemed to include provision of waste pipe upto and including gully trap to 1st manhole and soil pipe up to a distance of 2 metres from external face of wall but excluding first manhole. In case first manhole is located at distance other than 2 Metres, the length of pipe provided shall be adjusted through DO.

19 **INTERNAL ELECTRIFICATION**: Internal electrification shall be provided as given in Schedule ‘A’ & in BOQ.

Contd…

PARTICULAR SPECIFICATIONS (CONTD…)

19.1 General: Refer Para 19.2 of MES Schedule (Part-I).

19.2 No price adjustment in prices shall be made on account of change in location of fittings and accessories than that shown on drawings.

19.3 Material and workmanship of fittings and fixtures shall be all as given in MES Schedule (Part-I) and as specified in Schedule 'A'.

19.4 Terminal points of light and power plugs (socket outlets) switches, regulators, fittings, etc. shall terminate in recessed mild steel boxes fixed flush to the wall, top covered with 3mm thick plastic laminated bakelite sheet instead of wooden blocks.

19.5 **Earthing**: Earthing shall be provided all as per Plate No. 3 of MES Schedule (Part-I) using plate electrode.

Note: PCC/ Masonry pit to be constructed shall be one metre away from the outer edge of the edge of the earth pit. Pit cover shall be of 50mm thickness RCC and of size suitable to fully cover the PCC pit opening.

19.6 **Testing**: On completion of the work the following test shall be carried out:-

(a) Insulation resistance test overall and sectional. This shall be carried out between each face and neutral and between phase and earth.

(b) Polarity test of switches shall be carried out to ascertain that each switch has been fixed on phase wire.

(c) Earthing continuity test: This test shall be carried out as per clause 19.146.3 on serial page No. 19-39 of MES Schedule (Part-I). The result shall not be more than one ohm.

(d) All test carried out shall be recorded in triplicate and signed both by the contractor and Engineer-in-charge and shall be kept on record.

19.7 Records: On completion of work following record in triplicate shall be prepared by the contractor, singed by contractor and Engineer-in-charge and handed over to Engineer-in-charge:-

(a) Wiring circuit diagram for each building.

(b) Insulation resistance test for each circuit and over all.

(c) Earth continuity test.

(d) Wiring test Sheet.

20 **INTERNAL WATER SUPPLY**: Internal water supply shall be provided as given in Schedule 'A' & in BOQ.

20.1 **General requirements**: Refer Para 18.40, 18.41 of MES Schedule (Part-I). General layout of water supply work is shown in drawing. The exact position of water supply line and fittings shall be as directed by Engineer-in-charge. All internal water supply pipe line shall concealed in imternal surface.

20.2 **Excavation and preparation of trenches:** Refer specifications here-in-before and para 18.42 of MES Schedule (Part-I).

20.3 **Laying of GI pipe**: Refer para 18.50, 18.51 and 18.56 of MES Schedule (Part-I). Unions shall be provided at suitable places as directed by Engineer-in-charge so that long lengths of pipes are not disturbed during cleaning, changing/ repair etc. Uncovered threaded portion of pipes shall be painted with approved paint.

20.4 The contractor shall use proper bends/ Elbows/ Tees at turning/ corners etc. Bending of pipe is not permitted.

20.5 The contractor shall provide screwed plug to all open ends of pipes and fittings at the end of day work and at time when work is stopped.

20.6 Weight of chromium-plated adopter for connection of polyethylene pipe/ GI pipe shall be not less than 40 grams each.

Contd…

PARTICULAR SPECIFICATIONS (CONTD…)

20.7 **Bib taps and stop valve**: Refer para 18.14, 18.15 and 18.18 of MES Schedule (Part-I). The handles shall be crutch type. Handle and spindles may be cast brass, washers to be used for this purpose shall conform to para 18.18 of MES Schedule (Part-I).

20.8 **Testing**: Refer para 18.50.4 and 18.55 of MES Schedule (Part-I).

20.9 **Galvanized Iron pipes**: Galvanized iron pipes shall be medium grade complying with IS: 1239 (Part-I). GI fittings shall comply with IS-1239 (Part-II) butt welded or seamless. Fittings not covered by IS-1239 (Part-I to X) shall be of brands as approved by the GE. These fittings shall be galvanized.

20.10 **Ball Valve**: Refer clause 18.14 of MES Schedule (Part-I).

20.11 **PVC connections**: PVC pipes for PVC connection shall be heavy duty 45cm long with brass chromium plated coupling nuts on both ends.

20.12 **Pillar tap**: Refer clause 18.16, 18.16.2 &18.16.3 of MES Schedule (Part-I). Pillar taps shall be of brass chromium plated and shall confirm to IS-1795.

20.13 **Fancy pillar tap**: Refer clause18.16, 18.16.2 &18.16.3 of MES Schedule (Part-I). They shall be of cast copper alloy & shall confirm to IS-8934.

20.14 **Shower rose**: Refer clause 18.106.1 of MES Schedule (Part-I). Shower rose shall be chromium plated brass of diameter and inlet size specified in respective item of Schedule 'A'. Shower rose shall be swivel joint type with shower arm of adequate length.

20.15 **Jet spray**: Refer clause 18.107 & 18.113 of MES Schedule (Part-I).

21. **SEWAGE DISPOSAL:** The work of sewage disposal shall be provided as described in Schedule 'A' & in BOQ and specified in these specifications.

21.1 **General**: Specification of various trades e.g. excavation earth work, concrete, brick work, steel and iron work, plastering and pointing etc., required for sewage disposal works shall be as already given here-in-before under respective trades with modifications, amplification, additions etc., as given here-in-after and/ or in Schedule 'A' and as directed by Engineer-in-charge.

21.2 Excavation in trenches for sewer shall be allowed to the extent of authorised width as specified in para 3.2.3 of MES Schedule (Part-I)I or that actually excavated whichever is less and shall be measured and paid accordingly.

21.2.1 Beds of trenches shall be watered and well rammed and any depression thus formed shall be filled with approved earth to the required level and slopes as directed by Engineer-in-charge.

21.2.2 Refilling of trenches shall be done as specified in para 3.20 of MES Schedule (Part-I). Refilling of trenches on the top and around the pipes upto 45cm from the crown of the pipe or from top of the concrete encasing shall be done with selected approved earth only in layers not exceeding 25cm in thickness. The balance of the trenches may be filled up with mixture of earth and stone gravel/ boulders in layers not exceeding 25cm.

21.3 SGSW pipes and RCC pipes shall be laid and jointed as specified. Where indicated, these pipes shall be laid on PCC beds as mentioned laid to falls including packing under and haunching against the sides of the pipes after they are laid tested complete all as specified. Thickness and width of PCC beds, packing, haunching etc, shall be all as mentioned in MES Schedule (Part-I). Refer Para 18.28, 18.68 to 18.70 & 18.70.1 of MES Schedule (Part-I).

21.4 **Concrete**

21.4.1 Mix and grade of concrete shall be as specified in respective item of Schedule 'A' for sewage disposal. Thickness and width of PCC bedding, packing, surrounding and haunching for SGSW pipes and RCC pipes shall be all as mentioned in MES Schedule (Part-I).

21.5 **Brick Work**

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PARTICULAR SPECIFICATIONS (CONTD…)

21.5.1 (i) Refer para 5.6.1 to 5.6.9 of MES Schedule (Part-I). The bricks shall have minimum compressive strength of 75 Kg/Sqcm and shall be burnt clay bricks which are locally best available as per sample kept in GE office and water absorption of bricks shall not exceed 20% (Twenty Percent). Sampling and testing of bricks shall be carried out as per IS-5454 (1998). Brick and brick tiles shall be old size brick and old size tiles as mentioned in Para 5.6.3 MES Schedule (Part-I). Thickness of brick tiles shall be 40 mm.

(ii) In case of deviation the brick work shall be priced at appropriates rate for sub class 'B' bricks as given in MES SSR irrespective of the fact that bricks of minimum compressive strength of 75 kg per sqcm shall be/have been used in the work.

(iii) The bricks shall be soaked in water before incorporation as mentioned in Clause 5.22 of MES Schedule (Part-I).

21.6 **Steel work**: MS steps as shown on drawings shall be provided in manholes exceeding 60cm depth.

21.7 **Plastering and pointing**

21.7.1 Internal surfaces of brick work and PCC shall have 15mm plaster in cement mortar (1:4) water proofed by adding approved water proofing compound. The quantity of water proofing compound shall be as per manufacturer's instructions or 3% by weight of cement whichever more. The plaster shall be finished even and smooth using steel trowel.

21.8 **Painting**

21.8.1 All steel and iron work such as hold fasts, steps shall be treated with 2 coats of coal tar/ Black paint conforming to IS-280 of 1961.

21.9. **Manhole covers and frame**

21.9.1 Manhole covers with frames shall be provided all as per details under relevant section of Schedule 'A'.

21.10 **Testing**

21.10.1 Sewers shall be tested by water test as specified in para 18.79 of MES Schedule (Part-I).

21.10.2 Manholes shall be tested for water tightness as directed by Engineer-in-charge.

21.10.3 Record of testing shall be maintained as specified in para 18.79.5 of MES Schedule (Part-I).

21.10.4 Cost of testing as specified above shall be deemed to have been included in the rates/amount quoted by the contractor and nothing extra shall be paid for carrying out test. If any pipe burst during testing the same shall be made good by replacement by the contractor without any extra cost to the Govt.

21.10.5 **Concrete Pipes**: Refer clause No 18.29 of MES Schedule (Part-I). Reinforced concrete pipes for drain and culverts shall be non-pressure type class NP-2 and shall confirm to IS-458. Laying & jointing of concrete pipes shall be carried out as specified in clause 18.74 of MES Schedule (Part-I).

22 TO 24. **BLANK**

25. **EXTERNAL WATER SUPPLY**: External water supply shall be provided as given in Sch 'A'.

25.1 **General:** All works shall conform to the best method of modern practice and shall be executed by the fully qualified plumber/ fitter etc. the evidence of their qualification shall be produced by the contractor on demand by GE.

25.2 **Scope of Work**: Work under this contract relates to external water supply as per details in Schedule 'A' and described in these particular specifications.

25.3 **Excavation and Earth Work**

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PARTICULAR SPECIFICATIONS (CONTD…)

25.3.1 Trenches for pipes shall be excavated to gradient as directed by Engineer-in-charge at site. Minimum earth cushion over the crown of the pipe shall be as directed by the Engineer-in-charge.

25.3.2 The excavation for pipe line in trenches shall be restricted to the authorised width as defined in MES SSR Part-II and these shall be measured accordingly. Nothing extra will however be paid to the contractor in addition to the authorised width for working space if required for laying water mains and pipes.

25.3.3 Any additional width/depth of excavation made, if any, for pipe fitting in excess of required width/depth, shall be made good by the contractor in concrete as directed by Engineer-in-charge without any extra cost to the Govt.

25.3.4 Care shall be taken to keep this trenches/excavation free from water during the work. All water which may accumulate from rains or other cause shall be bailed or plumped out or otherwise removed. The tendered rates shall be deemed to include for pumping and/or bailing out of water as necessary. No claims what-so-ever will be entertained on this account.

25.3.5 Bottom surface of the trenches for pipe shall be formed to level/falls all as directed by the Engineer-in-charge.

25.3.6 All excavated earth shall be deposited at least one metre away from the edge of trenches.

25.3.7 Excavated earth from trenches (as approved) shall be allowed for refilling and any surplus earth shall be removed to a distance not exceeding 50 metres, deposited, spread and leveled to the satisfaction of the Engineer-in-Charge.

25.3.8 All excavation (except rough excavation) shall be dug to the exact dimensions and profile as directed by Engineer-in-charge.

25.3.9 When excavations are required across the roads, half the width of road shall be dug at time and proper sign board, lights etc shall be displaced and watchmen posted to prevent accident as directed by Engineer-in-charge.

25.3.10 No joints shall be covered up with earth till the pipe line has been tested under pressure, but certain lengths of the pipe line may be covered up if specifically permitted in writing by Engineer-in-charge for the purpose of ensuring safety of persons and to allow the traffic etc.

25.3.11 Returning filling in trenches shall be carried out in layers not exceeding 25cm thick and well ramming without the addition of water.

25.3.12 Tenders rates for disposal of soil against respective item (s) of Schedule 'A' shall be deemed to cover the quantity of earth spread and leveled over the trenches to allow for settlement of earth returned, filling in trenches with time.

25.4 **Cement, Aggregate, Bricks**: These shall be as specified here-in-before.

25.5 **Samples of Material**: The contractor shall produce samples of materials and catalogue/literature of requirements and obtained in writing from GE/Engineer-in-charge before placing bulk order for the materials for incorporation in the work.

25.6 **Equipment**

25.6.1 All equipment and materials to be incorporated in this work shall be of standard quality conforming to appropriate Indian Standard specifications or where ISS have not been issued they shall be of the best quality to the entire satisfaction of GE.

25.6.2 All similar equipment and similar materials shall be the same make and origin.

25.7 **Galvanised Iron Pipes and fittings**: Galvanised and iron pipes shall be medium grade complying with IS: 1239 (Part-I). GI fittings shall comply with IS-1239 (Part-II) butt welded or seamless. Fittings not covered by IS-1979 (part-I to X) shall be of brands as approved by the GE. These fittings shall be galvanised.

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PARTICULAR SPECIFICATIONS (CONTD…)

25.8 **Laying, Jointing and Testing of GI Pipe**

25.8.1 All pipes shall be laid as per the layout approved by GE. In location where it is decided by the GE to lay the pipes alongwith the roads, the exact distance of the pipe in trenches from the center of road sides be decided by the GE.

25.9 **Cast iron pipes and fittings**: All CI pipes and fittings shall be coated both externally and internally in manufacturer's workshop with a composition having tar or other suitable base all as specified in clause 18.2.4.6 of MES Schedule (Part-I). CI pipe and fittings shall be conforming to relevant IS.

25.10 **Gun Metal Globe Valve**: Gun metal globe valve shall be of size as mentioned in Sch 'A' and shall be IS marked.

25.11 **Laying, Jointing and Testing of Cast Iron Pipes**

25.11.1 All pipes shall be laid as per the layout approved by GE. In location where it is decided by the GE to lay the pipes alongwith the roads, the exact distance of the pipe in trenches from the centre of road sides be decided by the GE.

25.11.2 Cast iron fitting and special such as bends, tapers, tees, connecting pieces etc. shall be carefully and accurately aligned and jointed to pipe all as described in IS-3114.

25.11.3 Jointing material shall be of standard manufacturer's conforming to relevant IS standard. All joints after laying and jointing of pipes shall be tested for water tightness as per directions of the GE and all as specified in MES Schedule (Part-I) and record shall be maintained.

25.11.4 Jointing materials used between flanged joints of pipes shall be rubber of thickness 3.00mm. Rubber gasket shall be free from extractable substances. The rubber gasket shall comply with IS-5382. The samples of the same shall be got approved from the GE before procuring in bulk. Flanges where not specified shall be out of 12mm thick MS plate and shall be welded or screwed (at the option of contractor without any adjustment) on to the pipes as per IS requirements. Nuts, bolts and washers shall be of steel. The flanges shall be at right angle to the axis of the pipe or the fittings. The bolt holes shall be drilled with their axis perpendicular to the machine finished surface and burs removed.

25.11.5 The pipes and joints shall be absolutely water tight when tested. The pipes shall withstand the sweating or other defects of any kind. Testing of the pipe line shall be carried out after laying and jointed as specified in clause 18.48.7 of MES Schedule (Part-I).

25.11.6 All testing equipments and labour for testing shall be provided by the contractor without any extra cost to the Govt.

25.11.7 Date-wise giving reference to the main points between which each section has been tested shall be mentioned and signed by the contractor and Engineer-in-charge in register.

25.12 **Ductile Iron Pressure Pipes and fittings**: Refer clause No 18.94 of MES Schedule (Part-I). Ductile iron pressure pipes for water supply shall be spigot and sockets pipes class K-9 conforming to IS-8329-2000.DI fittings shall confirm to IS-9523-2000. DI pipes and fittings shall withstand the hydraulic test pressure after installation, without leakage, sweating or defects of any type as laid down in IS.

25.12.1 **Laying and Jointing of Pipes**: Refer clause 18.95, 18.95.1, 18.95.2 and 18.95.3 of MES Schedule (Part-I). Pipes shall be laid jointed and tested all as per IS-12288.Testing of DI pipes shall be carried out as specified in clause 18.95.4 of MES Schedule (Part-I).

25.13 **Valve pit**

25.13.1 Valve pit shall be of size as mentioned in respective item (s) of Schedule 'A' and as shown on drawings with following specifications :-

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PARTICULAR SPECIFICATIONS (CONTD…)

(a)	Excavation	-	Excavation shall be in loose/soft soil.
(b)	Foundation concrete	-	PCC (1:4:8) type D-2 using stone aggregate
(c)	PCC Top	-	PCC (1:2:4) type B-1 using stone aggregate
(d)	Brick Work	-	In cement and sand mortar (1:4)
(e)	Finishing	-	15mm thick in cement and sand mortar (1:4) finished fair without using extra cement (internally). Flush pointing in same mortar as the work proceeds (externally)
(f)	Steel and iron work	-	All as shown on drawings
(g)	Painting	-	MS cover angle iron frame and other steel work shall be given two coats of synthetic enamel paint over a cost of red oxide primer.
(h)	White washing	-	Three coats of white wash shall be carried out to internal plastered surface

25.12 **Record Drawings**: After completion, the contractor shall submit 3 signed copies of the drawings of circuit diagram showing the layout plan of the equipment/pipes as actually laid at site.

26. **Blank**

27 **EXTERNAL ELECTRIFICATION WORKS**: External Electrification Works shall be provided as given in Schedule 'A'.

27.1 **General**

27.1.1 All work shall strictly comply with the provision in the Indian Electricity Act and rules framed there under amended up to date) as applicable to this work. The work shall also comply with the provision contained in the latest edition on the relevant ISS/BSS issued up to the date of receipt of the tender irrespective of what is referred to in the particular specification.

27.1.2 All works shall conform to the best method of modern practice and shall be executed by the fully qualified electrician/lineman/wireman etc. he evidence of their qualification shall be produced by the contractor on deemed by GE.

27.2 **Layout**

27.2.1 The tentative layout is shown in the site layout plan.

27.2.2 The electric lines and cables shall be laid by route as actually directed by the Engineer-in-charge. The contractor shall measure on the ground the actual length alongwith the said route to work the exact requirement of electric lines and cables before placing orders for procurement of the same. The contractor is to ensure that materials/ equipment offered by him can be suitably placed in the space marked for the purpose.

27.3 **Samples of Materials/ Equipment**

27.3.1 All materials/ equipment incorporated in the work shall comply with relevant ISS. Samples of materials for which no IS Specification is issued and which are to be supplied by the contractor for incorporation in the work, shall be approved by the GE before incorporation in the work.

27.3.2 Materials offered for incorporation, shall be new and no reconditioned/used equipment/ materials will be accepted in the work.

27.3.3 All equipment, allied accessories and materials to be incorporated in this work shall be of the make(s) specifically mentioned or where the make(s) are not specifically mentioned then the same shall be of standard make and strictly comply with latest ISS.

27.4 **Excavation and Earth work**

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PARTICULAR SPECIFICATIONS (CONTD…)

27.4.1 Excavation for laying underground cables, foundation for poles/ struts/ stays etc shall be restricted to dimensions shown in the drawings and as directed by Engineer-in-Charge. The minimum depth of trenches shall be as laid down in Para 19.74.1 of MES Schedule (Part-I). In the case of excavation for poles, struts and stays, excavation in excess of the required depth shall be made good by the contractor in cement concrete (1:4:8) type D-2 without any extra cost to the Government.

27.4.2 All excavated earth shall be deposited atleast one metre clear of the edge of the trenches. When road has to be crossed, trench upto half the width of the roads shall be dug at a time and proper notices, sign boards and lights shall be displayed and watchman posted to prevent accident, without any extra cost to the Government.

27.4.3 Refilling of earth in trenches shall be done in 25cm layers with excavated soil approved by Engineer-in-Charge in a manner as to ensure the proper compactness and solidity. Each layer shall be well watered and rammed.

27.4.4 Soft/ loose soil, hard/dense soil and mud shall be classified as 'any type of soil'.

27.4.5 All surplus spoil shall be removed to a distance not exceeding 50 metres spread and levelled at the places as directed by Engineer-in-Charge.

27.5 **Underground Cables HT & LT**

27.5.1 The contractor shall produce original purchase vouchers and test certificates from the manufacturer for HT & LT cables, which shall be got verified by the GE before approval and incorporating in the work.

27.5.2 Laying and Jointing of Underground cables

27.5.3 The cables shall be laid and jointed strictly as specified in the MES Schedule (Part-I) and in accordance with instructions furnished by the manufacturer and latest IS specification and as specified herein in the particular specifications.

27.5.4 The sand for the purpose of cushioning should be fine sand.

27.5.5 The bricks for protection cover of the cable shall be sub class 'B' bricks. Bricks shall be laid across the cable length.

27.5.6 After the layer of brick covers is laid, the remaining trench will be filled with excavated earth all as specified in respective item of schedule 'A'.

27.5.7 The cable shall be snaked at all joints and junctions boxes. Snaking shall be done as directed by the Engineer-in-Charge. Extra length on account of snaking will also be payable under respective item of schedule 'A'. The quantity payable under Schedule 'A' item shall be the length of cable laid including the length in snaking and no price adjustment shall be made for variation in quantity of connected (allied) item like sand cushion/cover and brick layer protection cover.

27.5.7.1 Where the cable run vertically, they shall be firmly fixed with flat iron clamps as directed by the Engineer-in-Charge at one metre center to center along the supports.

27.5.7.2 Where cable is required to be fixed with wall, it shall be properly secured by means of clamps/saddles as specified by Engineer-in-Charge.

27.5.7.3 When more than one cable are laid in same trench, minimum spacing between cables shall be 25cm.

27.5.7.4 Jointing of cable shall be carried out by crimping method using proper crimping tools. Suitable glands at entry to existing cable shall be provided. Jointing of cable and fixing of compound shall be in accordance to relevant IS specifications and material shall be best quality of compound.

27.5.7.5 Joint boxes where required shall be epoxy type suitable for respective cable as specified in schedule 'A'. They shall be filled completely with ceiling compound and shall be tamped while doing so to insure that they are properly filled.

27.5.8 **Pipes**

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PARTICULAR SPECIFICATIONS (CONTD…)

27.5.8.1 GI pipes for laying cables and earth wire shall be light grade conforming to IS-1239.

27.5.8.2 Ends of pipes shall be properly sealed with wooden bush and bitumen compound after drawings the cable through pipes.

27.5.8.3 Where cables are to be fixed alongwith poles, these shall be drawn through pipes. The pipes shall be fixed to poles with suitable MS clamps and same shall be paid under appropriate item of Schedule 'A'.

27.5.9 **Testing during laying**: Cables shall be megger tested before jointing and after jointing is completed. The cables shall again be megger tested for the following:-

(a) Continuity.

(b) Insulation resistance to earth.

(c) Insulation resistance between conductors.

27.5.10 **Testing after laying and jointing**

27.5.10.1 On the completion of laying and jointing of cables following tests shall be carried out:-

(a) Insulation resistance test, sectional and overall.

(b) Continuity test sectional and overall.

(c) Full load test sectional and overall.

(d) Earth test.

27.5.10.2 The result of all the above tests shall be recorded duly signed by the contractor and the Engineer-in-charge. If the test is unsatisfactory, the defective cable shall be replaced by the contractor at his own expense to the entire satisfaction of Engineer-in-charge. The contractor shall supply necessary apparatus, labour and instruments required for testing. However the Engineer-in-charge is at liberty to use any other instrument he may wish to employ for the purpose.

27.6 **Prestressed concrete poles and struts**

27.6.1 Prestressed concrete poles and struts shall comply with the requirements of IS-1678. The contractor shall produce copy of the manufacturer's test certificate to the effect that the poles and struts comply with the requirements of IS-1678

27.6.2 Erection of poles shall be carried out in accordance with IS-5613 (Part-I, Section2). PCC in foundation for embedding the poles shall be as specified here-in-after and as shown on drawings.

27.6.3 The poles shall be erected with due care in such a manner that they are in true vertical position to the entire satisfaction of the Engineer-in-charge. These shall be erected exactly in a straight line except where line changes direction. Proper erection equipment such as derricks, cranes, sheet legs etc shall be used by the contractor in erection poles so that they are not improperly strained or damaged during erection and are firmly stayed till the foundation has properly set and secured.

27.6.4 All the poles shall be numbered as directed by the Engineer-in-charge with 3 inch high letters and figures at a height of 1.5 metres from the ground level in 30cm strips of black & white synthetic enamel paint. The cost of paint, painting and numbering shall be deemed to be included in rates quoted in Schedule 'A'.

27.7 **Stay Assembly**: While calculating the weight of stay wire, net effective length between thimbles shall be measured. The unit rate quoted shall be deemed to be inclusive of the cost of stay wire.

27.8 **ACSR Conductors**

27.8.1 Every care shall be taken by the contractor to ensure that the conductors are not dragged over sharp object. Rope cradles wooden guards shall be used over such obstacle. They conductor which become kinked, smashed or otherwise damaged will be spliced at that point.

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PARTICULAR SPECIFICATIONS (CONTD…)

27.8.2 The splicing/jointing of ACSR shall not be located within 3 metres from the point of support of poles and they shall be aligned properly with conductors at the end of the splices/joints.

27.8.3 While calculating the weight of ACSR conductor, no extra allowances shall be made for jumpers etc at turning/shackle points. Sagging in the overhead lines shall however be calculated and added in accordance with the procedure given in IS-5613 (Part- I Section-I) of 1970.

27.9 Continuous Earth Wire: GI earth wire shall be paid by weight either calculated from tables or actual, in case of variation, lesser only will be paid. No extra allowances for sag and jointing shall be made while computing the weight of GI wire.

27.10 **Earthing**

27.10.1 Earthing shall be carried out to the specification as given in respective item of Schedule 'A' and shall conform to IS-3043.

27.10.2 The earth resistance of the whole system shall not be more than one ohm.

27.10.3 Each item of equipment as ordered by GE shall be connected to two sets of earth connections.

27.10.4 The contractor shall obtain approval of Engineer-in-charge to the earthing before commencement and it shall be executed in the presence of his respective. Excavation shall be passed by Engineer-in-charge before filling the charcoal dust. Filling and back filling of earth shall be done in 15cm layers well watered and rammed.

27.11 **Anti-climbing device**: Anti-climbing device shall be all as described in Schedule 'A' and as specified in Para 19.72.1 of MES Schedule (Part-I). Painting to steel surfaces shall be done with two coats of synthetic enamel paint over a coat of primer. Anti-climbing device shall be of approved quality and shall be fixed on poles as directed by Engineer-in-Charge.

27.12 **Testing**: The contractor shall produce manufacturer's original test certificates for the following:-

(a) HT lightning arrestor.

(b) Air break switch gang operated.

(c) HT underground cable 11 KV.

(d) LT cable 1100 volts.

(e) Any other item (s) equipment (s) on plant as decided by GE.

27.13 **Record Drawings**: After completion, the contractor shall submit 3 signed copies of the drawing of circuit diagram showing the layout plan of the equipment/cables as actually laid at site.

27.14 Irrespective of whatever mentioned in Schedule 'A', all MCCB's with adjustable thermal and/ or magnetic release shall have overload thermal setting from 63% to 100%.

28. -BLANK-

29. **MISC ITEMS OF WORKS**:- This shall be provided all as described in Schedule 'A' including notes thereof, shown on relevant drawings, specifications and as per SSR. Any item for which specification is not given in Schedule 'A', the same shall be followed from specifications given for the lump sum part in the beginning of the particular specifications, or if not there then from SSR or relevant IS.

SIGNATURE OF CONTRACTOR
Dated_____

DCWE (Contracts)
For Accepting Officer

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PARTICULAR SPECIFICATIONS (CONTD…)

Appendix 'A'

LIST OF ISI CERTIFIED PRODUCTS TO BE USED IN WORKS

1. Concrete: Integral cement water proofing compounds (ISI-2645-1975) (First revision).
2. Joinery: Wooden flush door shutters, (solid core type), plywood Face panel (IS-2202(part-I) 1983). (Fourth revision)
3. Builder's Hardware :-
   - (a) Steel butt hinges (IS-1341-1981) (Fourth revision with amendment No.1 to 3).
   - (b) Non ferrous metal butt hinges (IS-205-1978) (Third revision).
   - (c) Ferrous Tower Bolts (IS-204-1978-part-I), (Fourth revision).
   - (d) Non ferrous tower bolts (IS-204-1978 part-II) (fourth revision with amendment No.1).
   - (e) Door handles (IS-208-1979), (Third revision).
   - (f) Parliament hinges (IS-362-1982),(Fourth revision).
   - (g) Hydraulically regulated door closers (IS-3564-1986), (Third revision with amendment No.1)
   - (h) Continuous (Piano) Hinges (IS-3818-1986), (Second revision with amendment No.1)
   - (j) Non ferrous metal sliding door bolts (IS-2681-1979) (Second revision with amendment No. 1 and 2).
   - (k) Tee and strap hinges (IS-206-1981), (Third revision with amendment No.1).
   - (l) Mild steel sliding door bolts for use with padlocks (IS-281-1973) (second revision).
4. Steel & Iron Work

   Steel doors, windows and ventilators (IS 1038-1983) (Third Revision)
5. Roof covering: Bitumen felts for water proofing and damp proofing (IS-1322-1982) (Third revision).
6. Ceiling and lining :-
   - (a) Plywood for General purposes (IS-373-1975) (second revision with amendment No. 1 to 3).
   - (b) Block boards (IS-1659-1979) (Second revision).
   - (c) Veneered particle board (IS-3097-1980), (First revision).
   - (d) Fibre hard board (IS-1658-1977) (second revision).
7. Flooring:-
   - (a) White Portland cement (IS-8042-1978), (First revision).
   - (b) Cement concrete flooring tiles (IS-1237-1980) (First revision)
8. Water supply, plumbing, drains and sanitary appliances
   - (a) Concrete pipes with or without reinforcement (IS-458-1971) (Second revision).
   - (b) Salt glazed stoneware pipes and fittings (IS-651-1980), (Fourth revision).
   - (c) Flushing cisterns for water closets (Valve less syphonic type) other than plastic (IS-774-1984) (Fourth revision).
   - (d) Cast copper alloy, screw down, bib taps and stop valves for water services (IS-781-1984), (Third revision).
   - (e) Mild steel tubes, tubular and other wrought steel fittings (IS-1239 part-II-1979), (Fourth revision) and mild steel tubular and other wrought steel fittings (IS-1239-Part-II-1982) (Third revision).

Contd…

PARTICULAR SPECIFICATIONS (CONTD…)

(f) Sand cast iron spigot and socket soil, waste and ventilating pipes, fittings and accessories (IS-1729-1979), (First revision).

(g) Ball valves (Horizontal plunger type) including floats for water supply purpose (IS-1703-1977) (Second revision).

(h) Cast iron manhole covers and frames (IS-1726-Part-I to VII-1974) (Second revision).

(k) Asbestos cement pressure pipes (IS-1592-1980) (Second revision).

(l) Automatic flushing cisterns for urinals (IS-2326-1987), (Second revision).

(m) Vitreous china, sanitary appliances

(ii) Wash down water closets (IS-2556 Part-II -1981) (Third revision).

(iii) Squatting pans (IS-2556-Part-III-1981) (Third revision).

(iv) Wash basins (IS-2556(Part-IV)-1972)-(Second revision).

(v) Laboratory sinks (IS-2556(Part-V)-1979), (Second revision).

(vi) Foot rests (IS-2556(Part-X)-1974), (Second revision).

(n) Plastic WC seats and covers (IS-2548 (Part-I & II)-1983) (Fourth revision).

(o) Vertically cast iron pressure pipes for water, gas and sewage (IS-1537-1976)(First revision)

(p) Pillar taps for water supply purposes (IS-1795-1982), (Second revision).

(q) Centrifugally cast (spun) iron spigot and socket soil, waste and ventilating pipes, fitting and accessories) IS-3989-1984), (Second revision).

(r) Centrifugally cast (spun) iron pressure pipes for water, gas and sewage (IS-1536-1976).

(s) Rubber sealing rings for gas mains, water mains and sewers (IS-5382-1985), (Second revision).

(t) Cast iron fittings for pressure pipes for water, gas and sewage (IS-1538-1976) part I to XXIII).

(u) Low density polyethylene pipes for potable water supply (IS-3076-1985) (Second revision).

(v) Sand cast iron spigot pipes (IS-1729 of 1979) (First revision).

(w) Ductile iron pipe fittings (IS-9523)

(x) Ductile iron pipe (IS- 8328-2000)

(y) Galvanised iron pipe IS-1239(Part-I 1979 & Part-II 1982)

(z) Sluice valve (IS- 14846 of 2000).

(aa) GI Fittings(IS- 1879 Part I to X –1987)

(bb) Thin walled GI pipe (IS-11722 of 1986).

9 ELECTRICAL WORKS

(a) Ceiling Roses (second revision) (IS-371-1979).

(b) Three pin plugs and socket outlets (Third revision) (IS-1293-1988).

(c) Switch fuses (main and switch) (IS-4064-1978-Part I & II).

(d) Rigid steel conduit (IS-9537-Part-II-1988) with amendment No.1 superseding (IS-1653-1972).

(e) Plain rigid conduit of insulating material. (IS-9537(Part-III)-1983) (With amendment No.1) superseding (IS-1653-1972 & 2509-1973).

(f) Polyethylene insulated cables for working voltages upto and including 1100 volts (IS-1596-1977), (Second revision).

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PARTICULAR SPECIFICATIONS (CONTD…)

Appendix 'A' (contd)

LIST OF ISI CERTIFIED PRODUCTS TO BE USED IN WORKS (CONTD)

(g) LT XLPE cable (IS-7098/1/88)
(h) Distribution boards(IS-8828 & IEC 898)
(i) Pre-stressed concrete poles(IS-2713 Part I to III)
(j) Steel tubular poles(IS-2713 -Part-I to III – 1980), (Second Revision)
(k) Lightning Arresters (IS-3070- Part-I-1985).
(l) RCBO(IS 12640 Pt-II of 1988)
(m) MCB (IS-8828 of 1996).
(n) RCCB (IS-12640 (Part-I) 2000).
(o) House wiring (Copper wire) IS- 694 (Part-II).
(p) Transformer (IS-1180:2014) Part-I

Note: - The items which are not included here in before shall be referred from SSR & website of the BSI

_____
(Signature of the Contractor)
Dated_____

DCWE(CONTRACTS)
FOR ACCEPTING OFFICER

Contd…

APPENDIX 'B' TO PARTICULAR SPECIFICATIONS
NAMES/MANUFACTURERS OF EQUIPMENTS/MATERIALS

Appendix 'B-1'

LIST OF MAKES/ MANUFACTURERS OF EQUIPMENTS/ MATERIALS/ PRODUCTS

"LIST OF MAKES"		
E/M ITEMS		
Srl No	**Description of item**	**Brand/Make/Name of Manufacturer**
1	**2**	**3**
1	LED Lights, Panels & Luminaries (Indoor)	EVEREADY, POLYCAB, HAVELLS, HALONIX, BENLO, HPL, WIPRO, LUKER, PHILIPS, ORIENT ELECTRIC, KCSAD, ASCENTECH, JAQUAR, GOLD MEDAL, SSK, PHILIPS, CROMPTON, BAJAJ, OSRAM
2	LED Light fitting & Luminaries for Road and Street Lighting (Outdoor)	EVEREADY, POLYCAB, HAVELLS, HALONIX, BENLO, HPL, WIPRO, LUKER, PHILIPS, ORIENT ELECTRIC, KCSAD, ASCENTECH, JAQUAR, GOLD MEDAL, SSK, PHILIPS, CROMPTON, BAJAJ, OSRAM
3	LED Lamps	POLYCAB, HALONIX, BENLO, WIPRO ORIENT ELECTRIC, KCSAD, EVEREADY, ASCENTECH, JAQUAR, GOLD MEDAL, PHILIPS, CROMPTON, BAJAJ, OSRAM
4	Smart street lights and control system	ORIENT ELECTRIC, KCSAD, EVEREADY, ASCENTECH
5	LED floor light	WIPRO, KCSAD, EVEREADY, ASCENTECH, JAQUAR, GOLD MEDAL
6	Tube light/ Street light fittings & accessories	POLYCAB, HAVELLS, HALONIX, HPL, JAQUAR, GOLD MEDAL
7	Street light fitting & accessories-HPSV (70/150/250/400), HPMV (80/125/250/400) Metal halide	GOLD MEDAL or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
8	Solar street light fittings	EVEREADY, GOLD MEDAL
9	Flood light fittings	POLYCAB, HALONIX, KCSAD, EVEREADY, GOLD MEDAL
10	Box type decorative tube light fittings	POLYCAB, HAVELLS, HALONIX
11	CFL lamp & fittings	HALONIX, HAVELLS, C & S ELECTRIC
12	LV Switchboard	L&T, CROMPTON, HENSEL
13	LT panels/ APFC/ panels/ AC control panels/ Pump house panels for SS having capacity 1000 KVA and above	SUPERTECH POWER CONTROL PVT LTD, IECO, BHANDARI, NEPTUNE, CORONET, SPC (SPC ELECTORTECH PVT LTD), DVEPL, PSC, ITE GURGAON, INDO ASIAN, HAVELLS, MEGAWIN, SHALABH, HPL, HARTEK, ABB, L&T, SIEMENS
14	LT panels/ APFC/ panels/ AC control panels/ Pump house panels for SS having capacity below 1000 KVA	SUPERTECH POWER CONTROL PVT LTD, IECO, BHANDARI, NEPTUNE, CORONET, SPC (SPC ELECTORTECH PVT LTD), DVEPL, PSC, ITE GURGAON, INDO ASIAN, HAVELLS, MEGAWIN, SHALABH, HPL, HARTEK, ABB, L&T, SIEMENS

PARTICULAR SPECIFICATIONS (CONTD…)

15	LT capacitor bank	HAVELLS, GOLD MEDAL, C&S ELECTRIC
16	Fan (Ceiling, exhaust, table, wall & pedestal fans)	GOLD MEDAL, POLYCAB, HAVELLS, ANCHOR, LUKER, CROMPTON, BAJAJ, KHAITAN, USHA, ORIENT
17	Storage water heaters	JAQUAR, GOLD MEDAL, AO SMITH, USHA, CROMPTON, RAMCO, BAJAJ
18	PT switch/ sockets/ ceiling roses/ fan regulators	GOLD MEDAL, SSK, LEGRAND, CRABTREE, SCHNEIDER, PHILLIPS, ANCHOR, BAJAJ, KINJAL
19	Modular switch/ Sockets/ Fan regulators	GOLD MEDAL, BENLO, INDO ASIAN, POLYCAB, HAVELLS, HPL, ANCHOR, LEGRAND, CRABTREE, SCHNEIDER, PHILIPS
20	HT 132/66/33 KV & 11 KV XLPE cables	LS CABLE, GRANDLAY, V-MARC, GEMSCAB, RALLISON, POLYCAB, HAVELLS, JMW KABEL, CABLE CORPORATION OF INDIA, UNIVERSAL CABLE, ELEKTRON, PARAGON
21	LT power & Control cables, 1100 Volts, XLPE	LS CABLE, PLAZA CABLES, V-MARC, GEMSCAB, SHALABH, JMW KABEL, RALLISON, PLOYCAB, HAVELLS, GRANDLAY, HPL, CABLE CORPORATION OF INDIA, ELEKTRON, PARAGON
22	PVC wires & cables 650/1100/ Volts	LS CABLE, GOLD MEDAL, PLAZA CABLES, V-MARC, GEMSCAB, SHALABH, HPL, POLYCAB, HAVELLS, BENLO, GRANDLAY, RALLISON, JMW KABEL, FINOLEX, ELEKTRON, PARAGON
23	HT/LT XLPE aerial bunched cables	GRANDLAY, PLAZA CABLES, V-MARC, LS CABLE, JMW KABEL
24	LT/ HT cable joints Heat shrinkable/ Cold shrinkable/ Push on type	MS-SEAL, M-SEAL, DENSON
25	Cable junction boxes, Circuit breaker boxes, DC rated junction boxes	DVEPL, HPL, MEGAWIN, TRANSGUARD, PHOENIX CONTACT
26	Push button stations	As per generic specification given in Sch ‘A’/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
27	LT Air Circuit Breaker	INDO ASIAN, HAVELLS, MEGAWIN, HPL, TRANSGUARD
28	Composite & Relay panel and Control & Relay panel	SUPERTECH POWER CONTROL PVT LTD, CORONET, PRECISION SYSTEM CONTROL (PSC)
29	Composite polymeric insulator	JAIPURIA, POWER-GRID, MG MATERIALS
30	Fibre glass reinforced products 11 KV & 33 KV cross arms/ Top hamper	JAIPURIA or As per generic specification given in Sch ‘A’/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
31	Cable tray, Grating, Enclosure, safety ladder	SPC (SPC ELECTROTECH PVT LTD) or As per generic specification given in Sch ‘A’/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
32	DG Gensets (diesel/ gas based engines)	MAHINDRA, CUMMINS, JAKSONS
33	Rigid PVC conduit pipes & accessories	PLAZA CABLES, GOLD MEDAL, MODI’S, KALINGA, PLAZA

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PARTICULAR SPECIFICATIONS (CONTD…)

34	GI/ MS conduit/ ERW conduit pipe	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
35	Conductive concrete earthing	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
36	ACSR conductor	ALIND, COYOTE, STERLITE POWER
37	Battery charger, ACDB, DCDB, ELDB	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
38	APFC units, HT/LT protection device & Automation cum protection units for electric & Water supply	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
39	MV switchgear	CGPISL or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
40	VCBs, GIS and numerical relays	CORONET, CGPISL or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
41	Medium voltage SFC gas insulated RMU (Ring Main Unit) and oil insulated RMU of 12KV, 24KV & 36KV	MEGAWIN, PASCAL, CGPISL, TRANSGUARD
42	HT switch gear 33/66 KV, SF6 (Outdoor)	MEGAWIN 2025, TRANSGUARD, CGPISL, HARTEK, PASCAL
43	HT switch gear 11 KV, VCB (Indoor/ Outdoor) HT ring main unit, SF6/Acuum, 11KV/CT & PT	PSACAL, TRANSGUARD, CORONET, HARTEK, CGPISL, ITE GURGAON, MEGAWIN
44	Package/ Unified sub-station	MUSKAAN, ITE GURGAON, MEGAWIN, CGPISL, CORONET
45	MCCBs	INDO ASIAN, HAVELLS, BENLO, HPL, ANCHOR, GOLD MEDAL, SSK, SHALABH
46	MCB/ELCB/RCCB/RCBO/ Isolators/ MCB distribution board/TPN-SPN	GOLD MEDAL, SSK, POLYCAB, INDO ASIAN, HAVELLS, BENLO, HPL, SHALABH
47	Change over switches	MEGAWIN, INDOASIAN, HAVELLS, HPL, SHALABH
48	Power contactor	INDO ASIAN, HAVELLS, HPL
49	Voltage stabilizers upto 25 KVA	MUSKAAN, IECO, ITE GURGAON, VOLINA, SINETRAC, VINITEC
50	Voltage stabilizers above 25 KVA (Servo controlled)	MUSKAAN, IECO, ITE GURGAON, VOLINA, SINETRAC, VINITEC, POWERWARE
51	Sodium hypochloride solution (Grade-I)	DECLIBAC, GRASIM or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
52	UPS/ Inverter/ stabilizer/ Circuit protection device/ wires & cables	PLAZA CABLES or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
53	UPS (Off line & online)	SINETRAC or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE

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PARTICULAR SPECIFICATIONS (CONTD…)

54	Single phase preventors/ Phase sequence corrector	SINETRAC, VOLINA or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
55	HT/ LT steel tubular swaged poles	SHIVAM METAL SHAPERS INDUSTRIES, HPL or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
56	Voltmeter/ Ammeter/ Frequency meter/ PF meter energy meter (Digital type)	HPL or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
57	PCC pole, Fencing pole of 8 feet long & Kerb stone	SURYA, HPL, VENUS, SVRCC
58	HT AVR'S	MUSKAAN or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
59	Earth inspection housing (Earth pit)	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
60	AC supplied electronic control gear for led modules	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
61	HT panel	PSC, HARTEK, PASCAL
62	Bus ducts/ Rising Main	SPC (SPC ELECTROTECH PVT LTD), PHONEX CONTACT, SHALABH
63	Servo controlled stabilizer 1-500 KVA	MUSKAAN or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
64	Static frequency converter	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
65	28V DC power supply	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
66	Solar cable	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
67	EBXL cable	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
68	Elastomeric (Rubber) cables	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
69	Medical lights : ceiling/ portable OT lights winged/ non winged, surgical head/ examination lights	ASCENTECH or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
70	Emergency lights : Emergency lights with battery bank and AC Gen set/ Vehicle mounted revolving search lights, portable high mast LEDs with telescopic stand (100W to 300W), rechargeable flood lights/ search lights/ exist lights	ASCENTECH or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE

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PARTICULAR SPECIFICATIONS (CONTD…)

71	AAC/AAAC/ACSR/HTLS conductors	RHINO or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
72	HT/LT Steel tubular decorative poles (3-7 Mtr)	JAQUAR or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
73	Accessories- Door Bell, Angle Holder, Spikes, Batten Holder & Extension cords	GOLD MEDAL or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
74	Feeder pillar panel	HPC or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
75	PCC cable cover for HV/ LV/HVP/EHV	MEGHA CONTRACTORS PVT LTD, Shri Ram Fly Ash Bricks or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
76	Motor protection circuit breaker	BCH or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
77	Starters & Submersible panels, Timers	BCH or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
78	Lead acid batteries	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
79	STAR RATED ENERGY EFFICIENT TRANSFORMERS STEP DOWN UPTO 200KVA CAPACITY (4/5 STAR RATING ONLY TO BE USED)	ANY MAKE AS APPROVED BY BUREAU OF ENERGY EFFICIENCY AND BEARING 4/5 STAR RATING LABEL LIST OF MAKES AVAILABLE ON BEE WEBSITE
80	OCTAGONAL/HIGH MAST POLES	FINOLEX, HAVELLS, CROMPTON GREAVES, C & S ELECTRIC, HOMEDEC,
81	PACKAGE/UNIFIED SUB STATION	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
82	HT CAPACITOR BANKS	ABB, UNIVERSAL, BHEL, SCHNIDER, SIEMENS, EPCOS INDIA PVT LTD,
83	PVC COPPER WIRES-650/1100 VOLTS	L & T, FINOLEX, RPG, RR KABLE, GRANDLAY, KALINGA PREMIUM, HAVELLS, HPL, POLYCAB, EON, GLOSTER, ORISON
84	Brass/bakelite lamp holder(ISI Marked)	SSK/GM/Anchor Penta/cona/Plaza/Royal/ Plaza

INTERNAL & EXTERNAL WATER SUPPLY

Srl No	Description of item	Brand/Make/Name of Manufacturer
1	2	3
1	GI pipes/ MS pipes	JINDAL, TATA, OSWAL
2	HDPE/UPVC/PPR pipes	FUSION, SFMC, FINOLEX, PRINCE, SUPREME

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PARTICULAR SPECIFICATIONS (CONTD…)

3	Bronze sluice valves/ Non return valves/ Air release valves/ Pressure reducing valve/ Fire hydrant valve/ Spring relief valve/ Ball valve/ Steam valve/ Spring relief valve/ Float valve	PRAYAG, SHAKTI, KIRLOSKAR, ZOLOTO, LEADER, L&T (AUDCO)
4	Float valve	PRAYAG, SHAKTI, AIRAEURO, AGROTECH, TELEFLO, TECHNO INTERNATIONAL
5	Butterfly valves/ Check valves	ISI Marked or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
6	Gun metal gate valve/ Globe valve/ Horizontal & Vertical check valve	KIRLOSKAR, PRIMS, LEADER, L&T (AUDCO)
7	PPR/PVC pipes and fittings	KPT, VECTUS or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
8	DI pipes	JINDAL, TATA or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
9	CI pipes & fittings	JINDAL, TATA METALIKS, TATA KUBOTA
10	GI fittings	JINDAL, TATA, BST
11	Pump sets-Mono block	KIRLOSKAR, CROMPTON, KSB, JOHNSON & JOHNSON
12	Centrifugal pumps	KIRLOSKAR, KSB, GRANDFOS, ITT
13	Submersible pumps	KIRLOSKAR, BEACON, KSB, GRANDFOS, WASP, ITT
14	Non clog sewage pumps	KIRLOSKAR, KSB, BAJAJ ATLANTA, JOHNSON & JOHNSON
15	Vertical turbine pump	KSB, KIRLOSKAR, BAJAJ ATLANTA, JOHNSON & JOHNSON
16	Dosing pump/ Bleaching dozer	ION EXCHANGE, MAIC INDIA, JESCO
17	Motor starters	HPL, L&T, BCH, SCHNEIDER, SIEMENS, ABB
18	Electric motor	BHARAT BIJLEE, KIRLOSKAR ELECTRIC, CROMPTON GREAVES, ABB, SIEMENS, GEC
19	Single phase preventors/ Phase sequence corrector	L&T, SIEMENS, LEGRAND, SCHNEIDER, ABB
20	UPVC pipe screen & Casing pipe for bore/ Tubewell (IS 12818:2010)	ASIAN TUBES or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE

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PARTICULAR SPECIFICATIONS (CONTD…)

AIR CONDITIONING/ COOLING APPLIANCES		
01	Water coolers	VOLTAS, BLUESTAR, SHRIRAM, USHA, SIDHWAL
02	Refrigerator	WHIRLPOOL, LG, SAMSUNG, VOLTAS, VIDEOCON, KELVINATOR
03	Desert coolers	SYMPHONY, KHAITAN, KENSTAR, CROMPTON GREAVES, BAJAJ, OSRAM

FURNITURE ITEMS		
1	Modular furniture (steel/ wooden)	ROYAL KOAS or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
2	Wooden furniture	ZUARI FURNITURE, GODREJ & BOYCE, DURAIN

B/R ITEMS		
1	**2**	**3**
1	Pressed steel door frames/ Chowkhats for doors/ Cupboard and window frames	PARSHOTAM STEEL IND (PSI), SHAKTI, MADHU INDUSTRIES, SHIVAM METAL SHAPERS INDUSTRIES, ASHISH INDUSTRIES,
2	Galvanised colour/ Powder coated steel windows, Doors, partitions & structural glazing	ASHISH INDUSTRIES or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
3	Steel windows/ Vents	PARSHOTAM STEEL IND (PSI), SHAKTI, MADHU INDUSTRIES, SHIVAM METAL SHAPERS INDUSTRIES, ASHISH INDUSTRIES
4	Rolling shutters & Rolling grills	PARSHOTAM STEEL IND (PSI) or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
5	Factory made panelled door shutters	JAIN DOOR PVT LTD, PARSHOTAM STEEL IND (PSI) or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
6	PVC boards/door frame/ Shutters/ PVC panel door/ Windows	ECOCELL/ ECHON, H R ENTERPRISES, RAJSHRI PLASTIWOOD
7	UPVC windows/ Doors/ Frames & Ventilators	ECOCELL/ ECHON, YASHPOLY, APARNA VENESTER/ OKOTECH, MADHU INDUSTRIES, H R ENTERPRISES, RAJSHRI PLASTIWOOD, FENESTA, ENCRAFT, SUPREME
8	Anodised aluminium doors/ Windows/ Frames/ Partitions	ASHISH INDUSTRIES, JINDAL, KALCO, ALPURE

Contd…

PARTICULAR SPECIFICATIONS (CONTD…)

9	Galvanised steel sheets &colour coated galvanized steel sheets	KAMDHENU, TATA, JINDAL
10	Polycarbonate profiles roofing sheets in compact & embossed multi wall sheets	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
11	Terrazzo tiles/ PPC tiles/ PPC chequered tiles	SURYA K., MOHINDRA, SWASTIK ALW, GPT, SVRCC
12	Interlocking tiles/ Exterior tiles/ Paver blocks	SURYA K, POOJA CONCRETE, MOHINDRA, HARIOM TILES, PAVERS, KB SPUN, RANA TILE CO, SHINO TILE, MOHINDRA, HARIOM TILES MOHINDRA, HARIOM TILES, KALOHA SPUN PIPE
13	Roof tiles, Kerb stone	MOHINDRA, HARIOM TILES MOHINDRA, HARIOM TILES MOHINDRA, HARIOM TILES
14	Fly Ash Cement bricks	KB SPUN, SBRCC or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
15	Glazed ceramic/ Non-skid wall/ Floor tiles	AGL, ORIENT BELL, SUNHEARRT CERAMIK, RAK CERAMICS, SOMANY, NITCO, JOHNSON, VITERO TILES
16	Vitrified tiles (Normal/ Anti-skid)	AGL, ORIENT BELL, SUNHEARRT CERAMIK, VARMORA, RAK CERAMICS, SOMANY, NITCO
17	HDPE & LLDPE storage water tanks	ASTRAL, SINTEX, SUPREME
18	Stainless steel kitchen sink with or without draining board, Plate rack	JAINKO, SHAKTI, SPC, PRIMA, SILVER SHINE, PRAYAG, DIAMOND, NIRALI
19	Ball valves (Horizontal plunger type)	PRAYAG, PRIMA, JANCO
20	Brass valves	PRAYAG, PRIMA, L&T VALVES, AMCO, VIP VALVES
21	Shower roses chromium plated (Swivel type)	PRIMA, PLAYER, AP ROYALE & BATHSENSE, JAINKO, SHAKTI, SILVER SHINE, VITERO, SOMANY, PRAYAG
22	CP bathroom fancy fittings & accessories/ CP bath fittings	PRIMA, SHAKTI, PLAYER, SOMANY, SILVER SHINE, JAQUAR, ESSCO,PRAYAG, PLAYER, AP ROYALE & BATHSENSE, VITERO
23	Bib taps and Stop valves (CP) fancy fittings	ESSCO, JAQUAR, PRIMA, PRAYAG, PLAYER, AP ROYALE & BATHSENSE, SILVERSHINE, JAINKO, SHAKTI
24	PTMT fittings/ PVC fittings	SHAKTI, SILVERSHINE, PRIMA, PRAYAG
25	Readymade bathroom cabinets	PRAYAG or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE

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PARTICULAR SPECIFICATIONS (CONTD…)

26	HDPE pipes/ SNR pipes (Water/Sewage)	ASTRAL, SFMC, SUPREME, UTKARSH, DURALINE
27	Sand cast iron spigot & socket soil waste, Vent pipes & Fittings	SKF, RPMF or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
28	RCC hume pipes	KB SPUN, SVRCC, KALOHA SPUN PIPES
29	Cement based paints	SNOWCEM, ASIAN, BERGER, DULUX
30	Decorative paint (Ext & Int)	J K MAXX PAINTS, SNOWCEM, DULUX
31	Plastic emulsion paint	J K MAXX PAINTS or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
32	High built texture & wall finishes (Ext &Int)	J K MAXX PAINTS, ASIAN, BERGER, SNOWCEM, DULUX
33	Synthetic enamel paint	J K MAXX PAINTS or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
34	Red oxide zinc chromate primer	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
35	FRP door frame & shutter	SPC, ROOFFIT or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
36	PVC wall paneling/ PVC ceiling & Partition	ECOCEL/ ECHON, HR ENTERPRISES, RAJSHRI PLASTIWOOD, DECOINN, SUNBEAM
37	HDF/ PVC door frame shutter moulded	HR ENTERPRISES, ECHON, ALCAD, DECOINN
38	PVC sheet cladding	ALCAD, DECOININ or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
39	CI centrifugally pipes & fitting (IS-15905)/ CI hubeless pipe (IS-3989)	SKF, RPMF or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
40	Acoustic panels	GYPTECH or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
41	UPVC ceiling & paneling	YASHPOLY, HR ENTERPRISES, GIZA

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PARTICULAR SPECIFICATIONS (CONTD…)

42	Pre fab panel boards/ Wall lining ceiling tiles	HI-STEEL, RAJSHRI PLASTIWOOD or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
43	False ceiling tiles/ Board (Gypsum board/POP / Mineral fibre)/ Jointing & finishing material	HI-STEEL, RAJSHRI PLASTIWOOD, GYPCORE, ARMSTRONG
44	False ceiling/ Metal false ceiling/ Metal framing	HI-STEEL, RAJSHRI PLASTIWOOD, ROYAL KRAFT, GYPCORE, ARMSTRONG
45	Particle board (Veneered and un-veneered laminated)	RELIANCE, THERMOPLAST or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
46	Road marking paint, water based/ thermoplastic	3M, VERTEX or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
47	WPC door frames/ Panels/ Hybrid sheet/ flooring/ Jalli	ECOCEL/ ECHON, RAJSHRI PLASTIWOOD, HR ENTERPRISES
48	Road furniture & Reflective sigh boards (Road studs, Solar, Studs, Speed breaker, Traffic cone, Spring post, Median marker, Delineator, Safety cones, Safety convex mirror, Q-manager, reflective jackets, Lights beton, Bollard, Road barricades, Caution tape etc)	3M, DARK EYE, SHAKTI, SHEETAL
49	Asbestos Cement pipes (MAZZA PROCESS)	KIRTI (MAZZA PROCESS) or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
50	FRP chajja	ROOFFIT or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
51	FRP plain/Profile roofing & cladding skylight sheets	ROOFFIT or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
52	FRP chemical resistant profile sheets/ FRP rain water gutter/ FRP chemical lining/ FRP gratings	ROOFFIT or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
53	Wind driven roof turbo ventilators with matching FRP base plate in any profile	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
54	CPVC pipes & fitting	FUSION, SENTINI FLOPIPES, PRAYAG, ASTRAL, SUPREME, FINOLEX, DUTTON
55	PVC/ UPVC/ SWR pipes & fittings	FUSION, SENTINI FLOPIPES, PRAYAG, ASTRAL, SUPREME, FINOLEX, DUTTON

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PARTICULAR SPECIFICATIONS (CONTD…)

56	Sanitary ware	SOMANY, RAK CERAMICS, JAQUAR, PRAYAG, AP ROYALE & BATHSENSE, HINDWARE, KOHLER
57	Pre painted galvalume steel sheet/ Galvalume	KAMDHENU, TATA, JINDAL, DYNA ROOFING PVT LTD
58	DI flanged pipes & fittings	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
59	CI/DI valves	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
60	Chain link fencing/ Barbed wire/ Punched tape concertina coil/ Razor blade tape fencing	ARMSTRONG WIRES, MAIMOM ROGER or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
61	Galvanised steel weld mesh fencing	A1 FENCE or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
62	Plain & pre laminated MDF & HDF boards	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
63	Prowud MDF board	CENTURY PLY or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
64	Self-supported steel roofing	PROFLEX or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
65	Glass Reinforced Gypsum (GRG) ceiling tiles	DIAMOND CEILING, HI-STEEL, GYPCORE, MARUTI GYPSUM, SHERA
66	Gypsum boards/ Jointing & finishing material/ Partition &Ceiling framing work/ Plastering material/ Gypsum ceiling tiles	HI-STEEL, GYPCORE or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
67	Glass wool tile and paneling	GYPCORE or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
68	ACC blocks & jointing adhesive	MODCRETE, CLAVECON or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
69	MS butt hinges	SURYA or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
70	Laminates & Plywood	VIRGO or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE

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PARTICULAR SPECIFICATIONS (CONTD…)

71	Plywood for general purpose	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
72	Aluminium rolled products (Sheets & coils)	VIRGO or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
73	ACP (Aluminium Composite Panel)	ALUCOBOND, EUROBOND, ALUDECOR, ALEX PANEL
74	Marine plywood & Plywood for concrete shuttering works	GI PLY or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
75	ERW pipes, Tube & Hollow sections, HRC-100	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
76	PVC flushing cistern	SHAKTI, RAK CERAMICS, PRIMA, SILVER SHINE, JAQUAR, PRAYAG, HINDWARE, PARRYWARE, SUPREME
77	Toilet seat cover	RAK CERAMICS, SILVER SHINE, JAQUAR, PRAYAG, PRIMA, AP ROYALE & BATHSENSE, PARRYWARE, CERA
78	UV printed cupboard	HR ENTERPRISES or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
79	Aluminium tower bolt, Hinges, Handles & Sliding door bolt	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
80	SS tower bolt & Sliding door bolt	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
81	MS tower bolt & Sliding door bolt	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
82	Brass tower bolt	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
83	Door handles (Brass, Zinc & SS)	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
84	Locking system (Mortice lock, Night latches, Cylindrical lock, Euro profile cylinders)	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
85	Door hardware (Door closure, Floor Spring, Tower bolt & Hinges)	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
86	Universal waterproof putty (Wallmax X, Shieldmax X)/ Coarse (Levelmax X)/ White cement based primer (JK Primax X)/ Premium gypsum plaster (Gypsum max X)/ Vermiculate based light weight gypsum plaster (Plastomax X)/ Perlite based light weight gypsum plaster (Bondmax X)/ Tile adhesive (Tilemax X)	JK WHITE CEMENT or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE

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PARTICULAR SPECIFICATIONS (CONTD…)

87	MS, RHS, SHS and round black pipe	PRAKASH SURYA or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
88	PUF panels	ROOFFIT or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
89	Pulley system, Wall stands, Floor stands & Accessories of pully system	EASYDRY or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
90	Flat glass (Float glass, mirror, Frosted glass, Lacquered glass, Extra clear glass, Solar control reflective glass, High performance low e glass, Tinted glass)	SISECAM or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
91	Box type steel windows	FRIENDS MANUFACTURING CO. KAPURTHALA, TEE PEE or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
92	Wooden panel doors, Window & Frames, Flush doors	JAIN DOORS, GL PLY,A-1 TEAK PRODUCTS
93	PCC manhole & drain cover, Earth pit, Cable route indicator	VENUS, HARIOM TILES & PAVERS, MOHINDRA, SVRCC
94	PVC kitchen cabinets & Cupboards	ECOCELL/ECHON, RAJSHRI PLASTIWOOD, GIZA
95	Wooden slat, Wooden ceiling	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
96	Magnetic wood wool tiles	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
97	Accoustic doors and Movable walls	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
98	Prepainted galvanised colour/ Powder coated steel windows, Doors, Partitions, Ventlators & Structural Glazing	CHANDANI INDUSTRIES, ELIXIR or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
99	Aluminium extrusions with anodizing & Power coating)	BHORUKA EXTRUSIONS or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
100	Wooden Flooring	A-1 TEAK PRODUCTS or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE

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PARTICULAR SPECIFICATIONS (CONTD…)

101	PVC foam sheet	RAJSHRI PLASTIWOOD or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
102	HDPE DWC Pipe	ASTRAL, DUTRON, GEMINI PIPES
103	Suction & Delivery hose	KANAFLEX or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
104	Braided Hose	DUPLON or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
105	Veneered decorative plywood	GL PLY or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
106	Block Boards	GL PLY or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
107	All type of granite & Marble	ACE HARMONY or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
108	Fly Ash Bricks	SWASTIK ALWST, INDERBIR INDUSTRIES, SHRI RAM FLY ASH BRICKS
109	Electric cable covers	INDERBIR INDUSTRIES, SHRI RAM FLY ASH BRICKS or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
110	Precast RCC covers	SWASTIK ALW, SVRCC, KALOHA SPUN PIPE
111	Stainless Steel (WASH BASIN, WC, IWC & URINAL)	SILVER SHINE or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
112	Precast CI Covers	RPMF or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
113	PTMT & Fittings	JAYNAM or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
114	WPC SPC (Stone Polymer Composite)	ECOCELL/ ECHON or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE

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PARTICULAR SPECIFICATIONS (CONTD…)

115	LEAD-FREE radiation shielding (wall tiles for hospitals)	ASSURAYAS or As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE
116	Bitumen	HINDUSTAN PETROLEUM, INDIAN OIL CORPORATION & BHARAT PETROLEUM
117	DRAPERY RODS	VISTA , LEVALOR
118	MIRROR LOOKING	SAINT GOBAIN, MODI FLOAT, TRIVENI FLOAT GLASS, CROWN PRAYAG POLYMERS
119	Hydraulic Door closer	Everest, Universal, Godrej, Sandhu, Priya
120	CONSTRUCTION CHEMICALS, WATER PROOFING COMPOUND/ PRODUCTS, APP MEMBRANE	(i) M/S CHOKSEY CHEMICALS PVT LTD (ii) M/S STP LIMITED (iii) M/S IWL INDIA LIMITED (iv) M/S BERGER PAINTS INDIA LTD (v) M/s ASIAN PAINTS LTD (vi) M/s TIKI TAR DANOSA (INDIA) PVT LTD (vii) M/s STANROSE ENVIROTECH INDIA PVT LTD (viii) M/s TORCHTAR MEMBRANE & BITUMEN PRODUCT PVT LTD. (i) M/s PIDILITE INDUSTRIES LTD (ii) M/s BOSTIK INDIA PVT LTD M/S SIKA INDIA PVT LTD
121	Anti termite treatment Agency	As per the specifications given in tender including valid licence and registration of competent authority.
122	Salt Glazed stone ware pipes/ Glazed stone ware pipe	As per generic specification given in Sch 'A'/ BOQ & relevant codal provisions/ IS codes and make to be approved by GE.
123	Dry Distemper	Berger,Shalimar,Jenson & Nicholson, Asian paints
124	Chlorpyrifos Emulsifiable concentrate (20 EC)	As per relevant codal provisions/ IS codes

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PARTICULAR SPECIFICATIONS (CONTD…)

Appendix 'B-2'

LIST OF MAKES/ MANUFACTURERS OF EQUIPMENTS/ MATERIALS/ PRODUCTS

Ser No	Company Name	Address	Type of Cement	Valid upto	Remarks
Cement- APPROVED CEMENT MANUFACTURERS FOR MES WORKS ON PAN INDIA LEVEL					
1	The Associated Cement Companies Ltd **Brand: 'ACC'**	414-421, Splendor Forum (4th Floor), 3, District Centre, Jasola, New Delhi – 110044, Ph : 011 46583600	All		
2	Ultra Tech Cement Ltd **Brand: 'ULTRATECH'**	'B' Wing, 2nd Floor, Mahakali Caves Road, Andheri (East) Mumbai – 400093 Ph- 022 66917800	All		
3	The India Cement	Dhun Building, 827, Anna Salai, Chennai – 600002	All		
4	Dalmia Cement (Bharat) Ltd **Brand: 'DALMIA INFRA PRO'**	Dalmiapuram, Distt – Truchirappalli, Tamil Nadu – 621 651	All		
5	Century Cements **Brand: 'CENTURY'**	Industry House, 159 Church Gate Reclamation, Mumbai – 400020, Ph : 022 22023936	All		
6	Saurashtra Cement **Brand: 'SAURASHTRA'**	Gala No A-1, Ground Floor, Udhyog Sadan No 3 MIDC, Central Road, Andheri (East) Mumbai – 400093, Ph : 022 32955557/ 67 Mob : 93202 90081	All		
7	The Ramco Cements Ltd **Brand : 'RAMCO'**	Auras Corporate Centre, 98-A, Dr. Radhakrishnan Salai, Mylapore, Chennai – 600004, Ph- 044 28478666	All		
8	Mangalam Cement Ltd **Brand: 'MANGALAM'**	PO Adityanagar, Morak, Distt Kota, Rajasthan – 326520 Ph : 9351468076	All		
9	Birla Corporation Ltd **Brand: 'BIRLA'**	Birla Building (3rd& 4th Floor) 9/1, R N Mukherjee Road, Kolkata – 700001, Ph : 033 30573700	All		
10	Orient Cement **Brand: 'BIRLA –A1'**	5-9-22/57/D, 2nd and 3rd Floor, GP Birla Centre, Adarsh Nagar, Hyderabad – 500063, Ph : 044 23688600	All		
11	Nuvoco Vistas Corporation Ltd (Formerly Lafarge Cement) **Brand : 'NUVOCO'**	Equinox Business Park, Tower-3, East Wing, 4th Floor, LBS Marg, Kurla (West), Kurla Mumbai, Maharashtra-400070	All		
12	Shree Cement **Brand : 'SHREE'**	Bangur Nagar, Beawar, Dist-Ajmer, Rajasthan-305901 Ph : 01462-2281101-06	All		
13	J K Cement	Kamla Tower	All		

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PARTICULAR SPECIFICATIONS (CONTD…)

	Brand: 'J K'	Kanpur – 208001			
14	J K Lakshmi Cement Ltd **Brand: 'JK LAKSHMI'**	Jaykaypuram, Distt. Sirohi, Rajasthan, Ph : 02971 244409/10	All		
15	Jaypee Rewa Cement **Brand: 'JAYPEE'**	Jaypee Nagar, P.O. - Jaypee Nagar, Rewa – 486450 M.P.	All		
16	Ambuja Cement Ltd **Brand: 'AMBUJA'**	Kodinar, PO- Ambujanagar Taluka– Kodinar, DIstt- Junagadh, Gujarat – 362715, Ph : 02795 237000	All		
17	M/s JSW Cement Ltd A P **Brand "JSW PSC (Portland Slag Cement)"**	JSW Centre Opp MIMRDA Ground Bandra Kurta Complex, Bandra (East) Mumbai-400051 Tele +91-22-42865047 Fax +91-22-26502001 Website : www.jswcement.in	PSC	**01 Apr 2024**	
18	M/s Kesoram Industries Ltd. **Brand: 'BIRLA SHAKTI'**	**M/s Kesoram Industries Ltd.** Unit 12th, 1201 of T19 Towers , Indra Nagar , Ginwala Compound, M G Road , Secundrabad , Hyderabad – 500003, Ph : 91-40-4334-4555 91-40-4334-4534 Website : www.kesocarpo.co	OPC 43 OPC 53 PPC	**27 Dec 2024**	
19	M/s Sagar Cement Ltd , Hyderabad **Brand "SAGAR"**	**M/s Sagar Cements Ltd** Plot No 111, Road NO 10, Jubilee Hills Hyderabad-500033 Tele +91-40-23351571, 2335672 Fax +91-40-2335673 Email : info@sagarcments.in Website : www.sagarcements.in	OPC 43 OPC 53 PPC PSC	**24 Aug 2025**	
	APPROVED CEMENT MANUFACTURERS FOR MES WORKS ON REGIONAL LEVEL				
1	M/S Star Cement Meghalaya	Lumshnong, PO-Khaliehriat, Distt Janta Hills, Meghalaya Ph – 03655-278215/16/18	PPC OPC		
2	M/S Meghalaya Cements Ltd **Brand:** **'TOP CEM'**	Lohia House, M.G Road, Factory Bazar, Guwahati – 781001 Tele: 0361-260367/671	PPC OPC		
3	M/s Hill Cement Company Ltd **Brand: 'TAJ'**	**M/s Hill Cement Company Limited** SHIVAM COMPLEX, Bharalumukh, A.T Road Guwahati, Assam-781009 Mob – 7086085118 Ph – (0361) 2735527, 2735552 Email: kchakraborty@tajcement.com	OPC 43 OPC 53 PPC	**19 Dec 2024**	
4	M/S Green Valley Industries Ltd **Brand: 'Sanghi'**	**M/s Green Valley Industries Ltd** 4th Floor, LB Plaza, G S Road, Bhangagarh, Guwahati – 781005 Tele: +91-361-2465482/84 FAX +91-361-2465481 Email – info@greenvalliey.com Website – www.maxcement.co.in	OPC 43 OPC 53 PPC	**24 Aug 2025**	

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PARTICULAR SPECIFICATIONS (CONTD…)

TMT STEEL: APPROVED TMT STEEL MANUFACTURERS FOR MES WORKS					
Ser No	**Company Name**	**Address**	**Type of Steel**	**Valid upto**	**Remarks**
1.	Rashtriya Ispat Nigam Limited (RINL) **Brand: 'RINL'**	Visakhapatnam Steel Plant, Visakhapatnam -530 031, India Tel (91 891) 518226, 518376. Fax : (91 891)518316 Email: cmdvsp@itpvis.ap.nic.in	All	-	
2.	Tata Iron & Steel Company (TISCO or Tata Steel) **Brand: 'TATA'**	Bombay House, 2, 4 Homi Modi Steel, Mumbai-400 001, Tel (91 22) 2049131, Fax : (91 22) 204 9522, 287 0840 Email: corpcomm@jsr.tatasteel.com (Br Office for North: Jeevan Tara Bldg, Patel Chowk, New Delhi)	All	-	
3.	Steel Authority of India Limited (SAIL) **Brand: 'SAIL'**	Central Marketing Organization Northern Region, 17th Floor, Scope Minar, Laxmi Nagar Distt Centre, Delhi- 110 092	All	-	
04.	M/S Kamachi Industries Ltd. **Brand: 'KAMACHI'**	ABC Trade Centre, 3rd Floor (Inside Devi Theatre Complex), Old No. 50, New No. 39, Anna Salai, Chennai- 600002, India Tel: 91 044 42961100, Fax: 91 044 42961122 Custom care:7700067000 Email: sales@kamachitmt.com Website: www.kamachitmt.com	TMT Bars of Gde Fe 500, Fe 500D Fe 550, Fe 550D& HCRM (Size 8-40mm)	29 May 2024	
05	M/s Shyam Metalics & Energy Ltd **Brand : "SEL"**	Viswakarma, 1st Floor, 86 C,Topsia Road , Kolkata-700046 Tel : +9133 -4011-3000 Fax : +9133-2285-2212 Website : www.shyammetalics.com	TMT Bars of Gde Fe 500&Fe 500D (Size 8-32 mm)	31 Aug 2024	
06	M/S Electrotherm (India) Ltd **Brand : 'ET TMT'**	Survey No. 72, Palodia, Via-Thaltej, Ahmedabad Gujarat-382115 Tel +91-2717-660649/660550 Fax +91-2717-234866 Website – www.electrotherm.com	TMT Bars of Gde Fe 500, Fe 500D & CRS, (Size 8-36mm)	05 Oct 2024	
07	M/s Tulsyan NEC Limited **Brand "TULSYAN TMT"**	APEX Plaza, 1st Floor, Old No 3, New No 77 Nungambakkam High Road, Chennai – 600034 (TN) Website – www.tulsyannec.in Tele – 044-61991060/61991045 Mob – 9840354010, 9677088334	TMT Bars of Gde Fe 500, Fe 500D & Fe 550, (Size 8-32mm)	29 May 2024	
08	M/s Incredible Industries Ltd (Formerly M/s Adhunik Industries Ltd) **Brand : 'ADHUNIK Fe 500 SD'**	Lansdowne Towers, 2/1A, Sarat Bose Road, 6th Floor, Kolkata-700020 Tel-033-30517100, Fax- +91-33-2289 0285 Website-www.adhunikindustries.com	TMT Bars of Gde Fe 500, Fe 500D &CRS (Size 8-32mm)	19 Jul 2024	
09.	M/S Gallantt Metal Ltd, Gujarat **Brand : 'GALLANTT TMX'**	Ward 10BC, Plot No 123, Ground Floor, Gandhidham, Kutch, Gujarat – 370201 Tel : + 91 – 2836-228164,	TMT Bars of Gde Fe 500 Fe 500D CRS	05 Jul 2025	

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PARTICULAR SPECIFICATIONS (CONTD…)

		Fax : +91-2836-235787, E-mail : gml@gallantt.com Website : www.gallantt.com	(Size 8-32 mm)		
10.	M/S Rashmi Metaliks Ltd(WB) **Brand : 'RASHMI TMT'**	**M/S Rashmi Metaliks Ltd(WB)** Premlata Building, 39, Shakespeare Sarani, 6th Floor, Kolkata – 700017 Tel : 033-22894255/56, Fax : 033-22894254 E-mail : mkt.domesticdip@rashmigroup.com Website : www.rashmigroup.com	TMT Bars of Gde Fe 500 (Size 8-32mm) Fe 500D, Fe 550D (Size 8-25mm)	23 Aug 2025	
11	M/S Bajrang Power & Ispat Ltd, Raipur **Brand: 'GOEL TMT'**	**M/S Shri Bajrang Power & Ispat Ltd, Raipur** Vill - Borjhara, Urla industrial Area, Raipur-493221, Chhattisgarh, Tel- 0771 4288019/ 29/ 39	TMT Bars of Gde Fe 500 Fe 500D (Size: 8-32mm)	08 Jan 2026	
12.	M/S Real Ispat & Power Ltd, Chhattishgarh **Brand : 'G K TMT'**	**M/S Real Ispat & Power Ltd, (CG)** Vrindavan, Near IDBI Bank Civil Lines Raipur-492001, C.G Tel : +91-771-4224000 Fax : +91-771-4224010 E-mail : real@realispat.com Website : www.realispat.com	TMT Bars of Gde Fe 500 Fe 500D (Size 8-36mm)	09 Mar 2026	
13.	M/S Steel Exchange India Ltd(AP) **Brand: 'SIMHADRI TMT'**	**M/S Steel Exchange India Ltd (AP)** D No 1-65/K/60, Plot No 60 Abhis Haryana, 1st floor Kavuri Hills, Hyderabad Telangana-500081 E-mail- info@seil.co.in	TMT Bars of Gde Fe 500D Fe 500D HSCRM	29 Jan 2026	
14.	M/S Super Smelters Limited. Kolkata **Brand : 'SUPER SHAKTI'**	**M/S Super Smelters Limited. Kolkata** Premlata, 39, Shakespeare Sarani, 3rd Floor Kolkata-700017 Tel/Fax : +91-33-2289-2734/36 E-mail : info@supershakti.in Website : www.supershakti.in	TMT Bars of Gde Fe 500 Fe 500D, Fe 550 (Size 8-32mm)	13 Feb 2026	
15.	M/S Shyam Steel Industries Ltd(WB) **Brand: 'SHYAM '**	**M/S Shyam Steel Industries Ltd(WB)** Shyam Towers EN-32, Sector-V, Salt Lake, Kolkata-700 091, Tel: 033-40074007, Fax: 033 40074010, E-mail: marketing@shyamsteel.com	TMT Bars of Gde Fe 500 Fe 500D (Size 8-32mm)	30 Jan 2026	
16	M/S Jai Balaji Industries Ltd(WB) **Brand: 'BALAJI SHAKTI'**	**M/S Jai Balaji Industries Ltd(WB)** 5, Bentinck Street, Kolkata-700 001 Delhi Office:- 510, Block-b, Navraung House, 21 Kasturba Gandhi Marg, New Delhi-110001, Tel: 011-43620219, 43620220 Mob: 7838272772/ 9958936103, E-mail: info@jaibalajigroup.com	TMT Bars of Gde Fe 500D Fe 500D CRS(Size 8-32mm)	09 Feb 2026	

Contd…

PARTICULAR SPECIFICATIONS (CONTD…)

17	M/S MSP Steel & Power Limited(Chhattisgarh) **Brand: 'MSP TMT 500D '**	**M/S MSP Steel & Power Limited(Chhattisgarh)** 16/S, Block-A, New Alipore, Kolkata - 700053, Tel: 033-400547777/2398 2239, Mob : 7381028976, E-mail: contacctus@mspsteel.com Website – www.mspsteel.com	TMT Bars of Gde Fe 500D (Size 8-32mm)	10 Mar 2026	

STRUCTURAL STEEL: APPROVED TMT STEEL MANUFACTURERS FOR MES WORKS			
Ser No	Company Name	Address	Type of Steel
1.	Rashtriya Ispat Nigam Limited (RINL) **Brand : 'RINL'**	Visakhapatnam Steel Plant Visakhapatnam – 530 031, India, Tel : (91 891) 518226, 518376, Fax : (91 891) 518316 Email : cmdvsp@itpvis.ap.nic.in	Structural Steel (Angle, Beam, Column, Channel, Plate)
2.	Tata Iron & Steel Company (TISCO, or Tata Steel) **Brand : 'TATA'**	Bombay House, 2, 4 Homi Modi Street Mumbai – 400 001, India, Tele : (91 22) 204 9131, Fax : (91 22) 204 9522, 287 0840 Email : corpcomm@jsr.tatasteel.com (Br office for North : Jeevan Tara Bldg, Patel Chowk, New Delhi)	-- do --
3.	Steel Authority of India Limited (SAIL) **Brand : 'SAIL'**	Central Marketing Organization Northern Region, 17th Floor, Scope Minar, Laxmi Nagar Distt. Centre, Delhi – 110092	-- do --
4.	M/s Jindal Steel and Power Ltd. **Brand : ' JINDAL'**	Jindal Centre, Plot No 2, Sector – 32, Gurgaon – 122001, Haryana, Tele – 0124 661 2000, Fax – 0124 661 2125, Website : www.jindalsteelpower.com	-- do --

Note:-

1. Validity of certain manufacturers in the above list might have not been renewed. The names thereof has not been deleted from the list presuming that validity of such manufacturers has been extended. The contractor can procure the material from such manufacturer(s) only in case their approval is valid as on bid submission end date.

Contd…

PARTICULAR SPECIFICATIONS (CONTD…)

Appendix 'B-3'

LIST OF FLY ASH BRICKS MANUFACTURERS

Ser No	Name of Manufacturers	Production Capacity	Correspondence Address
1	M/s GEE ESS Enterprises Bathinda (Pb)	10000 bricks per day	# 16697H, St No – 7, Basant Vihar, Bathinda – 151001 (Pb)
2	Singla Industries	10000 bricks per day	M/s Singla Industries, C/o Singla Rice Mil, Bathinda Road, Rampura Phul 0 151 103 (Pb)
3	Paras Construction	20000 to 25000 bricks per day	Vill – Saidpura, G T Road, Tehsil and Distt – Fategarh Sahib – 140406 (Pb)
4	Sachin Builders & Construction	30000 bricks per day	Sachin Prakash, 11, Aggar Nagar, Ext Ferozepur Road, Ludhiana-141012 (Pb)
5	Ramji Concrete	35400 bricks per day	Vill- Jhanjher, Landran, Chunni Road, Tehsil – Kharar, Mohali (Pb)
6	M/s MGM Infra Development Solution Pvt Ltd	80000 bricks per day	Office 74, Ward o-74, Gurudwara Road, Kharar Distt Mohalli (Pb)
7	SS Enterprises	10000 bricks per day	324, New Golden Anenue, Amritsar-143001
8	Ramjee Enterprises	10000 bricks per day	Ramjee Concrete Pvt Ltd Village Hjaanghari, Mohalli-140307
9	Royal Bricks	12000 bricks per day	Royal Birkcs, Industrial Vill Bigapur, Maler Kotla Road, Khanna, Pb
10	M/s KB Spun Pipes (Make KB)		M/s KB Spun Pipes, Ind Area, Defence Road, Vill-Chacheli, PO-Sujanpur, Pin-145023
11	M/s Mohindra Industries		M/s Mohindra Industries, Jammu Jalandhar Byepass, Near Military Hospital, Pathankot-145001

(SIGNATURE OF CONTRACTOR)
DATED_____

DCWE (CONTRACTS)
FOR ACCEPTING OFFICER

Contd…

PARTICULAR SPECIFICATIONS (CONTD…)

Appendix 'C'

SOURCES OF MATERIAL

Ser No	*MATERIAL*	*LOCAL NAMES/SOURCE OF MATERIALS*
1	*2*	*3*
1.	Sand for plastering/ pointing and mortar for masonry.	Contractor shall arrange for any resources available with them. However the material should conform to SSR/ IS specifications
2.	Sand for plain concrete, and coarse sand for reinforced concrete	-ditto-
3.	Sand for filling under floor.	-ditto-
4.	Coarse aggregate for plain and reinforced concrete.	-ditto-
5.	Aggregate for soling and WBM	-ditto-
6.	Hard Core	-ditto-
7.	Aggregate for premix	-ditto-
8.	Bricks/ Brick tiles	-ditto-

NOTE: - The source of materials shall be as given in Column 3 above or in vicinity thereof. The tenderer shall ascertain the actual position/exact location of source before submitting his tender. The contractor shall be deemed to have ascertain the location/actual position of the source whether actually be ascertained the availability and its distance from the site of work or not and no claim shall be entertained on this account for any reasons whatsoever and all taxes and all levies and royalty etc. shall be borne by the contractor.

_____
(Signature of contractor)
Dated_____

DCWE (CONTRACTS)
for Accepting Officer

Contd…

APPENDIX 'D' TO PARTICULAR SPECIFICATIONS *(Contd…..)*
MATERIALS AND THEIR TESTS *(Contd……)*

NOTES:-

1. The materials listed hereinafter shall be tested as per the frequency indicated therein. Tenderer is deemed to cater for the under mentioned provisions in his quoted lump sum.

2. It is mandatory for the Contractor to set up his own Site Lab for all contracts of Rs 1 Crore and above. However the contractor may be permitted to set up site lab for the works costing less than Rs 1 Crore at his option.

3. Out of the level 'A' tests carried out in Contractor's own Site Lab, a percentage/ selected checks as decided by the Accepting Officer, shall be got done independently in the MES (CE/ CWE/ GE)/ Govt approved lab, the expenditure for which shall be borne by the department. The contractor shall be responsible for tests to be carried out in site lab established by him and for that they shall employ a competent technical representative as approved by the GE.

4. Level of testing shown under Col 6 as 'A', 'B', 'C' are defined as under:-

Level 'A' : (a) "Site Lab" means own site lab established by Contractor at the work site for such tests. This lab shall house all the facilities including T&P, machinery, equipment, manpower etc. required for conducting tests. This lab shall be operative for the entire duration of the contract till its completion. Tests shall be carried out in the presence of Engineer-in-Charge.

(b) Records shall be maintained at work site. The successful test results shall be recorded and signed jointly by the Contractor and Engineer-in-Charge.

(c) Within 15 days of placement of work order No. 1, Site Lab shall be established and this fact alongwith the particulars of the technical representative of the Contractor responsible for the Site Lab, shall be reported by the Contractor to GE in writing who will verify the facts and satisfy himself of the facilities provided and the particulars of the technical representative of the Contractor. Thereafter, GE shall issue a certificate to this effect in writing listing out equipment, particulars etc. of each material test. Only after issue of this certificate by GE, the tests shall be carried out and materials so approved shall be incorporated in the work.

(d) Manpower, material and infrastructure like electricity, water etc. required for conducting these tests shall be provided by the Contractor.

Contd…

APPENDIX 'D' TO PARTICULAR SPECIFICATIONS *(Contd…..)*
MATERIALS AND THEIR TESTS *(Contd……)*

(e) Remedial measures, if any, required to achieve/ obtain desired results for each test shall be taken promptly by the Contractor.

(f) In case during any point of time, Contractor fails to adhere to the laid down frequency of the tests due to non availability of the required facilities in his site lab, the tests shall be carried out in MES (CE/CWE/GE) Laboratories, in which case the testing charges as stipulated therein' shall be levied. However, in case the testing facilities are not available in MES (CE/CWE/GE) laboratories, the tests shall required to be conducted in Engineering Colleges or any other Government approved test house and the actual charges as levied by these test houses/labs shall have to be paid by the contractor without any extra cost to the department. Whether the testing facilities exist in Contractor's Site Lab, MES (CE/CWE/GE) Laboratories or not shall be decided by the GE, whose decision shall be final and binding. All facilities for tests including conveyance/labour etc. shall also be borne by the contractor without any extra cost to the department. No extension of time shall be admissible on this account.

(g) However, in case GE in his opinion considers that Contractor is purposely not adhering to the laid down frequencies of the tests, he shall reserve the right to deduct penal recovery which shall be double the rates of tests indicated in Appendix 'D'. However, besides effecting penal recovery for non-compliance of contractual testing frequency, for adhering to quality control norms of testing, simultaneously GE will get tests done from MES (CE/ CWE/ GE) Lab as per laid down frequency and necessary testing charges shall be recovered from running bills. In case facilities are not available to conduct test in MES (CE/ CWE/ GE) Lab, then GE will get them tested from any other source and necessary testing charges paid by GE shall be debited to the running payments of the Contractor. GE's decision shall be final and binding on recoveries.

(h) No charges shall be recovered from the Contractor for tests carried out in his Site Lab.

(i) 'A' level tests for the works costing upto 100 lakhs: - The contractor may set up site laboratory at his own option for works costing up to 100 Lakhs. The other stipulations will be same as above. However in case the contractor has not set up the site lab and tests are carried out in MES (CE/ CWE/ GE) or any other lab approved / setup by GE, the recovery shall be made at rates applicable i.e. as given herein after.

Contd…

APPENDIX 'D' TO PARTICULAR SPECIFICATIONS *(Contd…..)*
MATERIALS AND THEIR TESTS *(Contd……)*

Level 'B' & 'C' : The Test charges mentioned under column 7 of Appendix 'D' are the charges to be paid by the contractors in case the tests are conducted in MES (CE/ CWE/ GE) laboratories. Wherever it is convenient to get 'B' level tests done at Govt. approved test houses/Engg colleges the same can be done at the cost of the contractor and no separate recovery shall be made by the Deptt for such tests. However, the tests required to be conducted in Engineering Colleges or any other Government approved test houses and the actual charges as levied by these test houses/ labs irrespective of the rates indicated shall have to be paid by the contractor without any extra cost to the department. The rates of 'C' level tests have been given for the purpose of recovery if these tests are done in MES lab (if facility available) or these are not done and non testing of 'C' level tests is accepted by the Accepting officer. Whether the testing facilities exist in MES (CE/ CWE/ GE) laboratories or not shall be decided by the GE, whose decision shall be final and binding. All facilities for tests including conveyance/labour etc. shall also be borne by the contractor without any extra cost to the department.

5 The recoveries on account of testing charges wherever applicable shall be effected from the RAR payments due to the contractor payable after completion of the respective tests or wherever the tests is due whichever is earlier.

LEGEND
A - SITE LAB
B MES (CE/CWE/GE) LAB
C - GOVT APPROVED TEST HOUSES/ENGG COLLEGES

Srl No	Materials	Name of tests	Relevant Code	Description	Type	Cost	Remark
1	2	3	4	5	6	7	8
1	Bricks	(i) Compressive Strength.	IS :3495 (Part-II) -do-	As per IS : 5454 as given under :-	`A'	330/-	Checks for visual and dimensional characteristics shall also be carried out as
				Lot size Sample size Permissible No. of defective bricks.			
		(ii) Water		1001 to 10000 5 0	`A'	330/-	

Contd…

APPENDIX 'D' TO PARTICULAR SPECIFICATIONS *(Contd…..)*
MATERIALS AND THEIR TESTS *(Contd……)*

		Absorption. (iii) Efflorescence	IS-3495 (Part-I)	10001 to 35000 10 0 35001 to 50000 15 1	`A'	330/-	per IS : 5454
2	Coarse aggregate	(i) Sieve analysis	IS :2386 (Part-I)	One test for every 16 Cu.m of aggregate or part thereof brought to site.	`A'	660/-	
		(ii) Flakiness Index	-do-	-do-	`A'	250/-	
		(iii) Estimation of deleterious materials	IS-2386 (Part-I)	One test for every 100 Cum of aggregate or part thereof brought to site.	`A'	600/-	
		(iv) Organic impurities	-do-	One test per source of supply	`B'	275/-	
		(v) Moisture Contents	-do- (Part-II)	Regularly as required.	`A'	330/-	
		(vi) Specific gravity	-do-	One test per each source of supply	`B'	330/-	
3	Fine Aggregate	(i) Sieve Analysis	IS: 2386 (Par I)	One test for every 15 Cum of fine aggregate or part when brought to site	`A'	660/-	
		(ii) Test for clay, silt and impurities	-do-(Part-I)	-do-	`A'	500/-	
		(iii) Specific Gravity	-do- (Part-II)	One for each source of supply	`B'	330/-	
		(iv) Moisture Contents	-do- (Part-II)	Regularly as required subject to two tests/day when being used	`A'	330/-	
		(v) Test for organic impurities	-do- (Part-II)	One test for each source of supply	`B'	275/-	
4	Cement	(i) Setting time	IS: 4031- 63 affirmed 1980	Once for each consignment or as and when required	`B'	500/-	
		(ii) Soundness	-do-	-do-	B	550/-	

Contd…

APPENDIX 'D' TO PARTICULAR SPECIFICATIONS *(Contd…..)*
MATERIALS AND THEIR TESTS *(Contd……)*

		(iii) Compressive strength	-do-	-do-	`B'	550/-	
		(iv) Fineness	-do-	-do-	`B'	275/-	
		(v) Consistency Test	-do-	-do-	`C'	140/	
5	Structural Concrete (M-15 Grade & above).	(i) Slump test or compacting factor test or Vee-Bee time	IS : 1199	The minium frequency of sampling of concrete of each grade shall be as under:-	`A'	300/-	Random sampling shall be carried out to cover all mix units.
				Qty of Concrete in the work No. of Samples			
		(ii) Compressive Strength	IS : 516	1-5 cum 1 6-15 cum 2 16-30 cum 3 31-50 cum 4 51 cum & above 4+1 for each additional 50 Cum or part thereof.	`A'	900/-	As per IS:456 2000 clause 14 for frequency of sampling
6	Design Mix			CTL Chandigarh		5000/-	As per PS Clause
7	(a) PCC block for walling (Hollow block)	(i) Compressive strength	IS : 2156-1984 (Appx`B')	8 block out of 14	`A'	900/-	Sample: 14 blocks from consignment of every 5000 blocks or part thereof.
		(ii) Water absorption	-do-(Appx 'E')	3 block out of 14	`B'	330/-	
		(iii) Density	-do- (Appx`A')	3 blocks out of 14	`B'	330/-	
	(b) PCC solid block for walling	(i) Compressive strength	IS : 2185	12 blocks out of 18	`A'	900/-	Sample: 18 blocks from consignment of

Contd…

APPENDIX 'D' TO PARTICULAR SPECIFICATIONS *(Contd…..)*
MATERIALS AND THEIR TESTS *(Contd……)*

							every 1000 blocks or part thereof. These blocks to be checked for dimension and weight.
		(ii) Water absorption	-do-	3 block out of 18	`B'	330/-	
		(iii) Density	-do-	3 blocks out of 18	`B'	330/-	
8	Cement Flooring tiles/ Terrazo tiles	(i) Water absorption	IS: 1237(Appx` D')	6 tiles out of 18	`B'	330/-	Sample of 18 tiles from each source of supply selected at random.
		(ii) Wet transverse strength	IS: 1237 (Appx`E')	6 tiles out of 18	`B'	660/-	
		(iii) Resistance to wear	IS : 1237 (Appx`F')	6 tiles out of 18	`C'	1000/-	
9	Burnt clay roofing tiles (Hand made) as per IS:2690 (Part-II) Length : 150-250 mm Width : 100-200 mm Thickness :35-50 mm	(i) Water absorption	IS : 3495 (Part-II)	6 tiles out of 12	`B'	216/-	12 tiles from each source of supply selected at random
		(ii) Compressive strength	-do- (Part-I)	6 tiles out of 12	`A'	180/-	

Contd…

APPENDIX 'D' TO PARTICULAR SPECIFICATIONS *(Contd…..)*
MATERIALS AND THEIR TESTS *(Contd……)*

10	Mangalore Pattern roofing tiles	(i) Water absorption	IS : 654 (Appx `A')	6 tiles out of 32	`B'	180/-	32 tiles from each Consignment of 3000 tiles or part thereof, These tiles shall be checked for dimension and weight.
		(ii) Breaking Load	-do- (Appx `C')	6 tiles out of 32	`B'	120/-	
11	Timber	(i) Specific gravity and weight	IS:1708	Minimum 3 samples from a lot of 4 Cu.m or 250 pieces of seasoned timber	`B'	120/-	
		(ii) Moisture content	-do-	-do-	`A'	120/-	
12	Water for construction purposes	(i) Test for Acidity	IS:456 and 3015	Once at the stage of approval of source of water.	`B'	500/-	Also refer clause 4.3 of IS-456 and its subsequent sub clauses regarding suitability of water
		(ii) Test for Alkalinity	-do-	-do-	`B'	500/-	
		(iii) Test for total dissolved solids (TDS) contents	-do-	-do-	`B'	500/-	
13	Welding of steel work	Visual inspection test	IS-822 clause 7.1	100% by visual inspection	Work site	360/-	Specialised tests their method & frequency to be decided on consideration of their importance by the Accepting Officer.

Contd…

APPENDIX 'D' TO PARTICULAR SPECIFICATIONS *(Contd…..)*
MATERIALS AND THEIR TESTS *(Contd……)*

14	Timber panelled and glazed door/ window and shutters including factory made shutters.	(a) Dimensions, sizes, workmanship and finish.	IS: 1003 (Part-I)	Frequency of sampling for each lot shall be as under :- Lot Size | Sample Size	`A'	180/-	
				26 to 50 — 5			
				51 to 100 — 8			
				101 to 150 — 13			
				151 to 300 — 20			
				301 to 500 — 32			
				501 to 1000 — 50			
				1001 and above — 80			
		(b) Strength Test					
		(i) Slamming	IS:1303				
		(ii) Impact indentation	-do-	From each lot 5% of the factory made shutters shall be tested for strength tests.			
		(iii) Shock resistance	-do-				
15	Plywood(IS:303)	(a) Moisture Content	IS:1734 (Part-I)	Six test pieces cut from each of the boards selected as per table I shall be subjected to tests.	`C'	240/-	Sampling shall be as per IS-7835 ables.
16	Wood Particle Board (Medium density) IS:3097-	(a) Density	IS:2360 (Part-III)	Three test specimens from each sample (size 150 mm x 75 mm).	`A'	60/-	Sampling shall be as per IS: 3487 with moisture metre.
		(b) Moisture content	-do-	-do-	`A' & `B	60/-	
		(c) Water absorption	-do-(Part-16)	-do- but sample size 300 mm x 300 mm	`A'	60/-	
		(d) Swelling due to surface absorption	-do-(Part-17)	-do- but sample size 125 mm x 100 mm	`A'	60/-	

Contd…

APPENDIX 'D' TO PARTICULAR SPECIFICATIONS *(Contd…..)*
MATERIALS AND THEIR TESTS *(Contd……)*

		(e) Swelling in Water	-do-	-do- but sample size 200 mm x 100 mm	`A'	60/-	
		(f) Modulus of rupture	-do-(Part-4)	Three test specimens as per IS:2380-77	`B'	90/-	
		(g) Screw withdrawal strength	-do-(Part-4)	-do- as per IS:2385	`C'	120/-	
17	Reinformcement Steel	(i) Physical tests upto 16mm dia (Normal mass, tensile elongation, bend and rebend)	IS : 1786	As per IS : 1786	'B'	2500/-	
		(ii) More than 16mm dia	IS : 1786	As per IS : 1786	'B'	2750/-	

_____
(Signature of contractor)
Dated:_____

DCWE(Contracts)
For Accepting Officer

Contd…

Appendix 'D-1'

LIST OF TESTS AVAILABLE IN COMMAND TEST LAB

CEMENT

Ser No	Test	**Sampling**
1	Consistency	1. Each sample for testing consists of a mixture of approx equal proportions, selected from atleast 12 different positions (12 different bags). The final sample should weigh atleast 5 Kg for each test and be brought in an air tight container. 2. Shall enclose copy of manufacturer's Test Certificate showing batch No and date.
2	Initial and final setting time	
3	Soundness	
4	Compressive strength	
5	Air permeability	

CONCRETE

6	Flakiness and elongation index	10 Kg	
7	Impact value test	4 Kg	
8	Crushing value test	12 Kg	
9	Abrasion value test	15-30 Kg according to aggregate size	
10	Sieve analysis of fine aggregate	3 Kg	
11	Sieve analysis of coarse aggregate	15 Kg	
12	Compressive strength of concrete cubes	Minimum 9 cubes per test	Sample cube must be dated
13	Flexure strength of concrete beam	Minimum 3 beams per test	-do-
14	Specific gravity of coarse aggregate	10 Kg	
15	Specific gravity of fine aggregate	1 Kg	
16	Free moisture of fine and coarse aggregate	3-4 Kg	Sample must be conveyed in an airtight container to maintain humidity.

BRICKS

17	Water Absorption	Total 50 bricks	Shall be selected at random from the complete lot to be tested.
18	Compressive strength		
19	Density		
20	Efflorescence		

SOIL

21	Dry sieve analysis	10 Kg	
22	Wet sieve analysis	10 Kg	
23	Liquid Limit Test	1 Kg	
24	Plastic Limit Test	1 Kg	
25	Shrinkage Limit Test	2 Kg	
26	Direct Shear Test	1 Kg	
27	Unconfined Compression Test (Remoulded)	1 Kg	
28	Moisture content	8 Kg	Sample must be conveyed in an airtight container to maintain humidity.
29	Dry density	8 Kg	
30	California Bearing Ratio Test	8 Kg	

Contd/…

31	Permeability Test	1 Kg	
32	Standard Penetration Test	In situ	
33	Moisture Content Using Speedy Moisture Meter	1 Kg	
34	Soil Cone Penetration Test	1 Kg	
35	Specific Gravity Test	1 Kg	

BITUMEN

36	Ductility Test	1 Kg	
37	Penetration Test	1 Kg	
38	Softening Point Test	2 Kg	
39	Flash and Fire Point	5 Kg	
40	Bitumen Extraction	5 Kg mix as per given design	
41	Specific Gravity of Core	In situ	
42	Flakiness and elongation index	10 Kg	
43	Viscosity	1 Kg	

Non Destructive Testing Facilities

1	Strength of concrete using digital test hammer	Available	
2	Quality of concrete using Ultra sonic Pulse Velocity meter	Available	
3	Deflection of flexible pavement under moving loads using Benkelman beam	Available	
4	Micro Cover Meter (Rebar loclator, Sizing and Cover Measurement)`	Being procured	

Contd/…

Appendix 'E'

1. CA No & Name of work :

2. Control No

3. Name of Manufacture/Brand Name/Gde of Cement (a) Manufacture _____ (b) Brand _____ (c) Grade _____

4. Qty of cement & Lot No/Week No(In Bags) : (Qty _____(b) Lot No/Week No _____

5. Manufacturer's test certificates No _____

6. Random test details (a) Physical test report from _____ vide their letter No _____(Name of approval Lab/Engg College)
(b) Chemical test report from _____ vide their letter No _____(Name of approval Lab/Engg College)

7. Details of physical & chemical properties :-

	Physical requirement (As per IS-4031)										**Chemical requirements(As per IS-4032)**							
	Specific surface area(M2/Kg)	**Soundness by Le Chatellar**	**Soundness by Auto Clave**	**Initial setting time(Minutes)**	**Final setting time(Minutes)**	**Comprehensive strength (MPA)**			**Temp during testing °C**	**Standard consistency(%)**	**Lime saturation Ratio**	**Aclumina iron Ratio**	**Insoluble residue(%)**	**Manesium(%)**	**Sulphuric Anhydride(%)**	**Loss of ignition(%)**	**Alkalies(%)**	**Chlorides(%)**
						03 Days	**07 Days**	**28 Days**										
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
As per relevant IS																		
As per manufacturer's test certificate																		
As per random test certificate																		

Remarks with signature
JE (Civil) : _____

_____

Engineer-in-Charge : _____

Contractor : _____-

Contd/…

Accepted/Rejected :

Garrison Engineer :

Remarks of BSO/Inspecting Officer/CWE

Signature of the Contractor

DCWE(Contracts)
FOR ACCEPTING OFFICER

Contd/…

Appendix 'F'

STEEL SUPPLY/ACCEPTANCE FORM

1. CA No. & Name of work.
2. Control No
3. Name of Manufacturer's TC No.
4. Manufacturer
5. Randon Test details (a) Physical test report from_____ vide their letter No._____
(Name of approv Lab/ Engg College)
(b) Chemical test report from_____ vide their letter No._____
(Name of approval Lab/ Engg College
6. Types of steel, Dia & Qty (a) type : TMT/CRS (b) Dia –----------mm (c) Actual Wt_____ MT (d) Conversion Wt_____ MT
:

Srl No.	Particulars	Chemical Test						Mechanical Test						
		Carbon %	Sulphur%	Phosphorous%	Manganese %	Silicon%	Corrosion resistant	Wt per Metre	Stress (N/mm²) 0.2% proof	Tensile strength (N/mm²)	Elongation %	Bend test	Rebend Test	Remark
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	AS per IS 1786													
2	As per manufacture's test certificate													
3	As per independent test													

Remarks with Signature Accepted/ Rejected

Contractor Junior Engineer Engineer-in-Charge

Garrison Engineer

Remarks of BOO/ Inspecting Officer/ CWE

_____
(Signature of contractor)
Dated: _____

DCWE (Contracts)
For Accepting Officer

Contd/…

LIST OF DRAWINGS

1. The following drawings shall form part of tender documents. Typical details drawings (TD) mentioned below shall also form Part of tender documents though not enclosed along with the tender TD drawings for architectural and structural drgs shall be deemed to be in possession with the tenderers.

2. The date of revision mentioned on the list of drawings mentioned above if differs from the date of revision mentioned in the respective drawings, the date of revision shown in the list of drawings shall be deemed to amended to the last date of revision as mentioned in the respective drawings and the same shall be followed for execution. No claim in this respect shall be entertained.

3. In case of discrepancy between the overall dimension of the bldgs with reference to internal room dimension and wall thickness, this overall dimensions arrived with reference to room internal dimension and wall thick nesses shall take precedence and contractor shall not have any claim over such discrepancies. The tenderer is supposed to check this aspect before quoting lump sum amount.

5. The drawings prepared at a later date and included in the contract will supercede the earlier drawings.

Srl No	Drawing No Particulars	Sh No		
			Date	Particulars
1	2	3	4	5
1	CWE/WD-370/24	01/06	10.05.24	Plan
2	CWE/WD-370/24	02/06	10.05.24	Elevations
3	CWE/WD-370/24	03/06	10.05.24	Roof plan, room detail & detail plan of water cooler space
4.	CWE/WD-370/24	04/06	10.05.24	Sections and room details
5.	CWE/WD-370/24	05/06	10.05.24 25.06.24	Electrification plan
6.	CWE/WD-370/24	06/06	10.05.24 25.06.24	Schedule of finishes
7.	CWE/STR-370/2024	01/06	10.05.24	Column footing layout schedule of footing
8.	CWE/STR-370/2024	02/06	10.05.24	Plinth beam layout schedule of column
9.	CWE/STR-370/2024	03/06	10.05.24	Roof beam layout schedule of beam
10.	CWE/STR-370/2024	04/06	10.05.24	Roof slab layout schedule of roof slab
11.	CWE/STR-370/2024	05/06	10.05.24	Detail of beam column junction & beam column at end junction
12.	CWE/STR-370/2024	06/06	10.05.24 25.06.24	Typical sec of slab, typical details of slab reinforcement
TD DRAWINGS				
13.	CEJZ/TD-1002A/08	1/3	-	Panelled Door and fly proof with pressed steel frame
14.	CEJZ/TD-1002A/08	2/3	-	Panelled Door and fly proof with pressed steel frame

1	2	3	4	5
15.	CEJZ/TD-1002A/08	3/3	-	Panelled Door and fly proof with pressed steel frame
16.	CEJZ/TD-33/12	1/1	-	PVC Door
17.	CEJZ/TD-1004/08	1/1	-	Schedule of fittings
18.	CEJZ/TD-1018/08	1/1	-	RCC parapet and benching
19.	CEJZ/TD-1034/08	1/1	-	Details of wall pegs
20.	CEJZ/TD-31/12	1/4 to 4/4	-	Typical detail of Aluminium doors
21.	CEJZ/TD-1058/08	1/4	-	MISC Details -2
22.	CEJZ/TD-1058/08	2/4	-	MISC Details -2
23.	CEJZ/TD-1058/08	3/4	-	MISC Details -2
24.	CEJZ/TD-1058/08	4/4	-	MISC Details -2
25.	CEJZ/TD-1062/08	1/2	-	Arch notes and General Notes
26.	CEJZ/TD-1062/08	2/2	-	Arch notes and General Notes
27.	CEJZ/TD-1065/08	1/1	-	Sump Detail
28.	CEJZ/TD-1069/08	1/1	-	INT/EXT E/M and W/S Notes
29.	CEJZ/TD-1071/08	1/1	-	Legends and notes of E/M services
30.	CEJZ/TD-1088/08	1/1	-	Details of FT, NT, GT
31.	CEJZ/TD-38/11	1/3 to 3/3	-	Detail of RWP, Splash stone and exhaust fan
32.	CEJZ/TD-48/11	1/1	-	Format for Numbering of Bldg
33	CEJZ/TD-1073/08	1/1	-	Notice BD, display BD, Mirror (450x1200)
34	CEJZ/TD-28/11	1/1	-	Detail of Cooler Rest
35	CEJZ/TD-1024/08	1/1R	-	Detail of Aluminium grill & Drapery rod
36	CEJZ/TD-32A/12	3/4	-	Typical detail of aluminium windows (with fly proof) & Ventilator
37	CEJZ/TD-32A/12	4/4	-	Typical detail of aluminium windows (with fly proof) & Ventilator
38.	CEJZ/TD-1103/08	1/2	-	Cupboard with rolled steel section
39.	CEJZ/TD-1103/08	2/2	-	Cupboard with rolled steel section
40.	CEJZ/STD-216/06	1/8 to 8/8	-	Seismic provisions
41.	CEJZ/STD-242/07	1/24 to 24/24	-	Sewer appurtenances
42.	CEJZ/STD-243/07	1/34 to 34/34	-	Typical RCC details
43.	CEJZ/STD-270/09	1/1	-	HDPE water storage tank
44	CEJZ/STD-232/07	1/1	-	Typical details of internal plaster groove and external plaster detail at junction of wall/beam/column
45	CEJZ/STD-14/08	1/1 to 4/4	-	Typical details of foundation

(Signature of Contractor)

DCWE (Contracts)
For Accepting Officer

Contd/…

GENERAL CONDITIONS OF CONTRACTS (IAFW-2249: PRINT–1989) FOR LUMP SUM CONTRACTS (IAFW-2159)

A copy of the MES GENERAL CONDITIONS OF CONTRACTS (IAFW-2249: Print-1989) with Errata and Amendments has been supplied to me/us and is in my/our possession. I/We have read and understood the Provisions contained in the aforesaid GENERAL CONDITIONS OF CONTRACTS before submission of this tender and I/We agree that I/We shall abide by the terms and conditions thereof.

It is hereby further agreed and declared by me/us, that the MES General Conditions of Contracts (IAFW-2249: Print - 1989) including Condition 70 thereof pertaining to settlement of disputes by Arbitration containing 33 pages with errata 1 to 20 and Amendment Nos.1 to 49 form part of these tender documents.

_____
(SIGNATURE OF CONTRACTOR)
DATED_____

DCWE (Contracts)
FOR ACCEPTING OFFICER

SCHEDULE OF MINIMUM FAIR WAGES

It is hereby agreed that the "Schedule of Minimum Fair Wages" (SMFW) as published vide Government of India Notification dated 10 Mar 92 (Revised upto date), form part of these tender documents.

My/Our signature hereunder amounts to my/our having read and understood the provisions contained therein and I/We agree that I/We shall abide by the same and that aforesaid documents form part of this tender.

NOTE: *"Schedule of Minimum Fair Wages" referred to above is available for reference, in any MES Office at Jalandhar Cantt"*

_____
(SIGNATURE OF CONTRACTOR)
DATED_____

DCWE (Contracts)
FOR ACCEPTING OFFICER

CONTD/…