

**INDEX****CA NO GE(AF)-25/2018-19 : TERM CONTRACT FOR ARTIFICERS WORK FOR NORTH SIDE  
AT AIR FORCE STATION SRINAGAR**

Ser No	Description	Page No	
		From	To
1	Index Page	01	01
2	Tender forwarding letter	02	03
3	Instructions to Tenderers	04	06
4	Notice of Tender IAFW-2162 including Appendix 'A' and amendment thereto	07	13
5	Term Contract for Artificers work IAFW-1821 (Revised 1960) including Sch "A (BOQ)", "B", "C" & "D" Tender pages	14	22
6	Special conditions	23	29
7	Particular Specifications including list of makes and relevant appendices	30	74
8	List of drawings/buildings	-	-
9	General conditions of contract IAFW-2249 including errata/amendments	75	85
10	Schedule of Minimum fair wages and annexure thereto	86	86
11	Amendments/Errata to tender documents		
12	Relevant correspondence		
13	Acceptance letter		

Total Pages:

**\*Note:** - Documents not enclosed along with tender which can be seen in the office of GE (AF) Srinagar, Military Engineer Services, Air Force Station, Srinagar - 190 007 during working hours.

(Signature of Contractor)  
Dated:

AGE (Contracts)  
For Accepting Officer

Tele/Fax: 0194-2305243

**e-Procure**  
Garrison Engineer (AF) Srinagar  
**Military Engineer Services**  
Air Force Station  
Srinagar - 190 007

8101/GE(AF)-25/2018-19/ 03 / E8

05 Jun 2018

M/s \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**CA NO GE(AF)-25/2018-19 : TERM CONTRACT FOR ARTIFICERS WORK FOR NORTH  
SIDE AT AIR FORCE STATION SRINAGAR**

Dear Sir (s),

1. Tender documents in respect of above work are uploaded on the site [www.eprocuremes.gov.in](http://www.eprocuremes.gov.in). The tender is on single stage two cover e- tendering system. The contents of cover I & Cover II 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 tenderers/bidders or their authorized 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 instruction 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, on or before 12 Jun 2018. You are requested not to write piece meal points and forward your points duly consolidated before due date viz 12 Jun 2018.

5. Unlisted contractors are required to submit the scanned copies (in pdf file) of documents required as per eligibility criteria mentioned in instructions for filling the tender documents and Appenidx 'A' to **NIT** along with EARNEST MONEY DEPOSIT (EMD) and tender fee on e-procurement portal and submit the physical documents in the office of GE AF Srinagar C/O 56 APO 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. (a) 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 & time fixed for this purpose. In case of failure to abide by any of these two requirements, the finance bid will not be opened.

(b) Contractor having not executed standing security bond and standing security deposit in any MES formation would be required to deposit individual security deposit on

acceptance of tender which will be calculated with reference to the tendered cost as per scales laid down by MES for calculation of " EARNEST MONEY" enhanced by 25% subject to maximum of Rs. 1875000/- (Rupees Eighteen Lakhs seventy five thousand only).

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 e-procurement portal and submit physical documents in the office of GE AF Srinagar C/O 56 APO before date & time fixed for this purpose.

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 there to, 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.

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

12. (a) 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 & time fixed for this purpose. In case of failure to abide by any of these two requirements, the finance bid will not be opened.

(b) Contractor having not executed standing security bond and standing security deposit in any MES formation would be required to deposit individual security deposit on acceptance of tender which will be calculated with reference to the tendered cost as per scales laid down by MES for calculation of " EARNEST MONEY" enhanced by 25% subject to maximum of Rs. 1875000/- (Rupees Eighteen Lakhs seventy five thousand only).

13. The salient points/instructions to the tenderers are highlighted as per annexure enclosed with this letter.

14. The letter shall form part of tender documents.

Yours faithfully,

Encls:- (As Above)

AGE (Contracts)  
For Accepting Officer

(Signature of Contractor)  
Dated:

**ANNEXURE TO FORWARDING LETTER**  
**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 one of the following forms, along with their tender/bid:-

(a) Deposit at Call Receipt from a Scheduled Bank in favour of Garrison Engineer AF Srinagar C/o 56 APO.

(b) Receipted Treasury Challan, the amount being credited to the Revenue Deposit of Garrison Engineer AF Srinagar C/o 56 APO.

It is advisable that Earnest Money is deposited in the form of deposit call receipt from an approved Schedule Bank for easy refund. In case the tenderer/bidder wants to lodge 'EARNEST MONEY DEPOSIT' 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 GE AF Srinagar C/O 56 APO.

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

**2. SECURITY DEPOSIT**

In case the tender/bid submitted by such contractor who is not enlisted with MES is accepted, the contractor will be required to lodge with the Controller of Defence Accounts INDIVIDUAL SECURITY DEPOSIT calculated with reference to TENDERED COST as notified by the Accepting Officer subject to a maximum of Rs.18,75,000/-. The amount is required to be lodged within 30(Thirty) days of the receipt by the contractor of notification of acceptance of tender/bid, failing which the sum shall be recovered from the 1<sup>st</sup> RAR payment or from the Final bill (See Condition 22 of GCC(IAFW-2249).

**3. CONTRACTORS ENLISTED WITH CHIEF ENGINEER NORTHERN COMMAND AND WHO HAVE EXECUTED STANDING SECURITY BOND AND DEPOSITED STANDING SECURITY DEPOSIT BUT OF LOWER CLASS.**

In case the tender/bid is accepted, the amount of Additional Security Deposit will be as notified by the Accepting Officer. The amount will be the difference between the "Individual Security Deposit" calculated with reference to the "TENDERED COST" and 'Standing Security Deposit' lodged. The amount is required to be lodged within 30(Thirty) days of the receipt by the contractor of notification of acceptance of tender/bid, failing which the sum shall be recovered from the 1<sup>st</sup> RAR payment or from the Final bill (See Condition 22 of GCC(IAFW-2249).

**4. CONTRACTORS ENLISTED IN MES FORMATIONS OTHER THAN CE NORTHERN COMMAND**

Contractors whose names are on the approved list of any MES formation i.e. other than CE Northern Command and who have deposited Standing Security and have executed Standing Security Bond may tender/bid without depositing Earnest Money with the bid and if the Accepting Officer decides to accept the tender/bid, such tenderers will be required to lodge Security Deposit as notified by the Accepting Officer. The amount is required to be lodged within 30(Thirty) days of the receipt by the contractor of notification of acceptance of tender/bid, failing which the sum shall be recovered from the 1<sup>st</sup> RAR payment or from the Final bill.

**ANNEXURE TO FORWARDING LETTER(CONTD)****5. GENERAL INSTRUCTIONS FOR COMPLIANCE**

5.1 The bids received only in the electronic form will be considered. All bids shall be submitted on 'eprocuremes.gov.in' portal. Documents should be scanned and forwarded in 'pdf' form and 'xls' form as indicated.

5.2 Bids shall be uploaded on 'eprocuremes.gov.in' portal 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.

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

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

5.5 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.

5.6 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 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 the 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.

5.7 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.

5.8 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.

5.9 Bid (cover 1&2) shall be uploaded online well in time.

5.10 The contractor shall employ Indian Nationals after verifying their antecedents and loyalty. Attention is also drawn to special condition 4 referred here in after and also conditions 24 & 25 of IAFW 2249 (General conditions of contract).

**ANNEXURE TO FORWARDING LETTER(CONTD)**

5.11 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.

5.12 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.

5.13 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 eprocurems.gov.in site only before the bid closing time and date.

**6. REVOKATION/REVISION OF OFFER UPWARD/OFFERING VOLUNATARY REDUCTION, AFTER OPENING OF FINANCIAL BIDS BY LOWEST BIDDER**

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 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.

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

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

7.2 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.

7.3 The tenderer'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.

7.4 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 tender department.

8. These instructions shall form part of the contract documents.

AGE (Contracts)  
ForAccepting Officer

(Signature of Contractor)  
Dated:

**MILITARY ENGINEER SERVICES**  
**NOTICE OF 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 cost more or less, a tenderer/bidder will have no claim on that account. The tender shall be based on as mentioned in aforesaid Appendix 'A'.
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. Normally contractors whose names are on the MES approved list for the area in which the work lies, and within whose financial category the estimated amount would fall, may tender/bid but in case of term contracts, contractors of categories SS to E may tender/bid. In case, where the tender amount is in excess of the financial limit of the contractor and the Accepting officer decides to accept the tender/bid, in which event the tenderer/bidder would be required to lodge additional security deposit as notified by the Accepting Officer in term of conditions of contract. Contractors whose names are on the MES approved list of any MES Formation and who have deposited standing security and have executed standing security bond may also tender/bid without depositing Earnest Money alongwith the tender/bid and if the tender/bid submitted by such a tenderer/bidder is accepted, the contractor will be required to lodge with the Controller of Defence Accounts concerned the amount of 'Individual security deposit' within thirty days of the receipt by him of notification of acceptance of his tender/bid, failing which this sum will be recovered from 1<sup>st</sup> RAR payment or from the first final bill. In the case of term/running contracts, remaining sum shall be recovered from subsequent bill(s) of the contractor. Not more than one tender/bid shall be submitted/uploaded by one contractor or one firm of contractors. 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. A breach of this condition will render the tenders/bids of both the parties liable for rejection.
5. The Office of **GE (AF) Srinagar C/O 56 APO** will be the Accepting Officer here in after referred to as such for purpose of the contract.
6. The technical Bid and Financial Bid (Cover-1 and Cover-2) shall be uploaded by the tenderer/bidder on or before the date & time mentioned in **NIT**. A scanned copy of DD with enlistment details/documents shall be uploaded as packet 1/cover-1 ('T' bid) of the tender/bid on e-tendering portal. DD is refundable in case T bid is not accepted resulting in non-opening of 'Q' bid. The applicant contractor shall bear the cost of bank charges for procuring and encashing the DD and shall not have any claim from Government whatsoever on this account.
  - 6.1 Tender form and conditions of contract and other necessary documents shall be available on [eprocuremes.gov.in/](http://eprocuremes.gov.in/) [eprocure.gov.in](http://eprocure.gov.in) site for download and shall form part of contract agreement in case the tender/bid is accepted.
  - 6.2 In case of contractor who has not executed the Standing Security Bond, the Cover-I shall be accompanied with by Earnest Money of amount as mentioned in Appendix 'A' in the form of deposit at call receipt in favour of concerned GE (P) AF Srinagar C/O 56 APO(see Appendix' A') by a scheduled bank or in receipted treasury Challan the amount being credited to the revenue deposit of the GE (P) AF Srinagar C/O 56 APO(see Appendix' A').

**NOTICE OF TENDER(CONTD)**

6.3 A contractor who is not enlisted for the area in which the work lies but whose name is in the MES approved list of any MES formation and who has deposited standing security and executed standing security Bond may bid without depositing earnest money along with the tender; but if the Accepting officer accepts the tender/bid, the contractor will be required to lodge with the Controller of Defence Accounts concerned the amount of 'Individual security deposit' within thirty days of the receipt by him of notification of acceptance of his tender/bid, failing which this sum will be recovered from 1<sup>st</sup> RAR payment or from the first final bill. In case of term/running contracts, remaining sum shall be recovered from subsequent bill(s) of the contractor.

6.4 A contractor who has executed standing security Bond but not corresponding to the appropriate class as mentioned above, shall lodge with the Accepting Officer, Additional Security Deposit as notified by the Accepting Officer within thirty days of the receipt of his notification of acceptance of his tender/bid, failing which this sum will be recovered from the first RAR payment or from the first final bill. In the case of term/running contracts, remaining sum shall be recovered from subsequent bill(s) of the contractor. However, in case where any payment is made to the contractor within thirty days of the receipt by him of notification of acceptance of tender/bid, the amount of additional security deposit shall be recovered from such payment.

6.5 The GE (AF) Srinagar C/O 56 APO will either return the Earnest Money wherever applicable to all unsuccessful tenderer/bidder by endorsing an authority on the deposit-at-call receipt for its refund on production by the tenderer, bidder a certificate of the Accepting Officer that a bonafide tender/bid was received and all documents were returned.

6.6 The GE (AF) Srinagar C/O 56 APO will either return the Earnest Money to the successful tenderer/bidder by endorsing an authority on the deposit-at-call Receipt for its refund on receipt of an appropriate amount of security Deposit or will retain the same in part or full on account of security deposit if such a transaction is feasible.

6.7 Copies of the drawings and other document pertaining to the work signed for the purpose of identification by the Accepting Officer or his accredited representative, sample of materials and stores to be supplied by the contractor will also be available for inspection by the tenderer/bidder at the office of Accepting Officer and concerned GE (AF) Srinagar C/O 56 APO during working hours.

7. The tenderers/bidders are advised to visit the site of work by making prior appointment with GE (AF) Srinagar C/O 56 APO who is also the Executing Agency of the work (see appendix 'A'). The tenderers/bidders are deemed to have full knowledge of all relevant documents, samples, site etc, whether they have inspected them or not.

8. Any tender/bid which proposes any alteration to any of the conditions laid down or which proposes any other condition or prescription whatsoever, is liable to be rejected.

9. The uploading of bid 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, tools and plants etc will be issued to him and local conditions and other factors having bearing on the execution of the work.

10. Tenderers/bidders must be in possession of a copy of the MES Standard Schedule of Rates (see appendix 'A') including amendments and errata there to.



**NOTICE OF TENDER(CONTD)**

11. Invitation for e-tender does not constitute any guarantee for validation of 'T' bid and subsequent opening of finance bid of any applicant/bidder, even of enlisted contractors of appropriate class, merely by virtue of enclosing DD. Accepting Officer reserves the right to reject the 'T' bid and not open the finance bid of any applicant/bidder. 'T' bid validation shall be decided by the Accepting Office based on, inter alia, capability of the firm as per criteria given in Appx'A' to this NIT. The applicant contractor/bidder will be informed regarding non-validation of his 'T' bid assigning reasons thereof through the eprocuremes website. The applicant contractor/bidder if he so desires may appeal to the next higher Engineer authority viz HQ CWE (AF) Srinagar on email Id [afsng3-mes@nic.in](mailto:afsng3-mes@nic.in) with copy to the Accepting Officer on email Id [afsnr4-mes@nic.in](mailto:afsnr4-mes@nic.in) before the scheduled date of opening of Finance Bid. The decision of the Next Higher Engineer Authority (NHEA) shall be final and binding. The contractor/bidder shall not be entitled for any compensation whatsoever for rejection of his bid.

12. The Accepting Officer reserves the right to accept a tender submitted by a public undertaking, giving a price 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 from such tenderer/bidder whose tender/bid is rejected.

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

14. This Notice Inviting Tender (NIT) including Appendix 'A' shall form part of the contract.

Signature of Contractor)  
Dated:

AGE (Contracts)  
For Accepting Officer

**MILITARY ENGINEER SERVICES**  
**APPENDIX'A' TO NOTICE INVITING TENDER (NIT)**  
**(SERIAL NO 12 OF 2018-19)**

1.	Name of work	:	TERM CONTRACT FOR ARTIFICERS WORK FOR NORTH SIDE AT AIR FORCE STATION SRINAGAR
2.	Estimated Cost	:	Rs 25.00 Lakh
3.	Period of completion	:	12 (TWELVE) Months
4.	Cost of lender documents	:	Rs 500.00 the shape of DD/Bankers cheque from any schedule Bank in favour of GE (AF) Srinagar and payable at Srinagar
5.	Website/portal address	:	www.eprocuremes.gov.in and www.mes.gov.in
6.	Type of contract	:	The tender will be based on IAFW-2249 and IAFW-1821(Revised 1960) where tenderers are required to quote his percentage above/below the rates contained in SSR-2010Part-II (Rates) and specifications contained in SSR-2009 Part-I (Specifications)
7.	Information & Details	:	
	(a) Bid submission start date		19 Jun 2018 at 0900Hrs
	(b) Last date of bid submission		26 Jun 2018 at 1800Hrs
	(c) Date of bid opening		27 Jun 2018 at 1200Hrs
8	Eligibility Criteria	:	
	(A) For M ES enlisted	:	All contractors enlisted with MES in Class 'E' above and category 'a (i)' shall be considered qualified provided they do not carry adverse marks in WLR of competent Engineer Authority
	(B) For other contractors	:	<p>(a) The firms not enlisted with MES shall meet the enlistment criteria of 'E' class MES &amp; category 'a(i)' i.e. with regard to having satisfactorily completed requisite value works, Annual turnover, Solvency, working capital, immovable property/fixed assets, T&amp;P, Engineering establishment, no recovery outstanding in any Govt Department, Police verification/ Passport etc. Enlistment criteria may be seen in Para 1.4 of Section 1 of Part of MES Manual on - 2007 (Reprint 2012) as available in all MES formations.</p> <p>(b) These firms shall also submit copy of Police verification from 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</p> <p>(c) They should not carry adverse remarks in WLR/or any other similar report of any authority</p>

**APPENDIX'A' TONOTICE INVITING TENDER (NIT) (Contd...)**

	(C) For A II Contractors	:	Contractor will not be allowed to execute the work By subletting or through power of attorney holder on his behalf to a third party/another firm except sons/daughters of proprietor/partner/ Director and firm's own employees, Director, Project Manager. This shall be subject to certain conditions which will be prescribed in the NOT forming part of the tender documents.
9	Tender issuing and Accepting Officer	:	Garrison Engineer Air Force Srinagar
10	Executing agency	:	Garrison Engineer
11	Earnesty Money	:	Rs 50,000.00 in favour of GE (AF) Srinagar

**NOTES :**

The contractor enlisted upto one\* class below the eligible class may also apply/bid. Application/bids from one class below eligible class applicants may be considered in the event of inadequate response/bids from the applicants of eligible class.

(\* This shall be 'two' in case of works in remote and difficult stations and following additional provision to be added:

"Application from two class below eligible class applicants may also be considered in the event of inadequate response from the applicants of eligible class and one class below eligible class."

- (i) Applications/bids not accompanied by scanned copies of requisite D/Bankers Cheque towards cost of tender and earnest money (as applicable) shall not be considered for validation of 'T' bid and their finance bids will not be opened.
- (ii) Tenderers/bidders to note that they should ensure that their original DDs and earnest money (as applicable) are received within 05 days of bid submission end date or else they shall be barred from the tendering process in MES for a period of (06) Six months from the date of Bid opening.
- (iii) In case of applications/bids from enlisted contractors of MES, where scanned copies of requisite DD/Bankers Cheque towards cost of tender has been uploaded but physical copies are not received by the stipulated date, finance bids will be opened However non-submission of physical copies of cost of tender shall be considered as wilful negligence of the bidder with ulterior motives and such bidder shall be banned from bidding for a period of six months commencing from the date of opening of finance bid.
- (iv) In case of applications/bids from un-enlisted contractors, where scanned copies of requisite DD/Bankers Cheque towards cost of tender has been uploaded but physical copies are not received by the stipulated date, finance bids will not be opened. Name of such contractors alongwith complete address shall be circulated for not opening of their bids for a period of six months commencing from the date of opening of finance bid.

**APPENDIX'A' TONOTICE INVITING TENDER (NIT) (Contd...)**

- (v) In case of applications/bids( enlisted contractor as well as un-enlisted contractor) where scanned copies of requisite Earnest money (as applicable) were uploaded but the same are not received in physical form within stipulated time, such bids shall not qualify for opening of finance bid.
- (c) Contractors enlisted with MES will upload following documents for checking eligibility:-
- (i) Application for bid in Firm's letter head
  - (ii) Enlistment letter
  - (iii) Scanned copy of DD of cost of tender
  - (iv) Scanned copy of EPF Code number allotment Letter
  - (v) Scanned copy of Goods and Service Tax (GST) Number
  - (vi) Scanned copy of Electric Licence pertain to Internal/External Electrification works
- (d) Contractors not enlisted with MES will be required to upload necessary documents to prove their eligibility for enlistment in eligible class & category of work , including Affidavit for no recovery outstanding. List of documents required for enlistment in MES has been given in para 1.5 of section 1 of Part of MES Manual on Contracts 2007(reprint 2012). Following documents shall also be uploaded amongst others:
- (i) Details of three highest valued similar nature of works executed during last five years. financial year-wise in tabular form giving name of work , Accepting Officer's details, viz , Address , Telephone , Fax No, E-mail ID etc, date of acceptance of tender and actual date of completion. This shall be duly signed by proprietor I all partners I authorised Director of Pvt I Public Ltd, as applicable. It should indicate whether extension was granted or compensation was levied. Attested copy of acceptance letter and completion certificate shall be enclosed of each work. In case performance report has been given by the client same shall also be submitted duly attested.
  - (ii) Solvency certificate and working Capital Certificate issued by scheduled bank.
  - (iii) Annual turnover certificate for last 2 years issued by Chartered Accountant along with relevant pages of audited balance sheets in support thereof.
  - (iv) Affidavits for possession of movable & immovable properties by proprietor/partner owning the immovable property along with Valuation Certificate from Regd Valuer in support of movable & immovable properties. In case of Limited Company, the immovable property is required to be in the name of the company.  
In case of Limited Company, the immovable property is required to be in the name of the Company.
  - (v) In addition, the un-enlisted contractors shall also furnish affidavit on non Judicial stamp paper in the form of hard copy declaring their turnover for last 2 (Two) years.
  - (vi) Scanned copy of DD of cost of tender and earnest money.

**APPENDIX'A'TO NOTICE INVITINGTENDER(NIT)(Contd...)**

(e) Contractor shall get themselves registered with the Employees Provident Fund Organization and obtain Provident Fund Code Number. Further, it is a mandatory requirement that all construction workers should be provided Universal Account Number (UAN) by the contractor by appropriately registering them on the EPRO portal. Failing of upload of Employees' Provident Fund Code Number letter in Cover 1, bid shall be disqualified in 'T' bid evaluation and finance bid Cover 2 shall not be opened.

(f) Contractor shall get themselves registered with the service/Sales Tax department and obtain Goods and Service Tax (GST) Number. Further, it is a mandatory for the contractors to upload their Goods and Service Tax (GST) Number alongwith T 'bid'. Failing of upload of Goods and Service Tax (GST) number in Cover 1, bid shall be disqualified in 'T' bid evaluation and finance bid Cover 2 shall not be opened.

(g) In case of rejection of technical /prequalification bid, contractor may appeal to next higher Engineer authority i. e HQ CWE (AF) Srinagar on email [afsngr3-mes@nic.in](mailto:afsngr3-mes@nic.in) against rejection, whose decision shall be final and binding. However contractor/ bidder shall not be entitled to any compensation whatsoever for rejection of technical/prequalification bid.

(h) Court of place from where tender has been issued shall alone have jurisdiction to decide any dispute out of or in respect of this tender. After acceptance of tender, condition 72- Jurisdiction of Courts of IAFW-2249 shall be applicable."

Signature of contractor

( Surinder Gupta )  
AGE (Contracts)  
For Accepting Officer

8101/GE(AF)- 25/2018-19/ 01 /E8 dated 04 Jun 2018

Military Engineer Services  
Garrison Engineer (AF) Srinagar  
Air Force Station  
Srinagar-190007

**IN LIEU OF IAFW-1821 (REVISED 1960)****TO BE USED IN CONJUNCTION WITH GENERAL CONDITION  
OF CONTRACTS IAFW-2249(1988 PRINT)  
MILITARY ENGINEER SERVICES**

Garrison Engineer (AF) Srinagar  
**Military Engineer Services**  
Air Force Station  
Srinagar - 190 007

8101/GE(AF)-25/2018-19/ 03/E8

05 Jun 2018

**TERM CONTRACT FOR CA NO: GE(AF)-25/2018-19 : TERM CONTRACT FOR  
ARTIFICERS WORK FOR NORTH SIDE AT AIR FORCE STATION SRINAGAR**

e-tender shall be submitted in electronic form duly digitally signed by the authorised signatory of the tenderer before the last date and time for submission of bids and the requisite documents as mentioned in the tender shall be physically delivered at Garrison Engineer (AF) Srinagar, Air Force Station, Srinagar - 190 007 one day before the closing date of bid submission.

Any Correspondence concerning this tender should be addressed as indicated at the top of this sheet quoting the reference to the tender id mentioned in the ***eprocuremes.gov.in*** portal.

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

(Signature of Contractor)  
Dated:

Signature of officer  
Issuing the tender  
Appointment: AGE (Contracts)

**SCHEDULE `A' NOTES**

1. The work under this contract will be carried out in North Side of Air Force Station Srinagar under AGE B/R-II.
2. The contract shall run for a period of **12 (TWELVE) Months** from the date of acceptance. The work order shall be placed by Engineer-in-charge within the period of one year from the date of acceptance of tender for the execution of work covered in this contract. The total estimate of any single work Job or service as defined in the condition 4-A of IAFW-2249 shall not exceed ₹ 1, 50,000.00
3. The area of the term contract is contained and bounded by all Military area and no work shall be ordered on the contractor outside the limit of these boundaries.
4. The area of the Term Contract for Artificer work is as marked on site plan maps of Srinagar Airfield. Site plan (s) is/are not attached with the tender document from security point of view. The tenderers are advised to see maps in this office during the working hours and to inspect all sites of work. No claim with respect of location of site(s) will be entertained on this account. The tenderer is deemed to have been acquainted himself to the area and site (s) whether he inspects the site(s) or not.
5. Contractor is required to furnish completion certificate from users on completion of work order each separately and shall be attached with the final bill.

(Signature of Contractor)  
Dated:

AGE (Contracts)  
For Accepting Officer

**SCHEDULE 'A' PART-II  
(SCHEDULE OF CREDIT)**

1. The tenderers are required to inspect/assess the condition of material at site of work before quoting their tenders. The retrieved (unserviceable) material will be handed over to the contractor in the existing condition and the recovery of material will be effected at the rates given below irrespective of the condition of material and whether the material at site exist or not and nothing extra/less will be recovered/claimed on this account. Serviceable retrieved material, if not utilized in the work, shall be taken on charge.

2. The material as mentioned in **Sch 'A'Part-II** shall be recorded in credit schedule duly accepted by the contractor. The quantity of material may vary as per **Sch 'A'Part-I**, However the recovery will be made for the quantity actually provided against each item of Sch 'A'.

3. Any material other than as mentioned above in **Sch 'A' Part-II** shall be the property of Govt and shall be deposited by the contractor in Store Yard of **GE (AF) Srinagar** and the same shall be taken on charge. No extra cost shall be payable by the dept on this account.

SI No	Description of items	Unit	Rate
	<b>Old used Materials retrieved from Sch 'A': -</b>		
1	Wooden Chowkats not exc 1.5 Sqm each including iron mongery	Each	250.00
2	Wooden Chowkats exc 1.5 Sqm but n exc 4 Sqm each including iron mongery	Each	400.00
3	Wooden shutter n. exc 1.0 Sqm each including iron mongery	Each Leaf	200.00
4	Wooden shutter exc 1.0 Sqm and not exc 2.0 Sqm each including iron mongery	Each Leaf	400.00
5	Wooden shutter exc 2.0 Sqm each including iron mongery	Each Leaf	500.00
6	GI tubing 15 mm dia including fittings	RM	10.00
7	GI tubing 20 mm dia including fittings	RM	20.00
8	GI tubing 25 mm dia including fittings	RM	30.00
9	GI tubing 40 mm dia including fittings	RM	40.00
10	GI tubing 50 mm dia including fittings	RM	50.00
11	Stop cock/ bib tap 15 mm bore cast copper alloy	Each	50.00
12	Stop cock/ bib tap 20 mm bore cast copper alloy	Each	70.00
13	Stop cock/ bib tap 25 mm bore cast copper alloy	Each	90.00
14	PVC stop cock/ bib tap 15/ 20 mm bore	Each	15.00
15	CP Hot and Cold Mixture	Each	200.00
16	Pillar tap brass CP 15 mm bore	Each	50.00
17	Float Valve brass 15 mm bore	Each	40.00
18	Float Valve brass 20 mm bore	Each	40.00
19	Float Valve brass 25 mm bore	Each	50.00
20	PVC/ HDPE water tank n exc 500 litre capacity	Each	100.00
21	PVC/ HDPE water tank exc 500 but not exc 1000 litre capacity	Each	150.00
22	Brick work	Cum	150.00
23	Stone slab, any thickness	Sqm	30.00
24	CI pipe 50 mm dia including fittings	RM	30.00
25	CI pipe 75 mm dia including fittings	RM	40.00



**SCHEDULE 'A' PART-II (Contd)**  
**(SCHEDULE OF CREDIT)**

SI No	Description of items	Unit	Rate
26	CI pipe 100 mm dia including fittings	RM	50.00
27	CI fittings	Each	50.00
28	MS tower rail, any size	Each	10.00
29	MS tower bolt, any size	Each	5.00
30	MS sliding door bolt, any size	Each	25.00
31	MS handle, any size	Each	10.00
32	Aluminium tower rail, any size	Each	10.00
33	Aluminium tower bolt, any size	Each	5.00
34	Aluminium handle, any size	Each	5.00
35	Aluminium sliding door bolt, any size	Each	25.00
36	CGI sheet plain or corrugated, any thickness	Sqm	50.00
37	PVC flushing cistern	Each	50.00
38	Wooden scantling	Cum	2000.00
39	Ceramic Tiles	Sqm	20.00
40	WC/WHB/Sink	Each	10.00
41	Scrap iron	Kg	10.00
42	Scrap Aluminium	Kg	50.00
43	PVC Connection	Each	5.00
44	Ceiling Board	Sqm	20.00

(Signature of Contractor)  
Dated:

AGE (Contracts)  
For Accepting Officer

**SUPPLEMENTARY RATES**

1. The following supplementary rates form part of the contract.
2. The rates are **at par with prevailing market rate**; hence no contractor's percentage is allowed over these rates.

SI No	Description of items	Unit	Rate
1	S/F in repairs MS Handle for steel windows left/right	Each	25.00
2	S/F in repairs MS peg stay 300mm long for steel windows	Each	60.00
3	M&L in repairs Wooden panelling of second class softwood 12mm thick with tongue and groove joint fixed in any position over and including wooden framework in second class softwood with plain fillets square or rectangular in section clean sawn, secured with nails/screws of sectional area exc 13 Sqcm and n exc 25 Sqcm at n exc 90cm centre to centre in both direction and including three coats of french polishing on all the exposed surfaces complete all as specified and as directed by Engineer-in-Charge	Sqm	1200.00
4	MS curtain rod fancy type 25mm dia as per sample kept at GE (AF) Srinagar	RM	100.00
5	MS fancy type brackets for curtain rod	Pair	60.00

(Signature of Contractor)  
Dated:

AGE (Contracts)  
For Accepting Officer

**SCHEDULE 'B'**  
**ISSUE OF MATERIALS TO CONTRACTOR**  
**(REF CONDITION 10 OF IAFW-2249)**

Ser No	Description of material	Unit	Rate at which material will be issued to contractor	Place of issue by name	Remarks
	NIL				

**SCHEDULE 'C'**  
**ITEMS OF TOOLS AND PLANTS (OTHER THAN TRANSPORT**  
**WHICH WILL BE ISSUED TO THE CONTRACTORS**  
**(See Condition 15, 34 & 35 of IAFW-2249)**

Ser No	Quantity	Particulars of Crew	Details	Hire charges per unit per working day	Standby charges per unit of off day	Place of issue	Remarks
	NIL						

**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	Remarks
	NIL			

(Signature of Contractor)  
Dated:

AGE (Contracts)  
For Accepting Officer

**TENDER**  
**(TO THE PRESIDENT OF INDIA)**

Having examined and perused the following documents: -

1. Specifications Signed by AGE (Contracts),GE (AF) Srinagar.
2. Drawings detailed in the Specification.
3. Schedule 'A' (BOQ), 'B', 'C', 'D' attached hereto.
4. MES Standard Schedule of Rates 2009 (Part-I) for specifications and 2010 (Part-II) for rates together with errata/amendment No 1 to 3 for Part-I and for errata/amendment No 01 to 59 for Part-II (as applicable) respectively here-in-after and in IAFW-2249 referred to as the MES schedule 5. General conditions of contracts IAFW-2249 (1989 Print) together with amendment No 1 to 40 and Errata 1 to 20.
5. Water Refer conditions 31 of IAFW-2249 General Conditions of contract. Water will be supplied by the MES. Water supply shall be metered and shall be paid for by the contractor to the department @ Rs 9.07 per 1000 worth of work done priced at contract rates.
6. Should this tender be accepted. I/We agree: -
  - (a)\* To the sum of ₹ \_\_\_\_\_  
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 with the time specified in condition 22 of IAFW-2249.
  - (b) To perform such services and execute such works upon the terms and conditions herein after contained as may be demanded and as enumerated as in the aforesaid MES Schedule upto one year from the date of accepting of contract at the rates contained in the aforesaid MES Schedule of Rates.
  - (c) And such other rates as may be fixed under the provision of condition 62 of IAFW-2249 and further agree to refer all disputes as required under condition 70 of IAFW-2249 to the Sole Arbitrator of a serving officer having a degree in Engineering or equivalent or having passed final/direct final examination of sub Division-II of Institution of Surveyors (India) to be appointed by Chief Engineer (AF) Udampur Zone or in the absence the officer officiating as Chief Engineer whose decision shall be final, conclusive and binding.
7. The total estimate of any single work, job or services as described in condition 4A shall not exceed ₹ 1, 50,000.00
8. The number of civilian work people who may be employed by the Garrison Engineer under provision of condition 4A (e)(ii) of IAFW-2249 shall not exceed on average of 50 per day in any calendar month.

\* Delete where not applicable

TENDER (CONTD)

Signature \_\_\_\_\_ in the capacity of \_\_\_\_\_ duly  
authorised to sign the tender for and on behalf of \_\_\_\_\_  
\_\_\_\_\_ (in block letters)

Date:

Witness \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Postal Address \_\_\_\_\_  
Telegraphic Address \_\_\_\_\_  
Telephone Nos, if any \_\_\_\_\_

ACCEPTANCE

\_\_\_\_\_ alterations have been made in these documents and evidence that these alterations were made before the execution of the contract agreement these have been initialed by the contractor and Shri Surinder Gupta, AGE (Contracts) GE (AF) Srinagar.

The said officer is hereby authorised to sign and initial on my behalf the documents forming part of this contract.

The above tender is accepted by me on behalf of the President of India at the uniform percentage of \_\_\_\_%.

( \_\_\_\_\_ Percentage) **ON/OFF** the Rates contained in the MES Standard Schedule of Rates (Part II) 2010.

On the \_\_\_\_\_ day of \_\_\_\_\_ 2018.

Signature

**Appointment:** Garrison Engineer

Garrison Engineer (AF) Srinagar

**Military Engineer Services**

Air Force Station

Srinagar - 190 007

(For and behalf of the President of India)

Accepting Officer

**SPECIAL CONDITIONS****1. GENERAL**

- 1.1. The following special conditions shall be read in conjunction with general conditions of contracts IAFW-2249 (1989 print), IAFW- 1779 A and errata/amendments thereto. If there are any provisions in these special conditions which are at variance with the provisions in the above mentioned documents, the provisions in these special conditions shall be deemed to take precedence.

- 1.2 General Rules, preambles, special conditions, method of measurement etc, specified in MES Schedule of Rates Part-II (2010) and specification Part-I (2009) shall be applicable unless specific provisions to the contrary are made in these tender documents.

**2. VISIT TO SITE(s) OF WORK**

The tenderers are advised to, visit the site of work prior permission of GE and make themselves familiar with the local working conditions accessibility of site, availability of materials and other relevant conditions which affect their pricing, workman like execution and entire completion of work. The tenderers shall be deemed to have visited the site before tendering whether they actually visit or not.

**3. ADMISSION TO SITE: - CONDITIONS FOR WORKING IN RESTRICTED AREA**

- (a) The work lies in **RESTRICTED AREA**.

(b) The contractor shall apply in writing well in advance of the compartment of work for the issue of security passes and shall submit list of person(s) concerned and shall satisfy Engineer-in-Charge who shall at his discretion issue passes or may get them issued through the security officer of the unit concerned for controlling admission of the contractor, his agents, his Engineers, Overseers, work mistries and his workmen. The cost of all his photographs required for passes shall be borne by the contractor. Passes thus issued shall be returned at any time or on demand by the issuing officer and in any case shall be surrendered to issuing Officer immediately after completion of the work.

(c) The contractors and his people on the work shall observe all security rules promulgated from time to time by the authorities controlling the area where the work is to be carried out e.g. prohibition of smoking and lighting in certain Zones, search of persons at entry and exit and keeping to specified routes etc. Any person or persons found violating the security rules laid down by the authorities in the area is/are liable to be expelled from that area without assigning any further reasons whatsoever and the contractor shall have no claim on this account.

(d) The contractor may not be allowed to take his vehicle for carriage of materials upto the point of the structure and the material may have to be unloaded at the points directed by the Engineer-in-Charge.

(e) In case site of work is undulating and the contractor shall have to take permission to stock the material at different places. The contractor shall take into consideration these factors while quoting his rates.

- 3A. **OFFICIAL SECRET ACT:** The contractor shall be bound by the Indian Official Secret Act, 1923, particularly Section 5 thereof all as per Condition 2A of IAFW-2249

**4. CONTRACTOR'S REPRESENTATIVES/AGENTS AND WORKMEN**

- 4.1 The contractor shall employ only Indian Nationals and verify their antecedents and loyalty before employing them on the work. He shall ensure that no doubtful antecedents and nationality is in any way associated with the works. If for reasons of technical collaboration or other considerations the employment of any foreign national is unavoidable the tenderers shall furnish full particulars to the Accepting Officer at the time of submission of tenders. As a proof that he has employed only Indian Nationals, the contractor shall render a certificate to this effect to GE within one month from the date of commencement of work.

- 4.2 The GE shall have full power, and without giving any reasons to order the contractor immediately to cease to employ in connection with this contract any representatives, agent servants and workmen or employees whose continued employment in his (GE's) opinion is undesirable. The contractor shall not be allowed any compensation on this account.

- 4.3 Tenderers attention is also drawn to condition 25 of IAFW-2249 in this connection.

**SPECIAL CONDITIONS (Contd)****5. HOURS OF WORKING**

- 5.1 Hours of working will normally be restricted from 0800 hours to 1700 hours. If, however, contractor wants to work beyond these normal hours he can do so, if permitted by the GE in writing. Similarly no work will be allowed to be carried out on Sunday and Gazetted holidays unless specifically permitted by the GE in writing. In case of restricted area the working hours shall be as notified by the authority controlling the area.

**6. LAND FOR STORAGE OF MATERIALS, WORKSHOP, OFFICE AND ACCOMMODATION FOR LABOURERS**

- 6.1 The contractor shall be permitted to store materials including erecting temporary sheds erect temporary workshop and the site office at the area(s) of land marked on the site plan(s) or as decided by the GE if the area(s) are not marked on the site plan(s). The contractor shall pay license fee of Rs. 1.00 (Rupees one only) per year or part thereof in respect of each any every separate area(s) of land allotted to him.
- 6.2 The contractor shall not be permitted to erect labour camp on Ministry of Defence land.

**7. CONTRACTOR'S PLANT EQUIPMENT AT SITE**

- 7.1 The contractor shall furnish to the Engineer-in-Charge every morning a distribution return of the plant and/or equipment on the site of work, stating the following particulars:-

- (a) Particulars of plant/or equipment, its make, manufacture No, Model No, if any, Registration No, if any, capacity, year of manufacture, year of purchase, etc.
- (b) Total No (quantity) on site of works.
- (c) Location indicating No (quantity) at each location on the site of works.
- (d) Purchase of value on the date of purchase. For the purpose of this condition, plant and/or equipment shall include vehicles i.e. trucks and lorries but neither the workmen's tools nor any manually operated tools/equipment.

- 7.2 The 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.

**8. LOSS OR DAMAGE ON ACCOUNT OF ENEMY ACTION**

If as a result of enemy action the contractor suffers any loss or damage, the Govt, shall reimburse to the contractor such loss or damage, to the extent and in the manner hereinafter provided.

- (a) The loss suffered by him on account of any damage or destruction of his plant and or equipments (as defined in special condition para 7 above) of materials or any part or parts thereof. (The amount of loss assessed by the Accepting Officer of the contract accepted by GE on this account shall be final and binding).
- (b) The compensation paid by him under any law for the time being in force to any workman employed by him or any injury caused to him or to the workmen's legal successors for loss of the workman's life.
- (c) 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).

No reimbursement shall be made nor shall any compensation be payable under the above provision unless the contractor has taken air defence/precautions ordered in writing by the GE concerned or in the absence of such orders reasonable precautions. No reimbursement shall be payable nor any compensation be payable for any plant and/or equipment or material nor lying on site of work at the time of enemy action.

**9. USE OF EXISTING BUILDING ETC**

The contractor shall not use the existing latrines, baths and other existing buildings if any for use by his work people or for storage of his materials or for any other purpose unless permitted to do so in writing by the Garrison Engineer.

**SPECIAL CONDITIONS (Contd)****10 WATER**

- 10.1 Refer Condition 31 of IAFW-2249 water will be supplied by the department at the point(s) indicated on the site plan and shall be charged @ ₹9.07 per 1000 worth of work done prices at contract rate. The supply of water may not be continuous; the contractor shall be deemed to have ascertained the hours of availability of water before submitting his tender. MES do not guarantee the output of water supply or break down in the system or supply is not sufficient. The contractor shall make his own arrangements as to store and supplement the water supply at his own cost and he will not have any extra claim on such account. Water meter will be arranged by the contractor
- 10.2 The contractor if he so desires, will be allowed to augment the water supply by boring well(s) at his own cost at site approved by the GE. On completion of the work, the contractor shall remove pipe etc., installed and make good the site as directed by the Engineer-in-Charge without any extra cost to the Govt. The contractor shall, however, ensure that the water drawn from such sources is clear and free from all impurities and is suitable for mixing mortar, washing aggregate and mixing of concrete as specified in IS-456. The contractor shall produce test certificate to the GE from recognised Govt laboratory at his own cost about the potability of water.

**11. ELECTRICITY**

- 11.1 Electric supply will be supplied by MES, if desired by the contractor in writing and shall be recovered from the contractor @ ₹ 12.10 (Rupees twelve and ten paise only) per unit for light point/power point.
- 11.2 Electric supply required for works shall be made available by the MES at the incoming terminal of the main Switch as marked on the site plan. The main Switch and KWH meter to register the electric energy supplied shall be provided and installed by 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 the execution of work.
- 11.3 The MES do not guarantee continuity of supply and no compensation whatsoever shall be allowed for supply becoming intermittent or for break down in the system.
- 11.4 The supply shall be AC, 3 phases.
- 11.5 In case supply point is not marked, it shall be as decided by GE.

**12. DAMAGE TO EXISTING BUILDING, ROADS AND DRAINS ETC**

The contractor shall be responsible to reinstate and make good at his own expense, the damage, if any caused by his workmen etc, existing buildings, roads, drains, cables etc while carrying out the work under this contract. Rectification reinstatement, replacement making good and touching up, etc shall conform to the standard of workmanship and materials originally used and the same shall be done to the entire satisfaction of the Engineer-in-Charge.

**13. QUARRIES AND ROYALTY**

Reference condition 14 of IAFW-2249 General Conditions of Contracts. Delete the condition in too and substitute as under:-

"Neither quarries are available nor shall the quarrying be permitted on the Defence land".

**14. OCTROI, SALES TAX AND OTHER DUTIES**

The lump sum quoted by the contractor shall be deemed to include all duties and taxes such as Octroi, sales tax, GST (Goods and Service Tax) etc as applicable. The contractor shall not include any condition for fluctuation in prices of labour and/or materials in his tender. Variation in prices of labour and materials during the progress of work subsequent on an act of legislature is already covered in condition 63 of IAFW-2249.

**15. MINIMUM WAGES PAYABLE TO LABOUR**

- 15.1 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, whichever is higher.
- 15.2 The fair wage referred to in condition 58 of IAFW-2249 will be deemed to be the same as the minimum wages as referred to above.



**SPECIAL CONDITIONS (Contd)**

- 15.3 The contractor shall have no claim whatsoever if on account of any local Regulation or otherwise, he is required to pay wages in excess of fair wages shown in schedule of minimum wages under condition 58 of IAFW-2249 subject, however, to the provision in condition 63 thereof.

15.4 **APPROACHES**

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

16. **PERMIT FOR PLYING GOODS TRANSPORT IN J&K AREA**

Recommendations for the issue of permits for plying goods transport private carriers for carrying materials for the work will be made by the Accepting Officer to competent Transport Authorities of J&K Govt. However, the Ministry of Defence does not guarantee issue of such permits. The Accepting Officer reserves the right to decide the routes, number of vehicles to be recommended for issue of permits, duration for which the permit is to be recommended and his decision shall be final conclusive and binding with reference to the matter referred to in the condition.

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

The contractor shall permit free access and afford facilities and usual convenience to other Agencies or departmental workmen if any, to carry out other work services (whether or not in connection with the work under the scope of this contract) on the site, simultaneously. The contractor shall not be allowed any extra payment on this account.

18. **BANK GUARANTEE BOND FOR SECURITY DEPOSIT/RETENTION MONEY**

On acceptance of the tender, the Govt may accept a guarantee bond from State Bank of India or any Nationalised Banks and/or schedule banks for security deposit and/or retention money. The bond is to be on the prescribed form which is available with and may be seen by the tenderers in the office of GE.

19. **RELEASE OF ADDITIONAL SECURITY**

Additional security Deposit in two instalments, the contractor shall be required to submit the security in Reference condition 22 and 68 of IAFW-2249. To enable the department to release the two equal parts which can be released separately.

20 **TIME AND PROGRESS CHART USING CRITICAL PATH METHOD**

Time and progress chart to be prepared as per condition 11 of General Conditions of contract (IAFW-2249) shall consist of details networks analysis and a time schedule. The critical path not work shall be drawn jointly by the GE and the contractor soon after acceptance of the 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 contractor to GE who will approve it after the scrutiny. The schedule will be submitted in four copies within two weeks from the date of handing over of site. During the execution of the work, the contractor is expected to participate in the review and updating of the network undertaken by the GE either as periodical appraisal measures or when the quantum of work ordered on the contract substantially changed through deviation orders for amendments. Any revision of the schedule as a result of the review will be submitted by contractor to the GE within a week who will approve it after due scrutiny. The contractor will adhere to GEs revised schedule thereafter. In case of contractor disagreeing with Accepting Officer whose decision will be final, conclusive and binding. During the currency of work, the contractor is expected to adhere to the time schedule and this adherence will be part of contractor's performance under the contract.

GEs 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. The contractor shall mobilise and employ sufficient resources to achieve the detailed schedule with in the board frame work of the accepted method of working and safety. No additional payment will be made to the contractor for any multiple shift work or other incentive methods contemplated by him in this work schedule even though the time schedule is approved by the department.

**SPECIAL CONDITIONS (Contd)****21. RECORD OF CONSUMPTION OF CEMENT**

For the purpose of keeping a record of cement issued and consumed in works, the contractor shall maintain a properly bound register in the form approved by the Engineer-in-Charge showing the daily receipt from MES, quantity used in works and balance in hand at the end of each day and such other information as is required to control the consumption and issue of cement. This register shall be signed daily by the contractor's representative in token of correctness of the entries made. It shall be signed in token of check by MES representative as follows:-

(a) Daily by JE (civil) in charge of supervision on works.

(b) Once in a week by the Engineer-in-Charge.

The register shall be kept at site of work in the safe custody of the contractor during progress of work and on demand shall produce the same for verification of inspecting officers. The register shall be returned to MES on completion of work. Foregoing provisions shall not, however, absolve the contractor of his responsibility of incorporating quantity of cement in various items of work and of returning of over issued quantity at the place of issue of the total quantity of cement issued is found to be more than the net requirement detected at the time of check/examination of final bill/works.

**22. SECURITY OF CLASSIFIED DOCUMENTS**

Tenderers special attention is drawn to condition 2A & 3 of General Conditions of Contracts, IAFW-2249 for compliance. The contractor shall not communicate any classified information regarding the work either to sub-contractor(s) or to any other person(s) without proper written approval of the Engineer-in-Charge. The contractor shall also not make copies of the decision and drawings and other documents furnished to him in respect of works and he shall return all documents to the department on completion of the work or earlier determination and/or termination of the contract. The contractor or shall attach with final bill the receipt from the Engineer-in-Charge to the effect that he (The contractor) has returned the classified documents as per conditions 3 of General Conditions of contract, IAFW-2249.

**23. CLEANING DOWN**

The contractor shall clean all floors, joinery, glass panes etc, and remove drops of cement/lime paint etc and touch up all painters' work and carry out all other items of work as are necessary to make and leave the premises clean and tidy before binding over the buildings and/or works. The contractor shall not be allowed any extra payments on this account.

**24. VALIDITY OF TENDER**

This tender shall remain open for acceptance for a period of 60 days from the date on which the same is due to be submitted.

**25. ADJUSTMENT OF TAXES/LEVIES**

Tendered rates are inclusive of all taxes in the shape of Goods and Service Tax (GST) and toll taxes /levies payable under the respective statutes.

**25.1 ADJUSTMENT OF TAXE ON SERVICES:-**

- (a) Govt. of Jammu and Kashmir Finance Department has levied Goods and Service Tax (GST) on services rendered by the contractor. It has been made obligatory for the disbursing officer to deduct this service tax at the rate given in Goods and Service Tax (GST) rule in Jammu and Kashmir on services rendered by the contractor on gross payment to contractor at source.
- (b) The rate of Goods and Service Tax (GST) prevailing as on last date of receipt of tender shall be applicable. Tenderer's are advised to independently ascertain and consider the rates of Goods and Service Tax (GST) etc. in their quotation/offer while quoting their rates of each item accordingly. No claim on account of any kind of misunderstanding on the issue shall be entertained at later date.

It has been made obligatory for disbursing officer to deduct the Goods and service tax (GST) as per Jammu and Kashmir Goods and Service Tax (GST) rule (ACT) 2017.

**SPECIAL CONDITIONS (Contd)****25.2 LABOUR/WORKERS WELFARE CESS/TAX: -**

Tendered rates are also inclusive of tax for Workers Welfare Cess. The Govt of Jammu and Kashmir vide SRO 274 dt 13.07.2007 has constituted the Jammu and Kashmir building and other const. workers welfare board under sub-section 1 of section 18 of the Building and other const. worker (RECS) Act 1996. Under sub-section 1 of section 3 of the building and other const. Workers Welfare cess Act 1996, the Govt of India vide S.O. 2899 dt 26-09-1996 has specified one percent Cess of the cost of construction incurred by an employer for the purpose of the building and other const. worker (RECS) Act 1996. The Cess levied shall be collected from every contractor, including deduction at source in relation to building or other construction work of a Government or of a public sector undertaking. Accordingly, the contractor shall include the tax for Workers Welfare Cess in his tender.

**26. SPECIAL CONDITION FOR CONCILIATION****26.1 Scope of conciliation****26.1.1 The scope of conciliation shall be restricted to the following types of disputes with financial limits as indicated therein: -**

- (a) Disputes relating to levy of compensation for delay in completion actual amount of compensation.
- (b) Disputes relating to technical examination of works.
- (c) Disputes relating to interpretation of the provisions of the contract with reference to their application to parties.
- (d) Disputes relating to non-return of Schedule 'B' stores/over issued to contractor.
- (e) Any other dispute having fair chances of being resolved by conciliation and considered fit to be referred to conciliation by the parties.

For item (b), (c), (d) and (e) each as stated above, the financial limit shall be Rupees Two Lakh or one percent of the contract amount whichever is less.

**26.2 Commencement of Conciliation Proceedings****26.2.1 The party initiating conciliation shall send to the other party a written invitation to conciliate, briefly identifying the subject of the dispute.****26.2.2 Conciliation proceedings shall commence when the other party accepts in writing the invitation to conciliate.****26.2.3 If the other party rejects the invitation, there will be no conciliation proceedings. If the party initiating conciliation does not receive a reply within 30 days from the date on which he sends or within such other periods of time as specified in the invitation, he may elect to treat this as a rejection of the invitation to conciliate and if he so elects, he shall inform in writing the other party accordingly.****26.3 NUMBER OF CONCILIATOR There shall be a Sole conciliator.****26.4 APPOINTMENT OF CONCILIATOR**

All disputes brought out in Para 26.1.1 (a) to (e) above shall be referred to the Sole Conciliator viz Serving Officer not below the rank of Superintending Engineer/ Superintending Engineer (QS&C) having degree in Engineering or equivalent or having passed final/Direct final examination of Sub division - II of Institution of Surveyors (India) to be appointed by the Engineer-in-Chief, Army Headquarters, New Delhi or in his absence the Officer Officiating as Engineer-in-Chief or Director General of works specifically delegated by the Engineer-in-Chief in writing.

**26.5 STATUS OF EFFECT OF SETTLEMENT AGREEMENT**

The settlement agreement signed by the parties as a result of conciliation proceedings shall have the same status and effect as it is an arbitral award on agreed terms.

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

(a) The rates quoted by the Contractor shall be deemed to be inclusive of all taxes (including Goods and service tax (GST) on materials, Goods and service tax (GST) on Works Contracts, Turnover Tax, Labour Welfare cess/tax etc), duties, Royalties, Octroi and other levies payable under the respective Statutes. No reimbursement/refund for variation in rates of taxes, duties, Royalties, Octroi and other levies, and/or imposition/abolition of any new/existing taxes, duties, Royalties, Octroi and other levies shall be made except as provided in sub para (b) here-in below.

**SPECIAL CONDITIONS (Contd)**

(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 and service tax (GST) on Works Contracts, 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 last due date of receipt of tenders. Any increase in percentage rates of "taxes directly related to Contract value" with reference to prevailing rates on last due date for receipt of tenders 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 last due date for receipt of tenders 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 last due date for receipt of tenders shall be reimbursed to the Contractor and abolition of any "taxes directly related to Contract value" prevailing on last due date for receipt of tenders 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 thereto which he may be in a position to supply. The Contractors 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 and 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.

**28. Testing of Materials**

- (a) The cost of testing of materials as listed in Appx 'D' except materials issued under Sch 'B' shall be borne by the contractor.
- (b) Test of various materials as specified in SSR Part I shall be carried out.
- (c) Rates given under Col 7 of Appx'D' shall be per lot of sample.
- (d) The recoveries shall be effected when the tests are carried out in the Zonal Lab instead of Site Lab.

**29. EMPLOYERS' PROVIDENT FUND**

Contractor shall get themselves registered with the Employees Provident Fund Organization and obtain Provident Fund Code Number. Further, it is a mandatory requirement that all construction workers should be provided Universal Account Number (UAN)/PF Code Number by the contractor by appropriately registering them on the EPRO portal.

Certificate to the effect that all the workers' employment directly or indirectly are registered for EPF and the due consideration have been credited into their account shall be rendered by the contractor alongwith each and every RAR/final bill.

**30. Goods and service tax (GST) ACT**

It is incumbent on the part of tenderer's to have Goods and service tax (GST) number. Irrespective of whether any tenderer has got his firm registered or not for execution of work, Goods and service tax (GST)/TDS on account of GST as applicable shall be deducted at source.

(Signature of Contractor)  
Dated:

AGE (Contracts)  
For Accepting Officer

GE (AF) Srinagar

**PARTICULAR SPECIFICATION****1. GENERAL**

1.1 Work under this contract shall be carried out all as per special conditions and particular specifications forming part of this contract and General specifications and other provisions in the MES standard Schedule of rate 2009 Part-I and 2010 Part-II (Rates) referred as SSR MES Schedule specifications given here in after are supplementary to specifications given in SSR (which have not been repeated and hence shall be read in conjunction with the specifications contained therein, where provisions in the particular specification forming part of this contract are at variance from the provisions in the SSR provisions in these particular specifications take precedence over the provisions in the SSR.

1.2 The term "General specifications" referred to in Para 1.1 above as well as referred in IAFW-2249 (General conditions of contracts) here in after shall mean the specifications contained in the MES Schedule 2009 (Part-I).

1.3 General Rules, Specifications, Special Conditions and all 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 provisions in these documents shall take precedence over the aforesaid provisions in the MES Schedule. The term "as specified" wherever appears in the tender documents relates to relevant Particular Specifications and in its absence, General Specifications. All references to MES Schedule/SSR in these specifications relate to Part-I of MES Schedule 2009 unless otherwise mentioned. Reference to only some Paragraphs of MES Schedule have been made in these Particular Specifications but other Paragraphs and provisions, as applicable, are also to be followed, if any, though not particularly mentioned hereinafter.

1.4 Specifications for any item of work which are not given in MES schedule or in these particular specifications as given in relevant Indian Standard Codes shall be followed.

**1.5 Scope of work**

The scope of work under this term contract comprises of artificer's work i.e. provision, additions, alteration, repairs etc as described in condition 4A of IAFW-2249. Duration of period and Zone of operation for artificer's work shall be stipulated elsewhere in these tender documents.

**2. MATERIALS**

2.1 Unless specific makes/manufacturers are specified in the tender documents, all the materials to be procured by the contractor for incorporation in the work under this contract (with the exception of local materials like bricks, stone aggregate, stones, sand etc) shall be with ISI certifications mark. For materials of specific make/manufacturer's names refer Para 2.2 here-in- below.

2.2 However, if any specific makes/manufacturers names are specified in Sch 'A' or Particular specifications, materials shall be of these specific makes/manufacturers only. ISI marking will not be mandatory for such items where makes/manufacturers have been specified unless the items of makes/manufacturers specified are available both with IS marking and without ISI marking. If any material is not manufactured with IS certifications mark in the country, it shall be conforming to relevant IS and other specifications specified elsewhere and shall also conform to samples displayed in the office of the GE/EIC as applicable.

2.3 Indian Standard (IS) of the year of publication/edition listed or specified in the SSR (Part-I) shall be applicable along with all the amendments issued till the issue of this tender for the work under this contract unless specifically indicated otherwise elsewhere in these tender documents.

2.4 **LOCAL MATERIALS** Irrespective of actual distance involved, local materials such as bricks, stones, aggregates, sand, road metals etc shall conform to or superior to the specifications given here in after and to the samples kept in the office of GEs/EIC. The tenderers are advised to inspect these samples. The tenderers shall be deemed to have inspected the samples and have full knowledge thereof whether they inspect them or not before quoting their tender.

**2.5 SAMPLE OF MATERIALS**

2.5.1 Refer condition 10 of IAFW-2249

2.5.2 Specific requirements, regarding dimensions, strength weight and finishes as per IS, SSR and the particular specifications given herein after vis- a- vis actual properties, check tests carried out reference to test certificates and marking, etc based on which samples of each materials are approved as conforming to relevant specifications shall be recorded in the sample approval register.

2.5.3 The contractor shall not procure materials unless the samples are first got approved from the Garrison Engineer.

**2.6 RECORD OF MATERIALS (REFER SPECIAL CONDITION)**

(a) The quantity of materials such as paints, Liquid water proofing admixture and the like as directed by the Engineer-in-Charge, shall be recorded in measurement books and signed by the contractor and the Engineer-in-Charge as a check to ensure that their required quantity has been brought at site for incorporation in the work.

(b) Materials brought to site shall be stored as directed by the Engineer-in-charge and shall be suitably marked for identification.

(c) The contractor shall on demand produce to the GE, original printed Vouchers /invoices in respect of the supplies. Vouchers/ invoices so produced and verified shall be stamped by the Engineer-in-Charge indicating contract number. 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 requirement of materials (being less than smallest packing).

2.7 The approved samples be suitably signed and dated by the contractor and MES for identification and proper displayed and preserved / packing till the expiry of the maintenance period. Transparent container/packing for display of approved samples shall also be supplied by the contractor. After expiry of maintenance period, the contractor may collect these samples including containers/packing within a period of three months there after he shall have no claim on the same.

**2.8 Production of vouchers/invoices for materials procured by the Contractor: -**

The contractor shall produce the original printed machine numbered purchase voucher / invoices for the following

GE (AF) Srinagar

materials (unless these are not required for incorporated in work) whenever procured and brought to site of work for incorporation in the work.

2.8.1 A xerox copy of such vouchers/invoices shall be kept on the record duly signed by the contractor and Engineer-in-Charge. The original vouchers/invoices shall be stamped (office stamp) and defaced in ink by the Engineer-in-Charge stating "verified" for materials purchased and brought to the site of work for incorporation in the work "under the subject CA" and signed with date before allowing payment for the material through RAR.

2.8.2 The vouchers/invoice shall clearly indicate the IS Number (with specific reference to alternatives to which the materials confirm in case of various alternative are given in the IS: -

- (i) Steel and cement
- (ii) Water proofing Compound/Liquid admixture
- (iii) Timber
- (iv) Particle boards, block boards, ply wood, plastic laminated sheets, pre-laminated particle boards and the like wood.
- (v) Builders hardware
- (vi) Electric cables/fittings/fixtures and electric equipment
- (vii) Paints, Distempers, varnish cement base paint and the like
- (ix) GI tubing and all water supply fittings & valves.
- (x) SGSW pipe
- (xi) Cast iron pipe
- (xii) CI pipes & fittings (Soil/waste/vent pipes)
- (xiii) Sanitary fittings
- (xiv) Any other material as decided by GE/AGE.
- (xv) Water storage tanks.
- (xvi) Any other proprietary articles,

Payment for above materials shall neither be made in the RARs nor these will be allowed for incorporation in the work unless purchase vouchers/invoices and test certificate of manufacturer as stated above are produced by the contractor and are verified by the Engineer-in-Charge.

2.9 **STANDARD OF WORKMANSHIP**

To determine the acceptable standard of workmanship and layout of fittings wiring etc GE shall order the contractor to execute certain typical portion of work (different trades) and services sufficiently in advance of other work in one portion of the building. These shall be executed and completed under the close supervision of the Engineer-in-Charge and shall be got approved from GE. On the approval by the GE of such items, these items shall be signed and/or suitably identified by the GE and labelled as guiding samples. The record of such inspection and passing of each stage of these samples shall be recorded by GE under his dated signatures. Works on each sample/portion of the building shall be progressed well ahead (minimum two stages ahead) of other portions of building. Approved finishes/workmanship shall be followed in the work as a whole.

2.10 **SCOPE OF WORK**

The scope of work under this contract comprise of full final and entire completion of works described in different parts of Schedule 'A' and in General Summary, all shown in drawings and as specified in these particular specifications.

2.11 **DEMOLITION/ DISMANTLING/TAKING UP OR DOWN**

Refer section 21 of SSR- Part -I in General

2.11.1 The tenderers shall visit the site of work to assess nature and extend of work involved in demolition/ dismantling/taking up or down and the quantity and quality of material obtained there from. The tenderer shall be deemed to have visited the site and availed the pre-tender opportunity to assess all the eventualities, which may affect his quotation whether he actually visits or not.

2.11.2 The contractor shall take all necessary precautions for the protection of adjoining property/ building while taking up work of dismantling/demolition/taking up or down. Any damage to exiting property/building shall be made good by the contractor without any extra cost to the department.

2.11.3 The material obtained under Schedule of credit shall be handed over to the contractor by the EIC on a proper gate pass and credit for demolished/dismantled/taking up or down material for these items will be deducted from the RAR paid subsequent to demolition/dismantling/taking up or down of the work catered for is executed. But in no case the material shall be allowed to be removed from the site until the credit has been recovered by the Govt.

2.11.4 The contractor will remove demolished/dismantled unserviceable material from the site of work and deposit all the serviceable materials not included in the Sch of credit to the store yard of GE (AF) Srinagar. No extra cost will be paid on this account and the cost is deemed to be included in the tender.

3. **EXCAVATION AND EARTH WORK**

3.1 **GENERAL REQUIREMENTS:** Refer Section 3 of MES Schedule Part-I and Special Conditions to Section 3 of MES Schedule Part II.

3.2 **FILLING IN TRENCHES/UNDER FLOORS:** The approved earth shall only be used for filling in trenches, under floors and any other situation as specified after removing big stones, grass roots and vegetable moulds, or other organic matter. Earth mixed with small stones/pebbles (if approved by GE/EIC) is permitted for use in filling under floors and foundations. Any earth required for the purpose of filling shall be arranged by the contractor at no extra cost to the department from outside the defence land.

3.2.1 Filling under floors/sides of trenches shall be in layers not exceeding 250mm thick, each layer shall be watered and well rammed.

3.2.2 Surplus spoil shall be removed and spread at places as directed by the Engineer-in-Charge, to a distance exceeding 50

GE (AF) Srinagar

metres, but not exceeding 100 metres, and levelled as directed by Engineer-in-Charge.

3.3 **HARD CORE:**

3.3.1 Hard core shall be of hard broken stone or boulders broken to gauge not exceeding 8mm. The material of hard core shall be well graded for providing dense and compact sub grade Hard core shall be deposited, spread and levelled in layers not exceeding 15cm thick and watered and well rammed to a true surface and compacted with sufficient fine material. The thickness of hard core specified or indicated in the relevant item of Sch 'A' shall be the thickness after consolidation.

3.4 **Bailing/pumping of water:** All water that may accumulate in trenches of foundations, column footing, rafts etc during the progress of work from rain/snow, sub soil water, spring etc shall be bailed/pumped out or otherwise removed all as per clause 3.17 of SSR Part-I and nothing extra except as provided for vide special condition 3.11 on page No 22 of SSR Part II (2010) shall be payable on this account. Contractors are therefore advised to ascertain level of sub soil water at site of work before quoting tender.

4. **CONCRETE WORK**

4.1 **GENERAL:**

4.1.1 Refer section 4 of MES Schedule Part-I and IS 456-2000 in general.

4.2 **CEMENT TO BE PROCURED BY THE CONTRACTOR:**

Contractor shall make his own arrangements to procure cement as specified here-in-after. The cost of cement, its transportation, storage, testing charge, it's accounting the preservation etc till consumed in work shall be borne by the contractor.

4.2.1 **TYPE OF CEMENT:** -

Type of cement to be used in this contract shall be ordinary Portland cement, minimum grade 43, conforming to IS-8112-1989, unless otherwise particularly specified. Different type of cement if so required, as per contract provisions, shall also be arranged by contractor at no extra cost to Govt. But however, Portland Pozzolana cement (PPC as per IS-1489) can be used in lieu of ordinary portland cement subject to fulfilling certain criteria as specified in succeeding Para's.

4.2.2 **PROCUREMENT:**

4.2.2.1 Cement shall be procured by the contractor directly or from the local authorised distributors/Dealers of following producers or firms: -

**A For OPC AND PPC**

- |                                       |                              |
|---------------------------------------|------------------------------|
| (a) The Associates Cement Co. Ltd     | (b) Saurashtra Cement        |
| (c) Ambuja Cement Ltd                 | (d) Ultra Tech Cement        |
| (e) Birla Corp. Ltd (Cement Division) | (f) Orient Cement            |
| (g) Grasim Industries Ltd             | (h) Madras Cement Ltd        |
| (j) Binani Cement                     | (k) Dhruv Industrial Co. Ltd |
| (l) Andhra Cement Ltd                 | (m) Century Cement           |
| (n) Dalmia Cement (Bharat Ltd)        | (o) The India Cements Ltd    |
| (p) Jammu & Kashmir Cements Ltd       | (q) Mangalam Cement          |
| (r) Jaypee Rewa Cement                | (s) Lafarge Cement           |
| (t) J K Lakshmi Cement                |                              |

**B For OPC Only**

- |                                      |                                    |
|--------------------------------------|------------------------------------|
| (a) M/s Cemtac Cement pvt Ltd, J & K | (b) Shiva Industries Kathua, J & K |
| (c) Star Cement Meghalaya            | (d) Meghalaya Cement               |
| (e) NK Cement Pvt Ltd                |                                    |
| (g) M/s Prism Cement Ltd, Lucknow    |                                    |

4.2.2.2 While using PCC, the following requirements shall be met with: -

- (a) PCC shall meet the strength criteria as per IS-8112-1989
- (b) Stripping time shall be 14 days
- (c) Mixing of OPC and PPC shall not be allowed in a work except for plaster and mortar.
- (d) While procuring PCC, the following requirements are to be ensured and certificate to the effect from the manufacturer shall be submitted by the contractor for each batch: -
  - (i) The quality of fly ash used is strictly as per IS-1489 Part-I.
  - (ii) The fly ash been inter- ground with clinker and not mixed with clinker.
  - (iii) The dry fly ash has been transported in closed containers and stored in silos. Only pneumatic pumping has been used.
  - (iv) The fly ash has been received from thermal power plants using high temperature combustion above 1000°C.
  - (v) While using PCC, it shall be ensured that atmosphere temperature is more than 15°C.

4.2.2.3 Cement brought by the contractor at site of work shall be in jute/polythene/paper bags containing 50 Kg cement in each bag originally sealed by manufacturer embossed with manufacturer seal/logo alongwith date of manufacturing/packing in the manner of manufacturers approved marketing pattern. It will be incumbent upon the contractor to ensure that the cement is not more than two months old. However, if the cement is more than two months old then its use shall be subject to the approval of Engineer-in-Charge before allowing any on account payment for material at site, test check shall be carried out to ascertain average weight of cement per bag.

4.2.2.4 Contractor shall produce original purchase vouchers, from the manufacturer or its local dealer/ stockiest, manufacturers, test certificates/sheet or authentic copy in lieu giving the result of each physical tests and the chemical composition of the cement and other valid documentary proof to the entire satisfaction of GE for entire quantity of each consignment to prove that cement has been purchased from the main producer as listed in Para 5.2.2.1 and 5.2.2.2 above. The contractor shall also submit particulars of the manufacturer of cement for every lot for verification by the site staff and

GE.

4.2.3 **TESTING OF CEMENT:-**

4.2.3.1 The contractor shall submit the manufacturer's test certificate in original along with the test sheets giving the result of each physical test as applicable and the chemical composition of the cement or authenticated copy thereof, in accordance with BIS provisions duly signed by the Manufacturer or his authorised representative with each consignment. The Engineer-in-Charge shall record these particular in the cement Acceptance Register (Format given in relevant Appx attached to these particular specifications) after due verification.

4.2.3.2 Cement brought to site of work shall remain the property of Govt. Contactor shall in no case, remove any bag of cement unless permitted in writing by GE. In addition to manufacturer's test certificate, GE shall also take random samples of cement drawn from various lots of each consignment as specified in IS Codes and get them tested from any one of the Govt. approved laboratories at his discretion or from SEMT Wing CME, Regional Research Laboratory or MES Zonal Laboratory, IIT all as per IS-3535-1986, IS-4031 and IS-4032-1985. Irrespective of result, cost of materials for such samples, cost of requisite handling & conveyance and cost of testing etc shall be borne by the contractor. Cement from each consignment shall be allowed to be incorporated in the work only after the GE is satisfied with the quality of cement brought by contractor.

4.2.3.3 Cost of all tests including testing undertaken as per provision in clause 4.3.1 of SSR Part-I shall also be borne by the contractor. It shall be ensured that tested and untested cement is segregated and stored separately with distinct identification. Cement of different brands shall be stacked separately.

4.2.3.4 If the test result on samples of a particular consignment are not within acceptable limits, the decision of the Accepting Officer regarding acceptability of such cement with price adjustment or removal from the site shall be final and binding. Cement so rejected or any bag of cement in go down showing indication of any setting shall be segregated and removed by contractor from the site within a week's time, due permission of GE for their removal.

4.2.4 **STORAGE/CONSUMPTION OF CEMENT:**

4.2.4.1 Cement in bags shall be stored in proper leak proof/damp proof storage go down, over at least a 20cm high platform and 60cm away from walls in such manner as to prevent deterioration due to moisture or intrusion of foreign matter, all as specified in clause 4.3.1 to 4.3.3 of SSR Part I.

4.2.4.2 For the purpose of keeping a record of cement procured and consumed in works, the contractor shall maintain a properly bound register in the form approved by the Engineer-in-Charge showing all procurements, quantity used in the work and balance in hand, at the end of each day and such other information as may be required to control the consumption of cement. Pages of the register shall be numbered and initialed by Engineer-in-Charge. This register shall be signed daily by the Contractor of his representative in token of correctness of the entries made. In token of check, it shall be signed by MES representative also as follows:-

a) Daily by JE (Civil) in charge of works.

b) Twice in a week by the Engineer-in-Charge.

4.2.4.3 The said register shall remain at site of work, in the safe custody of the contractor and on demand shall be produced for verification of Inspecting Officer. On completion of the work, the register shall be returned to MES for safe custody for any future reference. The cement Godown shall be provided with two locks on each door. The key of one lock on each door shall remain with the Engineer-in-Charge or his authorized representative and that of the other lock with the contractors authorized agent at site of work so that cement is removed from the Godown according to daily requirements and with the knowledge of both the parties.

4.2.4.4 Foregoing provision shall not, however, absolve the contractor of his responsibility of incorporating required quantity of cement in various items of works as per contract provisions.

4.2.4.4 Cement shall be used in order of which it is received. It shall be ensured that only one type/Make of cement is used in any structural member.

4.3 **DOCUMENTATION:**

4.3.1 The contractor shall submit original purchase voucher and Test certificate for the total quantity of cement supplied under each consignment to be incorporated in the work. All consignment received at the work site shall be inspected by the GE alongwith the relevant documents before acceptance. The original voucher and the test certificate shall be defaced by the Engineer-in-charge and kept on record in the office of the GE duly authenticated with cross reference to the control number recorded in the cement acceptance register. The cement acceptance register will be signed by the JE (Civil), Engineer-in-Charge, GE and the contractor. The entire quantity of cement shall also be suitably recorded in the measurement book for record purpose before incorporation in the work, as "not to be abstracted" indicated the voucher No. with dates, quantity, date of manufacture/expiry date etc. It shall form the basis to allow advance on account through RARs.

4.4 **SCHEDULE OF SUPPLY:** The contractor shall ensure that procurement action is taken immediately after acceptance of the contract so as to adhere to schedule of activities as per CPM Net Work Contractor shall procure sufficient quantity of cement of each consignment, to ensure that cement is available at site/store out of previous stock minimum for 30 days when sample for fresh consignment are taken for 28 days testing.

4.4 **AGGREGATES:** Aggregates for concrete work shall conform to specifications all as specified in clauses 4.4.1 to 4.4.7 of MES Schedule Part-I.

4.4.1 **FINE AGGREGATES (SAND):** Grading for fine aggregates shall be within the limits of grading zone I to II as given in clause 4.4.7(2) of MES Schedule Part-I.

4.4.2 **COARSE AGGREGATES:** Coarse aggregates for all concrete work in all situations shall be graded crushed stone aggregate (crushed in mechanically operated crusher) of approved quality, irrespective of whether indicated specifically in the description of items or otherwise or SSR provisions. Nallah shingle will not be used even for plain cement concrete work in any situation. Contractor shall not be allowed to install crusher on Defence land.



- 4.4.2.1 **GRADING OF COARSE AGGREGATE:** Graded aggregate of nominal sizes as given here-in-after, shall be used, unless specified otherwise in the specification here-in-after or in the relevant item of Schedule 'A' shall be used.
- (a) **REINFORCED CEMENT CONCRETE**
- i) For elements of depth/thickness more than and including 100mm - 20mm
  - ii) For elements of depth/thickness less than 100mm - 12.5mm
- NOTE:** - However in no case, the nominal size of aggregates shall be greater than one fourth the minimum size of the member.
- (b) **PLAIN CEMENT CONCRETE**
- i) Under 30mm thickness : 12.5mm
  - ii) 30 to 80mm thickness : 20mm except in 75mm thick sub base of flooring for which nominal size of aggregate shall be 40mm
  - iii) Exceeding 80mm thickness : 40mm
- 4.6 **WATER PROOFING ADMIXTURE:** Irrespective of specifications given elsewhere water proofing for all cement concrete/ mortar where indicated shall be integral (liquid) water proofing admixture as specified in respective appendix attached to these particulars specifications in the proportion recommended by the manufacturer. In case of deviation water proofing admixture shall be considered @ 1% by weight of cement.
- 4.7 **WATER:** Water shall conform to the requirements stipulated in IS-456-2000.
- 4.8 **MIX OF CONCRETE:**
- 4.8.1 Mix of cement concrete in various situations shall be provided as specified in schedule 'A'.
- 4.9 **PLACING AND COMPACTION OF CONCRETE:**
- (i) Concrete shall be transported without delay and incorporated in works at the position of laying within 20 minutes from the time of discharge from the mixer.
  - (ii) Mixed concrete shall be deposited in final position and solidly packed Around reinforcement, carefully poured and consolidated by means of portable vibrators or mechanically operated and of the kind as suitable for a particular situation as directed by the EIC are shall be exercised that no voids or honey comb pockets are formed. The concrete shall not be laid in position for more than 1 metre in height in one concrete operation.
- 4.10 **CURING** The concrete shall be protected from premature drying for at least 8 days after pouring and shall be cured as directed by the Engineer-in-Charge for a period of not less than 14 days.
- 4.11 **PRECAST CEMENT CONCRETE** Lintels (without chajja) with a span of less than 1.5 m clear and PCC bed blocks, copings and the like may be precast at the discretion of the contractor all as specified in Clause 4.20 of SSR Part I as applicable. All precast articles shall be set in CM (1:3) with joint to match.
- 4.12 **STRIPPING TIME FOR FORM WORK** The contractor's attention is invited to the stipulation in Clause 4.11.6.3 regarding stripping of form work. The periods stipulated therein are for concrete using ordinary Portland cement.
- 4.13 **LEAVE/FORM HOLES AND CHASES** The contractor as the work proceeds should leave/form holes/chases in concrete/masonry and RCC where and as directed by the Engineer-in-Charge and make good in cement and sand mortar (1:3) when ordered to do so.
- 4.14 **FINISH TO CONCRETE SURFACE** Finish to exposed surface of all concrete works shall be as specified below:-
- a) Exposed surface of RCC lintels, beams, party walls, Parapets column etc, which are continuous with the adjoining plastered surfaces of walls shall be plastered, specifications of plaster being same as that adopted for wall plastering. Plaster shall be applied all over the exposed surfaces of such concrete including projected portion of columns, beams/brackets etc.
  - b) Exposed RCC/Concrete surfaces such as soffits of floor/roof slabs, chajjas, canopies, parapets etc shall be finished fair and even by plastering as specified in Clause 4.11.16.2 (b) of SSR Part I.
  - c) Exposed surfaces of concrete other than those referred above shall be finished as specified in clause 4.11.16.2 (a) of SSR Part I.
- 4.15 **BEARING PLASTER AND WATER PROOFING PAPER** Provide bearing plaster and building paper as per Notes on TD drawing for Notes on RCC work and to the following specifications: -
- (a) Plaster shall be 20 mm thick in cement mortar (1:4) finished even and smooth without using extra cement. Sand shall be same as specified for plaster to walls.
  - (b) Water proofing building paper shall be bituminous impregnated laminated water proof paper complying with the requirements of IS-1398 type II jute lines (not less than 60 grams per square metre) and laps at joints shall be 60 mm minimum.
- 4.16 **PCC COVING** PCC coving with PCC (1:2:4) type B-0 mixed with integral waterproofing compound shall be provided at junction of RCC chajja with wall/lintel/beam to the radius of 75 mm irrespective whether shown or not shown on drawings. Covings shall be 15 cm high on wall and to the full length of chajja.
- 4.17 **FILLETING** Provide triangular filletings to skirting / dado as directed by Engineer-in-Charge with CM (1:3) finished even and smooth without using extra cement.
- 4.18 **RCC LINTELS** The bearing of lintels shall be 15 cm or effective depth (whichever is more), unless otherwise shown on drawings. Lintels (without chajja) for opening not exceeding 1.50 metres clear span may be precast at contractor's option. However, these shall be priced as cast-in-situ lintels in the event of deviation if any. All other lintels and bands shall be cast-in-situ.
- 4.19 **DRIP COURSE/TROATING/WEATHERING** Following works shall be executed whether shown on drawings or not: -
- i) Provision of proper drip course and / or throating and weathering to all chajja, roof, cills, coping and the like.
  - ii) All flat surfaces exposed to weather shall be finished with imperceptible slope for smooth run of rain water. (In cases no slope is mentioned in drawings or specified).
- 4.20 **WINDOW CILL** PCC window cill shall be in Grade M-15 (Nominal mix) finished even and smooth without using extra

cement in the locations as shown on drawing.

- 4.21 **DAMP PROOF COURSE** Damp proof course shall be 20 mm thick in CM (1:2) mixed with integral waterproofing compound conforming to IS-2645 over which a coat of blown bitumen of grade 85/25 and 1.5 Kg per Sqm blended with clean sand and 0.05 Cum/Sqm is to be provide. The percentage of water proofing compound shall be as per manufacturer's instructions. The same shall be taken as 3% (by weight of cement) while pricing of any deviation order in omit portion. Damp proof course shall be laid to the full width of walls, including under door and other opening at plinth level. Damp proof course shall not be provided for portion below door for 100 mm thick walls, dwarf walls and at locations where RCC / PCC plinth band or RCC plinth beams are provided.

- 4.22 **RCC BANDS**  
Provide RCC bands in 100 mm thick wall as specified in Notes on Drg.

5 **BRICK WORK**

5.1 **Materials**

- 5.2 **Bricks** Bricks shall be kiln burnt sub class 'B' locally available best quality conforming to the samples kept in GE's office. Unless specified otherwise in Schedule 'A' / Notes on drawings, brick shall have minimum crushing strength of 75 Kg/Sqcm. Water absorption of bricks shall not exceed 20% when tested in accordance with IS: 3495. Sampling and testing of bricks shall be carried out as per IS 3495 and IS 3454. The size of bricks shall be 230 mm x 115 mm x 75 mm. The tolerance in the dimensions shall be  $\pm 8$  percent.

- 5.3 **Cement:** Refer clause 3.2 here in before.

- 5.4 **Sand:** Sand and mortar shall be as specified in clause 5.4 of MES Schedule Part I.

5.5 **Workmanship:**

- 5.5.1 Brick work in all situations shall be built in cement mortar 1:6 except in half brick thick wall where it shall be in cement mortar 1:4.

- 5.5.2 Half brick thick wall of height more than 90 cms shall be reinforced with two Nos. 6 mm dia Mild Steel round bars placed horizontally, at every fourth (4<sup>th</sup>) course starting from the floor level and anchored in wall/columns at junctions. The anchorage length provided shall be not less than 100mm. Overlaps, if any, required in the reinforcement shall not be less than 30 cms

- 5.5.3 In the event of deviations, brick work as specified above shall be priced at the applicable rates in MES Schedule 2010 (Part-II) for material and labour with sub class 'B' bricks, subject to contractor's percentage for Schedule 'A' Part I.

5.6 **Laying & Bonding**

- 5.6.1 Bricks shall be laid and bonded, all as specified in clause 5.23 and 5.24 of MES Schedule Part I as applicable to old size bricks (FPS conventional bricks).

- 5.6.2 Half bricks wall upto 2100 mm height shall rest directly from the sub base floor. Half brick walls above 2100 mm height and dwarf walls shall be provided with foundations as shown on the drawings.

6 **STONE MASONRY**

6.1 **MATERIALS**

- 6.1.1 **STONE:** Stone shall be of best quality, locally available obtained from approved quarries or from boulders after chiselling and hammer dressing. Stone shall be hard, sound, durable and free from weathering, decay and defects like cavities, crack flaw, sand holes, injurious veins, patches of loose or soft materials and other similar defects that may adversely affect its strength and appearance. It shall be of uniform colour and texture. Generally stone shall not contain crypto crystalline silica or chert, mica and other deleterious materials like iron oxide, organic impurities, etc. Stone boulders (in their original rounded shape) shall not be used in the stone masonry work. The length of stone for stone masonry shall not exceed three times the height and the breadth on base shall not be greater than three - fourth the thickness of wall. Height of stone may be upto 30cm. Stones for random rubble masonry may be of any size and shape but shall be not less than 15 cm in any direction.

6.2 **WORKMANSHIP**

- 6.2.1 All stone masonry shall be set out and built to the respective type, dimensions, thickness and heights, as indicated. Stones shall be sufficiently wetted before laying to prevent absorption of water from mortar. The natural bed of the stratified stone shall be so laid that the pressure is always perpendicular to the strata. Stone in walling, steps, coping, cills etc, shall be placed with the grain or natural bed, horizontal. In arches the grains shall be parallel to the bed or voussoirs. In projecting cornices and corbels the natural bed shall be vertical and at right angle to the face of wall. The courses shall be built perpendicular to the pressure which the masonry will bear. In case of battered walls, the beds of stones and the plane of courses shall be at right angle to the batter. Vertical joints shall be staggered as far as possible. In the case of squared rubble coursed masonry, block in-course masonry and ashlar masonry, stones shall break joints, on the face for at least half the height of the course and the bond shall be carefully maintained throughout. No part of the wall during its construction shall rise more than 1 metre above the general construction level to avoid unequal settlement. Where there is a break in masonry work, the masonry shall be raked back in sufficiently long steps for facilitating joining of old and new work. The stepping of the raking shall not be more than 30° with the horizontal.

6.2.2 **RANDOM RUBBLE STONE MASONRY**

- 6.2.2.1 Stones shall be hammer-dressed on the face, the sides and the beds to enable to come in proximity with the neighbouring stones. The bushes on the face i.e. maximum depression from a straight edge held against the dressed surface shall not be more than 40mm on an exposed face and 20mm on faces to be rendered.

- 6.2.2.2 Every stone shall be carefully fitted to the adjacent stone so as to form neat and close joint. Face stone shall extend and bond well in the back. These shall be arranged to break joints, as much as possible and to avoid long vertical lines of joints. Thickness of joints shall not exceed 25mm. Walls shall be levelled up at top of plinths, cill and lintel levels of openings, floor and roof levels and at top with minimum amount of chips and spalls.

- 6.2.2.3 The hearting or interior filling of a wall face shall consist of rubble stones not less than 15 cm in any direction, carefully

laid, hammered down with a wooden mallet into position and solidly bedded in mortar. The hearting shall be laid nearly level with facing and backing.

6.2.2.4 Chips and spalls of stone shall be used wherever necessary to avoid thick mortar beds or joints and it shall be ensured that no hollow spaces are left anywhere in the masonry. Chips shall not be used below hearting stones to bring these up to the level of face stones. The use of chips and spalls shall be restricted to the filling of interstices between the adjacent stones in hearting and these shall not exceed 20 percent of the quantity of stone masonry. Spalls and pinnings may show on face.

6.2.2.5 In case type and grade of cement mortar for stone masonry is not indicated in drawings or not specified elsewhere in these particular specifications, the same shall be considered RR stone masonry, brought up to course, built-in cement mortar 1:6. In case contractor does the superior quality masonry, as per local practice than the masonry specified, nothing extra shall be admissible on this account to the contractor.

6.2.3 **BOND STONE** Bond stones shall be of the full thickness of wall or a set of two or more bond stones overlapping each other by at least 15 cm shall be provided in a line from face to back. Bond stones of stone shall be provided as per details shown on the drawings at the rate of 2 Nos per sqm of the face area of wall and shall be staggered. Contractor may use precast PCC 1:3:6 type C-1 bond stones in lieu of stone bond stones at his discretion (except where specifically indicated in respective Parts of Sch "A") without any extra cost to Govt. The bond stone shall be marked by a distinguishing letter for subsequent verification.

## 7 FORM WORK

7.1 The formwork shall be rigid and so constructed as to retain the shape and dimensions of the member being cast. It shall have sufficient strength and rigidity to withstand the load of concrete, vibrations, movement of men, materials and plants and any other incidental loads without excessive deflection beyond permissible limits. Before concreting is started, the props and wedges shall be thoroughly checked to see that these are intact, and are not loose. While concreting is in progress, a constant watch shall be kept on the props and immediate remedial measures taken as soon as any of these gets loosened. Care shall be taken that props and wedges do not get loose for the minimum period specified for the removal of formwork.

7.2 All propping and centering should be either of steel tubes with extension or built up sections of rolled steels.

7.3 Staging should be as designed with required extension pieces as approved by EIC to ensure proper slopes, as per design for slabs/beams etc and as per levels as shown in drawings. All the staging shall be either of tubular steel structure with adequate bracings as approved or made of built up structural sections from structural steel sections. In case of structures with two or more floors, the weight of concrete, centering and shuttering of any upper floor being cast shall be suitably supported on one floor below the top most floor already cast. Form work and concreting of upper floor shall not be done until concrete of lower floor has set at least for 14 days.

7.4 Shuttering used shall be of sufficient stiffness to avoid excessive deflection and joints shall be tightly butted to avoid leakage of slurry. If required, rubberized lining of materials as approved by the EIC shall be provided in joints. Steel shuttering used for concreting should be sufficiently stiffened. The steel shuttering should also be properly repaired before use and properly cleaned to avoid stains, honey combing, seepage of slurry through joints etc.

7.5 Form work shall be of steel. In case of any deviation involving form work, the pricing shall be done on the basis of timber form work.

7.6 Forms shall be removed gently. They shall be eased carefully in order to prevent the load being suddenly transferred to concrete. The minimum period that shall elapse after the concrete has been laid and before form work is eased and removed is given in section-4: Concrete, for ordinary Portland cement.

## 7.6 TIMBER

7.6.1 Timber shall be of good quality, well-seasoned, fairly uniform in colour and texture and free from blemishes, hollow pockets and loose knots. Coniferous sawn timber (soft wood) shall be free from spiral or twisted grain, warp, any kind of decay or live insect attack and cup shakes. Non-coniferous sawn timber (hardwood) shall be free from bow, any kind of decay, live insect attack, spiral or twisted grains, splits across the grain, spring, warp, cup and shake. Timber shall be obtained either in cut sizes or as sleepers and cut to the required sizes well in advance of the commencement of fabrication and stacked at site or work in a suitable manner for seasoning.

7.6.2 Timber shall be well seasoned whether air or kiln dried at the discretion of the contractor (except factory made door shutters which shall be kiln seasoned only) without any price adjustment. The moisture contents of timber shall not exceed the limits laid down in clause 7.7 of MES Schedule Part-I.

7.6.3 Timber for all joinery and woodwork shall conform to specifications given in clause 7.3 of the MES Schedule Part-I and shall be within the permissible limits of defects in clauses 7.4 and 7.5 of the MES Schedule Part - I.

## 7.7 SPECIES OF TIMBER

The species of timber and prefabricated wood products (i.e plywood, wood particulars board etc) shall be as specified below unless otherwise specifically specified elsewhere in these particular specification.

(i) Panelled/glazed/wire gauzed for doors, windows and vents (Styles, rails, glazing bars, beading/mouldings, fillets) : Fabricated at site using 2nd class Softwood (KAIL)

(ii) Wooden chowkhats for doors, windows, vents and cupboards, wooden boarding with frame work : 2nd class hard wood "KAIL".

(iii) Beading over ply wood and particle board for ceiling/lining : Second class soft wood "KAIL"

(iv) Panel inserts of door shutters : 12mm thick veneered particle board with commercial veneer facing on both sides, exterior grade as specified.

(v) Wooden handrail and wooden panelling, Edging of cup boards, ward robes, cabinet shutters, etc : First class hard wood "Teak wood"

(vi) Any other wood work not indicated or specified : First class soft wood "Deodar"

#### 8.8 JOINERY WORK

8.8.1 Only the species of timber indicated shall be used.

8.8.2 **Timber Panel** Timber panels shall be preferably made of timber of large width. The minimum width and thickness of a panel shall be 150 mm and 15 mm respectively. When made from more than one piece, the pieces shall be joined with a continuous tongue and groove joint, glued together and reinforced with metal dowels. The grain of timber panels shall run along the longer dimensions of the panels. The panels shall be designed such that no single panel exceeds 0.5 square metre in area.

8.8.3 All exposed faces of joinery shall be planed smooth (wrought) and neatly and truly finished to the full dimensions, rebates, roundings and mouldings as indicated. Unless dimensions are indicated to be finished dimensions, a tolerance of 1 mm shall be permitted for each wrought face.

8.8.4 Joints shall be made carefully and accurately. All mortice and tenon and other joints shall fit fully and truly without wedging or filling and finished neatly. Where indicated, butt joints shall be cross tongued. The tongue shall be cut at right angles or diagonally to the grains of the wood.

8.8.5 Defective knots, when permitted on surfaces exposed to view, shall be completely bored or cut out and tightly plugged with the same timber species and properly glued in. The grain of plug shall run in the direction of the grain of piece.

8.8.6 All joiner's work shall be cut and framed together well ahead of their incorporation in the work but shall not be wedged up until required for fixing in position and passed by the EIC. Any portion that may warp or develop shakes or other defects shall be replaced with new before being wedged up.

8.8.7 The contact surfaces of mortice and tenon shall be glued before putting together with bulk type synthetic resin adhesive conforming to IS 851 - 1978 suitable for construction work in wood. Tongued and grooved joints shall also be properly glued together with a suitable adhesive.

8.8.8 Unless otherwise indicated, the contractor shall supply members in one piece in lengths up to 3 metres. For lengths over 3m, the contractor may use more than one piece, one for every extra 3m or part thereof and shall connect the same with proper lengthening joints as directed by the EIC. The lengths of member should match.

#### 8.8.9 Plywood Boards

8.8.9.1 Plywood shall be formed by gluing and pressing three or more layers of veneers as indicated. The veneers shall be either rotary cut or sliced and shall be sufficiently smooth to permit an even spread of glue. Face veneers may be either commercial or decorative on both sides or one side commercial and the other decorative. Plywood shall be of BWP grade or BWR as per IS: 303 as indicated. Adhesive for bonding of veneers shall be synthetic resin adhesive conforming to IS - 848. The thickness of all veneers shall be uniform, within a tolerance of + 5 percent. Corresponding veneers on either side of the centre one shall be of the same thickness and species. The requirement of thickness and core veneers shall be as follows:

(a) In 3 ply boards up to 5 mm thick. The combined thickness of the face veneers shall not exceed twice the thickness of centre ply.

(b) In a multiply boards, the thickness of any veneer shall not be more than thrice the thickness of any other veneer.

(c) The sum of the thickness of the veneers in one direction shall approximate to the sum of the thickness of the veneers at right angle to them and shall not be greater than 1.5 times this sum except for 3 ply as specified as (a).

8.8.9.2 Plywood boards are available in thickness ranging from 3 to 25 mm. Tolerance in thickness shall be +10% for boards up to and including 5 mm; + 7% for boards for 6 to 9 mm, and + 5% for boards above 9 mm thickness. The boards shall be of uniform thickness and the surface of the boards shall be sanded to a smooth finish.

8.8.9.3 Moisture content of the plywood boards when tested in accordance with IS: 1734 (Part 1) shall not be less than 5 per cent and not more than 15 per cent.

#### 8.8.10 Particle Boards

Particle boards shall be of medium density and manufactured from particles of agro waste, wood or lingo-cellulose, i.e., material blended with adhesive and formed into solid panels under the influence of heat, moisture, pressure etc. The particle boards shall be flat pressed with single, three or multi layers and graded and of Type I as per Table 1 of IS: 3087. Both faces of particle board shall have sanded smooth finish. Particle boards are available in thickness ranging from 6 mm to 40 mm. Tolerance in thickness shall be + 5 % for boards up to and including 25 mm thick, and + 2.5% for boards above 25 mm thickness. Each board shall be of uniform thickness. Adhesive used for bonding shall be BWP type synthetic resin conforming to IS: 848.

#### 8.8.11 Veneered Particle Boards

Veneered Particle Boards have a solid core of medium density Type I particle board (which is covered with commercial or decorative veneers on both faces or with decorative veneers on one face and commercial veneers on the other). Face veneers are bonded using adhesives under the influence of heat and pressure. Veneered particle board shall be of exterior grade (Grade I) as per IS: 3097. The adhesive used for bonding shall be BWP synthetic resin conforming to IS: 848. Tolerance in thickness shall be + 5% for boards up to and including 25 mm thick and + 2.5% of boards above 25 mm thickness. Each board shall be of uniform thickness. Type of face veneers, thickness of veneered particle boards and adhesive used for bonding shall be as specified. Unless otherwise stated, exterior grade veneered particle board with BWP type synthetic resin adhesive shall be used.

#### 8.8.12 Pre-Laminated Particle Board

Pre-laminated particle board where indicated shall be of Grade-I, Type-II one side laminated other side balancing white as per IS: 12823 of 1990.

#### 8.8.13 Block Board

Block Boards have a solid core made up of uniform strips of wood each not exceeding 25 mm in width laid separately, or spot glued, or otherwise joined to form a slab which is glued between two or more outer veneers. In any one block board,

the core strips shall be of one species of timber only. Face veneers may be decorative or commercial on both faces or decorative on one face and commercial on the other. Block board shall be Grade 1 (Exterior Grade) as per IS: 1659. Both surfaces of the boards shall be sanded to a smooth finish. The adhesives used for bonding shall be BWP type synthetic resin conforming to IS: 848 for Grade I block boards. Block boards are available in thickness ranging from 12 to 50 mm. Tolerance in thickness shall be +5% for boards up to and including 25 mm thick, and +2.5% for boards above 25 mm thickness. Each board shall be of uniform thickness.

#### 8.9 Timber Frames and Chowkats

8.9.1 All members of the timber frames shall be straight without any warp or bow and shall be exactly at right angles, which shall be checked from the inside surfaces of the respective members. Frames shall have smooth, well planed surfaces except the surfaces touching the walls, lintels, cills etc. which may be left clean sawn, unless it is required for straightening up or to obtain the overall sizes. Rebates, roundings and moulding etc. shall be done before the members are jointed into frames.

8.9.2 Timber frames shall have dovetail joints. The jamb post shall be through tenoned into the mortices of the transom to full width and the thickness of the tenon shall be not less than 15 mm. The tenons shall be closely fitted into the mortices without any wedging or filling and shall be pinned with hard wood or bamboo dowels not less than 10 mm dia. The depth of rebate in the frames for housing the shutters shall be 15 mm. The joints before being put together shall be glued with a synthetic adhesive conforming to IS 851-1978 or IS 4835-1979 or animal glue conforming to IS 852-1994.

8.9.3 All door, window and ventilator frames shall be clamped together so as to be square and flat before being built in. Each assembled door frame shall be fitted with temporary cross battens.

8.9.4 The faces of frame abutting the wall, lintel, cill etc., shall be given two coats of hot tar before fixing, unless otherwise indicated.

#### 8.10 Shutters

8.10.1 The types of shutters for doors, windows, ventilators, cupboards, etc., viz. panelled, glazed, wiregauzed, partly panelled and partly glazed or gauzed, ledged braced and battened, louvered etc., shall be as indicated and detailed in the drawings. All members of the shutter shall be made out of one piece and shall be straight without any warp or bow. They shall have smooth, well planed surfaces at right angles to each other. The right angles of the shutters shall be checked by measuring the two diagonals from one extreme corner to the opposite one.

8.10.2 The contact surfaces of mortice and tenon and tongued and grooved joints shall be glued before putting together. In the case of double leaved shutters, the meeting stiles shall be rebated 20 mm or as shown on drawings. The rebating shall be splayed or square, as directed. All shutters shall be finished smooth with well planed faces. Tolerance in the thickness of joinery shall be + 2 mm. Shutters shall be of correct size and shall fit into the frames without excessive cutting at the edges. Adding of wooden strip etc., to make up the size shall not be allowed.

#### 8.10.3 Factory Made Shutters

8.10.4 Where indicated, the contractors shall supply panelled gauzed door and window shutters made in an approved factory. Tolerance on the width and height of factory made shutters shall be + 3 mm provided the shutter snugly fits into the frame.

#### 8.11 Panelled, Glazed and Gauzed Shutters

8.11.1 Timber paneled, glazed and gauzed shutters shall be constructed in the form of timber frame work of stiles and rails with panel inserts of timber, plywood, block-board or veneered particle boards and medium density wood particle board as indicated in case of panelled shutters, of glass in case of glazed shutters, and of wire cloth in case of gauzed shutters.

8.11.2 Stiles and rails of shutters shall be in one piece only. Lock and intermediate rails exceeding 20 cm in width may be made out of one or more pieces of timber but the width of each piece shall not be less than 10 cm: where more than one piece of timber is used they shall be jointed with a continuous tongued and grooved joint glued together and pinned with wooden/bamboo pins.

8.11.3 Stiles and rails shall be jointed to each other by tenon and mortice joints, at right angles. Rails more than 18 cm wide shall have two tenons.

8.11.4 Muntins and glazing bars shall have mitred joints and shall be stub tenoned to the maximum depth which the size of member would permit or to a depth of 25 mm, whichever is less. The thickness of each tenon shall be approximately one third the finished thickness of the member and the width of each tenon shall not exceed five times its thickness.

#### 8.12 Panelled Shutters

8.12.1 The panels shall be fixed by either providing grooves in the stiles and rails or by beading or both, as indicated. The edges of panels shall be tongued into grooves (feather tongued in case of timber panels) to the full depth leaving an air space of 1.5 mm and the faces shall be closely fitted to the sides of groove. Moulding to the edges of panel openings shall be scribed at the joints, where indicated.

8.12.2 Timber panels shall be preferably made of timber of larger width, the minimum width of panel shall be 15 cm. When made from more than one piece, the pieces shall be jointed with a continuous tongued and grooved joint glued together. The grains of timber panels shall run along the longer dimensions of panels. Unless otherwise indicated timber panels shall be flat. Thickness of flat panels, unless otherwise indicated shall be 12 mm thick or 1/3 thickness of shutter whichever is greater. Panels raised on one side shall be 2/3 thickness of shutters and panels raised on both sides shall be of full thickness of shutter. Unless otherwise indicated no single panel shall exceed 0.5 sqm in area.

8.12.3 Panelled shutters shall be provided with beading around the panel inserts on the outside of door. The size of beading shall be 20 mm in width and tapered thickness from 10 mm to 5 mm.

#### 8.12.4 Plywood panelling

Plywood panel shall be of thickness not less than 9 mm for two or more panel construction and 12 mm for single panel construction. All panels shall be made of one piece only. The plywood shall be of type AB, BWR grade conforming to IS 303-1989.

**8.12.5 Veneered Particle Board Panelling**

Panels of veneered particle board used shall be 12 mm thick using phenol formaldehyde and made of one piece only. Where indicated, timber panelled shutters may be provided with louvers or vision panel as detailed in the drawings.

**8.13 Glazed Shutters**

For Glazing refer Section 16. For external doors and windows, the beading, where provided, shall be fixed on the outside. Unless otherwise specified, beading shall be 15 x 10 mm and shall be secured to frame either with panel pins, or screws with cups where indicated. Exposed edges of beads shall be rounded.

**8.14 Wire Gauzed Shutters**

Wire cloth shall be securely housed into the rebates by giving a right angled bend and fixing by means of suitable staples at intervals of 75 mm. Over this wooden bead 15x15 mm shall be fixed with nails, where indicated to cover the rebate fully. The space between the beading and the rebate shall be filled with putty to give it a neat finish. Exposed edges of the beads shall be rounded.

**8.15 Standard Dimensions for shutters for Doors, Windows etc.**

The rates for shutters are based on the dimensions of the various components or parts indicated below. Any variations thereon, if specially ordered shall be adjusted on the basis of other appropriate items in the SSR.

(a) Panelled, Glazed, Gauzed or Partly Panelled and Glazed shutters as for doors

- (1) Bottom 200 to 250 mm wide.
- (2) Stiles, top and freeze rails 100 to 120 mm wide.
- (3) Muntins 100 mm wide.
- (4) Glazing bar 40 mm wide.
- (5) Middle or lock rail 160 to 250 mm wide.

(b) Glazed and Gauzed shutters as for windows, ventilators, etc.

- (1) Stiles and rails 60 to 80 mm wide.
- (2) Muntins 60 mm wide.
- (3) Glazing bars 30 to 45 mm wide.

**8.16 Flush Door Shutters**

8.16.1 Flush door shutter shall be solid core types with block core or particle board core, as indicated, and shall conform to IS 2202 (Part I) - 1999, Specification for wooden flush door shutters (solid core type) Part I plywood face panels; except with regard to the sizes of shutters which shall be as indicated. Flush door shutters shall be non-decorative (commercial) type; or decorative type where indicated.

8.16.2 Flush door shutters shall be internally lipped. Internal lipping may be provided separately or as one piece with the frame. The width of frame including lipping shall not be less than 50mm. Where separate lipping is specifically desired it shall be so indicated. Internal lipping shall have a total depth of not less than 25mm. Joints shall not be permitted in lipping.

8.16.3 In the case of double leaved shutters, rebating shall be splayed or square as directed. Where separate lipping is indicated, the depth of lipping at the meeting of stiles shall not be less than 35 mm. Flush door shall be free from twist or warp in plane and all the four edges of the door shutter shall be square. Both the faces of the door shutter shall be sanded to a smooth even texture.

8.16.4 Tolerance on nominal thickness shall + 1.2 mm. Thickness of shutter shall be uniform throughout with the variation not exceeding + 0.8 mm when measured at any two points.

8.16.5 Where indicated, opening for glazing 25x20 cm shall be provided, which shall be lipped internally with solid timber.

8.16.6 Venetian openings shall be provided where indicated. The width of opening shall be as indicated but shall provide for a clear space of at least 75 mm between the edges of the door and venetian opening.

8.16.7 Shutters shall be shop prepared for taking mortice locks and latches if specifically indicated.

8.16.8 Flush door shutters fixed in bath rooms and toilets shall be protected by providing aluminium sheet cover 0.5 mm thick where indicated. Aluminium sheets shall conform to IS 737 - 1986. Aluminium sheet shall be fixed to the door with chromium plated steel round headed screws conforming to IS 1284-1975 at distance not exceeding 10 cm centre to centre.

**8.17 Wooden panelling for wall lining & partitions**

8.17.1 Rails and stiles of frame for the wooden panelling and partitions shall be fixed to each other by tenon and mortice joints. The panels of timber planks, block boards, veneered particle boards etc. as specified for wall panelling/partitions and glass for glazed partitions, shall be fixed in the grooves made in the stiles and rails or by means of rebate and beading fixed by suitable screws.

8.17.2 Wooden panels shall be made out of one or more pieces of timber not less than 12.5 cm width and also not more than 20 cm width. When made of more than one piece, planks shall be jointed together by continuous tongued and grooved joint, glued together and reinforced by means of rust proof metal dowels. The grains of solid panels shall run along the longer dimensions of the panels.

8.17.3 The exposed faces of the panelling and partitions shall be planed smooth and even.

8.17.4 Panelling shall be fixed to the wall with wooden plugs fixed into the walls at suitable intervals and screws driven through the stiles and rails or alternatively the panelling may be fixed over rough ground as indicated.

**8.18 Pelmets**

8.18.1 Planks and curtain rods of specified timber shall be used; it shall be sawn in the direction of the grains. Sawing shall be truly straight and square. The timber shall be planed smooth and accurate to the full dimensions, rebates, roundings and moulding as shown in the drawings made before assembly. Patching or plugging of any kind shall not be permitted.

8.18.2 Sides, front and top of the pelmets shall be of 12 mm planks or boards of specified quality and width unless otherwise stated. These shall project from the wall face by 15 cm or as specified, and shall be securely fixed to walls with wood screws by means of wooden plugs and 10 cm long 25 x 3 mm MS flat bent in the form of angle or by any other device

approved by the EIC. The pelmet shall be provided with curtains rods and brackets or curtain rails with rollers, stop ends and brackets wooden, brass or chromium plated brass as specified. Intermediate wooden brackets shall be provided, if the front length of pelmet exceeds 1.5 metres.

#### 8.19 Shelves

8.19.1 Shelves and vertical partitions of cupboards shall be of timber planks, fibre board, particle board, blockboard as indicated. Each shelf shall be a single piece and vertical partitions between two consecutive shelves shall be without any joint. Exposed edge of boards having particle board core shall be sealed with 3 mm thick single piece teak wood strips of width to the thickness of board with headless pins. The arrangement of shelves and vertical partitions shall be as per drawings or as directed by EIC.

8.19.2 Planking for shelves shall be planned on all faces and edges. In case of boards they shall be sawn to the required size truly straight and square. Timber battens 25 x 40 mm unless otherwise specified shall be planed smooth and fixed inside the cupboard with wooden plugs and screws. Shelves shall be fixed to the battens and vertical portions shall be held in position by fixing them to the battens and shelves using screws. Teak wood strips for edging sealing of the boards shall be planed smooth and fixed with headless nails. Tolerance in width shall be + 1.5 mm and in thickness +1 mm.

#### 8.20 SOLID PVC JOINERY

8.20.1 **PVC Sheet/Plain Colour PVC Sheet** (FREE FOAM RIGID PVC SHEETS) shall be made out of PVC Resin (suspension grade) blended with suitable chemicals and additives. The sheets shall be made by extrusion process and foamed using organic blowing agents. The sheets will be self-coloured in plain shades by blending suitable pigments with PVC resin. The sheets will have silky matt surface finish free from any blistering, colour blots, creasing, pin holes etc.

8.20.2 **PVC Sandwich Panel** shall consist of Expanded Poly Styrene (EPS) conforming to IS 4671, of density 32 Kg/m<sup>3</sup> (tolerance limit + 15%) flame retardant (TF) grade of desired thickness (mm) sandwiched between two PVC sheets of 1 mm, 1.5 mm, 2 mm or 4 mm thickness using thermosetting adhesive.

8.20.3 **PVC Insulation Panel** shall consist of Expanded Poly Styrene (EPS) conforming to IS 4671 of minimum density 15 Kg/m<sup>3</sup> flame retardant (TF) grade of desired thickness (mm) stuck to PVC sheet of 1 mm, 1.5 mm, 2mm, or 5 mm thickness using thermosetting adhesive on one side.

8.20.4 **MS Square tube** shall be of size 19mm X 19mm & 15mm X 15mm of 19 gauge of required length with coat of steel primer.

8.20.5 **MS Angle** shall be of size 35mm X 35mm x 5mm of required length with coat of steel primer.

8.20.6 **EPDM Rubber gasket** with bulb-type profile shall be used to make doors & windows airtight.

8.20.7 **Decorative PVC Beading 'L' type (90o)** Decorative PVC Beading shall be of size 10mm X 10mm with wood moulding design.

#### 8.21 Factory Made Solid Panel PVC Door Shutter

8.21.1 30 mm thick Factory Made Solid Panel PVC Door Shutter consisting of frame made out of MS tubes of 19 mm X 19mm for stiles, & 15mm X 15mm for top & bottom rails. MS frame shall be covered with 5mm thick single piece extruded PVC profile 'C' channel having a 5mm thick PVC sheet strip of 20 mm width stuck inside with solvent cement, forming stiles, and 5mm thick PVC sheets for top rail, lock rail & bottom rail on either side, and 10mm (5mm X 2) thick, 20mm wide cross single piece extruded PVC profiles as gap inset for top rail & bottom rail. Panelling of 5mm thick PVC sheet to be fitted in the MS frame welded/sealed to the stiles & rails with PVC sheet beading, and joined together with solvent cement adhesive etc. shall be complete as per direction of EIC, manufacturer's instructions and drawing. The width of stiles & rails shall be in proportion to the width of the door shutter as detailed in Clause 8.34.2.1 of SSR Part I

8.21.2 For doors of sizes larger than 17.5 Sqft, an additional 15mm X 15mm, 19 gauge MS Square tube shall be welded to the MS frame below the top rail square tube keeping a gap of 50mm between the two MS Square tubes. In the case of double leaved shutters, the meeting stiles shall be rebated 20mm as shown on drawing. The rebating shall be square, as directed.

8.21.3 Factory Made Solid Panel PVC Door Shutters shall conform to the permissible limits as per testing methods provided in IS 4020

#### 8.22 Factory Made Solid PVC Door Frames

8.22.1 Solid PVC Door Frame shall be of the size 50 X 47 mm made out of 5mm single piece extruded PVC profiles. The door profile are to be reinforced with 19 X 19mm MS Square tube. EPDM rubber gasket weather seal shall be provided throughout the frame. The profile shall be mitre cut at two corners and joined by inserting 2 nos of 150mm long brackets of 15 X 15mm MS square tube inside the 19mm X 19mm MS square tube and suitably screwed.

8.22.2 Solid PVC Double door frame shall be of size 50mm X 95mm made by joining 3 nos heat bent PVC Sheet 'C' Channel of 5mm thickness of sizes 35mm X 30mm X 25mm & 40mm X 35mm X 40mm & 25mm X 30mm X 35mm using solvent cement. The two side 'C' Channel shall be reinforced with MS tube of size 19mm X 19mm. All the three 'C' channel shall be fixed to flat base of 5mm PVC sheet with solvent cement. The profile shall be mitre cut at two corners and joined by inserting 4 nos 150mm long brackets of 15 X 15mm MS square tube inside the 19mm X 19mm square tubes & remaining each of them with four screws as indicated in the drawing.

#### 8.23 Factory Made Solid PVC Moulded Door Shutters

##### 8.23.1 Particle Board Core Solid PVC Moulded Door Shutter

28 to 30 mm thick factory made Solid PVC Moulded Door shutter shall be of 2, 4 or 6 raised panel design with solid core of particle board of 24mm thick (12mm x 2) as indicated. The particle board shall be lipped with 25mm thick baton made from PVC sheets on the stile where hinges are to be fitted. On the three other sides the lipping shall be of 15mm thick PVC baton. 2mm thick moulded PVC sheet shall be stuck on the front face of the particle board suitable prepared to accept the moulded design and 2mm PVC sheet shall be stuck on the back face of the particle board with thermosetting adhesive. The 2mm PVC sheets shall be stuck with lipping by using solvent cement.

##### 8.23.2 EPS Core Solid PVC Moulded PVC Door Shutter

28 to 30mm thick factory made EPS Core Solid PVC Moulded Door Shutter shall consist of frame made out of MS tube. The core panel shall consist of 25mm thick high density EPS conforming to IS 4671, routed with design, sandwiched in

between 2mm thick moulded PVC sheet on one face and 2mm PVC sheet on the other side. The door on all the edges to be sealed with lipping of 10mm (5mm X 2) thick X 25mm wide PVC sheet for three sides & 60mm wide PVC sheet for lock side. The lipping shall be bonded to the 2mm moulded/plain PVC sheet solvent cement.

## 9 BUILDERS HARDWARE

### 9.1 GENERAL

9.1.1 All articles of builder's hardware shall bear ISI marking. In case ISI marked articles are not manufactured, those shall conform to the relevant IS specifications given in the MES schedule for the relevant item.

9.1.2 The shape and dimensions of the fittings shall conform to the shape and dimensions given in the relevant IS Specifications, unless otherwise indicated. Where however shape of fitting or its components are indicated in the relevant IS Specification, as illustrative, they are not intended to limit their design. Such fittings or components shall be provided of the shape as approved by the GE.

9.1.3 Except where otherwise specified, articles of builder's hardware shall have the following finish :-

- (a) Mild Steel and cast iron fittings : Stove enamelled black
- (b) Brass fittings : Finished bright or satin polished.
- (c) Aluminium fittings : Anodised, Anodic film shall be transparent unless indicated to be dyed.

9.1.4 Unless otherwise indicated, brass articles shall be fixed with brass screws and mild steel, cast iron and aluminium articles with steel chromium plated screws or as indicated. Screws shall be of the sizes as given in the IS specification for the fitting or as required.

### 9.2 Tower Bolts

9.2.1 Brass and aluminium tower bolts shall comply with IS 204 (Part 2)-1992 Specification for tower bolts Part 2, non-ferrous metals. The type and size of the tower bolts shall be as indicated. The bolts shall be bright finished, stain finished, Ni-Cr plated as per IS 1068, copper oxidized as per IS 1376 or zinc plated as per IS 1573, as indicated.

9.2.2 Where diameter of bolt for particular size of tower bolts is stated in the IS as 10 or 12 mm, the bolt shall be of 10 mm dia upto size 125 mm and 12 mm dia for sizes 150mm and above.

### 9.3 Sliding Door Bolts

9.3.1 These shall comply with IS 2681-1993: Specification for non-ferrous sliding door bolts for use with padlock and shall be of the following types, as indicated: -

- (a) Brass sliding door bolts with sand or die cast brass hasp staple and fixing bolt and rolled or drawn brass bolts.
- (b) Aluminium alloy sliding door bolts with hasp, staple and fixing clips of sheet or extruded section and fixing and sliding bolts of extruded sections of aluminium alloy.

9.3.2 The sliding door bolt shall have smooth sliding action. The hasp, when not cast integral with the bolt, shall be properly secured to the bolt. Sliding bolts shall be provided with fixing bolts. Brass bolts shall have satin finish or polished. Aluminium bolts shall be anodised.

### 9.4 Sliding locking Bolts

These shall comply with IS 7534-1985: Specification for sliding locking bolts for use with padlocks. Locking bolt shall have smooth sliding action. Bolt shall be made from mild steel and shall be copper oxidized, electrogalvanised or stove enamelled black as indicated. The plate and strap shall be firmly riveted or spot welded and shall be stove enamelled black. Locking bolt shall be Type II (with straight locking plate). Size of bolt shall be indicated.

### 9.5 Hinges

9.5.1 Hinges shall be well made and shall be free from flaws and defects. All hinges shall be cut clean and square. The hole for the hinge pin shall be central and square to the knuckles/boss. All sharp edges and corners shall be removed. The sides of the knuckles shall be straight and at right angles to the flap. The movement of the hinges shall be free, easy and square and working shall not have any play or shake. The hinge pin shall fit inside the knuckles firmly and riveted in the case of steel hinges, and riveted or firmly notched in the case of nonferrous metal butt hinges and properly finished. Rivet bead shall be well formed so as not to allow any play or shake. All screw holes shall be clean countersunk, suitable for countersunk head wood screw.

9.5.2 Mild Steel butt hinges shall be of cold rolled mild steel and shall comply with IS 1341-1992: Specification of steel butt hinges. Steel butt hinges are classified as light weight, medium weight; broad type, square type; and heavy type I and II. Hinges shall be of medium weight, unless otherwise indicated. The pin shall be of mild steel wire. Hinges shall be finished bright with smooth surface.

9.5.3 Brass and aluminium butt hinges shall comply with IS 205-1992: Specification for nonferrous metal butt hinges and shall be of cast brass, extruded brass, sheet brass or extruded aluminium alloy, as indicated. Brass hinges shall be polished bright or satin finished. Aluminium hinges shall be anodised.

9.5.4 In the case of brass hinges, the hinge pin shall be made of mild steel; or of brass in location susceptible to atmospheric corrosion where indicated. In the case of aluminium alloy hinges, the hinge pin shall be of aluminium alloy; or of mild steel, galvanised, where indicated. The aluminium alloy hinge pin shall be hard anodised and sealed with oil, wax or lanolin.

### 9.6 Continuous (Piano) Hinges

Continuous (Piano) hinges shall be as per IS 3818-1992: Specification for continuous (Piano) hinges. These shall be of Type II; or Type IV where indicated. These shall be of mild steel galvanised or aluminium alloy as indicated. In the case of aluminium hinges, the hinge pin shall be of aluminium and in the case of steel hinges, the hinge pin shall be of mild steel. Mild steel hinges shall be bright polished, chromium plated or copper oxidized finish as indicated. Aluminium hinges shall be anodised.

### 9.7 Double Acting Spring Hinges

9.7.1 Double acting spring hinges shall conform to IS 453-1993: Specification for double acting spring hinges. These shall be of the following type as indicated.



(a) Mild steel double acting spring hinges with steel wire spring.

(b) Brass double acting spring hinges with phosphor bronze wire spring.

9.7.2 Mild steel hinges shall be finished stove enamelled black. The steel wire spring shall be electrogalvanized or copper plated. Brass hinges shall be finished bright. Double acting spring hinges shall work smoothly when fitted to swing doors. The hinges shall hold the door vertical in its normal closing position.

9.8 **Door Springs Rat-Tail Type**

These shall conform to IS 452-1973: Specification for door springs, rat-tail type and shall be of mild steel or brass as indicated. In the case of mild steel door springs, casing, tail rod, spindle cap and base plate shall be stove enamelled black. Spindle, roller plate and roller shall be bright finished. Brass door spring shall be bright finished. Spring for both mild steel and brass door spring shall be of mild steel wire, copper oxidized or electro galvanized as indicated.

9.9 **Drawer Locks and Cupboards Locks**

Drawer Locks and Cupboards Locks shall be of Grade 2 (light) quality and shall conform to IS 729-1979: Specification for drawer locks, cupboard locks and box locks. The size of locks shall be 40, 50, 65 or 75 mm as indicated. These shall be with brass or aluminium body, as indicated with a minimum of four levers. For brass locks the body, cover plate, body plate and striking plate, shall be of cast brass or brass sheet; key, key pivot pin, lever pivot pin, lever spring fulcrum pin of stainless steel. For aluminium locks, the body cover plate, body plate and striking plate shall be of aluminium alloy pressure die casting or aluminium alloy sheet; key of mild steel; key pivot pin, lever pivot pin, lever spring fulcrum pin of stainless steel. For both brass and aluminium locks, the locking pin, locking in both plate, locking bolt and lever shall be of cast brass and lever cover plate of brass sheet and lever spring of phosphor bronze wire. Brass locks shall be finished bright and those of aluminium shall be anodised.

9.10 **Hasps and Staples**

These shall conform to IS 363-1993: Specification for hasp and staples. Hasp and staples shall be well made and free from defects. The hinge pin shall be of mild steel in the case of mild steel hasp and staples, and of mild steel or brass in the case of brass or aluminium hasps and staples, as indicated. The movement of the hinge shall be free, easy and square and shall not have any play or shake. The hasps shall fit the staples correctly. The staple, except in the case of cast one, shall be riveted properly to its plate. The hinge pin for the safety type hasp shall be riveted and rivet head properly formed and finished. Screw holes shall be clean and counter sunk to suit countersunk head wood screws. Mild steel hasps and staples shall be stove enamelled black. Brass hasps and staples shall be finished bright and covered with clear lacquer. Aluminium alloy hasps and staples shall be anodised.

9.11 **Handles**

These shall conform to IS-208-1996. Door handles shall be finished smooth. When the grip portion of handle is joined with base piece by mechanical means, the arrangement shall be such that assembly handle shall have adequate strength. Cast iron, malleable cast iron and Mild steel door handles shall be finished stove enamelled black. Brass handle shall be with bright polished finish. Aluminium handles shall be anodized.

9.12 **Floor Door Stoppers**

These shall conform to IS 1823-1980: Specification for floor door stoppers. The door stopper shall be well made and shall have smooth action. The body or housing of the doorstopper shall be cast in one piece and it shall be fixed to the cover plate by means of brass or aluminium screws. The spring shall be fixed firmly to the pin. The tongue which would be pressed while closing or opening of the door shall be connected to the lower part by means of copper pin. On the extreme end, a rubber piece shall be attached to absorb shocks due to the pulling action of the door. The exterior of the brass door stopper, which will be in flush and above the floor, shall be finished bright or satin and exterior of aluminium stopper shall be anodised.

9.13 **Door Closers (Hydraulically Regulated) exposed type**

These shall comply with IS 3564-1995: Specification for door closer (Hydraulically regulated) and shall be of designation 2 suitable for door weighting 36 to 60 Kg or designation 3 suitable for doors weighting 61 to 80 Kg as indicated. Door closers shall have cast iron body or aluminium alloy body, as indicated. Materials of other parts shall be as per IS. Closers shall be universal type suitable for both anticlockwise and clockwise doors, without any change in parts of the closers. Closers shall be Bottle type (Type A) or Tubular type (Type B) as indicated. Door closers with cast iron body shall be painted and finished with lacquer. In case of aluminium body closer shall be anodised. The surface of the closer shall be clean, without sharp edges, free from cracks burrs, dents or any other visible surface defects. The door closer shall not allow any signs of leakage under working conditions. The closing time shall be easily adjustable by means of regulating screw between 5 to 20 seconds.

9.14 **Floor Springs (Hydraulically Regulated) for heavy doors**

These shall comply with IS 6315-1992: Specification for floor springs (Hydraulically regulated) for heavy doors suitable for doors weighting up to 125 Kg. These shall be single action or double action type as indicated. Foundation box, main body and half cover shall be of minimum 1.25 mm thick mild steel sheet or aluminium alloy sheet or brass sheet as indicated. Top cover shall be of minimum 2 mm thick aluminium alloy sheet or 1.25 mm thick brass sheet as indicated. Materials of other parts shall be as indicated in IS. The floor springs shall operate smoothly and easily without undue delay during opening and closing operation. The closing time shall be easily adjustable by suitable device between 3 to 20 seconds. The floor springs shall be free from all mechanical defects, sharp edges, and any other visible surface defects. The cover sheet, shoe and top centre shall be polished or electroplated as indicated. Mild steel parts shall be given phosphating treatment and thereafter two coats of enamel paint.

9.15 **Hold fast**

These shall comply with IS 7196-1974 specification for hold fast. These shall be of minimum 5 mm thick mild steel flats conforming to IS 1731 and shall be given a coat of bitumen and sanded. Size and dimensions shall be as indicated.

9.16 **Hat, Coat and Wardrobe Hooks**

These shall comply with IS 9899-1981: Specification for Hat, Coat and Wardrobe Hooks. These shall be of mild steel sheet, aluminium alloy (sheet/die cast/extruded section) or brass (sheet/cast) as indicated. The hooks shall be manufactured in one piece and shall be well made and free from all defects. They shall either be screwed or riveted to back plate or may be solid cast along with back plate. Mild steel hooks shall be stove enamelled black and brass hooks shall be finished bright. Aluminium hooks shall be anodised.

9.17 **Gate and Shutter Hook and Eyes**

These shall conform to IS 207-1964: Specification for gate and shutter hooks and eyes. The hook shall snugly fit in the eye. Steel and brass hooks, eyes and plates shall be finished bright. Aluminium hooks, eyes and plates shall be anodised.

9.18 **Curtain Rails**

These shall conform to IS 10342-1982: Specification for curtain rail system. Curtain rails of the specified size shall be supplied with rings and brackets for fixing. Two brackets for fixing to walls or pelmets shall be supplied. For rails exceeding 50 cm in length, one additional bracket shall be provided for every 50 cm. The mild steel rail and brackets shall be chromium plated and aluminium alloy rails shall have anodised finish. Rollers shall be provided one roller per 15 cm length of curtain rail.

9.19 **Towel Rails**

These shall be of hollow tube types, as indicated; size, thickness shall be as indicated. Towel rails shall be D Type with flanged ends for fixing to the background. Alternatively brackets with sockets suitable for a fixing to the background shall be provided.

9.20	<b>Stainless Steel Wire Cloth</b>
	These shall be of 0.36 mm nominal diameter stainless steel wire and average width of aperture shall be 1.40mm unless otherwise indicated.

## 10 STEEL AND IRON WORK

**NOTE:** No item of steel and iron work for incorporation/ required in this contract shall be issued under Schedule 'B'. Contractor shall make his own arrangements to procure steel and iron all as specified herein-after. The following checks shall be carried out before the steel supplied by contractor is accepted and is approved for incorporation in the work.

## 10.1 GENERAL

10.1.1 **Items of steel and iron brought to site by the contractor for incorporation in the work shall be free from defects all as specified in clause 10.4.3 and 10.17.6 of SSR Part-I and shall be conforming to IS specifications as given below: -**

- |     |  |   |
|-----|--|---|
| (a) | <b>Reinforcement Steel-</b>  | High strength deformed steel bars produced by Thermo Mechanical Treatment Process (TMT steel bars of grade <b>Fe-500/Fe 500D/ Fe 550/Fe</b> Conforming to IS-2062, Fe 410-W (Gde-E-250) quality |
| (b) | <b>Structural Steel</b><br>(i) Standard Quality                        | Conforming to IS-277.   |
| (c) | <b>Galvanized Steel Sheets</b><br>(Plain & Corrugated)                 | Conforming to IS-1566 <b>Concrete</b>   |
| (d) | <b>Fabric Reinforcement for</b>  | Conforming to IS-2062, Fe 290 (Gde-E-165)   |
| (e) | Ordinary steel (for door window frame grills, steel gates, hand rails) |   |

## 10.1.2 Procurement of materials

## 10.1.2(A)

Sl No	Company Name & Brand	Address	Type of Steel
1.	Rshtriya Ispat Nigam Limited (RINL) <b>Brand: "RINL"</b>	Visakhapatnam Steel Plant Visakhapatnam – 530 031, India Tel: (91 891) 518226, 518376 Fax: (91 891) 518316 Email: cmdvsp@itpvis.ap.nic.in	
2.	Tata Iron & Steel Company (TISCO, or Tata Steel) ** <b>Brand : "TATA"</b>	Bombay House, 2,4, Homi Modi Street Mumbai – 4000 001, India Tel: (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)	
3.	Steel Authority of India Limited (SAIL) <b>Brand: "SAIL"</b>	Central Marketing Organization, Northern Region 17th Floor, Scope Minar, Laxmi Nagar Distt Centre, Delhi – 110092	
4.	M/S Jai Balaji Industries Ltd. <b>Brand: "JAI BALAJI"</b>	5 Bentek Street, Kolkata – 700001 Delhi Office 510, Block-b, Navraung House 21 Kasturba Gandhi Marg New Delhi- 110001 011- 43620219, 43620220 Mob: 7838272772/9958936103 Email: info@jaibalajigroup.com	TMT Bars of Gde Fe 500 Fe 500D
5.	M/S Shyam Steel Industries Ltd. <b>Brand: SHYAM TMT"</b>	Shyam Towers EN-32, Sector-V, Salt Lake, Kolkata -700091 Tel- 033-40074007, Fax-033-40074010 Email: marketing@shyamsteel.com	TMT Bars of Gde Fe 500 Fe 500D CRS
6.	M/S SPS Steels Rolling Mills Ltd. <b>Brand: "ELEGANT TMT"</b>	Elegant Towers 68A, Ballygunge Circular Road, Kolkata – 700019 Ph- 033- 2895160/67 Fax- 033 – 22894386 Email: spsdelhi@spsgroup.co.in	TMT Bars of Gde Fe 500/FE 500D Fe550

7.	M/S Steel Exchange India Ltd <b>Brand: "SIMHADRI TMT"</b>	My Home Laxminivas Apartments Ameerpet, Hyderabad-500016, A.P. Tel-040-23403725 Fax-040-23413267 Email: info@seil.co.in	TMT Bars of Gde Fe 500 Fe 500D HSCRM
8.	M/S Jindal Steel and Power Ltd. <b>Brand: "JINDAL"</b>	OP Jindal Road, Hissar, Haryana, PIN – 125005 Tel - +911662 222471-84 Fax- +91 1662 220476	TMT Bars of Gde Fe 500/Fe 500D Fe 550/Fe 550D
9.	M/S SRMB Srijan Pvt Ltd <b>Brand: SRMB"</b>	SRMB House, 7, Khetra das lane Kolkata – 700012 Tel: 033 – 6600 6600 Fax: 033 – 2211 0483	TMT Bars of Gde Fe 500/Fe 500D Fe 550/Fe 550D (Size 8-32mm)
10	M/S Concast Steel & Power Ltd. <b>Brand: "CONCAST MAXX"</b>	21 Hemant Basu Sarani, Suit Nos – 511 & 512 5th Floor, Kolkata – 700001 Tel-91-33-2213 0481- 87 91-33-2213 0488 Email: info@concastgroup.com	TMT Bars of Gde Fe 500 Fe 500D (Size 8 – 32mm)
11	M/S Adhunik Metaliks Ltd <b>Brand: "ADHUNIK MET+"</b>	Lansdowne Towers, 2/1A Sarat Bose Road, Kolkata – 700 020 Tel: 033 3051 7100 Fax: 9133 2289 0285 Email: info@adhunikgroup.com	TMT Bars of Gde Fe 500 Fe 500D (Size 8-32mm)
12	M/S Shri Bajrang Power & Ispat Ltd. <b>Brand: "GOEL TMT"</b>	Vill – Borjhara, Urla Indistial Area, Raipur – 493 221, Chhattisgarh Tel: 0771 4288019 /29 /39	TMT Bars of Gde Fe 500 Fe 500D (Size 8-32mm)
13	M/S JSW Steel Ltd. <b>Brand: JSW TMT Plus"</b>	Jindal Mansion, 5A Dr G Deshmukh Marg, Mumbai – 400026 Phone – 022 -2351-3000 022 -2352-6400	TMT Bars of Gde Fe 500 Fe 500D CRS (Size 8-40mm)
14	M/S Electrosteel Steels Ltd. <b>Branch: "ELECTROSTEEL"</b>	G K Tower, 2nd & 3rd Floor 19 Camac Street, Kolkata, WB – 700017 Board No: 91-33-2283-9990 91-33-7103-4400 Fax 91-33-2290-2882 Website: www.electrosteel.com	TMT Bars of Gde Fe 500D (Size 8-36mm)
15	M/S Shyam Metalics & Energy Ltd. <b>Brand: "SEL"</b>	Viswakarma, 1st Floor, 86 C, Topsia Road, Kolkata – 700046 Ph: +91 33 2285 2212 Website: www.shyamgroup.com	TMT Bars of Gde Fe 500 (Size 8-32mm)
16	M/S Kamachi Sponge & Power Corporation Ltd <b>Brand: "KAMACHI"</b>	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 Email: sales@kamachitmt.com Website: www.kamachitmt.com	TMT Bars of Gde Fe 500 Fe 500D Fe 550, Fe 550D HCRM (Size 8-40mm)

**\*\* For works being executed in J&K region only :- Production of documents indicating origin Lot No and test certificate from TISCO along with purchase vouchers from TISCO authorized distributor from whom steel is purchased shall be mandatory.**

- 10.2.2 (B) **Structural Steel.** Structural steel shall also be procured from primary producers mentioned above. In case of non-availability with primary producers, the structural steel can be procured from approved secondary producers with a reduction of 5% (five percent) of the accepted rate of structural steel. In case the desired section of structural steel is not rolled/ manufactured by primary producers, there shall be no price adjustment in use of structural steel procured from approved secondary producers.
- 10.2.3(C) **Galvanised Steel Sheets and Fabric Reinforcement for Concrete.** These shall be procured directly from primary producers mentioned above and shall be ISI marked.
- 10.2.4(D) Steel section for railings, gates, fencing, guard bars, grills, steel chowkhat, halfasts etc, which do not constitute structural members, can be procured from primary producers/secondary producers/BIS marked manufacturers or their authorized dealers at the option of Contractor without any minus price adjustment. Tests will not be insisted upon for such steel sections.
- 10.2.5 The GE for every lot of steel shall obtain the particulars of the manufacturer/supplier of steel from the contractor separately. The form given at **Appendix 'B'** will be used for this purpose.
- 10.2.6 It shall be the responsibility of contractor to produce original purchase vouchers, test certificates and other valid documentary evidence to entire satisfaction of GE for entire qty of each consignment to prove that material have been purchased from sources as stated in particular specification.
- 10.2.7 The GE shall verify the original documents in support of the purchase of steel and will retain certified true copy of the results in GE's office.
- 10.2.8 The GE will ensure that contractor place their demand/requisition of steel with adequate lead time. The steel will be procured from the storage depots of the primary producers/approved secondary producers (as applicable) and not from their authorized agents/dealers.
- 10.2.9 Secondary producers for structural steel are as given in Appendix 'E'.
- 10.3 **Testing of Steel**
- 10.3.1 The manufacturer is to carry out inspections 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 results 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 Engineer-in-Charge shall record these details in Steel Acceptance Register, as given at **Appendix 'B'** after due verification and send a certified true copy of test sheet to GE for his records. The GE shall also organize independent test of random samples of steel drawn from various lots from National Test House, SEMT Wing CME, Regional Research Labs, NABL approved labs etc. as per the recommended minimum frequency shown in Table here in below. Sample from each lot should be tested for quality and elongation. The elongation shall not be less than 18%. Cost of samples, transportation and testing shall be borne by the contractor. The records of such checks shall be maintained in steel test register.

#### **FREQUENCY FOR NORMAL MASS, TENSILE, BEND AND REBEND TESTS OF STEEL**

Ser No	Nominal size	Quantity
<b>A. <u>STEEL FOR CONCRETE</u></b>		
1	Bars size less than 10mm	1 sample (3 specimens) for each test for every 25 tonnes or part thereof.
2	Bar size 10mm to 16mm inclusive	1 sample (3 specimens) for each test for every 35 tonnes or part thereof.
3	Bar size over 16mm	1 sample (3 specimens) for each test for every 45 tonnes or part thereof
<b>B. <u>STRU CTURAL STEEL:-</u></b>		
1	Tensile Test	
2	Bend Test	
<b>Note:-</b> For various tests, acceptance criteria tolerance etc, refer to Appendix 'B' and relevant BIS Code		

10.3.2 If the test fails and steel has been incorporated in the work, the further execution of work with that steel will be stopped and matter shall be referred to Accepting Officer. The decision of Accepting Officer regarding acceptance of work with the steel, which has failed in test with price adjustment as decided by him, or redoing the work with steel of proper specifications or any other decision shall be final and binding on the contractor. In case Accepting Officer decides to remove the sub standard steel, the work executed using sub standard steel shall also be demolished and site cleared by the contractor without any extra cost to the Govt.

10.4 **Documentation.**

10.4.1 The Contractor shall submit original purchase vouchers from the manufacturer for the total quantity of steel supplied under each consignment to be incorporated in the work. The GE shall inspect all consignments received at the work site alongwith relevant documents before acceptance. The original vouchers and the Test Certificate 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 will be signed by JE, Engineer-in-Charge, GE and Contractor. The entire quantity of all steel items shall be suitable recorded in the Measurement Book as not to be abstracted. Before incorporation in the work and shall be signed by the Engineer-in-Charge and the Contractor.

10.5 **Tolerances :**

10.5.1 Structural steel products shall be as specified in IS-1852. Tolerance on size and weight of reinforcement bars shall be as specified in clause 10.17.4 and 10.17.5 of SSR Part-I. Steel with less weight than permissible shall not be used and the steel below permissible limit shall be removed from the site of work without any extra cost to Govt. If weight of steel bars per metre is more than specified in SSR, the payment shall be allowed based on conversion factor specified in SSR. The contractor shall have no claim whatsoever in this regard.

10.6 **Schedule of supply**

10.6.1 The contractor shall ensure that procurement action is taken immediately after acceptance of contract so as to adhere to schedule of activity as per CPM net work.

10.7 **STORAGE, ACCOUNTING, PRESERVATION AND MAINTENANCE**

10.7.1 Structural steel/ bars of different classification, sections, sizes and lengths shall be stacked separately. Steel shall be marked with distinct painting marks for easy identification. Steel shall be recorded in MB for record purposes only.

10.7.2 All steel shall be stored on dunnage at least 15 Cms above ground level. Steel reinforcement shall be stored properly to prevent distortion and corrosion. In case of long time storage, suitable protective measures like cement coating, provision of temporary shelter etc. to save it from rusting/distortion etc shall be taken. Any item of steel that has deteriorated or corroded or considered defective by Engineer-in-Charge shall not be used in the work and shall be removed from the site of work.

10.7.3 Procedure for Making Payments for Steel including measurements, conversion weight etc.

10.8 **METHOD OF MEASUREMENT**

10.8.1 All items of steel brought at site shall be entered in MB as “Not to be abstracted” indicating the diameter and length of bars, quantities, voucher number with dates. It shall form the basis to allow advances on account through RAR's. While allowing advance on such materials, quantities so entered in MB shall be reduced by 2% to account for waste and off cuts and every care shall be taken to ensure that all such quantities will be utilised in the work.

10.9 **RECORD OF MEASUREMENTS**

10.9.1 Before casting of concrete, reinforcement incorporated shall be measured by rep. Of GE and contractor jointly. These measurements shall be entered in a register for the purpose of records and shall be signed by contractor's rep and Engineer-in-Charge. Proper reference of Drg No. Location, date etc. shall also be given therein.

10.10 **WEIGHT CONVERSION**

10.10.1 Conversion factor for various sections/ sizes of steel shall be as per conversion tables given in SSR. Where conversion table is not available in SSR, IS conversion table shall be followed.

10.10.2 Testing of steel as referred above is an essential requirement before the payment is released to contractor, as material lying at site or before the steel is incorporated in the work.

**Note:-**

(a) Mixing of different types and grades of bars shall not be done in the same structural members as main reinforcement to satisfy clause 26.1 of IS-456 of 2000 shall be avoided.

(b) TMT bars shall not be treated as corrosion resistant steel bars.

10.11 **Steel reinforcement**

- 10.11.1 Reinforcement of TMT (Thermo mechanically treated) bars etc. shall be provided as shown on drawings and in the absence thereof in accordance with the provision of IS-456.
- 10.11.2 Reinforcement shall be fabricated and 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.
- 10.11.3 Deviation orders in respect of TMT bars shall be priced at applicable rate of deformed or twisted bars in SSR subject to contractor's percentage quoted against respective part's of Schedule 'A'.

10.12 **Welding:**

- 10.12.1 Welding wherever shown on drawings shall be by metal arc process in accordance with IS-816 and IS823.

- 10.13 **Guard Bars/ Grills** Irrespective of whatever is shown on drawings, MS Guard bars/ Grills Type 'B' shall be provided to windows, ventilators etc.

- 10.14 **Hold fasts/ lugs** Flat iron hold fasts/ lugs shall be provided by welding except those to be provided to wooden chowkhats, which shall be fixed with bolts/ nuts as per details shown on drawings. Holes in wooden chowkhats shall be plugged with hard wood plugged.

10.15 **Fan hook with MS Boxes:**

Where fan hooks/ fan points have been shown mild steel boxes with fan hooks as per details shown on drawings shall be provided. Exposed faces shall be treated with two coats of synthetic enamel paint over a coat of red oxide primer.

10.16 **Aluminium sheet lining to Door shutters**

Where aluminium sheet lining to door shutters, it shall be provided all-round bottom rail of door shutter. The thickness of aluminium sheet shall be 0.50 mm and shall be fixed with steel screws at the spacing.

10.17 **Rolled steel section for door frames**

Where indicated, rolled steel section shall be provided and as specified in clause 10.28 of MES Schedule Part-I.

10.18 **Railing/ Parapet for Stair case/Verandah/Balcony**

All iron and steel work shall be given two coats of synthetic enamel paint over a coat of red oxide primer except wooden hand rail. Where wooden hand rail is indicated, it shall be French polished. Species of wooden hand rail if not indicated in drawing, it shall be of teak wood. Where GI pipe hand rail shown, it shall be provided of medium grade.

10.19 **Steel Doors, Windows and Ventilators**

- 10.19.1 Steel doors, windows and ventilators shall comply with IS 1038-1983: Specification or steel doors, windows and ventilators; except with regard to sizes, which shall be as indicated; and shall be of approved make. Rolled steel sections for fabrication shall conform to IS 7452-1990.

- 10.19.2 Both fixed and opening frames shall be constructed of sections mixed at corners. The corners offrames shall be welded to form a solid fused welded joint. All frames shall be square and flat. The process of welding adopted may be flash butt welding or any other suitable method which complies with therequirements listed in the IS. Subdividing bars of the units shall be tenoned and riveted to the frames. Casements shall be fitted to their frames so as to provide continuous contact to weathering on the inside and outside and shall be secured in closed position by the fittings which shall have been properly adjusted. Windows and doors may have holes in the web of bars other than those required during manufacture and fixing. Fixing lugs shall have standard slot of 8mm wide for MS screw of 6 mm dia and 12 mm long with square nuts. For fixing steel hinges, slots shall be cut in the fixed frame and the hinges inserted inside and welded to the fame. The hinges shall be projecting type and not less than 65mm and not more than 75mm wide. The hinge pin shall be of electro-galvanised steel of suitable thickness. Where indicated, friction hinges shall be provided for side hung windows.

- 10.19.3 The handles for side hung shutters shall be of steel or of hot pressed brass, where indicated and shall be mounted on a steel handle plate. Thickness of handle shall not be less than 3 mm for mild steel and brass. The handle shall have a two point nose which shall engage with a steel/brass striking plate on the fixed frame in a slightly open position as well as in a fast position. The boss of the handle shall incorporate a friction device to prevent the handle from dropping under its own weight and the assembly shall be so designed that the rotation of the handle may not cause it to unscrew from the pin. The strike plate shall be so designed and fixed in such a position in relation that with the latter bearing against its stop, there shall be adequate tight fit between the casement and the outer frames.

- 10.19.4 In cases where non-friction type hinges are provided, the windows shall be fitted with peg stays which shall be of steel and shall be 300 mm long with steel peg and locking brackets riveted or welded to the fixed frames. Side hung casement fitted with friction hinges shall not be provided with peg stays.

10.20 **Pressed Steel Frames for Wooden Doors/Window Shutters**

- 10.20.1 Steel frames for wooden shutters shall be pressed out of cold rolled mild steel sheets of 1.25 mm or 1.60 mm thickness as indicated and shall comply with requirements of IS 4351- 2003: Specifications for steel door frames. Cold rolled mild steel sheet shall conform to IS 513. The size, type (profile) and dimensions of the frames shall be as indicated. Tolerance in the size of frames shall not vary by more than + 2 mm. The tolerance over the profile size shall be + 1 mm. Steel frames shall be of approved make.

- 10.20.2 Frames shall be either painted with two coats of ready mixed paint or power coated (conforming to IS 13871) as indicated.

- 10.20.3 Frames shall be filled with PCC 1:3:6 Type C1.

10.21 **Anodised Aluminium Doors, Windows, Ventilators, Partitions, Composite units etc.**

(a) Sections manufactured by reputed firms shall be used for fabrication as indicated. Chemical and mechanical properties of sections shall comply with requirements given in IS 733-1983: Specification for wrought aluminium and aluminium alloys bars, rods and sections, IS 737-1986: Specification for wrought aluminium and aluminium alloys sheet and strip for general engineering purposes and IS 1285-2002: Specification for wrought aluminium and aluminium alloys extruded round tube and hollow sections for general engineering purposes.

(b) Aluminium sections and fittings shall be anodized and minimum average thickness of anodizing (coating of anodizing) on all aluminium section and fitting shall be 15 micron and shall conform to IS:1868- 1996: Testing of anodizing coating shall be in accordance with IS:5523-1983.

(c) Joining of sections, providing fittings, lugs, method of fixing etc shall be as per IS 1948- 1961.

(d) Aluminium Doors, Windows, Ventilators, Partitions, Composite units etc. shall have matt, scratch brush or polished finish as indicated.

(e) Glazing: - Glass panes shall be as indicated. Unless otherwise indicated, fixing of glass panes 5mm thick shall be provided with aluminium beading with CP brass or stainless steel screws spaced not more than 10 cm from each corner and intermediate not more than 20 cm apart. When glass panes are fixed with aluminium beading having mitred joints, epoxy resin or silicon sealant shall be applied between glass panes and sash bars and also between glass panes and beading. Aluminium beading shall also be from firm of sections used for fabrication of aluminium Doors, Windows, Ventilators, Partitions, Composite units etc. Joints shall be filled with PVC/neoprene felt, cleats etc as indicated.

(f) Panelling: - Panels shall be of decorative plywood, prelaminate particle board, aluminium etc as indicated. The panels shall be cut to correct size with minimum 12 mm portion being inserted in the frame and shall be fixed firmly with CP brass or stainless steel screws. The joints between panels and members shall be sealed with epoxy resin or silicon sealant. Joints shall be filled with PVC/neoprene felt, cleats etc as indicated.

(g) PVC protected sheeting shall be used while fixing the frame of doors, windows, ventilators etc to avoid damages, scratches etc.

10.22 **Anodised Aluminium Frame Work (snap grid) for false ceiling Work**

## 10.22.1 (a) Materials:-

(i) Aluminium sections incorporated in frame work shall conform to IS 733, IS 737 and IS 1285.

(ii) The snap grid consist of anodized aluminium main/cross tee of size as indicated.

## 10.22.2 (b) Workmanship:-

(i) Snap grid frame work shall be fixed to ceiling with supporting hanger consisting of 6mm dia mild steel rod, J bolts with necessary bolts, nuts and washers all as manufacturer's instruction.

(ii) The main and cross tees shall be jointed at junction/crossings with anodized aluminium angle bracket of size as indicated, if not indicated it shall be 15mm x 15mm x 1.5mm, weighing 0.12 Kg per running metre, fixed with suitable mild steel, bolts nuts and washers, all as manufacturer's instructions.

(iii) The snap grid (main/cross tee section) shall be supported at ends all along the wall with anodized aluminium angle of size as indicated, if not indicated it shall be 40mm x 25mm x 2mm, weighing 0.36 Kg per running metre.

(iv) Size of the snap grid shall be as indicated.

(v) PVC protected sheeting shall be used to avoid scratches, damage to the framework while fixing to ceiling.

11 **Roofing**11.1 **Corrugated Galvanised iron sheet roofing**

(a) Corrugated steel sheet in roofs shall be 0.63mm thick corrugated galvanised iron steel sheets (class-VIII) with zinc coating of 275 gm/ Sqm both sides, ridge 1 metre wide, hip section for covering valleys/ ridges and flashing where 0.80 mm thick plain galvanised iron sheets (class-VIII) with zinc coat of 275 gm/ Sqm both sides shall be provided and fixed with roof members, all as shown on drawings and as specified in clause 11.21 and 11.22 of MES Schedule 2009 Part-I and as specified here in after.

(b) Sheetting shall be fixed with two corrugation side lap and minimum 15 cm end lap.

(c) Sheetting shall be fixed to steel purlins with hot dip galvanized, self-drilling and self-tapping screws neoprene and EPDM washers.

(d) The roof sheets length shown on drawings is tentative but the number of purlins as shown on drawings are firm. Any variation in number of purlins shown on drawings shall be regularized through deviation order.

(e) Roof slope and roof projection shall be as shown on drawings.

(f) Wind Tie: - Flat iron 40 x 6 mm wind tie shall be provided at either side of eaves and ridges with an overlap of 75 mm at joints and jointed with two numbers nuts and bolts of suitable size. Irrespective of whatever is shown on drawings, wind tie shall be provided with two coats of synthetic enamel paint over a coat of red oxide primer.

(g) Camouflaging to CGI sheet roofing: - Top surface of CGI/ PGI sheets in roofing shall be treated with mordant solutions and shall be given two coats of matt finish paint over a coat of primer in camouflaging pattern

(h) Eaves Board: - Eaves board shall be provided all as shown on drawings. It shall be of PBI sheet 1.25 mm thick and 250 mm wide PBI sheet and steel surface shall be treated with two coats of synthetic enamel paint over a coat of red oxide primer on all sides.

11.2 **Galvalume Sheet Roofing**

(a) Galvalume sheet shall be 0.50mm thick (total coated thickness), 550 Mpa minimum, yield strength. It 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/Sqm 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. Penetrations and laps in sheet shall be sealed by using proper sealant profile. HDPE fillers shall be provided wherever required to close voids between sheets, sheet & fasteners etc.



- (b) Fixing system shall be as per manufacturers' instructions and shall be safe against effects of Wind velocity.
- (c) Galvalume Sheet Wall Cladding: Galvalume Sheet for wall cladding shall be same as for roof and shall be fixed with 8mm and 30mm deep trapezoidal profile sheeting fixed with self-trapping fasteners.
- (d) Roofing accessories ie Corner piece apron, eaves/valley gutters, hoppers, ridges, sheet floor connectors, etc shall be of galvalume sheet and of size shape as specified.
- (e) Fasteners for Steel Sheet, Aluminium Sheets and Asbestos Cement Sheets L-types and J-type hook bolts and nuts, mushroom head roofing bolts and nuts, and bituminous felt and steel washers shall conform to IS 730-1978. Specification for Hook-bolts for corrugated sheet roofing. Steel bolts, nuts and washers shall be galvanised. However, washers for aluminium sheet shall be of plain aluminium sheet of same quality as that of corrugated sheet.
- (f) Eaves Board: - Eaves board shall be provided all as shown on drawings. It shall be of Galvalume sheet 0.5 mm thick and 250 mm wide.

### 12.3 **CEILING WORK**

#### 12.3.1 **Fibre Insulation Boards**

12.3.1.1 Fibre insulation boards shall conform to the requirements of IS 3348-1965; Specification for fibreinsulation boards. The boards shall be ordinary type except where flame retardant type is indicated. The meandensity of the boards shall not exceed 0.4 gm/cu.cm. Flame retardant boards may be treated on one face or both the faces, as indicated. In the case of flame retardant boards on one face only, the face which is treated shall be clearly marked. Permissible tolerance on the thickness of the fibre insulation board shall be  $\pm 0.75$  mm for 12 mm thick boards and  $\pm 1.0$  mm for 18 mm thick boards.

12.3.1.2 Insulation boards shall be fixed invariably as per the manufacturer's instructions; Where such instructions are not given, the method of fixing shall be as follows. Where joints are to be covered the boards shall be spaced 3 to 6 mm apart. Where joints are to be left exposed, the sheets shall be butt laid with their edges abutting in moderate contact, but without having to force them into place. Where the joints are to be left exposed the outer row of nails shall be placed at 10 cm centres and about 12 mm from the edge of the sheet. Along the line of intermediate support, the nails shall be spaced 20 cm apart. Nails in the outer rows on either sides of joint shall be paired and not staggered. Where the joints are to be covered with beading, felt headed (clout) nails shall be used instead of lost head nails. The spacing of the nails in the interior rows in boards shall be 20 cm centres. In the outer rows at edges to be covered by beading, the nails shall be spaced at 20 cm centres in each row but which the nails staggered. The beading shall then be fixed over the sheets with screws at 20 cm centres in each row with screws in the two rows staggered and passing through beading, sheet and framing.

#### 12.3.2 **Particle Boards for Insulation Purposes**

Particle boards for insulation purposes shall conform to the requirement of IS 3129- 1985; Specification for particle board for insulation purposes. Boards shall have either flame retardant chemical mixed during manufacture or shall be impregnated with a solution of flame retardant chemical. The density of the board shall not exceed 0.4 gm/cu.cm and shall not vary from board to board by more than  $\pm 10$  percent. The permissible tolerances on the nominal thickness of finished boards shall be  $\pm 0.8$  mm for boards upto 25 mm thick and  $\pm 1.0$  mm for boards above 25 mm thick.

#### 12.3.3 **Gypsum Plaster Board**

Gypsum plaster board shall conform to IS 2095-1996 Part 1 or 2 as indicated. The type of board shall be well board or base board as indicated. The thickness shall be indicated. The board shall be square edge board or tapered edge board as indicated.

#### 12.3.4 **Particle Boards**

Particle boards shall conform to the requirements of IS 3087-2005; Specification for wood particle boards (medium density) for general purposes. Adhesive used for bonding purposes shall be phenol formaldehyde as indicated. Particle boards may be either flat pressed single layer type or flat pressed three-layer type, unless a particular type has been indicated. In case of three-layer particle boards the construction shall be well balanced about the central plane. In the case of single layer particle board the particles shall be uniformly distributed. Particle boards shall be of uniform thickness and uniform density throughout the board. Both faces of particle board shall have sanded smooth finish. Mean density of the boards shall be between 500 to 900 kg/cum. The density shall not vary from one board to another by more than 10 percent of the mean density. Particle boards shall not crack or split when drilled, sawed or nailed perpendicular to the surface. Tolerance permissible on the thickness of particle boards shall be  $\pm 5$  percent for boards upto 25 mm thick and  $\pm 2.5$  percent for boards above 25 mm thick.

#### 12.3.5 **Plaster of Paris (Gypsum Anhydrous Tiles) Ceiling Board**

12.3.5.1 Plaster of Paris (Gypsum Anhydrous) tiles shall be made from Gypsum Anhydrous conforming to IS 2547: Part 1-1976 reinforced with Hessian cloth. The thickness of tiles shall be 12 mm or as indicated.

12.3.5.2 Tiles of Plaster of Paris reinforced with Hessian cloth shall be prepared on glass or smooth surface in suitable sizes as indicated. The maximum size of tiles shall be limited to 600mm. In each direction wooden forms of height equal to the thickness of tiles shall be placed on a true level and smooth surface such as a glass sheet.

12.3.5.2 The section of form sides shall be such that the edge of the tiles shall be provided with a neatly formed camber all round of 5 mm width and 8 mm depth, unless the tiles are to be provided with cover fillet over joints in which case the edges of the tiles shall be truly square. Plaster of Paris shall be evenly spread into the form upto about half the depth and Hessian cloth weighing not less than 230 gms per square meter shall be pressed over the Plaster of Paris layers. The ends of the Hessian cloth shall be turned over at all edges to form a double layer to a width of 50 mm. The Hessian cloth shall be of an open webbed texture so as to allow the plaster below and above to intermix with each other and form an integral hole. The form shall then be filled with Plaster of Paris which shall be uniformly pressed and then wire out to an even and smooth surface. The tile so moulded shall be allowed to set initially for an hour or so and then removed from the form and allowed to dry and harden for a week. A good tile after drying and hardening shall give a ringing sound when struck. The tiles shall be true and exact to shape and size and with clean and regular chambers. The exposed surface shall be truly

plane and smooth.

- 12.3.5.3 12 mm thick Plaster of Paris tiles shall be fixed to the cross battens of the ceiling frame with 40 mm brass screws at a spacing not exceeding 20 cm centre to centre on all edge. The tiles shall be laid with their edges in just close position to the adjoining tiles without any gap in between. The line of screws shall not be less than 15 mm away from the edges of the tiles. The screws shall be slightly countersunk into the tiles. Holes for screws shall be drilled. The countersunk heads of screws shall be covered up with Plaster of Paris and smooth finished. Where surface unbroken by visible joints is required, the joints sealed with Plaster of Paris shall be trowelled smooth so that the whole surface appears as one without any joints. Nothing extra shall be paid for this closing of joints.

### 13 **FLOORING**

#### 13.1 **General**

- 13.1.1 Cement shall be ordinary Portland cement conforming to IS 269-1989.
- 13.1.2 White cement shall conform to IS 8042-1989. Specification for white Portland cement.
- 13.1.3 The flooring shall be provided as specified in respective items of Schedule of Finishes.
- 13.1.4 The thickness of each course or layer constituting the floor shall be as specified or indicated.
- 13.1.5 The floors shall be laid to levels or falls as indicated or as directed by the EIC. The surface shall be finished to a reasonably true plain surface. The desired slope for proper drainage shall be provided in the subfloor and subgrade.
- 13.1.6 All points of level from the finished floor surface and outlets shall be clearly marked and outlet openings made beforehand.
- 13.1.7 Where full size tiles cannot be fixed these shall be cut/sawn to the required size and then edges rubbed smooth to ensure straight and true joints.
- 13.1.8 Tiles fixed in the floor adjacent to the wall shall enter plaster, skirting or dado to a minimum depth of 10mm.
- 13.1.9 Cement, Lime and composite mortars shall be made as required for Brickwork. The quantity of water added shall be the minimum to give sufficient plasticity and workability for laying. A high water-cement ratio will produce a screed bed with a high drying shrinkage and shall be avoided. Unless otherwise specified, bedding layer of mortar for laying floor units, where specified shall be not less than 15mm. Mortar in joints shall be restricted to the width of joints and any smearing of mortar on the surface of floor on either side of joint shall be removed immediately. The finished surface of mortar in joints shall be flush with the floor surface.
- 13.1.10 The ground or earth filling shall be thoroughly compacted so that there are no loose pockets left anywhere in the whole area. Before laying lime concrete or cement concrete sub-floor, the surface of sub-base such as hard-core shall be thoroughly compacted and cleaned of all dirt, dust, loose particles and any other deleterious materials.
- 13.1.11 The dividing line between floors of different types wherever met between rooms shall be determined on the basis of the finish visible when the door are closed and the applicable finish shall accordingly be provided.
- 13.1.12 Floors finish shall be extended over dwarf walls, doors and other openings.
- 13.1.13 Floors shall be laid in levels or to falls as shown on drawings and as directed by Engineer-in-charge.
- 13.1.14 Under layer and topping layers of cast-in-situ cement and terrazzo floors shall be laid in panels conforming to pattern as approved by the Engineer-in-Charge. Length of panel shall not exceed 1.2 m and length to width ratio not exc. 1.5 times. Not more than 3 dividing strips shall be meeting at any point. Dividing strip shall be of plain glass having width 2 mm less than of the thickness of floor topping and 4mm thick. Dividing strips shall be finished smooth with top surface of floor. However, where different floor levels indicated to be provided, dividing strips shall not be provided and flooring at junction shall be provided in the shape of fillet. The glass dividing strips shall not be provided in floors having thickness of top layer more than 40mm. No price adjustment shall be made if form work is not used in making bays and glass dividing strip are used in lieu thereof.
- 13.2 **Cement Concrete Sub-floors, Base or Sub Base**  
Cement concrete of the specified mix in sub-floor base or sub-base etc., shall be mixed as specified in Section 4-Concrete of SSR Part I, and shall be laid, compacted and finished as specified under Cement Concrete Flooring. The top surface shall be broomed to have adequate bond with the topping. Flooring shall be commenced within 48 hours of laying the concrete sub floor etc, failing which the surface of the sub-floor, etc, shall be roughened with steel wire brushes, wetted by sprinkling water and smeared with a coat of cement slurry at 3kg per sqm. Sub base shall not be laid in panels.
- 13.3 **Cement Concrete Flooring Cast in situ**
- 13.3.1 Wherever indicated in drawing / schedule of finishes, PCC floor of 50mm thick shall be provided with glass dividing strips and finished fair with a float without using extracement over 100mm thick sub base 1:4:8 type D2 over 150mm thick hardcore with broken boulders or aggregates not exc 63mm over consolidated approved earth filling.
- 13.3.2 The floor topping shall be divided into suitable panels. Size of the panel is governed by the thickness of floor finish, the type of construction (monolithic or separate), local conditions of temperature, humidity and the season in which flooring is laid. Generally, no dimension of a panel shall exceed 4m in case of floor topping laid monolithically with the base concrete and 2m in case of floor topping laid separately on a hardened base. In case of ground floors, topping panel may synchronize with that of the base concrete. Length of a panel shall not exceed one and a half times its breadth. The exact dimensions of the panels shall be as directed by EIC.
- 13.3.3 Unless otherwise specified, cement concrete floor topping shall be finished even and smooth without using extra cement.
- 13.3.4 Spike rolling to concrete surface where indicated shall be executed with a suitable roller to produce indentations, whilst the concrete is green. Expanded metal impressions, where indicated, shall be made on the floor surface while green by pressing expanded metal of the mesh as directed to a depth of 3mm and removing the same carefully.
- 13.3.5 **GLASS DIVIDING STRIPS** Glass dividing strips for PCC floor shall be of 3 mm thick sheet glass irrespective of what is indicated on drawing and shall be provided to the full depth of wearing course. The quality of glass dividing strip for flooring shall conform to IS-2835.

13.4 **Non Skid Ceramic Tiles Flooring**

13.4.1 Wherever shown on drawing/indicated in schedule of finishes, Non-skid ceramic tiles shall be laid over 15mm thick screed bedding layer in CM 1:6 over 75mm thick PCC 1:4:8 type D2 over 75mm thick hardcore of stone aggregate n exc 63mm over rammed earth.

13.4.2 Non-skid ceramic floor tiles shall be of Ist quality and shall conform to IS: 13755. The surface of tiles and components shall be finished matt or semi-matt (anti-skid) as indicated. The tiles shall be flat true to shape, sound and free from flaws and other manufacturing defects. The top surface of the tiles shall be glazed. The underside of the tiles shall be free from glaze in order that the tiles may adhere properly to the base. The glaze shall be uniform in quality and shall be free from welts, chips, craze, crawling or other imperfections, detracting from appearance when viewed at a distance of one meter. The texture and colour of tiles shall be as approved by GE. Tiles shall be of sizes as indicated. If not indicated size of tiles shall be 400x400 mm. The thickness shall be as specified by the manufacturer but in no case it shall be less than 7mm.

13.5 **Glazed Ceramic Tiles Dado/Skirting etc**

13.5.1 Wherever shown on drawing/indicated in schedule of finishes, glazed ceramic tiles upto height as shown on drg/schedule of finishes laid over 15mm thick rendering in CM 1:4 jointed and pointed with grey cement with pigment to match the colour of tiles.

13.5.2 Ceramic Glazed wall tiles shall be of Ist quality and shall conform to IS: 13753. The surface of tiles and components can be smooth, profiled, decorated or finished, glossy, matt or semi-matt as indicated. The tiles shall be flat true to shape, sound and free from flaws and other manufacturing defects. The top surface of the tiles shall be glazed. The underside of the tiles shall be free from glaze in order that the tiles may adhere properly to the base. The glaze shall be uniform in quality and shall be free from welts, chips, craze, crawling or other imperfections, detracting from appearance when viewed at a distance of one meter. The texture and colour of tiles shall be as approved by GE. Tiles shall be of sizes as indicated. If not indicated size of tile shall be 200mm x 300 mm. The thickness shall be as specified by the manufacturer but in no case it shall be less than 6mm.

13.6 **Vitrified Porcelain Tiles**

13.6.1 Wherever shown on drawing/indicated in schedule of finishes, Vitrified Porcelain Tiles shall be laid over 15mm thick screed bedding layer in CM 1:6 over 75mm thick PCC 1:4:8 type D2 over 75mm thick hardcore of stone aggregate n exc 63mm over rammed earth.

13.6.2 Vitrified polished porcelain floor tiles shall be of Ist quality. These vitrified tiles are classified under group B1a of the International Standard for ceramic tiles ISO: 13006. Tiles shall be hard, dense, impervious and frost resistant. Water absorption of tiles shall be less than 0.5% and flexural strength (Modulus of Rupture) shall be more than 35 N/Sqmm. Vitrified polished porcelain floor tiles shall be provided of sizes, colour, shades, texture and designs as approved by GE and if size not indicated it shall be 600mm x 600 mm/ 605 x 605 mm. The thickness shall be as specified by the manufacturer but not less than 10mm.

13.7 **Chequered Cement Concrete**

13.7.1 Chequered cement concrete tiles, coloured chequered cement concrete tiles and chequered terrazzo tiles shall conform to IS 13801-1993; Specification for Chequered cement concrete tiles. Chequered tiles shall be with the centre to centre distance of chequers not less than 25mm and not more than 50mm, the groove in chequers being uniform and straight with the depth of grooves not less than 3mm. Tiles shall be manufactured by pressure process. Thickness of wearing layer measured from top of the chequers shall not be less than 6mm.

13.7.2 Unless otherwise directed, the tiles shall be supplied with initial grinding and grouting of the upper layer. The upper layer of the tiles shall be free from projections, depressions and cracks, holes, cavities and other blemishes. The edges of the tiles may be rounded. All angles shall be right angles and all arises shall be sharp and true. The colour and texture of the wearing layer shall be uniform throughout its thickness. The size of Chequered Tiles shall be 200mm x 200mm x 22mm thick or 250mm x 250mm x 22mm thick or 300 x 300mm x 25mm thick as indicated. The tolerance on length or breadth of tiles shall be +1mm and tolerance on thickness of tiles shall be +5mm. In addition, the difference in thickness between the thickest and thinnest tile in the sample shall not exceed 3mm.

13.8 **Precast Interlocking Paver blocks**

Precast concrete Paver blocks shall conform to IS 15658:2006; Specification for Precast concrete blocks for paving. Paver blocks shall be sound and free from cracks or other visual defects. The tolerance on length or breadth of paver blocks shall be +2mm and tolerance on thickness of tiles shall be +3mm. Water absorption shall not be more than 6 percent by mass. Shapes shall be triangular, Zigzag, Hexagon or other shape as indicated. Colour of paver blocks shall be as indicated or as decided by GE. Thickness and grade of concrete of paver blocks, unless otherwise specified, is 80mm and M-40.

13.9 **Linoleum Flooring**

Linoleum shall comply with the requirements of IS 653-1992; Specification for linoleum sheets and tiles. There shall be adequate adhesion between the composition and the Hessian backing. The surface shall be smooth, uniform, free from indentations and protrusions, streaks and marks. The thickness and size shall be as indicated. The mean thickness shall not vary by more than 0.1 mm from the specified thickness. Linoleum shall be plain, moiré or jaspé, or marbled type, as indicated. Colour and shade shall be as approved by the GE. The adhesive used for laying linoleum floors shall be vegetable and casein glues, gum spirit adhesives, bitumen rubber emulsion or bitumen rubber solution as approved by EIC.

13.10 **GRANITE /MARBLE SLABS**

Granite/Marble slabs wherever shown on drawings shall be 18mm thick. These shall be grinded and polished and exposed edged shall be moulded to half round/full rounded all as specified in SSR Part I and as directed by Engineer-in-Charge.

13.11 **PLINTH PROTECTION**

Plinth protection in all situations shall be provided with 75 mm thick PCC 1:3:6 type C-1 using 20 mm graded stone aggregate, the width of the plinth protection shall be 750 mm. PCC shall be laid in alternative bays n exc 2 sqm each and finished even and fair on top without using extra cement. 6 mm wide joints shall be provided throughout the thickness of plinth protection in concrete between bays and in between the walling and plinth protection. All joints in bays of concrete as well as between walling and plinth protection shall be filled with mastic filling comprising of one part of heated bitumen 85/25 or 80/10 grade and 3 parts of sand (all by weight).

#### 14 **PLASTERING AND POINTING**

##### 14.1 **General**

14.1.1 Plaster and skirting/dado shall be returned in jambs, soffits of lintels and windows etc.

14.1.2 Where plaster on concrete surface is shown to match the adjacent wall surface the mix of plaster shall be same as for the wall surfaces.

14.1.3 All plastered surfaces shall be trowel led to even and smooth surfaces without using extra cement.

14.1.4 All external finishes shall be carried out up to 15 cm below ground level except where plinth protection etc is provided.

14.1.5 Thickness of cement plaster mentioned in Sch of finishes is mentioned is the minimum thickness above the protruded part of masonry and is exclusive of thickness of key. Dubbing may, however, be done in one operation with plaster. In case thickness of plaster has not been indicated in Sch of finishes, it shall be 15mm thick in CM 1:4 for external plaster and 10mm thick in CM 1:6 for internal plaster.

14.1.6 All corners, angles, junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Corners around joints openings and junction of walls shall be rounded to minimum radius of 5mm, 10mm wide groove at the junction of wall and RCC slabs/beams, as applicable, depth of groove 1mm less than depth of wall plaster shall be provided. Also 10mm groove shall be provided at junction of wall and RCC columns, beams or any other dissimilar materials wooden/steel chowkhats etc.

14.1.7 **PLASTER GROOVE AND CHICKEN WIRE MESH** The chicken wire mesh to be provided on the either side of all junctions indissimilar construction for internal and external plaster and shall be galvanised mild steel fabric cloth 0.56 mm nominal dia of wire and average width of aperture 12 mm, 7.5cm wide both sides of junctions before the plaster is applied. The position where the brick walling is on the both sides of lintel/beams/columns, the width of chicken wire mesh shall be 7.5 cm on either side and fixed with tinned tacks on PCC walls.

##### 14.2 **One Coat Plaster Work**

Mortar shall be firmly applied to the masonry walls and well pressed into the joints forcing it into surface depressions to obtain a permanent bond. The plaster shall be laid in a little more than the required thickness and levelled with the wooden float. On concrete walls, rendering shall be dashed on to roughened surface to ensure adequate bond. The dashing of rendering coat shall be done using a strong whipping motion at right angles to the face of walls. The surface shall be finished even and fair, unless indicated to be finished even and smooth. The surface of the dubbing out, if carried out separately, shall be left rough or scored to provide key for the plaster coat.

##### 14.3 **Two Coat Plaster Work**

###### 14.3.1 **First Coat**

The first coat of the specified thickness shall be applied in a manner similar to one coat plaster work. Before the first coat hardens, the surface of the cement and cement lime plasters shall be scored to provide key for second coat. In case of lime plasters the surface shall be beaten with edges of wooden thapies and close dents shall be made on the surface, to serve as a key to the subsequent coat. The rendering coat shall be kept damp for at least two days. It shall then be allowed to become thoroughly dry.

###### 14.3.2 **Second Coat**

Before starting to apply second coat, the surface of the rendering coat shall be damped evenly. The second coat shall be completed to the specified thickness in exactly the same manner as the one coat plaster work.

##### 14.4 **Neeru Finish**

After applying and finishing the undercoats and before they set the finishing coat of specially prepared lime putty about 1.5 mm thick shall be applied. It shall be well polished with a trowel.

##### 14.5 **Sand Faced Plaster**

After the undercoat of cement and sand mortar 1:4, not less than 10 mm thick, has been applied and finished, the final coat of cement and sand mortar 1:4 shall be applied to a thickness not less than 5 mm and brought to an even surface with a wooden float. The surface shall then be tapped gently with a wooden float lined with cork to retain a coarse surface texture; care being taken that the tapping is even and uniform.

##### 14.6 **Roughcast Finish**

After applying the under coat of cement and sand mortar 1:3 not less than 10 mm thick and while it is still in plastic state the roughcast mixture consisting of crushed stone or fine gravel aggregate (which is generally of size between 6 to 12 mm depending on the texture required) mixed with coarse sand and cement in the ratio of 1: 1: 1 shall be applied and finished even. The mix of cement and sand shall be made slightly wetter than normal for rendering to ensure that larger aggregates are thoroughly covered.

##### 14.7 **Dry Dash Finish**

A rough finish rendering coat of cement and sand mortar 1:3 shall be laid on to a thickness of not less than 10 mm and shall be lightly pressed over to straighten it. The aggregate used for dashing viz crushed stones or pebbles of suitable size generally from 10 to 20 mm, shall be well washed, drained and thrown wet on to the rendering coat while it is still plastic, rough covering material being partially embedded in the surface. To insure satisfactory bond between the dashing and the mortar the aggregate may be lightly tapped into the mortar with wooden float or the flat of a trowel.

##### 14.8 **Curing**

Each coat shall be kept damp continuously for at least two days. Moistening shall commence as soon as the plaster has

hardened sufficiently and is not susceptible to injury. The water shall be applied preferably by using a fine fog spray. Soaking of wall shall be avoided, and only as much water as can be readily absorbed shall be used. Excessive evaporation on the sunny or windward sites of buildings in hot dry weather shall be prevented by hanging matting or gunny bags on the outside of the plaster and keeping them wet. After the completion of finishing coat, the plaster shall be kept wet for at least seven days and shall be protected during that period from extremes of temperature and weather.

14.9 **Water Proofing Plaster**

Integral water proofing compound shall be mixed with cement in the proportion indicated by weight. When not indicated it shall be 3% by weight of cement. Care shall be taken to ensure water proofing material gets well and integrally mixed with cement and does not run out separately when water is added.

14.10 **GROOVE AT JUNCTION OF RCC WORK AND BRICK WORK**

Groove shall be provided at all junctions of dissimilar materials such as brickwork, concrete, etc and as directed by Engineer-in-charge.

14.11 **Pointing** Raised pointing in cement and sand mortar 1:3 shall be provided to all external surfaces of PCC solid block walling and exposed faces of stone masonry in plinth upto GL.

15 **WHITE WASHING/COLOUR/WASHING/DISTEMPER AND CEMENT BASE PAINT:**

15.1 **General**

15.1.1 All plastered surface except skirting and dado shall be finished with white wash or colour wash or dry/oil bound distemper or cement base paint etc. as specified in schedule of finishes. The finish to be provided viz. white washing, colour washing, distempering or painting, etc. the number of coats to be applied, and any special process or treatment to be adopted shall be as indicated. No finish shall be executed until a sample of the finish to the required colour and shade has been approved by the EIC. Where more than one coat of any finish is indicated, each coat shall be approved by the EIC before the subsequent coat is applied. The colour shall be of even shade over the whole surface, if it is patchy or otherwise badly applied the work shall be redone by the contractor at his own expense.

15.1.2 **Protective Measures**

Surfaces of doors, windows, floors, articles of furniture etc., and such other parts of the building not to be treated shall be protected from being splashed upon. Such surfaces shall be cleaned of splashes of whitewash, colour wash, distemper, etc. The contractor shall be responsible for any damage to the fittings, fixture and furniture.

15.1.3 **Scaffolding**

Wherever scaffolding is necessary, it shall be erected in such a way that, as far as possible, no part of scaffolding shall rest against the surface to be treated. A properly secured and well tied suspended platform (JHOOLA) may also be used. Where ladders are used, pieces of old gunny bags shall be tied at top and bottom to prevent scratches to the walls and floors. For work in ceilings, proper stage scaffolding may be erected, where necessary.

15.2 **White washing and Colour Washing**

15.2.1 Where indicated on drawing, provide three coats of whitewash and two coats of colour wash over a coat of whitewash. Lime used for white washing shall be freshly burnt fat lime (Class 'C') or magnesium/siliceous dolomitic lime (Class 'D' or 'F'), white in colour, conforming to IS 712-1984; Specification for building limes. The pigment for making colour wash shall conform to IS 44-1991; Specification for Iron oxide/pigment for paints. The solid lump shall be crushed to powder. Fresh crystals of hydrous copper sulphate (blue vitriol) shall conform to IS 261-1982 Specification for copper sulphate and shall be ground to fine powder.

15.2.2 **Preparation of New Surfaces**

The surfaces shall be thoroughly cleaned of all dirt, dust, mortar drops, efflorescence, chalking, grease and other foreign matter before white wash is applied.

15.2.3 **Preparation of Old Surfaces**

Old surfaces already white washed or colour washed shall be broomed to remove all dust, dirt and all loose scales of lime wash and other foreign matter. Where heavy scaling has taken place, the entire surface shall be scrapped clean. Old colour wash on surfaces where white wash or different colour wash is to be applied shall be entirely removed, before white wash or different colour wash is applied.

15.2.4 **Old Surfaces Spoiled by Smoke Soot**

The surface shall be scrapped with steel wire brushes or steel scrapers. The surface shall then be broomed to remove all dust and dirt and shall be washed with clean water.

15.2.5 **Oil and Grease Spots**

Oil and Grease spots shall be removed by a suitable chemical and smooth surfaces rubbed with wire brushes.

15.2.6 **Moulds, Moss etc.**

Any growth of mould, moss etc. shall be removed by scrapping with steel scrapers, or treated as directed by EIC.

15.2.7 **Unsound Portions**

All unsound portions of the surface plaster shall be removed where directed, to full depth of plaster in rectangular patches and plastered again after raking the masonry joints properly. Such portions shall be wetted and allowed to dry. They shall then be given one coat of whitewash.

15.2.8 **Nails, Holes etc.**

All unnecessary nails shall be removed and the holes, minor pittings and cracks filled with lime putty or Plaster of Paris to make the surface smooth.

15.2.9 **Preparation of Whitewash**

The lime shall be slaked at site and shall be mixed and stirred with about five liters of water for 1 kg of unslaked lime to make a thin cream. This shall be allowed to stand for a period of 24 hours and shall then be screened through clean coarse cloth. 1 kg of gum dissolved in hot water shall be added to every one cubic meter of lime cream. About 1.3 Kg of sodium chloride dissolved in hot water shall also be added for every 10 kg of lime for making the coating hard and

rub-resistant. Small quantity of ultramarine blue (upto 3 gm per kg of lime) shall also be added to the last two coats of white wash solution and the whole solution shall be stirred thoroughly before use.

15.2.10 **Preparation of Colour wash**

Sufficient quantity of colour wash shall be prepared in one operation to avoid any difference in shade. The basic whitewash solution shall be prepared as described for white wash. Mineral colours not affected by lime shall be gradually added and solution stirred until the required tint is obtained.

15.2.11 Yellow ochre, red ochre and blue vitriol where used in the preparation, of colour wash shall be first dissolved in water. Sufficient quantity of solution enough to produce the colour of required shade shall be strained through a clean coarse cloth and the filtrate mixed evenly and thoroughly to the white wash.

15.2.12 **Application of Whitewash**

Whitewash shall be applied with 'MOONJ' brush or other brush to the specified number of coats. The operation for each coat shall consist of a stroke of the brush given from the top downwards, another from the bottom upwards over the first stroke and similarly one stroke horizontally from the right and another from the left before it dries. Each coat shall be allowed to dry before the next coat is applied. No portion of the surface shall be left out initially to be patched up later on. The brush shall be dipped in whitewash, pressed lightly against the wall of the container and then applied by lightly pressing against the surface with full swing of hand.

15.2.13 **Whitewashing on ceiling should be done prior to that on walls.**

15.2.13.1 For new work, unless otherwise indicated, three coats shall be applied so that the surface presents a smooth and uniform finish through which the plaster does not show. The finished dry surfaces shall not show any signs of cracking and peeling and the whitewash shall not come off readily on the hand, when rubbed.

15.2.13.2 For old work, after the surface has been prepared, a coat of whitewash shall be applied over the patches and repairs. Then the specified number of coats of whitewash shall be applied over the entire surface. The white washed surface shall present a uniform finish through which the plaster patches do not show.

15.2.14 **Application of Colour wash**

15.2.14.1 The colour wash shall be applied as described for white wash. For colour wash on new surfaces after the surface has been prepared, the first primary coat shall be of whitewash. The specified number of coats (minimum two) of colour wash shall then be applied. The entire surface shall present a smooth and uniform finish. To start with 0.1 Sqm of the prepared surface shall be colour washed with a first coat of whitewash and subsequent coats of colour wash solution in full number of coats and the shades so obtained shall be approved before the work of colour washing is taken up in hand. It shall be noted that small areas of colour wash will appear lighter in shade than when the same shades are applied to large areas.

15.2.14.2 For colour wash on old work after the surface had been prepared, a coat of colour wash shall be applied on the patches and repairs. Then the specified number of coats of colour wash shall be applied over the entire surface. The colour wash surface shall present a uniform colour shade. No primary coat is needed for old surfaces bearing colour of the same shade.

15.2.14.3 On surface requiring a change of colour, after the surface has been prepared, a coat of whitewash shall be applied before application of specified number (minimum two) of coats of colour wash of the new shade.

15.3 **Distempering with Dry Distemper**

15.3.1 Where indicated on drawing, provide two coats of dry distemper all as specified in clause Nos. 15.5 and 15.13 of SSR Part I. Distemper dry of required colour and shade shall be obtained ready mixed conforming to IS 427 -2005; Specification for distemper, dry. The material shall be in the form of fine dry homogeneous powder free from odour of putrefaction as such and when mixed with water.

15.3.2 **Preparation of New Surfaces**

The surface shall be thoroughly cleaned of dust, dirt efflorescence, chalking, grease, mortar drops and other foreign matter. The surface shall be sand papered with grade I abrasive paper and dusted off to achieve an even and smooth surface. If surface so obtained is uneven, it shall be brought to a perfectly even surface by applying putty and allowing it to dry completely and then it shall be rubbed with the abrasive paper and dusted off.

15.3.3 **Preparation of old surfaces**

Old surface of white wash or colour wash if in good condition shall be lightly sand papered down but if in bad condition shall be removed completely by scraping on or rubbing and allowed to dry completely, care being taken that the surface is not scratched. Old surfaces already distempered with dry distemper and required for the application of dry distemper, if in good condition shall be lightly sand papered with fine sandpaper and dusted off. When the old surface is in bad condition, the entire film may be removed either by dry rubbing with sand papers or by rubbing down with water and pumice stone and allowed to dry out completely and then lightly sand papered.

15.3.4 Old surfaces covered by smoke, soot, having oil and grease spot, mould and moss shall be prepared as specified under white wash & colour wash except that after a portion of plaster is replaced, it shall be given a coat of dry distemper in lieu of white wash.

15.3.5 All the undesirable nails shall be removed and nail holes and inequalities filled with putty and allowed to completely dry. The surface shall then be rubbed down with abrasive paper grade I and dusted off.

15.3.6 **Priming Coat**

For distempering with dry distemper, the priming coat, where indicated shall be a coat of caracol composed of 1 Kg of Glue mixed with 15 litres of boiling water. The mixture shall be suitably tinted where required. Priming coat shall be applied by brushing and allowed to dry before distempering coat is given.

15.3.7 **Preparation of distemper**

The dry distemper shall be added to clean warm water and stirred slowly using 0.6 litres of water per Kg of distemper or proportion as specified by the manufacturer. The mixture shall be allowed to stand for at least 30 minutes before use. The mixture shall be well stirred before application to maintain an even consistency.

15.3.8 **Application of distemper**

The surface of priming coat, where applied shall be lightly sand papered taking care not to rub out the priming coat and then dusted off. Specified number of coats of distemper shall then be applied with proper distemper brushes in horizontal strokes immediately followed by vertical ones which together shall constitute one coat. The subsequent coat shall be applied only after the preceding coat has dried. The finished surface shall be even and uniform without patches, brush marks, distemper drops etc.

15.4 **Distemping with Oil bound Distemper (Washable Distemper)**

15.4.1 Wherever indicated in Schedule of finishes/drawing provide two coats of oil bound washable distemper over a coat of approved primer of whitening mixed with petrifying liquid as specified in clause Nos 15.6 and 15.14 of SSR Part I. Distemper of required colour and shade shall be obtained ready mixed conforming to IS 428-2000 Specification for distemper, oil emulsion. The material shall be in the form of a homogeneous paste free from odour of putrefaction as such and when mixed with water.

15.4.2 **Preparation of Surfaces**

Surfaces shall be prepared as specified under dry distemper. Pitting in plaster shall be made good with Plaster of Paris mixed with dry distemper of the colour to be used. The surface shall then be rubbed down again with sandpaper and made smooth. A coat of distemper shall be applied over the patches. The surface shall be allowed to dry thoroughly before the regular coat of distemper is applied.

15.4.3 **Preparation of Old Surfaces**

Old surfaces already dry distempered and required for applying oil bound distemper The distemper whether in good or bad condition shall be removed completely by washing even to the last trace and allowed to dry completely. It shall then be sand papered to obtain an even and smooth surface.

15.4.4 **Old surfaces already painted with oil bound distemper and required for painting with oil bound distemper**

The surface shall be treated similarly as for the case above except that the removal of distemper in bad condition shall be done only by dry rubbing.

15.4.5 **Priming Coat**

Priming coat for oil bound distemper shall be whitening mixed with petrifying liquid. Newly plastered surfaces to be distempered before a period of six months shall be given a coat of alkali resistant priming paint conforming to IS: 109-1968; Specification for ready mix paint brushing, priming plaster to IS colour No 361 light stone and No. 631 light grey, or any other primer as specified by the manufacturer and allowed to dry for at least 48 hours.

15.4.6 **Preparation of Oil Bound Distemper (Washable Distemper)**

The distemper shall be thinned with water or any other prescribed thinner in the proportion of four parts of paste by weight to one part of cold water or in the proportion as specified by the manufacturers which shall invariably be followed. To obtain a better finish and longer durability Copolymer based resin glue be added to the prepared distemper solution at the rates recommended by the manufacturers.

15.4.7 **Application of Washable Distemper**

15.4.7.1 After the priming coat has dried, the surface shall be lightly sandpapered with zero grade abrasive paper, taking care not to rub out the priming coats and then dusted off. Prepared distemper shall then be applied with brushes in coats comprised of horizontal strokes immediately followed by vertical ones which together constitute one coat. Distemping shall always be started from ceiling down. A uniformly finished surface without patches, brush marks distemper drop etc shall be obtained.

15.4.7.2 Distemper shall be applied in dry weather with double bristled distemper brushes. The first coat shall always be of lighter tint than that required finally and the subsequent coat shall be applied only after the previous one has thoroughly dried for at least 24 hours.

15.4.7.3 The distemper shall be thinned and prepared using prescribed thinner as per manufacturer instruction.

15.4.7.4 Workability of oil bound distemper surface shall be tested with wet cloth. Oil bound distemper shall not come out when surface is rubbed with wet cloth.

15.5 **CEMENT BASE PAINT**

15.5.1 Where indicated on drawing, provide two coats of cement base paint. Cement paint shall comply with IS 5410-1992; Specification for cement paint colour as required. The material shall be in the powder form, free from lumps that are not friable and when mixed with required volume of water shall be suitable for use on porous surfaces of masonry, concrete, bricks and rough plasterwork.

15.5.2 **Preparation of Cement Paint**

Cement paint shall be made by adding equal volume of paint powder to water and the mix stirred to obtain a thick paste, which shall then be diluted to a brushable consistency. If the proportion recommended by the manufacturer differs, the recommendation of the manufacturer shall invariably be followed. The water mixed paint shall be kept well stirred during use and shall be applied within one hour of preparation. To prevent algae and moss growth and efflorescence, silicon base water repellent compound may be added to mixture, at the rate as recommended by the manufacturer. The lids of cement paint drums shall be kept tightly closed when not in use, as the cement paint rapidly becomes air set.

15.5.3 **Preparation of Surfaces**

The surfaces shall be prepared as specified under whitewashing and colour washing.

15.5.4 **Wetting of Surface**

Before applying cement paint, the surface shall be thoroughly wetted to control surface suction. The surface shall be moist but not dripping wet when the paint is applied. Surfaces which readily absorb moisture shall be wetted in one operation not more than one hour before painting. Surfaces which absorb moisture slowly shall be wetted in at least two operations not less than 30 minutes apart.

15.5.5 **Application of Paint**

- 15.5.5.1 No painting shall be done when the paint is likely to be exposed to a temperature below 7° C within 48 hours after application.
- 15.5.5.2 When weather conditions are such as to cause the paint to dry rapidly, work shall be carried out 'in the shadow' as far as possible, for proper hardening of the paint film.
- 15.5.5.3 To maintain a uniform mixture and to prevent segregation, the paint shall be stirred frequently in the bucket.
- 15.5.5.4 Unless otherwise indicated, new surfaces shall be treated with minimum of two coats of cement paint of the same colour. Not less than 24 hours shall be allowed between two coats and the second or subsequent coat shall not be started until the preceding coat has become sufficiently hard to resist marking by the brush being used. In hot dry weather the preceding coat shall be slightly moistened before applying the subsequent coat. For old surfaces the treatment will be with one coat, unless two coats are indicated.
- 15.5.5.5 Cement paint shall be applied with a brush with relatively short stiff hog or fiber bristles. The paint shall be brushed in uniform thickness and shall be free from excessive brush marks. The laps shall be well brushed out.
- 15.5.5.6 On external plastered and concrete surfaces, cement paint shall be vigorously scrubbed on in such a manner as to work the paint into the voids and provide a continuous paint film free from pin holes or other openings.
- 15.5.5.7 Spray applications may be adopted only for dense concrete or interior surfaces where the paint is not required for waterproofing purposes.
- 15.5.5.8 The finished surface shall be even and uniform in shade, without patches, paint drops etc.
- 15.5.6 **Curing**  
Painted surfaces shall be sprinkled with water using a fog spray two or three times a day. Curing shall be done between coats and for at least two days following the final coat. The curing shall be started as soon as the paint has hardened so as not to be damaged by the spray, about 12 hours after the application.
- 15.6 **White Cement Based Putty**
- 15.6.1 **Material**  
White cement based putty shall be obtained ready mixed from the approved manufacture as approved by GE. White cement based putty shall be in the form of fine dry homogeneous powder free from odours of putrefaction and when mixed with water shall have the following properties.
- |  |                         |
|--|-------------------------|
| (a) Tensile Adhesion strength at 28 days | > 1.0 N/mm <sup>2</sup> |
| (b) Compressive strength at 28 days      | > 9.0 N/mm <sup>2</sup> |
| (c) Initial setting time                 | > 100 minutes           |
| (d) Final setting time                   | > 500 minutes           |
| (e) Water retentivity                    | > 98%                   |
- 15.6.2 **Preparation of White Cement based putty**  
White cement based putty shall be made by adding 30 to 35% of water by volume strictly as per manufacturer instructions, and the mix stirred to obtain a thick uniform paste. The water mixed putty shall be kept well stirred during use and shall be applied within 2 to 3 hours of preparation.
- 15.6.3 **Preparation of Surfaces**  
The surface shall be prepared as specified under white washing and colour washing.
- 15.6.4 **Wetting of Surface**  
Before applying white cement based putty, the surface shall be thoroughly wetted to ensure proper covering capacity, workmanship and better sticking properties of putty.
- 15.6.5 **Application of Putty**  
(a) Unless otherwise indicated, the surfaces shall be treated with two coats of putty. First coat of putty shall be applied on wet surfaces starting from the bottom of surfaces towards top and shall be applied with putty blade to maintain homogeneity of application of putty. The surface so prepared shall be allowed to dry for at least 3 hours. After the surface becomes dry, the surface shall be gently rubbed with wet sponge or putty blade so as to remove the loose particles. Then the second coat of putty shall be applied as like first coat and the surface shall be allowed to dry completely for minimum 12 hours.  
(b) After ensuring that the surface is completely dry, the surface shall be rubbed gently with waterproof emery paper greater than 500.
- 15.6.6 **Precautions during application**
- 15.6.6.1 Mixing of the "White Cement Putty" is very important activity and hence extreme care is required to be taken for proper and thorough mixing with hand or mechanical stirrer in order to get best results. Mixing is to be continued till a uniform paste is formed. It is important that during mixing, the required amount of water is added incrementally to "White Cement Putty" and not vice versa (do not add putty into water).
- 15.6.6.2 The "White Cement Putty" shall be applied over wet surface.
- 15.6.6.3 It is recommended not to rub the "White Cement Putty" strongly and harshly with rough emery paper. This breaks the film formed over the "White Cement Putty", which decreases the water repellency properties.
- 15.6.6.4 In case of fresh concrete/mortar surface, it is recommended that two coats of white cement wash be done before application of white cement putty.
- 15.7 **Acrylic Distemper**
- 15.7.1 **Preparation of Acrylic Distemper**  
The distemper shall be thinned with water or any other prescribed thinner in the proportion of 1 kilogram of distemper to 600 ml of water or in the proportions as specified by the manufacturers, which shall invariably be followed. Add water slowly to the paste while continuing to stir the mixture.
- 15.7.2 **Preparation of surfaces**  
Surfaces shall be prepared as specified under oil emulsion distemper.



**15.7.3 Priming Coat**

Apply a coat of wall primer as per manufacturer's instructions and allow it to dry for 6 – 8 hours. Smoothen the surface by filling dents with thin coats of wall putty and allow drying for 4-6 hours. Sand the surface with Emery paper 180 and wipe clean. Apply another coat of primer and allow drying for 6 - 8 hours. Sand the surface with Emery paper 320 and wipe clean.

**15.7.4 Application of Distemper**

Application of Distemper shall be done as is being done for oil emulsion distemper in minimum two coats. For Acrylic distemper the time interval shall be 3-4 hours between successive coats.

**16 GLAZING**

16.1 All glazing shall be with sheet glass or ordinary quality and shall conform to IS-2835. Sheet glass shall be flat transparent and clear as judged by the naked eye. It may, however, possess a light tint when viewed edgewise. It shall be free from any cracks and other defects. Tolerance on the thickness of glass sheet shall be as under:

<b>Normal thickness</b>	<b>Tolerance</b>
2.0, 2.5, 3.0 and 4.0 mm	± 0.2 mm
4.8, 5.5 and 6.3 mm	± 0.3 mm

16.1.1 Glazing to windows/doors etc shall be with 4 mm thick unless otherwise specified. Glass used shall be plain sheet glass except in baths/WC/Toilets/Lav as applicable where it shall be frosted glass/one side frosted.

16.1.2 The glazing to steel frames, shall be fixed with special spring glazing clips with putty and glazing to wooden joinery shall be fixed with wooden beads/putty all as specified in clause 15.5 to 16.10.2 of MES Schedule Part-I.

**16.2 Putty**

Linseed oil putty for glazing in wooden and metal surrounds or frames shall conform to IS 419-1967; Specification for putty for use on window frames. Putty shall be homogeneous paste and shall be free from dust, grit and other visible impurities. The putty after thorough working in hands shall have good plastic quality without sliminess or stickiness. The putty shall work readily and smoothly under a palette knife without crumbling or cracking and after being moulded in place, it shall convert itself into cohesive mass.

**16.3 Size of Glass**

A clearance of 2.5 mm between the edge of glass and wood or metal surrounds and 3 mm for stone, concrete or brick surrounds shall be allowed. Each pane of glass shall be one whole square; piecing shall not be allowed. Broken or damaged glass shall be hacked and replaced.

**16.4 Glazing in Wood Surrounds****16.4.1 Glazing with putty**

Sufficient putty shall be applied to the rebate so that when the glass has been pressed into the rebate, the putty between the glass and the surround (back putty) shall not be less than 1.5 mm thick and there shall also be surplus of putty squeezed out above the rebate which shall be stripped at an angle and not undercut. The glass shall be secured by springs spaced not more than 450 mm apart around the perimeter of the pane. Front putty shall then be applied around the perimeter of the pane to form a triangular fillet stopping 1.5 mm short of the sight line.

**16.4.2 Glazing with Beads**

The glass shall be back puttied as specified under "Glazing with putty". The glass shall then be secured by springs not more than 450 mm apart around the perimeter of the frame. All beads shall be bedded against the glass and the rebates with putty. Care shall be taken to ensure that no voids are left between the glass and the beads. Beads shall be secured to frames with panel pins or screws where indicated. When panel pins are used to secure the beads, they shall be spaced at not more than 75 mm from each corner and at intervals not exceeding 230 mm. When screws are used they shall be spaced to ensure that no flexing or movement of the beads take place.

**16.5 Glazing In Steel Surrounds****16.5.1 Glazing with putty**

The glass shall be back puttied in the rebates as specified for glazing in wood surrounds. Where the frame size exceeds 600 X 300 mm, glass shall be secured by special spring glazing clips which shall be inserted in holes provided in the steel surrounds before applying the front putty. Where frame sizes do not exceed 600x 300 mm spring clips may not be provided. Front putty shall then be applied around the perimeter of the pane to form a triangular fillet stopping 1.5 mm short of the sight line and neatly finished. In case of galvanised steel surrounds, to help stick to steel frame, a thin film of raw linseed oil shall be applied to the glazing rebate with cloth soiled in linseed oil.

**16.5.2 Glazing with Beads**

The glass shall be back puttied and secured in the rebates as specified under "Glazing with putty". Beads shall be bedded against the glass with putty and secured to frame with screws. An adequate number of screws shall be used so as to prevent flexing or movement of the beads.

**17 PAINTING**

All paints and allied materials shall be of quality not inferior to that required by the relevant IS specification. Paints, etc shall be ready mixed. The colour and tints of paints, unless indicated, shall be as approved by the GE.

17.1 The Contractor shall inform the GE, well before he places bulk order for the materials, the names of the brands and manufacturers of paints he proposes to use in the works and submit samples thereof and obtain prior written approval of the GE.

17.1.1 The contractor shall, where required by the GE produce certificate of the manufacturer or their authorised agent to establish that the brand of paint purchased by the contractor satisfy the requirement of the relevant IS.

17.1.2 The whole of the materials required for the painting work shall be obtained direct from, approved manufacturers or their authorized agents and shall be brought to the site in makers, drums, kegs, etc, with seals unbroken.

17.1.3 The type of paint and allied materials to be used, the number of coats to be applied, the preparatory treatment

appropriate to the surface and any special process or treatment to be adopted shall be as indicated. Where more than one coat is indicated, each coat shall vary slightly in shade, undercoat being lighter than subsequent coat; and shall be approved, in writing, by EIC before the next coat is applied. No painting work shall be carried out in wet and very humid weather when there is danger of dew or weather is otherwise unfavourable. No painting or any other process likely to be damaged by dust shall be carried out in windy weather. Painting except the priming coat shall be taken in hand after all other builder's work is practically finished. The paint in the drum shall be thoroughly mixed prior to application. The materials shall be mixed, prepared and applied strictly in accordance with the instructions or recommendations of the manufacturer except where otherwise directed by the GE. The paints shall be mixed periodically during brushing.

17.1.4 Thinners (such as mineral turpentine) shall not be added to paints on the feeling that the consistency of the paint supplied by the manufacturer is too thick. If the paint has been manufactured to conform to the specifications, the paint shall have the correct consistency and shall not require further dilution. If there is any doubt, the viscosity of the paint may be checked. If a slight adjustment of viscosity is necessary, thinner, recommended by the manufacturer shall be used after prior approval of EIC.

17.1.5 The surface must be thoroughly dry and clean before painting work is proceeded with at all stages or processes of work. All dust, dirt, rust and grease shall be removed before painting is started. Painting shall follow immediately after pre-cleaning or pre-treatments; any contamination which may occur in the intervening period shall be removed. Every individual coat shall be properly applied, reasonably level and smooth and free from runs and holidays (minute uncovered areas).

## 17.2 **WORKMANSHIP**

### 17.2.1 **Preparing New Surfaces**

All wood work shall be dry and free from dust, dirt or any other extraneous material. Paint applied over discoloured sapwood is liable to become discoloured; resin from knots tends to exude through the paint. Any such unsound portions shall be cut out and replaced with sound wood. Nails shall be punched well below the surface to provide a firm key for sopping.

17.2.2 Flat portions shall be smoothed with abrasive paper used across the grain prior to painting and with the grain prior to straining or if the wood is to be left in its natural colour. Mouldings shall be carefully smoothed with abrasive paper and projecting fibres left after machining shall be removed. Quirks need particular attention.

17.2.3 All loose knots shall be removed and the holes filled with well fitted sound timber set in red or white lead paint and securely pinned. Any knots, resinous streaks or bluish sapwood that are not large enough to justify cutting out, shall be treated with two coats of pure shellac knotting, applied thinly and extended about 25 mm beyond the actual area requiring treatment. Aluminium primer may be used in place of shellac knotting. If the area is small and the wood is not highly resinous, it is permissible, instead of applying two coats of knotting, to apply one coat slightly pigmented with aluminium powder.

### 17.3 **Priming**

On clean prepared surfaces, a priming coat of paint shall be applied by brushing. Unless otherwise directed, the priming coat shall be applied before the woodwork is fixed in position. In case there is already a primer coat but an unsatisfactory one, it shall be rubbed to bare wood and the surface re-primed. Stopping and filling shall be done after priming.

### 17.4 **Under Coating**

Undercoat shall be applied by brush after the surface has been primed stopped, filled and rubbed down to a smooth surface. After drying, the undercoat shall be carefully rubbed down and wiped clean before the next coat is applied.

### 17.5 **Finishing Coat**

The finishing coat shall be applied by brush. The extent of gloss shall be as directed by the GE. The finished surface shall be free from hair or brush marks, streaks clogging of paint, puddles in the corner or pavement angle of moulding.

### 17.6 **Painting steel and Iron work**

#### 17.6.1 **Preparing New Surfaces**

The surfaces shall be thoroughly cleaned of dirt, fluxing material, other foreign matter and scrapped thoroughly with hand scraper followed by wire brushing first with coarse and then with fine wire brushes and finally sand papering the surface to remove all mill scale and rust. The surface shall then be wiped finally with mineral turpentine to remove oil, grease and perspiration left by hand marks. Temporary rust protectives materials applied to steel sheets to protect during transport and storage shall be removed with suitable solvent as a preliminary to other preparatory treatment. Surfaces already pretreated or primed in a factory shall be carefully inspected and damaged areas shall be thoroughly degreased and cleaned off all rust and touched up.

17.6.2 Application of Mordant Solution over Galvanised Surfaces Mordant Solution shall be composed of soft water 64 parts and copper chloride, copper nitrate, aluminium chloride and hydrochloric acid, each one part; all by weight. New galvanised surfaces and also old galvanised surfaces where ordered by the GE, shall be treated with mordant solution at the rate of about 5 litres per 100 sqm, rubbing the solution on generously with brush or a bundle of rags on a stick. After about half an hour, the surface will turn grey, any part remaining bright shall be retreated and the entire surface washed down thoroughly with clean cold water and allowed to dry before applying primer.

#### 17.6.3 **Primer Coat**

Immediately after the preparation of the surfaces priming coat shall be applied by brush, working in the paint into the fine dents and ensuring a continuous film without runs and holidays.

#### 17.6.4 **Filler Coat**

After the primer coat is hard dry, the surface shall be rough sanded without scratching or in any way damaging the primer coat and surface cleaned free from dust. Deep dents and scratches, if any shall be filled with paste filler using a good putty knife pressing firmly into the dents and applying in optimum layers. Each layer shall be allowed to dry hard and then cut down by wet rubbing to a smooth finish. Where indicated, after the paste filler is hard dry, a coat of liquid filler shall

be applied by brush to fill all fine dents, allowed to hard dry and then wet rubbed to a smooth finish.

17.6.5 **Under Coating**

An optimum coat or under coating shall be applied by brush. The film shall be allowed to hard dry, wet rubbed and cut down to a smooth finish ensuring that at no place the under coat is completely removed.

17.6.6 **Finishing Coat**

Finishing coat shall be applied by brush. Special care shall be taken while painting over bolts, nuts, rivets and overlaps etc.

17.6.7 **Preparation of Old Painted Surfaces**

17.6.7.1 If the old paint is oily and dirty, but is firm and has not disintegrated, it shall be cleaned down by washing with solution of alkaline soap and greasy spots shall be rubbed with turpentine. The surface shall then be thoroughly rinsed with clean water and rubbed down with abrasive paper or pumice stone. All holes and cracks shall be prepared for stopping by touching them with primer, when dry the stopping shall be completed.

17.6.7.2 In the case of steel surfaces where old paint is not deteriorated and is in good condition the underlined surface being free from corrosion the surface shall be rubbed down with sand paper. The surface shall then be wiped finally with mineral turpentine to remove grease and perspiration of hand marks etc. and then allowed to dry.

17.6.8 **Removal of Paint**

Where complete removal of paint is indicated or ordered in writing, old paint shall be removed either by hand scraping or by blow lamps/flame cleaning or by paint removing chemicals, as directed. In the case of flame cleaning, the Contractor shall be liable for all fire risks, in burning off paint from woodwork care shall be taken that wood is not burnt in spots. Paint removing chemicals shall be used as per manufacturers' instructions. After use of chemicals containing strong alkalies, a weak acid such as diluted vinegar shall be used in washing down to neutralise the alkalies. After removal of paint the surface shall be finally sand-papered and surface cleaned of all dust.

18 **WATER SUPPLY, PLUMBING DRAINS AND SANITARY APPLIANCES**

18.1 **INTERNAL WATER SUPPLY/PLUMBING**

18.1.1 **Mild Steel Galvanized Tubes (Pipes) and fittings**

18.1.1.1 Mild Steel Tubes shall comply with IS 1239 (Part I)-2004 specification for mild steel tube-tubulars and other wrought steel fittings, Part I mild steel tubes. These shall be hot finished welded, electric resistance welded, or high frequency induction welded pipes, galvanized, and screwed and socketed. The tubes shall be of medium grade as indicated. Each tube shall be supplied with one socket. The end of socket shall be chamfered internally to prevent damage to the leading thread.

18.1.1.2 Mild steel tubulars and other wrought steel fittings for use with mild steel tubes shall be galvanized complying with IS 1239 (Part 2)-1992 for mild steel tubulars and other wrought fittings. These may be butt welded or seamless. Fittings may alternatively comply with the requirement of IS 1879-1987, specification for malleable cast iron pipe fittings. These fittings shall be galvanized.

18.1.1.3 Tubes and fittings shall be cleanly finished, well galvanized in and out, reasonably straight and shall be free from scale, cracks, surface flaws, laminations and other defects. Zinc coating shall be uniformly adherent, reasonably smooth and free from such imperfections as flux, dross inclusions, bare patches, pimples, lumping, runs, rust stains and blisters. All screw threads shall be clean and well cut; the end shall be cut cleanly and square with the axis of tubes. Screwed tubes shall be taper threads while the sockets shall have parallel threads. Tubes of any grade and fittings shall withstand a test hydraulic pressure of 5 MPa without showing defects of any kind.

18.1.2 **Laying and Fixing Pipes**

(a) The pipes for supply of water to all fittings in the buildings shall run on the internal walls (from OHT) except otherwise as specified in these tender documents or shown on drawings, connected to various fittings and shall be brought in the room at point/position approved by the Engineer-in-Charge at site. Pipes for internal water supply shall run on internal surfaces of walls/floors having a clearance to accommodate PUF type insulation. Lagging shall be done to all the exposed pipes.

(b) Where pipes are laid underground, the trenches shall be excavated as directed by Engineer-in-Charge. The pipes running along face of the walls shall be clamped in the walls specified in SSR. Where pipe is passing through a wall, a mild steel tube sleeve shall be fixed all as specified in clause 18.51.1 of SSR Part-I.

18.1.3 **Lagging** Material for lagging of pipes shall be all as specified in Sch 'A' (Bonded mineral wool preformed SNAPON pipe section of density 144 Kg/Cum conforming to IS 9842-1994 insulation may be covered completely by chicken wire mesh 25 gauge 20mm mesh reinforced with 1.00mm galvanized wire applied spirally at 80mm centre to centre and providing 5mm thick smooth and over layer of plastic composition consisting of 85% magnesia aspects and plaster of cement mortar 1:2 of required strength to such exposed weather condition under sub-zero temperature.

18.1.4 **Plumbers Brass work: Generally**

Fittings shall be of approved pattern, type and make and shall conform to the relevant IS Specification. All cast fittings shall be sound and free from laps, blow holes and pittings. External and internal surfaces shall be clean, smooth and free from sand burning: plugging stopping or patching of casting shall not be permissible. The bodies, bonnets, spindles and other parts shall be machined true to shape so that when assembled the parts are axial parallel and cylindrical with surfaces, smoothly finished and are correct in adjustment. Where taps and stop valves, etc., are specified to be nickel/chromium plated the thickness of plating shall not be less than that for the grade specified in the relevant IS Specifications. The plating shall be capable of taking high polish and shall not easily tarnish or scale. Galvanisation of malleable iron and cast iron bodies shall be done by hot dip process. Mild steel components shall be electro-galvanized.

18.1.5 **Bib Taps and Stop Valves**

18.1.5.1 They shall be screw down type and shall conform to IS 781-1984, (Specification for cast copper alloys screw down bib taps and stop valves for water service). A bib cock (bib tap) is a draw off tap with a horizontal inlet and free outlet and a stop cock (stop tap) is a valve with a suitable means of connections for insertion in a pipe line for controlling or stopping the

flow. They shall be of specified size and shall work by means of disccarrying a renewable non-metallic washer which shuts against water pressure on a seating of right angles to the axis of the threaded spindle which operates it. The handle shall be either crutch or butterfly type securely fixed to the spindle valve shall be of the loose leather seated pattern. The cocks (taps) shall open in anticlockwise direction.

18.1.5.2 The bib cock and stop cock shall be polished bright. In case these are required to be nickel plated, the plating shall be of the first quality with a good thick deposit of silvery whiteness capable of taking high polish which will not easily tarnish or scale. The minimum furnished weight of bib tap and stop cock shall be as specified in Clause 18.14.2 of SSR Part I.

18.1.6 **Pillar Taps**

Pillar taps shall be of brass or bronze and shall conform to IS 1795--1982, Specification for pillar taps for water supply purposes. The nominal size of pillar taps shall be 15mm or 20 mm as specified. The nominal size shall be designated by the nominal bore of the pipe outlet to which the tap is to be fitted. Casting shall be sound and free from laps, blow holes and pitting. External and internal surfaces shall be clear smooth and free from sand and be neatly dressed. The body, bonnet and other parts shall be machined true so that when assembled, the parts shall be axial, parallel and cylindrical with surface smoothly finished. The area of water way through the body shall not be less than the area of the circle of diameter equal to the bore of the seating of the tap. The seating of pillar tap shall be integral with the body and edge rounded to avoid cutting of washer. Pillar taps shall be nickel chromium plated and thickness of coating shall not be less than service grade No 2 of IS 4827 and plating shall be capable of taking high polish which shall not easily tarnish or scale. Every pillar tap complete with its component parts shall withstand an internally applied hydraulic pressure of 20 Kg/sqcm. Maintained for a period of 2 minutes during which period it shall neither leak nor sweat.

18.1.7 **Ball valves**

Ball valves shall be of brass or bronze, high pressure type, and shall conform to IS 1703- 2000: Specification for Ball valves (horizontal plunger type) including floats for water supply purposes. The float shall be of polyethylene. High pressure ball valve with float immersed to not more than half its volume shall remain closed against test pressure of 1.05 MPa. The minimum finished mass of ball valves exclusive of floats, and the wall thickness of floats shall be as specified in Clause 18.19 of SSR Part I.

18.1.8 **Cast iron Soil, Waste and Ventilating Pipes**

18.1.8.1 Irrespective of what is shown on drawing all soil pipes and fittings shall be 100 mm dia and all waste vent pipes and fittings shall be of 75 mm dia as mentioned here-in-after in these specifications. 100 mm dia CI pipe shall be provided from gully trap to first manhole. They shall comply with IS 3989-1984; Specification for centrifugally cast (spun) iron spigot and socket soil, waste and ventilating pipes, fittings and accessories as indicated. Fittings as indicated and accessories shall conform to the particular standard.

18.1.8.2 Cast iron spun pipes and fittings shall be provided in following situations: -

- i) All waste pipes from Nahani Trap/floor trap to Gully trap.
- ii) Soil pipe/fittings from WC to vertical soil/vent pipe.
- iii) Waste pipe connection from Nahani trap to first manholes.
- iv) All other pipes underground/floors.

18.1.8.3 Soil/Waste/vent/anti-syphonage pipes & fittings shall be fixed to walls 50 mm clear of wall, distance pieces & spike nails to run 65mm into tarred hard wood plug built into walls & with wooden plugs & screws 22 gauge for securing to concrete. Pipes & fittings shall be jointed & fixed as specified in clause 18.23 of MES Schedule Part I.

18.1.8.4 Cast Iron pipes and fittings below ground level & concealed under floor shall be jointed with lead joints. Other cast iron pipes & fittings shall be jointed properly with mixture of cement, linseed oil & chopped hamp well pressed into the joint.

18.1.8.5 All drain pipes from surface gully (i.e. gully trap) up to first manhole outside the building as well as vent pipe connecting cast iron soil pipe duck foot bend below ground level up to first manhole shall be 100 mm dia salt glazed stoneware pipe of approved make grade 'A' conforming to IS-651. Bedding, packing under & haunching shall be in PCC (1:3:6) Type C-2 as specified in clause 18.68 of MES Schedule Part I.

18.1.9 **Nahani Traps**

Cast iron Nahani traps shall conform to IS 3989-1984 and shall have outlet of nominal diameter 50mm, 75 mm as indicated. Approximate weight of Nahani traps shall be not less than 5.50 Kg and 6.50 Kg for traps with outlet dia of 50 mm and 75 mm respectively. Nahani traps shall be provided with cast iron grating.

18.1.10 **Floor Traps**

Cast iron floor traps shall conform to IS 3989-1984 and shall have outlet of diameter 50 mm, 75 mm and 100mm. Weight of floor traps shall be not less than 2.50 Kg, 4.8 Kg and 7.5 Kg for traps with outlet dia of 50 mm, 75 mm and 100 mm respectively. Floor trap shall be provided with cast iron grating.

18.1.11 **C I Cows**

Cast iron cows shall conform to IS 3989-1984 and shall approximately weigh 1 Kg, 1.5 Kg, 2.7 Kg and 5.8 Kg for pipes of nominal diameters 50 mm, 75 mm, 100 mm and 150 mm respectively.

18.1.12 **Traps P and S Types**

Traps for wash basins, sinks and baths shall be of cast copper alloy, chromium plated conforming to IS 5219 (Part I)-1969, Specification for cast copper alloys traps, Part I, P and S traps.

18.2 **SANITARY APPLIANCES**

18.2.1 All sanitary appliances shall be of vitreous China, unless otherwise indicated and shall conform to IS 2556 (Part I) -1994; Specification for vitreous sanitary appliances, Part I. General requirements and shall be of approved make. Appliances shall be strong, of high grade and shall be coated on all exposed surface with an impervious white vitreous glaze. The glaze shall be uniform, free from craze and discolouration and shall possess an impervious surface.

18.2.2 Sanitary appliances shall be of one piece construction. Water closets and urinals shall have an integral flushing rim. Inside of the pans shall be regular and smooth in order to ensure efficient flush.

- 18.2.3 All waste pipe and fittings upto floor/nahani trap shall be galvanized tubing light grade all as specified in clause 18.4 of MES schedule Part I.
- 18.2.4 Flush pipe and socket of flushing rim of WC shall be jointed with white cement and red lead (white cement and red lead in equal proportion by weight) and linseed oil to form paste.
- 18.2.5 'P' or 'S' trap shall be jointed to WC pan with cement joints as per specified in clauses 18.48.5 of MES Schedule Part I.
- 18.2.6 **PVC Flushing Cistern White / Colour**  
PVC Flushing Cistern for water closets and urinals shall be built and conforming to IS 7231-1994 (Specifications of PVC high level and low level flushing cistern for water closets and urinals). It shall be solid moulded with valveless syphonic fitting. Manually operated with one PVC ball valve. Horizontally plugged type and with inbuilt polyethylene of float. Flushing pipe of required length for cistern including coupling and bend shall be as per manufacturer. The PVC flushing cistern shall be high level or low level of capacity 10 litres single flush/dual flush type as indicated. The parts of single/dual flush system in a cistern shall be as per IS. The cistern shall be manufactured from high density polyethylene (HDPE) IS 7328-1992 or polystyrene high impact IS 2267-1972 or polypropylene or Acrylonitrile-butadiene-styrene (ABS) or Glass fibre reinforced plastic (GRP) as indicated. The chain shall be hot-dip galvanized steel wire or interlocked nonferrous metal as indicated. The coupling nut and lock nut shall be of non-ferrous metal or Hot-dip galvanized steel / malleable iron or injection-moulded (HDPE) / polyacetal. The thickness of the body including cover at any point shall not be less than 2mm for GRP and not less than 3mm for other material.
- 18.2.7 **Wash Down Water Closet**
- 18.2.7.1 Water Closet shall conform to IS 2556 (Part 2)-2004; Specification for vitreous sanitary appliances (vitreous china), part II, specific requirements for wash down water closets, and shall be of pattern 1 or 2 as indicated, and of height 390 mm and 410 mm respectively. Each closet shall have an integral trap either with Por S outlet; trap inlet depth shall be at least 75mm. Where required the closet shall have an anti-syphonage 50mm dia vent horn on the outlet side of the trap. The serrated part of the outlet shall not be glazed externally. Each closet shall have not less than two holes for fixing to floor.
- 18.2.7.2 10 litre discharge capacity polythene low level flushing cistern, solid moulded with valve less syphonic fitting, manually operated with one PVC ball valve horizontally plugged type and polythene float valve shall be provided with each water closet and connected with 32mm dia brass chromium plated flush pipe of required length including brass coupling and bend and 15mm dia PVC pipe to flushing cistern up to 75mm from floor level.
- 18.2.7.3 The closet shall be fixed to the floor by means of 75mm long, 6.5 mm diameter counter sunk bolt embedded in concrete floor.
- 18.2.7.4 Plastic Water Closet Seats and Covers shall conform to IS 2548 (Part-I & II) -1996: Specification for plastic water closet seats and covers. Seats and covers shall be made of moulded synthetic materials, which shall be tough, hard with high resistance to solvents. Unless otherwise indicated, seats and covers shall be black in colour.
- 18.2.8 **Squatting Pans**
- 18.2.8.1 Squatting Pans shall conform to IS 2556 (Part 3)-2004; Specification for sanitary vitreous appliances (vitreous china), part III, specific requirements for Squatting Pans. These shall be of long pattern size 580 or 630mm or Orissa pattern size 580x440 mm or 630x540mm as indicated. The flushing inlet shall be at the narrow end unless indicated to be provided at both the ends. Each pan shall be provided with a 100 mm dia Por S trap with or without inspection vent as directed. The trap shall be glazed inside. The inside of the pan shall be regular and smooth to ensure an efficient flush.
- 18.2.8.2 10 litre discharge capacity polythene low level flushing cistern, solid moulded with valve less syphonic fitting, manually operated with one PVC ball valve horizontally plugged type and polythene float valve shall be provided with each water closet and connected with 32mm dia brass chromium plated flush pipe of required length including brass coupling and bend and 15mm dia PVC pipe to flushing cistern up to 75mm from floor level.
- 18.2.8.3 The pan shall be sunk into the floor and embedded in a cushion of average 15 cm cement concrete 1:5:10 or lime concrete 1:2:4 both preferably using brick ballast 40 mm nominal size. This concrete shall be left 115 mm below the top level of the pan so as to allow for flooring and its bed concrete. The pan shall be provided with a 100 mm trap 'P' or 'S' type with an approximately 50 mm seal and 50 mm dia vent horn, where required. The joint between the pan and the trap shall be made leak proof with cement and sand mortar 1:1.
- 18.2.9 **Wash Basin**  
Wash basin shall conform to IS 2556 (Part 4)-2004; Specification for vitreous sanitary appliances (Vitreous China) (Part-4) Specific requirements for wash basins. The basins shall be of flat back pattern, size 660x460mm (surgeon's basin), 630x450mm, 550x400mm or 450x300mm: or angle back pattern 600x480mm or 400x400mm, as indicated. Wash basin to be installed in surgeon's room and operation theatre shall not be provided with soap holder recess and combined overflow. Basins shall be provided with a single or double tap holes as indicated. A suitable tap hole button shall be supplied if the tap is not required in installation. The waste hole shall be either rebated or bevelled internally with an overall dia of 65 mm and a depth of 10mm. Each basin shall be provided with 32 mm brass, chromium plated waste fitting. A slot type overflow having an area of not less than 5 sqcm shall be provided at the back of the bowl. Every basin shall have an integral soap holder recess or recesses, which shall fully drain into the bowl.
- 18.2.10 **Sinks**
- 18.2.10.1 Laboratory Sinks shall conform to IS 2556 (Part 5)-1994: Specification for vitreous sanitary appliances (vitreous china), part 5, specific requirements for Laboratory Sinks. The floor of sink shall gently slope towards the outlet. The waste hole shall have a minimum dia of 65 mm at the bottom to suit the waste fitting. Each sink shall be provided with a brass, chromium plated 50 mm dia waste fitting. The sinks shall have weir type overflow and their invert shall be 30 mm below the top edge.
- 18.2.10.2 The basin or sink shall be supported on a pair of cast iron brackets set in cement mortar 1:3 for lighter appliances or embedded in cement concrete 1:2:4 type B1, blocks 100 x 75 x 150 mm in size. The wall plaster on the rear shall be cut to rest over the top edge of the basin where directed. After fixing the basin, the plaster shall be made good and surface

finished as directed.

- 18.2.10.3 The chromium plated trap and union shall be connected to 32 mm dia waste pipe in case of washbasins and 50 mm waste pipe in case of sinks, which shall be suitably bent towards the wall. Waste pipe shall discharge directly on to a floor or Nahani trap or gully trap or into an open channel leading to floor trap, or shall be connected to a waste pipe stack through a floor trap. CP brass union shall not be provided when a surface channel, drain or floor trap is placed directly under the wash basin and the waste discharges into it vertically. The height of front edge of wash basin or sink from the floor level shall be 80 cm unless otherwise indicated.

18.2.11 **Bowl Type Urinals**

- 18.2.11.1 Urinals basins shall be flat back or corner wall type, lipped in front and shall conform to IS 2556 (Part -6) 1995: Specification for vitreous sanitary appliances (vitreous china), part 6, Specific requirements for Urinals Section 1 Bowl type. The urinal shall be of one-piece construction. Each urinal shall be provided with not less than two fixing holes on each side. Each urinal shall have an integral flushing rim of suitable type and inlet or supply horn for connecting flush pipe. The flushing rim and inlet shall be of the self-draining type. The bottom of the pan shall have sufficient slope from the front towards the outlet for efficient draining. When installed, there should be no liquid left over in the bottom of the pan of urinal after flushing.

- 18.2.11.2 Urinals shall be fixed in position by using wooden plugs and screws. Wooden plugs of suitable size shall be fixed in the wall in cement and sand mortar 1:3. The height of front edge of lipped urinal, from the standing level, shall be 65 cm unless otherwise directed. Each urinal shall be connected to 32 mm dia. Waste pipe which shall discharge into a channel or a floor trap. The connection between the urinal and flush or waste pipe shall be made by means of putty or white lead mixed with chopped hemp.

18.2.12 **Partition Slabs**

Vitreous China partition slabs shall conform to IS 2556 (Part - 6) 1995 (Re-affirmed 2003). Specification for vitreous sanitary appliances (vitreous china), part VI, Specific requirements of urinals, section 4 Partitions slabs. Partition slabs be of size 825 x 450 x 100 mm or 675 x 325 x 85 mm as indicated. Slab shall be provided with fixing arrangement at the flat back top and also with counter sunk hole at the bottom end to keep it fixed.

18.2.13 **Mirror**

- 18.2.13.1 Mirror shall be made of selected quality sheet glass not less than 5.5 mm thick with edges rounded or bevelled as indicated. It shall be free from all flaws, specks or bubbles. The glass shall be uniformly silver plated on the back, free from silvering defects. The silvering shall have a uniform protective coating of red lead paint.

- 18.2.13.2 The Mirror shall be mounted on 4 mm thick asbestos cement building board or 4 mm thick, 3 ply, plywood with commercial face veneers and shall be fixed in position by means of 4 No Chromium plated brass screws and cup washers and wooden plugs embedded in walls. Alternatively, CP brass clamps with CP brass screws may be used for fixing. Unless otherwise directed, the longer side shall be fixed horizontally.

18.2.14 **Water Storage Tanks**

These shall also include for provision of the following: -

- (a) HDPE Water storage tanks shall be rotational moulded, cylindrical vertical type/Rectangular all as directed.
- (b) PVC water storage tanks shall be of capacity as indicated in schedule 'A'.
- (c) Mild steel galvanized medium grade 25mm bore over flow and wash out pipe and float ball valve with brass rod and polythene ball. Wash out pipe shall be provided with stop valve and anti-mosquito rose.
- (d) Over flow pipe shall be connected to wash outlet pipe beyond the stop valve at an approximate distance of 50cm from take-off point of wash out pipe and beyond this the combined wash out and over flow pipe shall be provided.
- (e) Combined wash out and over flow pipe of all insulated overhead water storage tank placed in one place (tank room) shall be connected to each other and only one wash out pipe of 40mm bore medium grade GI pipe (in case of single tank wash out pipe shall be 25mm bore GI medium grade) shall be taken to discharge the water at 15cm above ground level.

19 to 21 Blank

22 **DEMOLITION / DISMANTLING**

- 22.1 Demolition/dismantling shall be carried out properly and shall be ensured that these operations at any stage do not endanger the safety of the adjoining buildings/structures. Dust and nuisance effect on the use of adjacent buildings shall be kept to the minimum. The unserviceable materials obtained from demolition declared as such by EIC shall be removed from the site promptly within 100 m lead and stacked/spread at places where directed. Any useful material at the discretion of Engineer-in-Charge and except those included in Schedule of Credit shall be deposited in the MES Storeyard at contractors own cost.

- 22.2 During execution of work all precautionary measures shall be provided by the contractor to ensure safety of workmen in foul/risky conditions.

- 22.3 The rates quoted by contractor for demolition/dismantling under Sch 'A' shall be deemed to be included the separation of serviceable/unserviceable materials for disposal as per Schedule of Credit or for removal from site or for reuse where described in relevant item of Schedule 'A'. The decision of Engineer-in-Charge as to which materials are serviceable or unserviceable shall be final and binding.

23

**SCHEDULE OF CREDIT**

The contractor shall note that the materials obtained from taking down shall become the property of the contractor unless otherwise stated to be reused in the works or those ordered by EIC to dispose of otherwise. These items are included in the Schedule of Credit and department has assessed the rate there of. The contractor shall however visit the site and ascertain the exact condition of the materials considered for credit.

24

**COMPLETION**

The contractor on completion of work shall clean the entire site of work by removing surplus materials, debris or other rubbish etc, stagnated during the period of contract and ensure the whole premises clean and tidy to the entire satisfaction of EIC, before handing over the site to MES.

25

**LIST OF MANUFACTURERS**

The make of products given in Appendix 'A' are conforming to IS specifications/bear ISI mark and shall be of Ist quality. In case, they do not conform to IS, they automatically deemed to be deleted from this list. The tenderers therefore, shall make market enquiry about the same and no claim whatsoever on this account shall be entertained. In such cases, the make shall be as approved by the Garrison Engineer. **The makes if given in Schedule 'A' shall take precedence over this list of makes.**

26

Refer relevant clauses of MES SSR Part I 2009 (Specification) for all items.

(Signature of Contractor)

Dated:

AGE Contracts)

For Accepting Officer

**LIST OF APPROVED MAKE/MANUFACTURES**

<b>B/R ITEMS</b>		
1	Liquid Water Proofing Admixture	J K Cement, ACC Ltd, Pidilite, Fosroc Chemical (India) Ltd, Choksey Chemical, Sika India Pvt Ltd, Roffe Chemicals Ltd
2	Synthetic Enamel Paint	Luxol (Berger), Nerolac (Nerolac), Borolac (Johnson), Apcolite (Asian), Carcoat (Garware), Superlac (Shalimar), Dulux
3.	Vitrified tiles	(a) Nitco (b) Kajaria (c) Rak (d) Cera (e) Varmora (f) Bell
4.	Glazed Ceramic Tiles/ Non Skid Tiles	(a) Nitco (b) Kajaria (c) Rak (d) Cera (e) Varmora (f) Bell
5.	Vitreous China Sanitary and Toilet Fittings and Appliances	(a) Jaquar (b) Roca (c) Kohler (d) Marc (e) Parry Ware (f) Hindware (g) Cera (h) Neycer (j) Jonson
6.	Brass and Brass CP Bathroom Fittings	(a) Jaquar (b) Roca (c) Kohler (d) Marc (e) Hindware (f) Essco (g) Cera (h) Parko (j) Jaingo (k) Prima (l) Status Sanitech Pvt Ltd (Brand Player) (m) Prayag
7.	PVC Flushing Cistern/ Seat cover for EWC	(a) Simline (b) Hindware (c) Cera (d) Prayag (e) Commander (f) Kajaria (g) Johnson (h) Pearl
8.	Stainless Steel Sinks/ Basin/ Plate Rack	(a) Nirali (b) Diamond (c) Neelkanth (d) Jayna (e) Silver Shine (f) Prayag
9.	Interior / Exterior Emulsion Paint	(a) ICI India (b) Asian Paint (c) Jenson & Nicholson (d) Shalimar (e) Berger (f) Kamdhenu
10	Oil Bound Distemper/ Paint	(a) Nerolac (b) Asian (c) ICI Dulux (d) Jenson and Nicholson (e) Berger (f) Shalimar (g) Garware (h) Kamdhenu
11	Cement Base Paint	(a) Snowcem (b) Birla White (c) Eco Cerm of TATA (e) Dura Cem (f) Berger (g) Aqua Lac Park (h) Kamdhenu
12	Cement Putty	(a) Nerolac (b) Asian Paints (c) ICI India (d) Birla White Cement Putty (e) Jenson & Nicholson (f) JK cement Putty (g) Berger paints (h) Shalimar Paints (j) Kamdhenu
13	Aluminium Section of shutters / Frames for Door / Window/ Ventilator	(a) Jindal (b) Hindalco (c) Indal (d) Nalco (e) Sterlite (f) Valco
14	Aluminium door & window Fittings and Fabricators for aluminium work	(a) Valco (b) Alupex Industries Jammu (c) Gupta Aluminium Jammu (d) Aluminium Udyog (e) Dada Industries, Jalandhar
15	Aluminium Composite Panel	(a) Alstrong (b) Alucobond (c) Alstone (d) Oropanel (e) Aludecor
16	UPVC Windows & Doors	(a) Fenesta India Pvt Ltd (b) LG Hsusys (c) H2O Solution
17	Roof Sheet : color coated galvalume roof sheet / CGI Sheet	(a) Tata Bluescope (b) Kirby (c) Jindal Steel (d) Zamil Steel (e) Lloyd Insulation (f) Everest India (g) Metal Scope (h) Indian Steel Corpn Ltd (J) Crill
18	False ceiling : Gypsum Board	(a) Saint Gobain (b) Armstrong (c) Dexune (e) National Gypsum
19	False ceiling : Mineral Fibre	(a) Armstrong (b) Gyproc (c) Everest (d) Dexune (e) Anchor Ceiling Tiles
20	False ceiling : Metal Sheet / Tiles	(a) Armstrong (b) Saint Govain (c) Hunter Douglas (d) Durlum
21	Calcium Silicate Board/ Tiles	(a) Ramco Industries Ltd (b) Aerolite Ceiling System (c) RK Ceiling Pvt Ltd (d) Bharat Steel Rolls
22	Cement Bonded Particle Board	(a) Everest (b) Bison (c) RAMCO (d) Visaka
23	Non Asbestors Fiber Cement Sheets / Boards	(a) Hyderabad Industries Ltd (b) RAMCO (c) Everest (d) Swastik Industries
24	Wooden Flush Door	(a) M/S Green Ply Industries Ltd (Green Ply) (b) M/S Kit Ply Industries Ltd (Kitply) (c) M/S Century Ply Wood Ltd (Century) (d) MP Woods products, Indore (e) Jain Wood Industries (Jayna) (f) M/S Sitapur Ply Wood (g) M/S Mysore wood product (h) M/S National Plywood Industries



25	Factory Made PVC Door, FRP Shutters, Frames, False ceiling, kitchen cupboards, caninets & wardrobes	(a) M/S Rajshri Plastiwood Pvt Ltd (b) M/s Sintex Industries Ltd (b) M/S Accure Polytech Pvt Ltd (d) M/S Duro Plast Extrusion (e) M/S Durian Doors
26	Panelled/ Glazed/ Gauzed Door Shutters (Factory made)	(a) M/s Jain Wood Industires 50KM Stone Murthal Sonapat, Haryana (b) M/S Goyal Industries corporation 8743 Desh Bandhu, Gupta, Road, New Delhi-55 (c) M/S Wood Craft Assam, New Delhi (d) M/S Sarab Enterprises, 28- Industrial Area, Kathua (J&K) Ph-01992-236064 (e) M/S M.S. Joinery works, Parimpora, Srinagar (f) MP Wood Products, Indore
27	Steel Doors/ Windows/ Ventialtors/ Pressed Steel Frames	(a) M/S Godrej & Boyce Steel MFG (b) Sen Harvic, 37, Abdul rahman Street, Bombay-400063 (c) M/S Shiv Mular, Naroda, Ahmedabad (d) M/S Agew Steel manufacturer's Pvt Ltd Ahmedabad-300002 (e) M/S Bihar Bobbin & Engg work, Katihar (f) M/S Shree Krishna Associates, 304 IND Area, Phase-II, Panchkulla-134109 (g) Raymus Structural & Engg Pvt Ltd, New Delhi
28	Hydraulic Door Closer/ Door Spring	(a) Dorma India Pvt Ltd (b) Godrej (c) Everest (d) Universal (e) Hardwyn (f) Everite
29	Aluminium Hardware Fittings	(a) Dorma India Pvt Ltd (b) Jindal (c) Crown (d) Aluminium Udyog (e) Alutrac
30	Locks Mortice	(a) Godrej (b) Harrison (c) Link (d) Johnson
31	Sheet Glass Plain/ Forsted/ Flot Heat Absorbing Glass & Reflective Glass	(a) Saint Gobain (b) Modi Float (c) Modiguard (b) Atul Glass Industries (d) Asahi
32	Toughened Glass/ Rough cast Wired Glass	(a) Saint Gobain (b) Modiguard (c) Asahi (d) Hindustan Pilkington Glass Works (e) Atul Glass Industries (f) Gold Fish
33	Mirror	(a) Saint Govain (b) Modi Float/ Modi Guard (c) Asahi India Safety (d) Hindustan Piklington Glass Works (e) Triveni Float Glass (f) Swastic (g) Atul Glass Industries
34	Plywood / Block Board	(a) Novopan (b) Kitply (c) Green Ply (d) ECO Board (e) National (f) hutan Board (g) DECO (h) Century Ply wood (j) Anchor (k) M/S Mysore wood product (l) M/S Sitapur ply wood (m) M/S Swastik
35	Laminated Sheets	(a) Bakelite Hylum (b) Sunmica (c) Greenlam (d) Formica (e) Dura (f) Marino
36	Pre-Laminated Particle/ MDF/ HDF Board	(a) Novopan (b) Kitply (c) Green Ply (d) Century Ply Wood (e) National (f) Bhutan Board (g) M/s Mysore Wood Product (h) Anchor (j) M/S Sitapur Ply Wood (k) M/S Swastik
37	CI Spun Pipes for soil waste and vent pipes and fittings	(a) Jayaswal Neco (b) SKF (c) Kapilansh (d) HIF
38	UPVC Sanitary Pipes & fittings and rain water pipes	(a) Supreme (b) Prince (c) Finolex (d) Kisan (e) SFMC
39	PVC Float Valve, Bath fittings i.e. Bib cock, pillar tap, Stop cock, Shower, Grating etc	(a) Prayag (b) Supreme Pearl (By precision products) (c) Polytuf (d) Shakti
40	HDPE Water Storage Tanks	(a) Sintex (b) Polycon (c) Prayag (d) Rotex (e) Lotus
41	Terrazo tiles/ Mosaic/ Cement Flooring Tiles	(a) NITCO (b) Ultra Tiles (c) NTC
42	PVC Sheet / Tile Flooring	(a) Krishna Vinyl Tiles (b) Armstrong World Industries (c) Bhor Industries (d) Wonder Floor Tiles (e) Premier Vinyl Rikvin Floor Ltd (f) Neelkamal (g) LG Hsusys
43	GI Tubing & fittings	(a) TATA (b) GST (c) Jindal (d) Prakash Surya (e) Swastik (f) BST (g) Zenith (h) Nidhi (j) Oswal (k) Advance Steel

44	CI Pipes & CI Fittings / Special	(a) Electro Steel Casting (b) Kapilansh Dhatu Udhog (c) SKF (d) New Janta Metal Wks (e) Kejriwal (f) Keroram (Birla Group)
45	MS Pipes & Fittings	(a) TATA (b) GST (c) BST (d) Prakash surya (e) Jindal (f) Zenith (g) Swastik
46	HDPE Pipes	(a) Finolex (b) Supreme (c) Tirupati (d) Prince (e) Kissan
47	DI Pipes DI fittings	a) TATA (b) Electro Steel Ltd (c) Jindal Saw Ltd (d) Rashmi Metalic Ltd (e) Rashmi Metalic Ltd (f) AARKO pipe gram Udyog (g) Sanghi Pipes and Tubes (h) Electrotherm India Ltd (j) Jaibalaji IndustriesRK Pipes
48	SGSW pipes (IS-651)ISI Marked	(a) Perfect Jabalpur (b) Devraj Ind Gaziabad (c) Buran (d) R.K.
49	PVC/SWR pipes	(a) PRINCE (b) SUPREME (c) KISAN (d) SFMC
50	Adhesive	(a) Fevicol (b) Pidilite

(Signature of Contractor)  
Dated:

AGE (Contracts)  
For Accepting Officer

Appendix 'B'**CEMENT SUPPLY AND ACCEPTANCE REGISTER**

1. CA No and Name of work :
2. Control No\* :
3. Name of Manufacturer / Brand Name / Gde of cement (a) Manufacturer \_\_\_\_\_ (b) Brand \_\_\_\_\_ (c) Grade \_\_\_\_\_
4. Qty of cement & Lot No / Week No (in bags) : Qty \_\_\_\_\_ (b) Lot No / week No \_\_\_\_\_
5. Manufacturer's test certificate No :
6. Random test detail (s) (a) Physical test report from \_\_\_\_\_ vide their letter No \_\_\_\_\_ (Name of approved lab/ Engg College)  
(b) Chemical test report from \_\_\_\_\_ vide their letter No \_\_\_\_\_ (Name of approved lab/Engg College)
7. Details of physical & chemical properties:-

	As per random test certificate	As per manufacturer's test certificate	As per relevant IS	Physical requirements (As per IS-4031)							Chemical requirements (As per IS- 4032)										
				Specific surface area (Sqm/ Kg)	Soundness by Le-Chatelier	Soundness by auto clave	Initial setting Time (Minutes)	Final setting Time (Minutes)	Compressive Strength (MPs)			Temp during testing °C	Standard Consistency (%)	Line Saturation Factor (ration)	Alumina iron Ratio (Ratio)	Insoluble Residue (%)	Magnesium (%)	Sulpheric Anhydride (%)	Loss on ignition (%)	Alkailes (%)	Chlorides (%)
									03 days	07 days	28 days										

**Remarks with signatures**

Accepted/Rejected

Contractor

Junior Engineer

Engineer-in-Charge

Garrison Engineer

Remarks of BOO / Inspecting Officer / CWE

\*To be allotted serially by GE consignment wise.

Appendix 'C'**STEEL SUPPLY AND ACCEPTANCE REGISTER**

1. CA No and Name of work :  
 2. Contract No. :  
 Dated :  
 3. Name of Manufacturer's T.C. No :  
 4. Manufacturer :  
 5. Random Test Details  
 (a) Physical test report.....vide letter No..... (Name of approval Lab/Engg College)  
 (b) Chemical test report from.....vide their No..... (Name of approval Lab/Engg College)

5. Types of steel, Dia and Qty (a) Type: TMT/CRS (b) Dia ..... mm (c) Actual Wt.....MT (d) Conversion Wt.....MT

	Carbon %	Sulphur %	Phosphorous %	Manganese %	Silicon %	Corrosion Resistant element	Wt per meter	Stress (N/mm <sup>2</sup> ) 2% proof	Tensile Strength (N/mm <sup>2</sup> )	Elongation%	Bent Test	Rebend test	Remarks
As per Is 1786													
As per manufactu re's test certificate													
As per independe nt test													

Remarks with Signature

Accepted/Rejected

Contractor

Junior Engineer

Engineer-in-Charge

Garrison Engineer

**TEST OF MATERIALS AND RECOVERY RATES OF TESTING CHARGES****Legend**

College

'A' Site lab (Established at site by the contractor) 'B' Zonal Lab 'C' National test house/SEMT wing Pune/Engg

**Note:** Establishing of site lab is not compulsory and is at the discretion of the contractor. Materials where level of test 'A' & 'B' is mentioned, can be tested In Zonal lab/Deptt. Lab and rate of recovery shall be as under:-

Ser No	Materials	Test	Method of testing	Frequency of test			Levels of test	Rate per test	Remarks
1	Bricks (except Leh and Kargil area)	(i) Compressive strength	IS-3495 (Part-II)	As per IS-5454 as given under :-			‘A’	₹ 180/-	Checks for visual and dimensional characteristics shall also be carried out as per IS-5454
		(ii) Water absorption	IS-3495 (Part-II)	Lot Size	Sample size	Permissible No of defective bricks	‘A’	₹ 150/-	
		(iii) Efflorescence	IS-3495 (Part-I)	1001 to 10000	5	0	‘A’	₹ 180/-	
				10001 to 35000	10	0			
				35001 to 50000	15	1			
2	Coarse aggregate	(i) Sieve analysis	IS-2386 (Part-I)	One test for every 15 Cum of aggregate or part thereof brought to site			‘A’	₹ 120/-	
		(ii) Flakiness Index		-do-			‘A’	₹ 90/-	
		(iii) Estimation of deleterious materials		One test for every 100 Cum of aggregate or part thereof			‘A’	₹ 120/-	
		(iv) Organic impurities		One test per source of supply			‘C’	₹ 120/-	
		(v) Moisture content	IS-2386 (Part-II)	Regularly as required			‘A’	₹ 120/-	
		(vi) Specific gravity		One test for each source of supply			‘B’	₹ 120/-	
3	Fine aggregate	(i) Sieve analysis	IS-2386 (Part-I)	One test for every 15 Cum of fine aggregate or part thereof brought to site			‘A’	₹ 180/-	
		(ii) Test for clay, silt and impurities		-do-			‘A’	₹ 90/-	
		(iii) Specific Gravity	IS-2386 (Part-II)	One of each source of supply			‘B’	₹ 180/-	
		(iv) Moisture content		Regularly as required subject to 2 tests per day when being used			‘A’	₹ 180/-	
4	Cement	(i) Setting time	IS-4031-63 affirmed 1980	One for each consignments or as when required			‘B’	₹ 180/-	
		(ii) Soundness		-do-			‘B’	₹ 120/-	
		(iii) Compressive strength		-do-			‘B’	₹ 360/-	
		(iv) Fineness		-do-			‘B’	₹ 120/-	

Appendix 'D' (Contd)TEST OF MATERIALS AND RECOVERY RATES OF TESTING CHARGES (Contd)

Ser No	Materials	Test	Method of testing	Frequency of test		Levels of test	Rate per test	Remarks
5.	Structural concrete (M-20 grade and above)	(i) Slump test (OR) compacting factor test vee-bee time test	IS-1199	The minimum frequency of sampling of concrete of each grade shall be as under :-		'A'	₹ 180/-	Random sampling shall be carried to cover all mix unit
		(ii) Compressive strength	IS-516	Qty of concrete in the work (Cum)	No of Samples	'A'	₹ 120/-	As per IS : 456-2000 clause 14 for frequency of sampling
				1-5	1			
				6-15	2			
				16-30	3			
				31-50	4			
				51 & above	4 + 1 for each addl 50 cum or part thereof			
6.	(a) PCC Block for walling (Hollow block)	(i) Compressive strength	IS:2156-1984 (Appx 'B')	08 Blocks out of 14		'A'	₹ 60/-	Sample:- 14 blocks from consignment of every 5000 blocks or part thereof
		(ii) Water absorption	-do- (Appx 'E')	03 Blocks out of 14		'B'	₹ 120/-	
		(iii) Density	-do- (Appx 'A')	03 Blocks out of 14		'B'	₹ 90/-	
	(b) PCC solid block for walling	(i) Compressive Strength	IS-2185	12 Blocks out of 18		'A'	₹ 60/-	Sample:- 18 blocks from consignment of every 1000 blocks or part thereof. These blocks to be checked for dimension and weight
		(ii) Water absorption	-do-	03 Blocks out of 18		'B'	₹ 120/-	
		(iii) Density	-do-	03 Blocks out of 18		'B'	₹ 120/-	
7	Cement Flooring Tiles/ Terrazzo Tiles	(i) Water absorption	IS-1237 (Appx 'D')	06 titles out of 18		'B'	₹ 180/-	Sample of 18 tiles from each source of supply selected at random
		(ii) Wet transverse strength	IS-1237 (Appx 'E')	06 titles out of 18		'B'	₹ 144/-	
		(iii) Resistance to wear	IS-1237 (Appx 'F')	06 titles out of 18		'C'	₹ 540/-	

Appendix 'D' (Contd)TEST OF MATERIALS AND RECOVERY RATES OF TESTING CHARGES (Contd)

Ser No	Materials	Test	Method of testing	Frequency of test	Levels of test	Rate per test	Remarks
8	Burnt clay roofing tiles (hand-made) as per IS-2690 (Part-II) <b>Length</b> 150mm to 250mm <b>Width</b> 100mm to 200mm <b>Thickness</b> 35mm to 50mm	(i) Water Absorption	IS-3495 (Part-II)	6 tiles out of 12	'B'	₹ 216/-	Sample of 12 tiles from each source of supply selected at random
		(ii) Compressive strength	IS-3495 (Part-I)	6 tiles out of 12	'A'	₹ 180/-	
9	Mangalore Pattern roofing tiles	(i) Water Absorption	IS-654 (Appx 'A')	6 tiles out of 32	'B'	₹ 180/-	Sample: - 32 tiles from each consignment of 3000 tiles or part thereof. These tiles shall be checked for dimension.
		(ii) Breaking Load	IS-654 (Appx 'C')	6 tiles out of 32	'B'	₹ 120/-	
10	Water for construction Purposes	(i) Test for Acidity	IS-456 & 3015	Once at the stage of approval of source of water	'B'	₹ 240/-	Also refer clause 4.3 of IS 456 and its subsequent sub clauses regarding suitability of water
		(ii) Test for alkalinity	IS-456 & 3015		'B'	₹ 240/-	
		(iii) Test for solid content	IS-456 & 3015		'C'	₹ 300/-	
11	Welding of steel work	Visual inspection test	IS-822-1790 Clause 7.1	100% by visual inspection	Work site	₹ 360/-	Specialized tests, their method and frequency to be decided on consideration of their importance by the accepting Officer
12	Timber	(i) Specific gravity and weight	IS-1708-1960	Minimum 3 samples from a lot of 4 cum 250 pieces of seasoned timber	'B'	₹ 120/-	
		(ii) Moisture content	IS-1708-1960		'A'	₹ 120/-	

**TEST OF MATERIALS AND RECOVERY RATES OF TESTING CHARGES (Contd)**

Ser No	Materials	Test	Method of testing	Frequency of test	Levels of test	Rate per test	Remarks
13	Timber panelled and glazed door /window & shutters (including Factory made shutters)	(a) Dimensions, sizes, workmanship and finish	IS-1003-1977 (Part-I)	Frequency of sampling from each lot shall be as under :-	'A'	₹ 180/-	
				Lot Size			
				26 to 50			
				51 to 100			
				101 to 150			
				151 to 300			
				301 to 500			
				501 to 1000			
				1001 and above			
		(b) <u>Strength test</u> (i) Slamming (ii) Impact indentation (iii) Shock resistance (iv) Edge loading	IS 1303-1990	From the each lot 5% of the factory made shutters shall be manufacturer tested for strength tests			
14	Ply wood (IS-303-1989)	(a) Moisture content	IS-1734-1983 (Part-I)	Six tests of pieces cut from each of the boards selected shall be subjected to tests	'C'	₹ 240/-	Sampling shall be as per IS-7835-1975 tables
15	Wood particles board (medium density) (IS-3097-1985)	(a) Density	IS-2360 (Part-III)	Three test specimen from each sample (size 150mm x 75mm)	'A'	₹ 60/-	Sampling shall be as per IS-3487-83 with moisture metre
		(b) Moisture content			'A' & 'B'	₹ 60/-	
		(c) Water Absorption	IS-2360 (Part-XVI)	Three test specimen from each sample (size 300mm x 300mm)	'A'	₹ 60/-	
		(d) Swelling due to surface absorption	IS-2360 (Part-XVII)	Three test specimen from each sample (size 125mm x 100mm)	'A'	₹ 60/-	
		(e) Swelling in water		Three test specimen from each sample (size 200mm x 100mm)	'A'	₹ 60/-	
		(f) Modules of rupture	IS-2360 (Part-IV)	Three test specimens as per IS-2380-77	'B'	₹ 90/-	
		(g) Screw withdrawal strength		Three test specimens as per IS-2385	'C'	₹ 120/-	



**SECONDARY PRODUCERS FOR STRUCTURAL STEEL SECTIONS**

- 1 M/S K.L. Steel Pvt Ltd  
Post Box no 61, Ial Kuan  
Bulandshahar Road  
Ghaziabad (U.P)
- 2 M/S Kashri Vishwanath Steel Ltd  
46, BB Ganguli Street  
Kolkata-700012  
Tele-22369999 (Hunting), Fax-033-223666
3. M/s Shyam steel Industries Ltd  
White Towers, 115, college Street  
1st Floor, kolkata-12
4. M/s Amba Shakti Ispat Ltd  
Plot no 6, Phase-11 industrial area, Kala Amb, Distt, Sirmour-173030 (H.P)  
Tele; 01734-309983, 309986  
Fax: 01702-238927
5. M/s Pushpak steel Industries Pvt Ltd  
Gate No 119  
Aland Market Road  
Tele: 02135-232427/28/232244  
Fax: 02135-233171
6. Shree Parashnath Re-Rolling Mills Ltd  
3511, Part Dr BC Roy Avenue  
Durgapur-713201  
Phone: 0343-2550537/0538  
Fax: 0343-2554457
7. SRMB Srijan Pvt Ltd  
7 No. Khetra Das Lane, Kolkata-700012  
Tele-033-22369999 (Hunting), Fax-033-22113636
8. M/S Amba Steels  
21/6 West Patel Nagar, New Delhi-110008  
Tele : 011-25885225, 25885226, Fax-011-25886914
9. M/S Shree OM Rolling Mills (P) Ltd  
D-51/2, Additional MIDC, Jalna  
Tele : 011-25885225, 25885226, Fax-011-25886914
10. M/S Anant Steel Pvt Ltd  
368, Civil Line, Jhansi (U.P), Phone-0517-2330115,619 , Fax-0517-2330618
11. M/S Karam Steel Corporation  
Narsali Road, Po Box 56, Mandi Gobind-147307 (PB)  
Tele : 01765-257536

**GENERAL CONDITIONS OF CONTRACTS (IAFW-2249) (1989 PRINT)****FOR****~~LUMP SUM CONTRACT (IAFW-2159)~~****TERM CONTRACT FOR ARTIFICERS WORK (IAFW-1821)****~~ITEM RATE CONTRACTS (IAFW-1779 A)~~**

1. A copy of the GENERAL CONDITION OF CONTRACT (IAFW-2249) (1989 PRINT) with errata 1 to 20 and amendment No. 1 to 40 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 as modified, if any elsewhere in these tender documents.

2. It is hereby further agree and declared by me/us, that the GENERAL CONDITIONS OF CONTRACTS (IAFW-2249: 1989 PRINTS) including condition 70 of thereof pertaining to settlement of disputes by Arbitration, containing 33 pages with errata 1 to 20 and amendment No. 1 to 40 containing 8 pages form part of these tender documents.

\* Retain as applicable

**Accepting Officer**

**Signature of Contractor**

Amendment No	Page No	Particulars
18 1989	3 and 4	<p><u>(b) Condition 1(p) ,line 4</u> For : "air craft and acts of God" Read: "air craft and natural calamities "</p> <p><u>(j) Condition 1(p) ,line 5</u> For : "floods and tornado." Read: "floods, tornado and Tsunami. "</p>
19 1989	5	<p><u>(a) Condition 4 A ,line 7</u> For : " Rs. 60,000/-" Read: " Rs. 1,50,000/-"</p> <p><u>(b) Condition 4 A(a) ,line 4</u> For : " Rs. 2,500/-" Read: " Rs. 10,000/-"</p> <p><u>(c) Condition 4 A(c) ,line 4</u> For : " Rs. 2,500/-" Read: " Rs. 10,000/-"</p> <p><u>(d) Condition 4 A(d) ,lines 2 and 3</u> For : " Rs. 5,000/-" Read: " Rs. 20,000/-"</p> <p><u>(e) Condition 4 A(f) ,line 1</u> For : " Rs. 60,000/-" Read: " Rs. 1,50,000/-"</p>
20 1989	5	<p><u>(a) Condition 6 , subpara 1</u> The existing contents shall be substituted as under :-  <b>"6. Provisional Items</b> --The amount pertaining to provisional items need not be deducted from the Contract Sum. The Engineer-in-Charge and Contractor shall set out the works covered under provisional items and provisional lump sum based on the description of items, drawings forming part of contract agreement and considering the ground conditions as encountered at site of works. The statement of variation in quantities, new items or deletion of items from the contract agreement as required will be worked out for approval of Engineer-in-Charge who will convey approval of such changes through site order book. For the purpose of payment the variation in value of work executed under these items shall be ascertained by measurement or valuation as for deviation. The variations shall be regularized as per condition 7."</p>

Amendment No	Page No	Particulars
23 1989	8, 9 and 10	<p><u>(a) Condition 10 A.subpara 2</u> Add in the end after the word "comply ." following: "However if the cost of particular item of material in a contract exceed Rs 1 lakh, these materials shall be procured only from the manufactures or from their authorised dealers/ stockist (except in case of materials of local origin) and the contractor shall furnish proof thereof to the satisfaction of the GE that the material so comply.</p> <p><u>(b) Condition 10 A.subpara 3</u> Add in the end after the word " in the Contract ." following: "The approved samples of materials which loose their identity after incorporation in the work shall be preserved with the GE till completion of work. Thereafter the same shall be removed in 'as is where is' condition by the contractor with prior permission of the GE without any extra cost to the Government. However, the approved samples of materials which do not loose their identity after incorporation and which can be incorporated in the work as decided by the Engineer-in-Charge shall be allowed to be used in the sample quarter/block/work."</p> <p><u>(c) Condition 10 B. line 1 of last subpara of page 9</u> For : "cost of loading," Read: "cost of carriage , loading,"</p> <p><u>(d) Condition 10 B. line 3 of subpara 3 of page 10</u> For : "the Engineer-in-Charge may," Read: "the GE may,"</p> <p><u>(e) Condition 10 B. line 5 of subpara 3 of page 10</u> For : "as decided by the GE ." Read: "on the date of notifying to the contractor by GE (after technical check of final bill in CWE's Office) as decided by the GE or the stock book rate as fixed by the department, which ever is higher."</p> <p><u>(f) Condition 10 B, line 6 of subpara 3 of page 10</u> For : "the market rate," Read: "the recovery rate,"</p>



Amendment No	Page No	Particulars
24 1989	10 and 11	<p><u>(a) Condition 11(A) ,subpara (i) to (viii)</u> Existing contents of subpara (i) to (vii) shall be replaced as under with sub para (i) to (iv) :-</p> <p>“(i) by reason of civil commotion, local combination of workmen, strike or lockout, affecting any of the trades employed on the work, or</p> <p>(ii) by reason of delay on part of nominated sub-contractors, or nominated suppliers which the Contractor has, in the opinion of G.E., taken all practicable steps to avoid, or reduce, or</p> <p>(iii) by reason of delay on the part of Contractors or tradesmen engaged by Government in executing works not forming part of the contract, or</p> <p>(iv) by reason of any other cause (except force majeure) which in the absolute discretion of the Accepting Officer is beyond the Contractor’s control,”</p> <p><u>(b) Condition 11(A) ,last subpara,line 2</u> For : “G.E.” Read: “Accepting Officer”</p> <p><u>(b) Condition 11(B) ,last but 3<sup>rd</sup> line from from end</u> For : “G.E.” Read: “Accepting Officer”</p> <p><u>(c) Condition 11(C)</u> The existing contents shall be substituted as under :-</p> <p>“(C) Extension of time if due shall be granted within 45 days of receipt of request from the contractor along with supporting documents, but before expiry of original/extended period of completion.</p> <p>(D) No claim in respect of compensation or otherwise, for idle labour and/or idle machinery etc. and/or business loss or any such loss, howsoever arising, as a result of extensions granted under Conditions (A) and (B) above shall be admissible. The decision on reason and quantum of extension shall be final and binding.</p>

Amendment No	Page No	Particulars
<u>24</u> 1989	10 and 11	<p>(E) DELAY ON ACCOUNT OF FORCE MAJEURE –</p> <p>Should any force majeure circumstances arise, each of the contracting party will be excused for the non fulfillment or for the delayed fulfillment of any of its contractual obligations, if the affected party within 15 days of its occurrence informs the other party in writing.</p> <p>Force majeure shall mean fires, floods, natural calamities such as earth quakes, lightening or other acts such as war, turmoils, strikes (otherwise than contractor's employees), invasion, act of foreign enemies, hostilities, civil war, rebellion, revolution, insurrection, military or usurped power, damage from aircraft, sabotage, explosions, quarantine restrictions, beyond the control of either party.</p> <p>It is understood and agreed between the parties here to that the rights and obligations of the parties shall be deemed to be in suspension during the continuance of the force majeure even as aforesaid and the said rights and obligation shall automatically revive upon cessation of the intervening force majeure event. The period within which the rights and obligations of the parties shall be in suspension due to force majeure event, shall not be considered as a delay with respect of the period of completion and/or taking over work under the contract or otherwise to the detriment of either party.</p> <p>Notwithstanding the provision of the immediately foregoing clauses, it is further understood and agreed between the parties hereto that in the event of any force majeure persisting for an uninterrupted period exceeding 6 (Six) months, either party hereto reserves the right to terminate this contract upon giving prior written notice of 30 (thirty) days to the other party of the intention to terminate without any liability other than agreement for the completed work and/or contractor's materials lying at site."</p>
<u>25</u> 1989	12	<p><u>(a) Condition 17, line 1</u></p> <p>For : "The Contractor shall not"</p> <p>Read: "The Contractor including Public Sector undertaking/Government agency shall not "</p>



Amendment No	Page No	Particulars									
26 1989	13	<p>(a) Condition 18 ,line 1 For : "The Contractor shall not" Read: "The Contractor including Public Sector undertaking/Government agency shall not "</p>									
27 1989	14 and 15	<p>(a) Condition 25 ,the contents of subpara 2 after line 5 shall be substituted as under :-</p> <table border="1"> <tr> <td>(a)</td><td>For works costing between Rs 50 lakh to 1000 lakh</td><td>A Degree holder in Engineering from a Govt recognized Institution or equivalent, final or direct final passed of Sub Division II of the Institution of Surveyors (India) with at least 4 years practical experience of works</td></tr> <tr> <td>(b)</td><td>For works costing between Rs 7.5 lakh and Rs 50 lakh</td><td>A Degree holder in Engineering from a Government recognised Institution or equivalent, with final or direct final passed of Sub Division II of the Institution of Surveyors (India) with at least 2 years practical experience of works.</td></tr> <tr> <td>(c)</td><td>For works costing below Rs 7.5 Lakh.</td><td>A Diploma holder in Engineering from of Govt. recognised Institution with adequate practical experience of works.</td></tr> </table> <p>Notes:-            (1)Engineers (Degree/Diploma holders) employed should be of the relevant discipline to which nature of work pertains.            (2) The provision at Serial (b) &amp; (c) above shall be applicable irrespective of the fact whether contractor himself is a Qualified Engineer or not.            (3)Contractor shall employ additional Engineers as directed by GF where there are scattered sites.            (4) For works costing more than Rs 10 crore, the requirement of Engineering staff shall be as given in the tender documents.</p>	(a)	For works costing between Rs 50 lakh to 1000 lakh	A Degree holder in Engineering from a Govt recognized Institution or equivalent, final or direct final passed of Sub Division II of the Institution of Surveyors (India) with at least 4 years practical experience of works	(b)	For works costing between Rs 7.5 lakh and Rs 50 lakh	A Degree holder in Engineering from a Government recognised Institution or equivalent, with final or direct final passed of Sub Division II of the Institution of Surveyors (India) with at least 2 years practical experience of works.	(c)	For works costing below Rs 7.5 Lakh.	A Diploma holder in Engineering from of Govt. recognised Institution with adequate practical experience of works.
(a)	For works costing between Rs 50 lakh to 1000 lakh	A Degree holder in Engineering from a Govt recognized Institution or equivalent, final or direct final passed of Sub Division II of the Institution of Surveyors (India) with at least 4 years practical experience of works									
(b)	For works costing between Rs 7.5 lakh and Rs 50 lakh	A Degree holder in Engineering from a Government recognised Institution or equivalent, with final or direct final passed of Sub Division II of the Institution of Surveyors (India) with at least 2 years practical experience of works.									
(c)	For works costing below Rs 7.5 Lakh.	A Diploma holder in Engineering from of Govt. recognised Institution with adequate practical experience of works.									

Amendment No	Page No	Particulars
<u>27</u> 1989	14 and 15	<p>(5) For specialist works/services Accepting Officer may vary requirement of supervisory staff in tender documents.</p> <p><u>(b) Condition 25 ,last subpara on page 15 :</u> The contents of last subpara on page 15 shall be substituted as under :-</p> <p>“The G.E. shall have full powers, to put the contractor on notice on account of default either for non-employment of Engineer(s) or absence of Engineer(s) from site and levy penalty @ Rs 500/- per day per vacancy upto 30 days period. Thereafter GE shall have the option to either suspend the work or employ Engineer(s) at contractor's cost and recover the amount from contractor's dues. “</p>
<u>28</u> 1989	15	<p><u>(a) Condition 26 ,last subpara ,last line</u> For: “ Rs. 50/-” Read: “ Rs. 5,000/- (Rupees five thousand only)“</p>
<u>29</u> 1989	16	<p><u>(a) Condition 31 ,third subpara ,line 2</u> For: “at the *All India Flat Rate per 1,000 gallons which” Read: “at the *All in cost Rate per 1,000 gallons subject to a minimum of Rs 3.75 per every Rs 1000/- worth of work done priced at contract rates which”</p>
<u>30</u> 1989	17	<p><u>(a) Condition 36 ,last subpara</u> Add the following at the end:- “Fencing be provided wherever necessary as decided by GE to isolate the working area to make the area unrestricted from restricted”</p>
<u>31</u> 1989	17	<p><u>(a) Condition 44 ,subpara 3,line 1</u> For: “rupees one lakh” Read: “rupees two lakh” <u>(a) Condition 44 ,subpara 3,line 2</u> For: “rupees five lakh” Read: “rupees ten lakh”</p>
<u>32</u> 1989	18	<p><u>(a) Condition 46 ,subpara 2 ,line 11 to 14</u> For: “Provided always that the liability of the Contractor under this Condition shall not extend beyond the defects liability period except as regards workmanship which the G.E. shall have previously given notice to the contractor to rectify. ” Read: “Alternatively, such work, if technically/structurally acceptable, without detriment to the safety and utility of the item and the structure may be permitted</p>

(contd)



Amendment No	Page No	Particulars
<u>32</u> 1989	18	<p>to be accepted as devalued and recovery shall decided by competent authority (CWE in respect of contract concluded by himself and GE's and AGE(I) and CE in respect of contract concluded by him) or he may reject the work outright without any payment and/or get it and other connected and incidental items rectified, or removed and re-executed at the risk and cost of the contractor. Whether any particular defect is due to unsound, imperfect or unskillful workmanship or due to normal wear &amp; tear or user's negligence, decision of GE shall be final and binding. Provided always that the liability of the Contractor under this Condition shall not extend beyond the defects liability period except as regards workmanship which the G.E. shall have previously given notice to the contractor to rectify. Govt. further reserves the right to get the work technically inspected during currency of the contract and also during defects liability period by the Additional Director General of Technical Examination and/or his Officers or any other agency. The defects observed as a result of such technical examination shall be rectified by the contractor as notified by the GE. However, if the defects are not rectified, the devaluation of the work shall be carried out and recovery thereon shall be affected."</p>
<u>33</u> 1989	19	<p>(a) <u>Condition 49, subpara 2, lines 2,3 and 4</u>  For : "within such period as may be notified by the Engineer-in-Charge, to the place of issue against written receipt from the Engineer-in-Charge."  Read: "to the place of issue as stipulated in Condition 10(B) here-in-before against written receipts from the Engineer-in-Charge."</p> <p>(b) <u>Condition 49, subpara 5, lines 3,4 and 5</u>  For : "before the completion of entire group, but for all purposes of the contract except for compensation for delay, the completion of the entire group shall be taken into account."  Read: "before the completion of the entire group. In such event, the grouping (phasing) of items as catered for in the contract shall be deemed to have been amended accordingly. "</p>

Amendment No	Page No	Particulars
<u>33</u> 1989	19	<p><u>(c) Condition 49 ,subpara 7</u> Existing contents shall be substituted as under :-            “On receipt of notice from the Contractor that the work has been completed, the G.E. shall within seven days certify to the Contractor the Date(s) on which the items or group of items of Works are completed and taken over and the state thereof or shall notify the details of incomplete items of work to the Contractor. In case of dispute between G.E. and the Contractor over completion of work, the decision of Accepting Officer or CWE in case of G.E.'s contract shall be final and binding.”</p>
<u>34</u> 1989	21	<p><u>(a) Condition 55</u> Existing contents shall be substituted as under :-            “<b>55. Termination of Contract for Death</b> ---Without prejudice to any of the rights or remedies under this contract, if the Contractor dies, the Accepting Officer shall have the option of terminating the Contract without compensation to the Contractor. If proprietor has nominated a person during his lifetime, the nominee will be allowed by the GE to complete the balance work. However if the nominee is not willing or in the opinion of Accepting Officer is not capable of completing the work as contracted for, he shall terminate the contract without any compensation to the nominee. The decision of the Accepting Officer whether the nominee is capable or not shall be final and binding. “</p>
<u>35</u> 1989	21 and 22	<p><u>(a) On page 2 ,against Sl 59 ,Blank ,add following in description</u>            “Determination of contract in the event of Force Majeure.”  <u>(b) On page 22 ,against Sl 59 ,Blank</u>            Insert new condition 59 in lieu of blank as under :  <b>59. Determination of contract in the event of Force Majeure</b> – The contract may be determined at the option of either party by giving 30 days notice in writing to the other party should any event of ‘Force Majeure’ continue to prevail for an uninterrupted period of six months and no progress of work is achieved owing to such circumstances during these six months. On receipt of notice from one party to other explaining circumstances of ‘Force Majeure’ the Garrison Engineer and contractor will carry out joint inspection of works and an inventory of completed, incomplete works and the materials collected for incorporation in the work shall be</p>



Amendment No	Page No	Particulars
<u>35</u> 1989	21 and 22	prepared for processing of final bill. The contractor shall have no claim to payment of any compensation on account of any profit or advantage which he may have derived from the execution of work in full but which he could not derive due to determination of contract on account of 'Force Majeure.'
<u>36</u> 1989		(a) <u>Condition 61, Last but one para, line 6</u> For : " Rs. 500/-" Read: " Rs. 5,000/-"
<u>37</u> 1989	24	(a) <u>Condition 64, subpara 1 and 2</u> Substitute existing contents with following :- "64. Advances on Account - The contractor may at intervals of not less than 30 days for contracts of value less than Rs.50 lakh and 15 days in case of contracts more than 50 lakhs submit claims on I.A.F.W.-2263 provided the payment due is not less than Rs.50,000/- and for Term Contracts, contractor may prefer not more than two claims for payment of advances on account of work done and of materials delivered in connection with Measurement and Lump Sum Contracts. However such claim for work done, which are required to be measured, shall be submitted only after recording joint measurements in the MES Measurement Book IAFW-2261." (b) <u>Condition 64, subpara 3, line 3</u> For : "Engineer-in-Charge:-" Read: "Garrison Engineer:-" (c) <u>Condition 64, subpara 8 and 9</u> Insert a new subpara between subpara 8 and 9 as follows:- " Provided further, the contractor may be paid advance on account to the full value of materials such as fittings and fixtures and other manufactured items as decided by the GE which do not lose their identity, brought on the site, on his furnishing Guarantee Bond(s) or Fixed Deposit Receipt (s) from a Scheduled Bank for the amount of retention money which should otherwise be recoverable from him under the contract. The Guarantee Bond and Fixed Deposit Receipt shall be executed and kept valid in a manner as described here-in-before."
<u>38</u> 1989	25	(a) <u>Condition 66, line 2</u> For : "the period being" Read: "the period to be" (b) <u>Condition 66, line 3</u>

Amendment No	Page No	Particulars
<u>38</u> 1989	25	For : "by the G.E." Read: "by the Engineer-in-Charge" (c) Condition 66(a) For : "Four months." Read: "Six months. "
.		(d) Condition 66(b) For : "Six months. " Read: "Nine months."
<u>39</u> 1989	27	Existing Condition 71 Jurisdiction of Courts shall be renumbered as Condition 72
<u>40</u> 1989	27	Add a new Condition 71 Conciliator as under :  <b>71. Conciliator</b> --- If a dispute (other than those for which the decision of the CWE or any person is by the contract expressed to be final and binding) of any kind whatsoever arises between the parties to the contract during the execution of the works, or after completion or after determination /cancellation/termination of the contract, including any disagreement by either party with any action, inaction, opinion, instruction, certificate or valuation by the Accepting Officer or his nominee, the matter in dispute shall, in the first place be referred to the Disputes Resolution Board (DRB) in case of contracts valuing Rs 10 crore or more and to conciliation, by a sole conciliator, in case of contracts valuing less than Rs 10 crore. In case of disagreement with the decision of such DRB or conciliator, any party may invoke arbitration clause. Procedure for the constitution/appointment of DRB / Conciliator shall be as laid down in the Contract Agreement.

Signature of Contractor

ForAccepting 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 14 Jul 94 forms part of these documents.

My/our signature hereunder accounts to my/our having read and understood the provisions contained therein and I/we shall abide by the same and that aforesaid documents forms part of this tender.

It is expressly mentioned here that although latest notification of labour wages as available with the Dept has been included in the tender, in case the Govt has further revised the wages, the latest revised wages shall be taken minimum wages in place of wages mentioned in above notification.

Note: "Schedule of Minimum Fair Wages" referred to above is available for reference in the office of Accepting Officer.

**Accepting Officer**

**Signature of Contractor**