

**SURAT MUNICIPAL CORPORATION
SOUTH EAST ZONE(LIMBAYAT)**



NAME OF WORK: Repairing and Maintenance work of School building In T.P.S. No. 19 (Parvat-Magob), T.P.S. No. 35 (Kumbhariya) and T.P.S. No. 64 (Dumbhal-Magob) in South East zone (Limbayat), Surat.

e-TENDER NOTICE NO. : Dy. Commissioner/SEZ/01/2026-27

Work No. 14

VOLUME-I : TECHNICAL BID

Downloading of Tender Documents including Addenda Corrigendum in any	:	From Dt. 25/06/2026 to 15/07/2026 upto 18.00 hrs.
On line Query Submission	:	N/A
Submission of Technical Bid https://smctender.nprocure.com BY SCANNING	:	EMD,Tender fee to be submitted online through. https://smctender.nprocure.com before Date 15/07/2026 upto 18.00 Hrs.
Online submission (Last Date)	:	On Or Before Dt. 15/07/2026 upto 18.00hrs.
Submission of Tender fee, EMD (Only Banker cheque/D.D.), in hard copy.	:	On or Before Dt. 23/07/2026 upto 18.00 hrs. in sealed envelop strictly by R.P.A.D./ Speed Post to Chief Accountant, SMC, Muglisara, Surat. 395003 Gujarat.
Opening of Technical Bid along with other documents submitted online through	:	On Dt. 16/07/2026, 16.00 Hrs.
Estimated Amount	:	RS. 37,51,760.63
E.M.D.	:	RS. 37,600.00
Document Fees	:	RS. 1,770.00
Class	:	"E-1" Class or Above

**TENDER TO BE SUBMITTED TO:
THE CHIEF ACCOUNTANT,
SURAT MUNICIPAL CORPORATION, MUGLISARA
SURAT – 395 003.**

SURAT MUNICIPAL CORPORATION

NAME OF WORK:- Repairing and Maintenance work of School building In T.P.S. No. 19 (Parvat-Magob), T.P.S. No. 35 (Kumbhariya) and T.P.S. No. 64 (Dumbhal-Magob) in South East zone (Limbayat), Surat.

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SURAT MUNICIPAL CORPORATION

1.0 NOTICE INVITING TENDER

(A) RECEIPT AND OPENING OF TENDER :

Online Tenders will be received from the established and reliable contractors on or before 18.00 hours on **25/06/2026 to 15/07/2026** on website smc.nprocure.com. The tender received after due time and date specified will not be accepted.

(B) NAME OF WORK:- **Repairing and Maintenance work of School building In T.P.S. No. 19 (Parvat-Magob), T.P.S. No. 35 (Kumbhariya) and T.P.S. No. 64 (Dumbhal-Magob) in South East zone (Limbayat), Surat.**

- 1) Estimated Cost : RS. 37,51,760.63**
- 2) Earnest Money Deposit : RS. 37,600.00**
- 3) Time Limit : 01 (One) Year Including Monsoon**
- 4) Document Fee : Rs. 1770.00**
- 5) Registration required : "E-1" Class or above**

- (1) " Following Documents shall be submitted in HARD COPY to Surat Municipal Corporation
- . All necessary documents mentioned in Technical bid (If any).
 - . Earnest Money Deposit as mentioned in the Tender.
 - . Tender Fees
 - . Addenda Corrigendum (if any) duly signed by Contractor

Technical Bid and Price Bid are not to be submitted in Physical Form, Please note that Non submission of Technical Bid as well as price bid does not absolve the bidders from any liability created from the bid condition and bidding process. Technical-Bid & Price Bid in Hard copy shall be submitted by Successful Bidders upon intimation from SMC."

(C) OPENING OF TENDERS :

The tenders will be opened online in presence of bidders and opening authority subject to receipt of **Tender Fees & EMD in hard copy** in account department (Main Office). But tenderer has to upload relevant documents as required /mentioned in the technical bid in **Soft Copy (By Scanning)** .The tenders will be opened in two stages i.e. Technical Bid and Commercial Bid.

(D) PURCHASE OF TENDER DOCUMENTS :

Tender Documents can be downloaded from smc.nprocure.com upto **Dt. 25/06/2026 to 15/07/2026 upto 18.00 hrs.** Tender documents fees of **Rs. 1770.00 (Rs. One thousand Seven hundred Seventy only)** per set which is required for submission of tender towards the cost of tender documents in cash, pay order or by demand draft of any nationalized bank, in favour of "The Commissioner, Surat Municipal Corporation" payable at Surat and shall be submitted along with EMD and other documents. The cost of the Tender Documents will not be refunded in any circumstances. The Surat Municipal Corporation shall not be liable for any postal delay in any case.

Demand draft for E.M.D & Tender Fee shall be submitted in electronic format only through online (by scanning) while uploading the bid. this submission shall mean that E.M.D and tender fee are received for purpose of opening the bid. Accordingly offer of those shall be opened whose E.M.D and tender fee is received electronically. However for the purpose of realization of D.D. bidder shall send the D.D. in original through RPAD/Speed post so as to reach to Account Department (Main office) within stipulated date as mentioned in tender notice for the submission of tender FEE & E.M.D.

- 1.1. Demand Draft for E.M.D. & Tender (Bid) fee shall be submitted in electronic format through online mode (by scanning) while uploading the bid. This submission shall mean that E.M.D. & tender fee are received for purpose of opening of the bid. Accordingly offer of those shall be opened whose E.M.D. & tender (bid) fee is received electronically. However, for the purpose of realization of D.D. bidder shall send the D.D. in original through RPAD / Speed post so as to reach to Chief Accountant, SMC within 7 days from the last date of online submission of the bid as per tender notice.**

Penaltative action will be taken for not submitting original Demand Draft in the account department of Surat Municipal Corporation within 7 days from the last date of online submission of the bid for the first time as mentioned below.

Sr. No.	Tender Amount	Penalty Amount in Rs.
1.	Up to Rs. 1 Crore	Rs. 10,000/-
2.	More than Rs. 1 Crore and Upto Rs. 10 Crore	Rs. 20,000/-
3.	More than Rs. 10 Crore and Upto Rs. 50 Crore	Rs. 30,000/-
4.	More than Rs. 50 Crore and Upto Rs. 100 Crore	Rs. 70,000/-
5.	More than Rs. 100 Crore	Rs. 1,00,000/-

If bidder will not submit the penalty amount within 10 days to Surat Municipal Corporation and/or bidder will not submit the demand draft in original for the second time and after, Penaltative action shall be taken for abeyance of registration and cancellation of E-tendering code for 6 (six) months.

Any documents in supporting of bid shall be in electronic format only through online (by scanning) & hard copy will not be accepted separately.

All documents must be colour scanned to be seen as original. scanning in black and white or grey shall not be acceptable.

All the documents must be notarised with clearly displaying stamp, number and name of the notary.

(E) CONTRACT PERIOD :

The total contract period is hereby fixed as **01 (One Year) Including Monsoon** from the **10th Day** of issuance of work order.

(F) Tenderer must comply with and agree to all instructions & requirements in the Notice and in the Instructions to Tenderers, including requirements in the Contract Documents.

(a) All tenders must be submitted in the prescribed Tender form.

(b) Each Tender must be accompanied by the completion Schedule.

(c) Each tender must be accompanied by the Tender Security (Earnest Money Deposit) **RS. 37,600.00** as specified in the **IT-07**.

(d) The successful tenderer shall execute the Contract Agreement within Ten days after the date of Notice of award.

(e) The successful Tenderer will be required to furnish a performance bond (Security Deposit) of and amount equal to (2 or 4%) Two or Four percent of the tendered amount. As per clause no. **IT-27**.

(f) The successful Tenderer shall furnish insurance in accordance with the contract documents.

(g) The Surat Municipal Corporation may withhold issuance of the Notice of proceed for a period not exceeding fifteen days after the date of execution of the contract agreement.

(h) The tender and tender guarantee bond (Earnest Money Deposit) shall be submitted by the Agency in whose name tender has been issued. Transfer of tender documents to any other party is prohibited.

(i) All intending tenderers will have to purchase digital signatures in order to participate in the online bidding process.

(j) All the applicant contractors are required to have their own employers code number under EPF Act, 1952 and are required to comply the applicable provisions of said statute regularly and totally.

Further the contractors for services are required to produce the certified copies of paid challans in respect of employees/workers employed by said contractor in respect of work allotted by Surat Municipal Corporation, along with copies of Pay Roll and Muster Roll. If the same are not produced, the bills will not be released.

(G) RECEIPT OF TENDER DOCUMENTS:

The following details are to be submitted online on smc.nprocure.com :

- a. Document fees and EMD Details
- b. Commercial Bid
- c. Statement A to B along with all necessary supporting documents
- d. Bank solvency
- e. Pan Card
- f. GST Registration
- g. Power of attorney
- h. Partnership deed in case of Partnership firm.
- i. Affidavit of Annexure A on Non Judicial Stamp Paper of Rs.300/-
- j. Anti-Blacklist Certificate on Non Judicial Stamp Paper of Rs.300/-

The following details shall be submitted in hard copy at prescribed address :

- a. Tender fees in prescribed format
- b. Earnest Money Deposit in prescribed format
- c. Affidavit of Annexure A on Non Judicial Stamp Paper of Rs.300/-
- d. Anti-Blacklist Certificate on Non Judicial Stamp Paper of Rs.300/-
- e. Other necessary documents mentioned in Technical Bid (if any)

Please note that commercial bid shall not be submitted in hard copy under any circumstances. This will hold the tender liable for rejection.

(H) Tender Validity Period :

The validity period of the tender submitted for this work shall be of one hundred twenty (120) calendar days from opening date of price bid of the work and the Tenderer shall not be allowed to withdraw or modify the tender offer on his own during the validity period.

(I) Rights Reserved :

Without assigning any reason, The Surat Municipal Corporation reserves the right to reject the LoSOUTH or any other or all tenders or part of its. To waive any informality or irregularity in any tender, which in the opinion of the Surat Municipal Corporation does not appear to be in its best interest and the tenderer shall have no cause of action or claim against the Surat Municipal Corporation or its officers, employee, successors or assignees for rejection of his tender.

The Surat Municipal Corporation further reserves the right to withhold issuance of the notice to proceed, after execution of the contract agreement by the successful Tenderer. The Surat Municipal Corporation is not obliged to give reasons for any such action.

During Tender validity period, if any Tenderer withdraws or makes any modifications or additions in the terms and conditions on his own in this tender, then The Surat Municipal Corporation shall without prejudice to any right or remedy be at liberty to reject the tender

and forfeit the Earnest Money Deposit in full. Such Tenderer may be disqualified from tendering for further works under the jurisdiction of The Surat Municipal Corporation.

The Surat Municipal Corporation reserves the right to increase or decrease the scope of work and split the tender in two or more parts without assigning any reason even after the award of contract.

EXECUTIVE ENGINEER
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION

SIGNATURE OF THE CONTRACTOR.

DATE:

NAME AND ADDRESS :-

2.0 INFORMATION TO TENDERER :

1. Tender validity period : 120 days (One hundred & Twenty days) from the opening of the date of opening of price bid of tender
2. Earnest Money Deposit : **Rs. 37,600.00**
3. Security Deposit : Two Percent (2%) of tendered Amount.
4. Retention Money : Two Percent (2%) of R.A.Bill(as SD)
+ Additional 5% of R.A.Bill
5. Time of Completion : For the complete contract 12 (Twelve) months
6. Period of liability for defects. : Twelve Months after completion of work.
7. Penalty for delay : Zero Point two percent (0.2%) of the contract price per day maximum upto ten percent of the contract price.
8. Last date of download of tender Date :- : **25/06/2026 to 15/07/2026 upto 18.00 hrs**
from <https://smctender.nprocure.com>
9. Last date of submission of online Tender : Date :- **15/07/2026 upto 18.00 hrs**
10. Last date of submission of Tender fees, EMD and other Documents in hard copy. : **On or Before Dt. 23/07/2026 upto 18:00 hrs**

EXECUTIVE ENGINEER
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION,

SIGNATURE OF THE CONTRACTOR.

DATE:

NAME AND ADDRESS :-

3.0 CHECK LIST

1. Tenderers to note last date and time of submission of Tender Fees, EMD and other documents and that they are to be posted by Registered Post A. D. / Speed Post only.
2. Tender (Technical Bids and Documents) should be duly sealed and the covering envelope is to be only superscribed as **Repairing and Maintenance work of School building In T.P.S. No. 19 (Parvat-Magob), T.P.S. No. 35 (Kumbhariya) and T.P.S. No. 64 (Dumbhal-Magob) in South East zone (Limbayat), Surat.**
3. Tender Security Bond for Earnest Money Deposit should be submitted as per Articles **IT-07** (Earnest Money Deposit).
4. Conditional tender will be rejected outright by the Surat Municipal Corporation, without giving any reason.
5. All information as demanded should be submitted.
6. Information regarding capability etc. as per clause No. **IT-04** (General Performance Data) should be submitted in hard copy along with tender fee and EMD.
7. Please verify before SEALING that Tender (Technical Bids and Documents) are signed, wherever required in each and every respect.

EXECUTIVE ENGINEER,
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION

SIGNATURE OF THE CONTRACTOR.

DATE:

NAME AND ADDRESS :-

4.0 GENERAL DETAILS OF WORK IN BRIEF :

1. NAME OF WORK :- **Repairing and Maintenance work of School building In T.P.S. No. 19 (Parvat-Magob), T.P.S. No. 35 (Kumbhariya) and T.P.S. No. 64 (Dumbhal-Magob) in South East zone (Limbayat), Surat.**
2. Estimated cost of the work : **RS. 37,51,760.63**
3. Amount of Earnest Money Deposit : **RS. 37,600.00**
4. Tender cover to be superscribed as :

NAME OF WORK :- **Repairing and Maintenance work of School building In T.P.S. No. 19 (Parvat-Magob), T.P.S. No. 35 (Kumbhariya) and T.P.S. No. 64 (Dumbhal-Magob) in South East zone (Limbayat), Surat.**

Tender Notice No. :- **Dy. Commissioner/SEZ/01/2026-27, work no. 14**

Name Of Department :- South East zone(Limbayat)

Name and Address of Tenderer.

EXECUTIVE ENGINEER
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION,

SIGNATURE OF THE CONTRACTOR.

DATE:-

NAME AND ADDRESS :-

INSTRUCTION TO TENDERERS

IT-01 GENERAL :

The Contract documents may be secured in accordance with the notice Inviting Tender for the work called. The work shall include supply of materials necessary for construction of the work.

IT-02 INVITATION TO TENDER:

The Surat Municipal Corporation hereinafter referred to as the Corporation will receive tenders for the **Repairing and Maintenance work of School building In T.P.S. No. 19 (Parvat-Magob), T.P.S. No. 35 (Kumbhariya) and T.P.S. No. 64 (Dumbhal-Magob) in South East zone (Limbayat), Surat** as per the specifications in the tender documents. The tenders shall be opened in presence of opening authority Surat in the presence of tenderers or their representatives who are present. The Corporation reserves the right to reject the lot or any other or all tenders or part of it which in the opinion of the Corporation does not appear to be in its best interest, and the tenderer shall have no cause of action or claim against the corporation or its officers, employees, successors or assignees for rejection of his tender.

IT-03 LANGUAGE OF TENDER :

Tenders shall be submitted in English, and all information in the tender shall also be in English, Information in any other language shall be accompanied by its translation in English. Failure to comply with this may make the tender liable to reject.

IT-04 QUALIFICATIONS OF TENDERERS :

- A. Tenderer shall be required to submit the enlisted documents in hard copy along with the Technical Bid, EMD and tender fees. **If documents are insufficient or it does not match the required criteria mentioned below, then the Price Bid of the tenderer shall not be opened.**

Mainly tenderer shall fulfill following for pre-qualification,

- (a) Solvency certificate from bankers of schedule bank / Nationalized bank for the 20% of Estimated cost of the tender. Tenderer has to submit higher Amount of bank solvency if so desired by Commissioner.
- (b) An attested copy of registration with MES, various department of State Government, Surat Municipal Corporation, CPWD etc.
- (c) List of the works already completed in last 7 years from **(01.04.2018 to 31.03.2025)** and attested copies of certificates from head of the office concerned for completion of the works.

Following enhancement factors will be used for the cost of works executed and financial figures to common base for the value of the works completed in India.

Financial Year	Multiplying factor
Immediate last year of assessment year *	1.10
Second	1.21
Third	1.33
Fourth	1.46
Fifth	1.61
Sixth	1.77
Seventh	1.95

Bidder should indicate actual figures of costs and amount for the work executed in Statement –A without accounting for the above mentioned factors.

- (d) List of work on hand.
- (e) Following Criteria should be fulfilled by tenderer.

- I. Average Annual financial turnover during the last 3 years, ending 31st March of the previous financial year, should be at least 30 % of the estimated cost. (certificate from C.A. shall be submitted)
- II. Experience of having successfully completed similar works during last 7 years ending last day of month previous to the one in which applications are invited should be either of the following :-
 - a. One similar completed works costing not less than the amount equal to 80 % of the estimated cost.
Or
 - b. Two similar completed works costing not less than the amount equal to 50 % of the estimated cost.
Or
 - c. Three similar completed works costing not less than the amount equal to 40 % of the estimated cost.
- III. Definition of "**Similar work**" means Maintenance and Repairing work of All types of Building work done for Govt. or Semi Govt. only.

In addition to above the criteria regarding satisfactory performance of works, personnel, establishment, plant, equipment etc. may be incorporated according to the requirement of the Project.

- IV
 - (a) Experience certificate issued from semi Govt. / govt. Organization only will be taken in to consideration.
 - (b) The work certificate of sub-contract shall not be considered for evaluation.
 - (c) Details of 7 years experience certificate shall be fill up completely in STATEMENT - A
 - (d) List of works on hand shall be fill up completely in STATEMENT - B
 - (e) List Of Tools
 - (f) Technical Establishment/Staff.
- V Application received from joint venture / consortium shall not be considered.
 - (a) Attested copy of partnership deed, power of attorney etc.
 - (b) Pastpost size photographs of partner / all partners on relevant page of Technical Bid.
 - (c) Tenderer shall submit only one tender for the work put to this tender.

VI . Tenderer shall submit the certificate of Employers code number under EPF Act.

IT-05 TENDER DOCUMENTS :

Printed and online documents and set of drawings shall comprehensively be referred to as Tender documents. The several sections forming the documents are the essential parts of the contract and a requirement occurring in one shall be binding as though occurring in all. They are to be taken as mutually explanatory and describe and provide for complete works.

IT-06 EXAMINATION BY TENDERERS :

- A. At his own expenses and prior to submitting his tender, each tenderer shall (a) examine the contract Documents, (b) visit the site and determine local conditions which may effect the work including the prevailing wages and other pertinent cost factors, (c) familiarize himself with all CENTRAL, State and local laws, ordinance, rules, regulations and codes affecting the material supply including the cost of permits and licenses required for the work and (d) correlate his observations, investigations, and determinations with the requirements of the Tender Documents.
- B. The tender quantity is approximate and may increase or decrease. Any increase or decrease in quantity will not entitle tenderer to claim any extra over the quoted rate.
- C. Tender Documents be completed by legible ink, checked in a responsible manner, signed, stamped and returned together with the Tender Security Bond by the stipulated date, which shall form the Tender.

The Tenderer is required to complete :

- (i) The form of tender, including the Appendices thereto Tender Security Bond and the Tender summary duly signed and stamped.

All the pages in which entries are required to be made by the tenderer are contained in the tender documents and the tenderer shall not take out or add to or amend the text of any of the documents except in so far as may be necessary to comply with any addenda issued pursuant to Clause IT-17 hereof.

IT-07 EARNEST MONEY DEPOSIT:

- A. The Tender shall be accompanied by of Earnest Money Deposit **Rs. 37,600.00** The tenderer shall pay 100% EMD amount in form of crossed Demand Draft or Payorder of Nationalised Bank payable at Surat issued in favour of "Commissioner, Surat Municipal Corporation, Surat" through Nationalised/Schedule Bank only or **as per City Engineer Note No.61, dtd. 16/05/2021** the tenderer can pay Tender Fees & EMD separately through online by NEFT/RTGS/IMPS as mentioned in Clause 1 (D) on page Number 8 of Technical bid Vol. I (Part-I). **The Earnest Money Deposit in the form of FDR or cheque shall not be accepted.** The tenderer shall have to mention details of Earnest Money Deposit on the seal cover of Earnest Money Deposit. The tender received without Earnest Money Deposit shall be out rightly rejected

The instruments for Earnest Money Depository shall be issued by or payable/encashable at Surat Branch of the said nationalized bank.

- (1) AXIS Bank
- (2) AU small finance bank
- (3) Bandhan bank
- (4) Barclays bank
- (5) City union bank
- (6) CSB Bank
- (7) DBS bank india limited
- (8) DCB Bank
- (9) Equitas small finance bank
- (10) ESAF small finance bank
- (11) FEDERAL bank
- (12) HDFC Bank
- (13) HSBC bank
- (14) ICICI bank
- (15) IDBI bank
- (16) IDFC First bank
- (17) Jammu and kashmir bank

- (18) Jana small finance bank
- (19) Karnataka bank
- (20) Karur vyasya bank
- (21) Kotak Mahindra Bank
- (22) South indian bank
- (23) Standard chartered bank
- (24) Tamilnad merchantile bank
- (25) Utkarsh small finance bank
- (26) YES bank
- (27) The Ahmedabad Mercantile Co-Operative Bank Ltd.
- (28) Nutan Nagarik Sahakari Bank Ltd.
- (29) Rajkot Nagarik Sahakari Bank Ltd.
- (30) Saraswat Co-operative bank Ltd.
- (31) SBPP Co-operative bank Ltd.
- (32) SVC Co-operative bank Ltd.
- (33) The Cosmos Co-operative bank Ltd.
- (34) The Gujarat state Co-operative bank
- (35) The Mehsana Urban Co-Operative Bank Ltd.
- (36) The Surat District Co-Operative Bank Ltd.
- (37) The Surat people's Co-Operative Bank Ltd.
- (38) The Kalupur Commercial Co-Operative Bank Ltd.
- (39) The Panchmahal District Co-Operative Bank
- (40) The Baroda District Co-Operative Bank
- (41) Baroda Gujarat Gramin Bank
- (42) Saurashtra Gramin Bank

- B. The Earnest Money Deposit (Tender guarantee) will be forfeited in the event, the successful tenderer fails to accept the contract and fails to submit the Performance Guarantee Bond to the owner as stipulated in this tender documents within ten days after receipt of notice of award of contract. In such case owner may disqualify the tenderer from tendering for further works, under the jurisdictions of the Corporation (S.M.C.)

C. The Earnest Money Deposit of the successful tender shall be returned after the performance guarantee bond, as required, if furnished by the contractor.

D. No interest shall be paid by the owner on any tender guarantee.

IT-08 INCOME TAX CLEARANCE CERTIFICATE :

In view of the latest circular of IT Department IT clearance certificate is not required. However the contractor shall give Xerox copy of the PAN card.

IT-09 PREPARATION OF TENDER DOCUMENTS :

Tenderers are requested to note the following while preparing the Tender Documents:

A. Technical bid, EMD and Tender fees shall be submitted on the Tender Form bound herein in English. All tender items and statements shall be properly filled in. Numbers shall be stated both in words and in figures where so indicated, and signatures of all persons signing shall be in long hand.

B. Technical Bid shall be accompanied by the prescribed tender security bond and other required documents and drawings. All witnesses and sureties shall be persons of status and probity and their full names, occupations and address shall be stated below their signatures. All signatures in the Tender Documents shall be dated.

C. Variations to the Contract Documents requested by the tenderer may be affixed to the Tender Document in the space available and duly signed and stamped. Such variations may be approved or refused by the Engineer at the time of adjudications of Tenders, and in either case the Engineer is not obliged to give reasons for his decisions.

D. Delivery of Tenders shall comply with Notice inviting tenders as to place, date and time.

E. Price Bid shall be submitted online. Tenderers are requested to quote for all four parts of the tender.

" Demand Draft for E.M.D. & Tender fee shall be submitted in electronic format only through online (by scanning) while uploading the bid. This submission shall mean that E.M.D. & tender fee are received for purpose of opening the bid. Accordingly offer of those shall be opened whose E.M.D. & Tender fee is received electronically. However for the purpose of realization of D.D. bidder shall send the D.D. in original through RPAD/ Speed Post so as to reach to Account Department (Main Office) within given timelimit from the last date of uploading. ~~Penaltative action for not submitting D.D. in original to Account Department (Main Office) by bidder shall be initiated and action shall be taken for abeyance of registration and cancellation of E tendering code for One year.~~ Any documents in supporting of bid shall be in electronic format only through online (by scanning) & hard copy will be not be accepted separately. "

IT 10 SUBMISSION OF TENDERER DOCUMENT :-

1. Following documents shall be submitted in HARD COPY TO Surat Municipal Corporation:
non submission of Technical Bid as well as price bid does not absolve the bidders from any liability created from the bid condition and bidding process. Technical-Bid and Price Bid in hard copy shall be submitted by Successful bidder upon intimation from Surat Municipal Corporation.

1. As per Commissioner Note No.C.N.129, dtd. 9/9/2016

- E.M.D & Tender Fee shall be submitted in electronic format only through online(by scanning) while uploading the bid. This submission shall mean that E.M.D and tender fee are received for purpose of opening the bid. Accordingly, offer/tenders of those tenderers whose E.M.D & tender fee is received electronically, shall be opened. However, for the purpose of realization of EMD and Tender fee, bidder shall send the EMD as well as Tender fee in required format in original through RPAD/Speed post so as to reach to Account Department (Main office) within stipulated date as mentioned in tender notice for the submission of tender FEE & E.M.D. ~~Punitive action shall be initiated for non submission of EMD & Tender fees in original to Account Department~~

~~(Main Office) by bidder including abeyance of registration and cancellation of E – tendering code for one year.~~ all documents in supporting of bid shall be in electronic format only through online (by Scanning) during the bidding period & hard copy will not be accepted separately.

- All documents must be colored scanned to be seen as original. Scanning in black and white or gray shall not be acceptable.
- All the documents must be notarized with clearly displaying stamp, number and name of the notary.

"Following Documents shall only be submitted in HARD COPY to Surat Municipal Corporation by all bidders."

- Earnest Money Deposit as mentioned in the Tender.
- Tender Fees as mentioned in the tender
- Affidavit of Annexure A on Non Judicial Stamp Paper of Rs.300/-
- Anti-Blacklist Certificate on Non Judicial Stamp Paper of Rs.300/-
- Other necessary documents mentioned in Technical Bid (if any)

All necessary documents mentioned in Technical bid (if any). shall be submitted online.

(i) COVER-1 : Technical Bid

Affidavit, E.M.D and Tender Fees for the work of **Repairing and Maintanance work of School building In T.P.S. No. 19 (Parvat-Magob), T.P.S. No. 35 (Kumbhariya) and T.P.S. No. 64 (Dumbhal-Magob) in South East zone (Limbayat), Surat** along with other Documents in Hard Copy during **On Or Before Dt. 23/07/2026 up to 18.00** hrs. Also mention the name of tenderer, address, tender notice number etc. on the cover.

(ii) PRICE BID

Price bid for the work of **Repairing and Maintanance work of School building In T.P.S. No. 19 (Parvat-Magob), T.P.S. No. 35 (Kumbhariya) and T.P.S. No. 64 (Dumbhal-Magob) in South East zone (Limbayat), Surat** shall be submitted online.

The name of work to be written on cover shall be work of **Repairing and Maintanance work of School building In T.P.S. No. 19 (Parvat-Magob), T.P.S. No. 35 (Kumbhariya) and T.P.S. No. 64 (Dumbhal-Magob) in South East zone (Limbayat), Surat**. Also mention the name and the address of tenderer, tender notice number on the cover and to be submitted to the **Chief Accountant, Surat Municipal Corporation, Muglisara, Surat – 395 003.**

2. Tenderer shall be required to submit the enlisted documents as mentioned below in Cover-1. If necessary document founds insufficient then the Price Bid of the tenderer shall not be opened.

- (a) The tender shall be accompanied by Earnest Money Deposit **of Rs. 37,600.00** The tenderer will pay Earnest Money Deposit by Pay Order/Demand Draft issued in favour of "Commissioner, Surat Municipal Corporation, Surat" by Nationalized Bank. In the form of Demand Draft and Bank Guarantee.
- (b) A covering letter detailing various considerations considered in tender shall invariably be given.
- (c) Passport size photographs of all the partners (incase of partnership did) to be fixed on relevant Page of the tender documents.

- 3.
- (a) List of tools, plants and equipments with tenderer in detail.
 - (b) Technical establishment/staff of the tenderer in required Performa with their names, qualifications and experience.
 - (c) Tenderer shall furnish along with the tender, information regarding Income tax circle of the district in which he is assessed for income tax with PAN No.

4. Submission of a tender by a tenderer shall mean that he has read this notice and contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and nature of required quantities of materials stores, tools and plants etc. that may be required by him in carrying out the work and of local conditions and laws and bylaws of the Government, Surat Municipal Corporation and other factors bearing influence on the execution and cost of the works.
5. E.M.D., Tender Fee and other necessary document in hard copy shall be received by Registered Post A.D. or by Speed Post through Postal Authority only by the "Chief Accountant, Surat Municipal Corporation, Muglisara, Surat-395003 on during **Dt. On Or Before Dt. 23/07/2026 up to 18.00 hrs.** Opening of Technical Bid along with other Documents submitted online through on **Dt. 16/07/2025, 16.00 hrs. (Technical Bid) onwards (Probable)** in the presence of the tenderers, who shall remain present in the office of "Tender opening officer, Surat Municipal Corporation, Surat. Late tenders (i.e. tenders received after the specified time of opening), delayed tender (i.e. tenders received before the time of opening but after due date and the time of receipt of tender) shall not be considered at all. Tenders received by Registered Post A.D./ Speed Post after the time and the date specified in the tender notice shall not be received by the client from the postman. Such tenders if received will not be opened and will stand rejected.
6. Tender shall stand rejected if:
 1. Any eraser is made in the tender unauthenticated or any page or pages is/are removed or replaced.
 2. The tenderer shall submit the tender which satisfied each and every conditions laid down in the notice tender documents, failing which the tender will be liable for rejection.
 3. Tenderer's tender/quotation containing conditions shall be liable for rejection out rightly without assigning any reason for the same.
 4. Stipulates the validity period less than what is stated in the form or tender.
 5. Stipulates his own conditions.
 6. Does not quote his rates inclusive of Octroi duty and other terminal or sales tax or CENTRAL taxes in his rates.
 7. Does not disclose the full names and address of all his partners in the case of partnership firm.
 8. Does not pay the Earnest Money Deposit by Demand Draft/Pay order and Tender Fees with Technical Bid (Cover-1).
 9. Does not submit the tender before the stipulated time and specified date in the Account Office as directed.
 10. Does not attached the document mentioned.
 11. The tenderer proposes any alteration in the work specified in the tender or in the time limit allowed for carrying out the work or any other condition.
7. All corrections, additions or posted slips to be initialed by the tenderer.
8. All page of tender documents including specifications should be initialed by the contractor.
9. The tenderer shall submit the tender which satisfies each and every conditions laid down in this notice and tender documents failing which the tender is liable for rejection.
10. Notice of inviting tenders shall be a part of the contract documents.
11. Acceptance of tenderer/quotation will rest with the competent authority of Surat Municipal Corporation who does not bind himself to accept the lowest and reserves the right to accept or to reject any or all quotations/tenders and no reasons will be given for acceptance or rejection thereof.
12. The contractor shall also attach list of machineries, tools, plants, equipments which he propose to deploy for this work.
13. All octroi duty and other taxes chargeable by the Municipal Corporation shall be payable by the Contractor.
14. Tender once accepted shall be binding on the contractor even if the formal agreement is not signed.

15. Tender once offered can not be withdrawn except with the permission of head of the concerned department, Surat Municipal Corporation, Surat.
16. The successful tenderer shall be required to enter in to agreement with Municipal Corporation after placing the work order for the said work from SMC.
17. The successful tenderer may be required to furnish surety of 20% of the contract value on stamp paper if so desired by the Municipal Commissioner.
18. The tenderers are requested to give complete specification of work quoted.
19. Unless specifically mentioned by the tenderer for the extra payment of taxes on price quoted by them it will be presumed the prices quoted are inclusive of the all taxes and no claim will be entertained for payment of extra taxes on the bills submitted by them.
20. The Price-bid will be opened only after technical clarifications are clarified.
21. Surat Municipal Corporation reserves the right to open or not to open any or all Price-bid without assigning any reason thereof.

IT-11 TENDER VALIDITY PERIOD :

The validity period of the tender submitted for this work shall be of one hundred twenty (120) Calendar day from the date of opening of price bid and that the tenderer shall not be allowed to withdraw or modify the tender offer on his own during the validity period. The tenderer will not be allowed to withdraw the tender or make any modifications or additions in the terms and conditions of his own in his tender. If this is done then the owner shall, without prejudice to any right or remedy, be at liberty to reject the tender and forfeit the Earnest Money Deposit in full.

IT-12 SIGNING OF TENDER DOCUMENTS :

If the Tender is made by an individual it shall be signed with his full name above his current address. If he tender is made by a Proprietary firm it shall be signed by the proprietor above his name and the name of his firm with his current address.

If the tender is made by a firm in partnership it shall be signed by all the partners of the firm above their full names and current addresses, or by a partner holding the power of attorney for the firm signing the Tender in which case a certified copy of the power of attorney shall accompany the Tender. A certified copy of the partnership deed, current addresses of all the partners of the firm shall also accompany the tender.

If the tender is made by a limited company or a limited Corporation, it shall be by a duly authorised person holding the power of attorney for signing the Tender in which case a certified copy of the power of attorney shall accompany the Tender. Such limited company or Corporation may be required to furnished satisfactory evidence of its existence before the contract is award.

All witnesses and sureties shall be persons of status and probity and their full names, occupations and addresses shall be stated below their signatures. All signatures in the Tender document shall be dated.

IT-13 WITHDRAWAL OF TENDERS :

If, during the Tender validity period, the Tenderer withdraws his Tender, the Tender Security (Earnest Money) shall be forfeited and the Tenderer may be disqualified from tendering for further works under the jurisdiction of SURAT MUNICIPAL CORPORATION.

IT-14 INTERPRETATIONS OF TENDER DOCUMENT :

Tenderers shall carefully examine the tender documents and fully inform themselves as to all the conditions and matters which may in any way effect the work or the cost thereof. Should a tenderer find discrepancies or omission from the specifications or other documents, or should be in doubt as to their meaning, he should at once address query to the Divisional Head provided for concerned authority as referred in the Tender Document in Clause GC-01 (Definitions and interpretations) of the (General Condition of Contract). Any resulting interpretation of the Tender documents will be issued to all Tenderers as an addenda corrigendum. Verbal clarification and / or

information given by the SMC / Consulting Engineer shall not be binding on the Municipal Corporation.

IT-15 ERRORS AND DISCREPANCIES IN TENDERS :

In case of conflict between the figures and words in the rates, the rates expressed in words shall prevail and apply in such cases.

IT-16 MODIFICATION OF DOCUMENTS :

Modification of specifications and extension of the closing date of the tender, if required, will be made by an addendum. Copies of each addendum will be sent to all tenderers. These shall be Signed and shall form a part of tender. The tenderer shall not add to or amend the text of any of the documents except in so far as may be necessary to comply with any addenda.

IT-17 ADDENDA

Addenda form part of the contract documents & full consideration shall be given to all addenda in the preparation of tenders. Tenderers shall verify the number of addenda issued, if, any and acknowledge the receipt of all Addenda in the Tender. Failure to acknowledge may cause the Tender to be rejected.

- A. The Engineer of the owner may issue Addenda to advise Tenderers of changed requirements. Such addenda may modify previously issued Addenda.
- B. No Addendum may be issued after the time stated in Notice Inviting Tenders.

IT-18 TAXES AND DUTIES ON MATERIAL :

GST(goods and service tax) has come in existence from 1st July 2017 contractor / successful bidder is bound to pay any amount of GST prescribed by the Govt. of India as per the term of contract agreed upon during the course of execution of this contract.

During the course of execution of contract, if there is any change in rate of GST (Goods & Service Tax) by the Government, The same shall be reimbursed / recovered separately by SMC. Subject to the submission of original Receipt / Proof for the amounts actually remitted by the successful Tenderer / contractor to the competent Authority along with a Certificate from Chartered Accountant of Contractor / Successful Bidder certifying that the amount of GST paid to the Government and the same shall be intimated / submitted / claimed within 30 (Thirty) Days from the date of payment Remittance of GST within stipulated period shall be the sole responsibility of the successful Bidder / Contractor, Failing which, SMC may recover the amount due, From any other payable dues with SMC and decision of Municipal Commissioner shall be final and binding on the Contractor / Successful Bidder in this regard further, the non-payment of GST to the Government may lead to the termination of contract and forfeiture of Security deposit / Performance Guarantee Amount.

If imposition of any other new Taxes / Duties / Levies / Cess or any other incidentals etc. or any increase in the existing Taxes / Duties / Levies / cess or any other incidentals etc. (Excluding GST) are imposed during the course of the contract. The same shall be borne by the Contractor / Successful Bidder only. In no case SMC shall be liable for the same.

1% Construction Cess will be deducted from respective R.A. Bill and Final bill in accordance with the prevailing norms of Govt. of Gujarat.

IT-19 EVALUATION OF TENDERS :

As per IT (04), Experience of the Contractor shall be considered for Similar kind of works.

IT-20 EVALUATION OF TIME REQUIRED FOR COMPLETION :

The time required for completion of work shall be considered as indicated by the tenderer in the completion schedule attached with the tender. The completion period mentioned in this schedule is to be reckoned from 15th day from the date of work order to proceed. Total completion

period is calendar months from 15th day from date of issue of work order and tenderers should adhere to this delivery time.

IT-21 POLICY FOR TENDER UNDER CONSIDERATION :

Tenders shall be termed to be under consideration from the opening of the tender until such time an official announcement of award is made.

While tenders are under consideration, tenderers and their representative or other interested parties are advised to refrain from connecting by any means Municipal Corporation or representatives on matters related to the tenders under study. The Engineer's representative if necessary will obtain clarification on tenders by requesting information from any or all the tenderers either in writing or through personal contact, as may be necessary. The tenderers will not be permitted to change the substance of his tender after price submission. Non-compliance with this provision shall make the tender liable for rejection.

IT-22 PRICES AND PAYMENTS :

The tenderer must understand clearly that the price quoted are for the total works or the part of the total works quoted for and include all costs due to materials labour, equipment, supervisions, other services, royalties and Octroi etc. and to include all extras to cover the cost. No claim for additional payment beyond the prices quoted will be entertained and the tenderer will not be entitled subsequently to make any claim on any ground excepting for the condition laid down in GC-35 (Price Adjustment).

IT-23 PAYMENT TERMS :

The terms of payment are defined in the General Conditions of Contract. The Municipal Corporation shall not under any circumstances relax, their terms of payment and will not consider any alternative payment terms. Tenderers should therefore in their own interest note this provision to avoid rejection of their tenders.

IT-24 AWARD :

Award of the Contract or the rejection of tenders will be made during the Tender validity period stated in the Notice Inviting Tenders.

- A. After all contract contingencies are satisfied and the Notice of Award is issued, the successful Tenderer shall execute the Contract Agreement within the time stated in the Notice Inviting Tenders and shall furnish the Bond as required herein. The Contract Agreement shall be executed in the form stipulated by the owner. A copy of the required form is included in the contract documents.
- B. If the Tenderer receiving the Notice of Award fails or refuses to execute the Contract Agreement within the stated time limit or fails or refuses to furnish the Bond as required herein, the SMC may annul his award and declare the tender security forfeited.
- C. A Corporation, Partnership firm or other consortium acting as the Tenderer and receiving the Award shall furnish evidence of its existence and evidence that the officer signing the Contract Agreement & Bonds for the Corporation, partnership firm or other consortium acting as the Tenderer is duly authorised to do so.

IT-25 SIGNING OF CONTRACT :

The successful tender shall be required to pay the security deposit and to execute the contract within 10 days of receipt of intimation to execute the contract, failing which the Municipal Corporation will be entitled to annul the award and forfeit the Earnest Money Deposit. The person to sign the contract document shall be person detailed in Article IT-12.

IT-26 DISQUALIFICATION :

A tender shall be disqualified and will not be taken for consideration if :-

- (a) The outer envelope does not show on the outside the reference of bid and thus get opened before the due date of opening (as per Article IT-10 i.e. Submission of Tender Document).
- (b) The tender Security Deposit is not deposited in full and in the manner i.e. Earnest Money Deposit.
- (c) The tender is in a language other than English or does not contain its English Translation in case of other language adopted for tender preparation.
- (d) The tender documents are not signed by an authorised person.
- (e) The general performance data for qualification not submitted fully.
- (f) The tenderer does not agree to deposit security amount as specified (as per Article IT-25 i.e. Signing of Contract).
- (g) The tenderer does not agree to payment terms defined as per Article IT-23 i.e. Payment Terms.)
- (h) Conditional tender.
- A. Tenderer may further be disqualified if :
 - (a) Price variation is proposed by the Tenderer on any principles other than provided in the Tender Documents.
 - (b) Completion schedule offered is not consistent with the completion schedule defined and specified in tender documents.
 - (c) The validity of tender is less than that mentioned in Article IT-11 i. e. Tender Validity Period.
 - (d) Any of the page or pages of tender is/are removed or replaced.
 - (e) All corrections or pasted slips are not initialed by tenderer.
 - (f) Any erasure is made in the tender.

IT-27 PERFORMANCE GUARANTEE (SECURITY DEPOSIT) :

The total Security Deposit is 4% (Four) percent of contract value and shall be as under:

The successful tenderer shall have to pay initial security deposit at 2% (two) percent of the tendered amount.

- Initial Security Deposit (2%) shall be paid in form of Cash or Demand Draft/ Pay Order if the Tender Amount of work is **less than Rs. 2.00 crore.**
- Initial Security Deposit (2%) shall be paid in form of Cash or Demand Draft/ Pay Order / bank Guarantee (encashable at Surat city)/ FDR if the tender Amount of work is **more than Rs. 2.00 crore & 2.00 crore.**

The person/persons whose tender may be accepted [here-in after called the Contractor, which expression shall unless excluded by or repugnant to the context include his heirs, executors, administrators and assignees shall (within 15 days of the receipt by him of the notification of the acceptance of his tender) deposit with Municipal Commissioner cash or Government securities endorsed to the Commissioner sum sufficient which will make up the full security deposit specified in the tender.

If the amount of the security deposit to be paid in lump sum within the period specified above is not paid the tender contract already accepted shall be considered as cancelled. The security deposit lodged by Contractor shall be refunded after the expiry of the Defects Liability period as shown in the attached Memorandum after deducting dues, if any, which become liable to be recovered from the Contractor under the terms and conditions of this Agreement.

Regarding remittance and release of Security Deposit (SD), Retention money deposit (RMD) following clause will supersede over and above all the clauses depicted in the tender document.

Tender costing Less than Rs.2.00 Crore.

- (a) Remittance of SD/RMD**

- (i) The total security deposit shall be recovered at the rate of 4% from contractor. Out of which, 50% of amount as Initial Security Deposit shall be payable at the rate of 2% of approved tender cost in form of Cash or Demand Draft/ Pay Order of any Nationalised Bank (encashable at Surat city).
 - (ii) The remaining amount of the Security Deposit i.e. 2% to be deducted from each running account bill.
 - (iii) 5% Retention money deposit (RMD) to be retained from each running account bill.
- (b) Release of SD/RMD**
- (i) The 2% Initial security deposit **in form of Cash or Demand Draft/ Pay Order** shall be released after clearance of Final bill by Audit Dept and completion of defect liability period.
 - (ii) Whereas, the 2% security deposit recovered from the each running account bills Shall be released along with Final Bills according to Work Quality..
 - (iii) 5% Retention money deposit (RMD) to be released along with final bill.

Tender costing Rs.2.00 Crore. & more than Rs.2.00 Crore.

- (a) Remittance of SD/RMD**
- (i) The total security deposit shall be recovered at the rate of 4% from contractor. Out of which, 50% of amount as Initial Security Deposit shall be payable at the rate of 2% of approved tender cost in form of in Cash or Demand Draft/ Pay Order / FDR / Bank Guarantee of any Nationalised Bank (encashable at Surat city).
 - (ii) The remaining amount of the Security Deposit i.e. 2% to be deducted from each running account bill.
 - (iii) 5% Retention money deposit (RMD) to be retained from each running account bill.
- (b 1) Release of SD/RMD**
- (i)The 2% Initial security deposit **in form Demand Draft /Pay order / FDR** shall be released after clearance of Final bill by Audit Dept & completion of defect liability period.
 - (ii) Whereas, the 2% security deposit recovered from the each running account bills Shall be released along with Final Bills according to Work Quality.
 - (iii) 5% Retention money deposit (RMD) to be released along with final bill.
- (b 2) Release of SD/RMD**
- (i)The 2% Initial security deposit **in form Bank Guarantee** shall be released along with Final Bills according to Work Quality.
 - (ii) Whereas, the 2% security deposit recovered from the each running account bills Shall be released after clearance of Final bill by Audit Dept & completion of defect liability period.
 - (iii) 5% Retention money deposit (RMD) to be released along with final bill.

The amount recovered from the running bills as security deposit shall not be allowed to be transferred in the form of Bank Guarantee. However, the remaining 50% (2% of Security Deposit) of the amount so, deducted from running bills will be allowed for conversion in the form of interest bearing fixed deposit receipt, (FDR) issued in favour of the Municipal Commissioner, Surat Municipal Corporation, Surat by a Nationalized Bank located at Surat only. Additional stamp duty payable as per government prevailing rule shall be paid by contractor for remittance of this FDR.

It is clarified that the amount of security deposit shall be collected on the basis of contract price and not on the basis of Estimated Amount put to tender. As initial Security Deposit as mentioned above, accepted by the competent Authority shall have to be paid toward Security Deposit at the time of execution of agreement.

Interest will be payable on FDR (that is deducted from Running Bill and converted in to FDR for initial SD) for One year, after completion of work. After that no further interest shall be paid for any extended period what so ever.

If the Security Deposit is not paid within 15 days from the date of L.O.I. / Work Order than penalty at the rate of 0.065% per day of the amount of Security Deposit will charged. If the Security Deposit is not paid within one month with interest, necessary actions as per condition of contract will be taken.

Initial Security Deposit (i.e. 2% Of Tender Amount) in form of Bank Guarantee may be accepted as per relevant tender provision, However BG shall be valid till final date of completion of work+1year (Whether final bill is audited and paid or not). It shall be contractor's responsibility to extent the BG On Or Before expiry of time limit of BG. In case of late renewal of BG, penalty of security deposit shall be levied at the rate of 0.065% of per day of BG amount.

The successful tenderer shall have to enter into an agreement on a non-judicial stamp paper of Rs. 300/- if initial Security Deposite paid in form Bank Guarantee or Demand draft as per the form of the agreement approved by the Municipal Corporation, Surat.

If initial Security deposit is paid in form of Fixed Deposit, additional stamp paper amounting As per government's prevailing rule of Security Deposit shall be used to execute the agreement.

The undertaking shall be executed on stamp paper worth Rs. 300/-.

The Surety shall be executed on stamp paper worth Rs. 300/-.

IT-28 STAMP DUTY :

The successful tenderer shall have to enter into an agreement on a non-judicial stamp paper of Rs.4.90% of S.D. Amount, if S.D. Amount in FDR and otherwise as per the form of the agreement approved by the Municipal Corporation, Surat.

The agreement shall be executed on stamp paper worth Rs.4.90% of S.D. Amount.

The Undertaking and Surety shall be executed on stamp paper worth **Rs.300/- + Rs.300/-**.

Specific references in the specifications to any materials by tender's name, or catalogue number shall be construed as establishing a standard or quality and performance and not as limiting competition and the tenderer in such cases, may at their option freely use any other product, provided that it ensures and equal or higher quality than the standard mentioned and meets Municipal Corporation approval

IT-29 BRAND NAMES :

Specific references in the specifications to any materials by tender's name, or catalogue number shall be construed as establishing a standard or quality and performance and not as limiting competition and the tenderer in such cases, may at their option freely use any other product, provided that it ensures and equal or higher quality than the standard mentioned and meets Municipal Corporation approval.

IT-30 NON-TRANSFERABLE :

Tender documents are not transferable.

IT-31 COST OF TENDERING :

The owner will not defray expenses incurred by Tenderers in tendering.

IT-32 DEFECT OF TENDER :

The Tender for the work shall remain open for a period of 120 calendar days from the date of receipt of the tenders for this work and that the tenderer shall not be allowed to withdraw or modify the offer on his own during the period. If any tenderer withdraws or makes any modifications or additions in the terms and conditions on his own, then the Municipal Corporation, shall without prejudice to any right or remedy, be at liberty to reject the tender and forfeit the earnest money in full.

IT-33 CHANGE IN A QUANTITY :

The Surat Municipal Corporation reserves the right to waive any informality in any tender and to reject one or all tenders without assigning any reasons for such rejections and also to vary quantities of items or group as specified in the Schedule of price as may be necessary. Claim what so ever by the contractor on the basis of variation of quantities shall not be entertained.

IT-34 NEW EQUIPMENT AND MATERIAL :

All materials, equipment and spare parts thereof shall be new, unused and originally coming from manufacturer's plant to the Corporation. The rebuilt or overhauled equipment/materials will not be allowed to be used on work.

IT-35 RIGHTS RESERVED :

The SMC reserves the right to reject any or all tenders, to waive any informality or irregularity in any tender without assigning any reasons. The SMC further reserves the right to withhold issuance of the notice to proceed, after execution of the contract agreement, for the period of time stated in the notice inviting tenders and no additional payment will be made to the successful tenderer on account of such withholding. The SMC is not obliged to give reasons for any such action.

IT-36 RIGHTS TO REDUCED THE SCOPE OF WORK:

Municipal Commissioner reserves the right to reduce the scope of work and split the tender in two or more parts without assigning any reason even after the award of contract.

IT-37 MOBILIZATION ADVANCE :

No mobilization advance or advance on machinery will be given.

IT-38 CONDITIONAL TENDER

The scope of work is clearly mentioned in the tender documents. The contractor shall have to carry out the work in accordance with the details specifications. No conditions will be accepted. The conditional tender will be liable to be rejected.

IT-39 The surplus excavated earth, after backfilling the trenches shall have to be removed from the site as directed. After compaction and consolidation, if any short fall of earth is found then contractor has to bring the same to the required quantity in order to meet shortfall at his own cost. Moreover, if any settlement of road after reinstatement is observed during the defect liability period of the work. Contractor shall be fully responsible for the defective work and patches/ depression / settlement shall be repaired with quarry spoil or metal at contractor's own cost. If contractor fails to repair the patches / depression / settlement in time, corporation will repair it at all risk and cost of contractor.

Surplus earth shall not be disposed off in a way that leads to nuisance to the public or SMC.

IT-40 ROYALTIES:

Tenderer/Supplier shall have to pay, and furnish all receipts of materials to The Engineer-in-charge, whenever required.

IT-41 INSURANCE:

The successful Tenderer shall furnish insurance in accordance with clause No. GC-83 of the Conditions of Contract.

IT-42 TESTING OF CEMENT AND STEEL:

It should be specifically noted that the cement and steel brought by the contractor at site of work shall be used only after the same is tested at the approved laboratory as per the direction of the Engineer-in-charge. Such approved laboratory may be located at Surat, Baroda, and Ahmedabad or Mumbai.

All the charge for the transport and testing of the samples shall have to be borne by the contractor. The frequency of testing such material shall be in accordance to the relevant Indian Standards as directed by Engineer - in- charge.

EXECUTIVE ENGINEER,
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION ,

SIGNATURE OF THE CONTRACTOR.

GENERAL CONDITION OF CONTRACT

SECTION-I

GC-01 DEFINITIONS AND INTERPRETATIONS :

1.0 In the contract documents, as herein defined the following words and expression used shall, unless, repugnant to the subject or context thereof, have the following meanings assigned to them.

1.1 The "Owner/Municipal Corporation, Surat represented by Municipal Commissioner/Add.City Engineer, any officer authorised by the Municipal Corporation.

1.2 The "Contractor" shall mean the person or the persons, firm of company whose tender has been accepted by the owner and includes his legal representative successors and permitted assigns.

1.3 The "Engineer-in-charge" shall mean the person designated as such by the owner from time to time and shall include those who are expressly authorised by the Municipal Corporation to act for and on its behalf for the operation of this contract.

1.4 "Engineer - in - charge's Representative" shall mean any Engineer or Assist. to the Engineer-in-charge designated from time to time by the Engineer-in-charge to perform duties set forth in the Tender documents whose authority shall be notified in writing to the Contractor by the Engineer-in-charge.

1.5 "Tender" The offer or proposal of the Tenderer submitted in the prescribed form setting forth the prices for the work to be performed, and the details thereof.

1.6 "Contract Price shall mean total money payable to the Contractor under the contract documents.

1.7 "Addenda" shall mean the written or graphic notices prior to submission of tender which modify or interpret the contract documents.

1.8 "Contract Time" - The number of consecutive calendar months for the completion of work as stated in the executed contract agreement.

1.9 "Contract" shall mean agreements between the parties for the execution of works including therein all contract documents.

1.10 "Tender document" shall mean Designs, Drawings, specifications, agreed variations, if any, and such other documents constituting the tender and acceptance thereof.

1.11 "The Sub-Contractor" means any person, firm or company (other than the contractor) to whom any part of the work has been entrusted by the Contractor with the written consent of the Engineer-in-charge and the legal personnel representative, successors and permitted assigns of such person, firm or company.

1.12 "The Specifications" shall mean all directions' the various technical specifications provisions and requirements attached to the contract which pertain to the method and manner of performing the work to the quality of the work and the materials to be furnished under the contract for the work and any order(s) or instruction (a) there under. It shall also mean the latest Indian Standards Institution Specifications for or relative to the particular work or part thereof, so far as they are not contrary to the Tender specifications or I.S.I. specifications, and in absence of any tender specifications, the specifications of any other country applied in India as a matter of Standard Engineering practice and approved in writing by the Engineer-in-charge with or without modifications.

1.13 The "Drawing" shall include maps, plans, tracings or prints thereof with any modifications approved in writing by the Engineer-in-charge and such other drawings, as may, from time to time, be furnished or approved in writing by the Engineer-in-charge in connection with the work.

1.14 The "Work" shall mean the works to be executed in accordance with the context or the part thereof as the case may be and shall include extra, additional altered or substituted works as required for the purpose of the Contract. It shall mean the totally of the work by expression or implication envisaged in the contract and shall include all material, equipment and labour required for or relative or incidental to or in connection with the commencement, performance and completion of any work and/or for incorporation in the work.

- 1.15 The "Permanent work" means works which will be incorporation in and form part of the work to be handed over to the owner by the contractor on completion of the contract.
- 1.16 The "Temporary Work" shall mean all temporary works of every kind required in or about the execution, completion and maintenance of the work.
- 1.17 "Site" shall mean the land and other place on, under, on or through which the work is to be carried out and any other lands or places provided by the Municipal Corporation for the purpose of the Contract together with any other places designated in the Contract as forming part of the site.
- 1.18 "The Construction Equipment" means all appliance/equipments of whatever nature required in or for execution, completion or maintenance of work or temporary works (as hereinafter defined) but does not include materials or other things intended to form or forming part of the permanent work.
- 1.19 "Notice in Writing or Written Notice" means a notice written, types or printed form delivered personally or sent by Registered post to the latest known private or business address at Registered Office of the Contractor.
- 1.20 The "Alteration/Variation order" means an order given in writing by the Engineer-in-charge to effect additions to or deletion from and alterations in the work.
- 1.21 "Final Test Certificate" shall mean the final test Certificate issued by the owner within the provisions of the Contract.
- 1.22 The "Completion Certificate" shall mean a certificate to be issued by the Engineer-in-charge when the work has been completed to his satisfaction.
- 1.23 The "Final Certificate" shall mean the final certificate issued by the Engineer-in-charge after the work is finally accepted by the owner.
- 1.24 "Defect Liability Period" shall mean the specified period between the issue of completion Certificate and the final certificate as specified in the tender.
- 1.25 "Approved" shall mean approved in writing including subsequent modification in writing of previous verbal approval and "Approval" means approved in writing including as aforesaid.
- 1.26 "Letter of Acceptance" shall mean an intimation by a letter to tenderer that the tender has been accepted in accordance with provisions contained therein.
- 1.27 "Order" and "Instruction" shall respectively mean any written order or instruction given by the Engineer-in-charge within the scope of his powers in terms of the Contract.
- 1.28 "Running Account Bill" shall mean a Bill for the payment of "On Account" money to the contractor during the progress of work on the basis of work done and the non-perishable materials to be incorporated in the work supplied by the Contractor.
- 1.29 "Security Deposit" shall mean the deposit to be held by the owner as security for the due performance of contractual obligations.
- 1.30 "The appointing authority" for the purpose of Arbitration shall be the Municipal Commissioner, Surat Municipal Corporation, Surat.
- 1.31 Retention Money shall mean the money retained from R.A. Bill for due completion of "NET WORK".
- 1.32 Unless otherwise specifically stated, the masculine gender shall include the feminine and natural genders and viceversa and the singular shall include the plural and vice-versa.
33. All work proposed to be executed by contract shall be notified in a form of invitation to tender pasted on a board hung up in the office of the Engineer & signed by the Engineer. This form will state the work to be carried out as well as the date/or submitting and opening tenders and the time allowed for carrying out work, also the amount of earnest money to be deposited with the tender and the amount of the Security Deposit to be paid by the successful tenderer and the percentage, if any, to be deducted from bills. It will also state whether a refund of quarry fees, royalties, octroi dues and ground rent will be granted. Copies of the specifications, designs and drawings and estimated rates and scheduled rates and any other documents required in connection with the work which shall be signed by the Engineer-in-charge for the purpose of identification shall also be open for inspection by contractors at the office of the Engineer-in-charge during office hours. Where the work is proposed to be executed according to the specifications recommended by a contractor and approved by a competent authority on behalf of the corporation, such specifications with designs and drawings shall form part of the accepted tender.

34. In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof, or in the event of the absence of any partner, it shall be signed on his behalf by a person holding a power of attorney authorising him to do so.
35. Receipts for payments made on account of any work, when executed by a firm, shall also be signed by all the partners, except where the contractor are described in their tender as a firm, in which case the receipts shall be signed in the name of the firm by one of the partners or by some other persons having authority to give effectual receipts for the firm.
36. Any persons, who submit tender shall fill up the usual printed form including the 'Column' total according to estimated quantities, stating at what rate he is willing to undertake the each item of the works, Tenders which proposal any alterations in the work specified in the said form of invitation to tender or in the time allowed for carrying out the work or which contain any other conditions of any short, will liable to be rejection No. single tender include more than one will liable to be rejection No. single tender include more then one work but contractors who wishes to tender for each. Tender shall have (to which they refer) written outside the envelope.
37. The Commissioner or his duly authorised assistant shall open tender in the presence of any intending contractors who have submitted tender or their representatives who may be present at the time. In the event of a tender being accepted, the contractor shall there upon for the purpose of identification, sign the copies of the specifications and other documents mentioned in this tender. In the event of the tender being rejected, the divisional officer shall authorised the accountant to refund the amount of earnest money deposited to the contractor making the tender on his giving a receipt for the returned of the money.
38. The officer competent to dispose of the tender shall have the right of rejecting all or any of the tenders.
39. No receipts for any payment alleged to have been made by a contractor in regard to any matter to this tender shall be valid and binding on corporation unless it is signed by the Engineer-in-charge.
40. The memorandum of work to be tendered for and the schedule of materials to be supplied by the concern department and their rates shall be filled in and completed by the officer of the Engineer-in-charge before the tender form is issued. If a form issued an intending tenderer has not been so filled in and completed, he shall request the said officer to have this done before he completes and delivers his tender.
50. All works shall be measured net by standard measure and according to the rules and customs of the Public Works Department without reference to any local custom.
51. Under no circumstances shall any contractor be entitled to claim enhanced rates for any items in this contract.
52. Every contractor shall unless excepted in writing by the Additional City Engineer concerned, produced alongwith the tender, a solvency certificate of his financial stability from the Collector of the District within which he resides or a Bankers certificates. If he fails to produce such a certificate, his tender may not be considered.
53. All corrections and additions or pasted slips should be initiated.
54. The measurement of work will be taken according to the usual method in use in the public works department and no proposals to adopt alternative methods will be accepted. The Engineer-in-charge decision as to what is "the usual method in use in the public works department" will be final.
55. A. The Insurance Company's bond will not be accepted against the Security Deposit.
56. The contractor shall have to attach to his tender Income Tax Clearance Certificate to be obtained from the Income Tax Officer.
57. The Contractor will have to construct a shed for storing control and valuable materials issued to him under Schedule-'A' of the agreement at work site having double locking arrangement. The materials will then be taken for use in the presence of the department person. No materials will be allowed to be removed from the site of work except with the written permission from Engineer- in-charge.
58. No foreign exchange will be released by the Corporation for the purpose of plant and machineries required for the execution of the work contracted for.

59. Controlled materials (Essentiality certificate)

- (i) As regard controlled materials the Corporation will help to arrange for the permit as far as possible and help the contractor in securing for the permit as far as possible and help the contractor in securing the same. All incidental charges met with in procuring these materials shall be borne by the contractor himself. Though the Corporation will help to arrange for the permit as far as possible and help the contractor in obtaining the materials it shall not accept any responsibility for any delay or loss on account of delay caused to the contractor while obtaining the same.
- (ii) The contractor shall submit to Engineer-in-charge on Close of every calendar months, the monthly returns in the prescribed forms as to the receipt and actual use of the controlled materials during the month.
- (iii) The contractor shall permit the Engineer- in- charge or his representatives to inspect the stock of the controlled materials stored by him at any time, whenever the Engineer-in- charge or his representatives so desired (s).

60. The tender for work shall remain open for a period of 120 days from the date of opening of the price bid for this works and that the tenderer shall not be allowed to withdraws or modify the offer on his own during this period. If any tenderer withdraws or makes any modifications or addition/s in the terms and conditions of his tender, not acceptable to the corporation then the corporation shall without prejudice to any right or remedy be at liberty in full the said earnest money absolutely (in figures as well as in words). This Blank Space should be filled in while preparing the draft tender papers.
61. The contractor shall employ only such labourer who shall produce a valid certificate of having been vaccinated against small pox within a period of last 3 years.
62. Tenderer should submit True Copy of the Certificate of Registration alongwith the tender without which the tender will not be considered.
63. The contractor shall have to give in writing the date completion of the work within a fortnight from the date of work completed by him. Otherwise the date noted on the record by the department shall be reawakened as final and no excuse or representation in that behalf shall be entertained at later date.
64. What ever **sales tax** is levied by the Government on works contract and if paid by the contractor in the first instance, **shall not be** refunded to the concerned contractor by Corporation.

GC-02 LOCATION OF SITE AND ACCESSIBILITY :

The site of works is within the limits of Surat Municipal Corporation. It is served by all weather roads and SOUTHERN Railway Broad Gauge line, Government Irrigation Canal Crossing. The intending Tenderer should inspect the site and make himself familiar with site conditions and available communication facilities. Non availability of access/roads shall in no case be the cause to condon any delay in the execution of the work or be the cause for any claims or extra compensation.

GC-03 SCOPE OF WORK :

The scope of work is defined broadly in the special conditions of Contract and specifications. The Contractor shall provide all necessary materials equipment and labour etc. for the execution and of the work till completion. All materials that go with the work shall be approved by the Engineer-in-charge prior to procurement and use.

Owner at his discretion may endeavour to provide water to the Contractor at the owner's source of supply at one point at the rate charged for such works.

The contractor shall make his own arrangement for the distribution pipe networks from the source of supply after getting prior permission for the same from the Engineer-in-charge. Supply of water shall not be free and the necessary charges as fixed by the Local Body shall have to be paid by the contractor.

However, owner does not guarantee the supply of water and this does not relieve the contractor of his responsibility in making his own arrangements and for the timely completion of the work as stipulated.

POWER SUPPLY :

The Contractor shall have to make his own arrangement for power supply.

LAND FOR CONTRACTOR'S FIELD OFFICE, GODOWN & WORKSHOP:

Owner will not be a position to provide land required for Contractors shall have to make his own arrangement for the same. No land will be provided by S.M..C. to the contractor for constructing his labour and supervisory comp and other service facilities.

GC-04 RULLING LANGUAGE :

The language according to which the contractor shall be constructed and interpreted shall be English. All entries in the contract documents and all correspondence between the contractor and the Municipal Corporation or the Engineer shall be in English. All dimensions for the materials shall be given in metric units only.

GC-05 INTERPRETATION OF CONTRACT DOCUMENT :

1. The provisions of the General Conditions of Contract and special conditions of contract shall prevail over those of any other documents of the contract unless specifically provided otherwise. Should there be any discrepancy, inconsistency error or omission in the several documents forming the contract, the matter may be referred to the Engineer-in-charge for his instructions and decision. The Engineer-in-charge's decision in such case shall be the final and binding to the contractor.

2. Works shown upon the drawings but not described in the specifications or described in the specific specifications without showing on the drawings shall be taken as described in the specifications and shown on the drawings.

3. The heading and the marginal notes to the clauses of those general conditions of contract or to the specifications or to any other part of tender documents are solely for the purpose of giving a concise indication and not a summary of contents thereof or be used in the interpretation or construction thereof of the contract.

4. Unless otherwise stated specifically, in this contract documents the singular shall include the plural and vice versa wherever the context so requires. Works implementing persons shall include relevant incorporated companies/registered associations/body of individual/firm of partnership.

5. Notwithstanding the sub-divisions of the documents into separate sections and volumes every part of each shall be supplementary to and complementary of every other part and shall be read with and into the context so far as it may be practicable to do so.

6. Where any portion of the General Conditions of contract is repugnant to or at variance with any provisions of the special conditions of contract, then, unless a different intention appears, the provisions of the special conditions of contract shall be deemed to override the provisions of General conditions of Contract and shall to the extent of such repugnancy or variance prevail.

7. The materials, Design and Workmanship shall satisfy the relevant I.S.S.and Codes referred to. If Additional requirements are shown in the specifications, the same shall be satisfied over and above I.S.S. and Codes.

8. If the specification mention that the contract shall perform certain work or provide certain facilities, it will mean that the contractor shall do so at his own cost.

9. The correctness of the details given in the tender documents is not guaranteed. The contractor shall independently obtain all necessary information for making the tender. The contractor shall be

deemed to have examined the Contract Documents, to have generally obtained his own information in all matters that might affect the carrying out of the work or the Tenderer rates. Any error in description of quantity or commission there from shall not vitiate the contract or release the contractor from executing the work comprised in the contract according to the Drawings and specifications at the tendered rates. He is deemed to have known the scope, nature and magnitude of the work and the requirements of materials and labour involved and as to what all works he has to complete in accordance with the contract what-soever be the defects, omissions, or errors that may be found in the contract documents. The contractor shall be deemed to have visited the site and the surroundings, to have satisfied himself to the nature of all existing structures, if any, and also as to the nature and the conditions of railways, roads, bridges and culverts, means of transport and communications, whether by land, air or water and as to possible interceptions thereto and the access and agrees from the site, to have made inquiries, examined and satisfied himself as to the sites for obtaining sand, stones, bricks and other materials, the sites for disposal of surplus materials, the available accommodation as to whatever required, the depicts and such other buildings as may be necessary for executing and completing the work, to have local independent inquiries as to the subsoil, subsoil water and variation thereof, storms, prevailing winds, climatic conditions and all other similar matters effecting the work. He is deemed to have acquainted himself as to his liability for payment of Government taxes, custom duty and other charges.

Any neglect or failure on the part of the contractor in obtaining necessary and reliable information upon the forgoing or any other matters affecting the contract shall not relieve him from any risks or liabilities or the entire responsibility from completion of the work at the tendered rates and time in strict accordance with the contract documents.

No verbal agreement or inference from conversation with any officer or employee of the worker either before or after the execution of the Contract Agreement shall in any way effect or modify any of the terms of obligations herein contained.

GC-06 CONTRACTOR TO UNDERSTAND HIMSELF FULLY :

The contractor by tendering shall be deemed to have satisfied himself, as to consideration and circumstance affecting the tender price, as to the possibility of executing the works as shown and described in the contract and to have fixed his prices according to his own view on these matters and to have understand that no additional allowances except as otherwise expressly provided, will after words be made beyond the contract price. The contractor shall be responsible for any misunderstanding or incorrect information given in writting by the Engineer.

GC-07 ERROR IN SUBMISSION ;

The contractor shall be responsible for any errors or ommissions in the particulars supplied by him. Whether such particulars have been approved by the Engineer or not, provided that such discrepancies, errors or ommissions be not due to inaccurate information or particular furnished in writing to the Contractor by the Municipal Corporation or the Engineer.

GC-08 SUFFICIENCY OF TENDER :

The Contractor shall be deemed to have satisfied himself before tendering as to the correctness of the tender rates which rates shall, except as or other wise provided for, cover all the Contractor's liabilities and obligation set forther or implied in the contract for the proper execution of work for compliance with requirements of Article GC-19 thereof.

GC-09 DISCREPANCIES :

The drawings and specifications are to be considered as mutually explanatory of each other, detailed drawings being followed in preference to small scale drawings and figures dimension in preference to scale and special conditions in preference to general conditions. Special direction or dimensions given in the specifications shall supersede all else. Should any discrepancies however,

appear or should any misunderstanding arise as to the meaning and intent of the said specifications or drawings, or as to the dimensions or the quality of the materials or the due and proper execution of the works, or as to the measurement or quality and valuation of the works executed under this contract or as extra there upon the same shall be explained by the Engineer-in-charge and his explanation shall subject to the final decision of the Additional City Engineer, in case reference be made to him, be binding upon the contractor shall execute the work according to such explanation (subject to aforesaid) and without addition to or deduction from the contract and shall also do all such works and things necessary for the proper completion of the works as implied by the Drawings and specifications, even though such works and things are not specially shown and described in said specifications. In cases where not particular specifications are given for any article to be used under the contract, relevant specifications of the Indian Standard Institution shall apply.

GC-10 PERFORMANCE GUARANTEE : (Security Deposit)

The total Security Deposit is 4% (Four) percent of contract value and shall be as under:

The successful tenderer shall have to pay initial security deposit at 2% (two) percent of the tendered amount.

- Initial Security Deposit (2%) shall be paid in form of Cash or Demand Draft/ Pay Order if the Tender Amount of work is **less than Rs. 2.00 crore.**
- Initial Security Deposit (2%) shall be paid in form of Cash or Demand Draft/ Pay Order / bank Guarantee (encashable at Surat city)/ FDR if the tender Amount of work is **more than Rs. 2.00 crore & 2.00 crore.**

The person/persons whose tender may be accepted [here-in after called the Contractor, which expression shall unless excluded by or repugnant to the context include his heirs, executors, administrators and assignees shall (within 15 days of the receipt by him of the notification of the acceptance of his tender) deposit with Municipal Commissioner cash or Government securities endorsed to the Commissioner sum sufficient which will make up the full security deposit specified in the tender.

If the amount of the security deposit to be paid in lump sum within the period specified above is not paid the tender contract already accepted shall be considered as cancelled. The security deposit lodged by Contractor shall be refunded after the expiry of the Defects Liability period as shown in the attached Memorandum after deducting dues, if any, which become liable to be recovered from the Contractor under the terms and conditions of this Agreement.

Regarding remittance and release of Security Deposit (SD), Retention money deposit (RMD) following clause will supersede over and above all the clauses depicted in the tender document.

Tender costing Less than Rs.2.00 Crore.

(a) Remittance of SD/RMD

- (i) The total security deposit shall be recovered at the rate of 4% from contractor. Out of which, 50% of amount as Initial Security Deposit shall be payable at the rate of 2% of approved tender cost in form of Cash or Demand Draft/ Pay Order of any Nationalised Bank (encashable at Surat city).
- (ii) The remaining amount of the Security Deposit i.e. 2% to be deducted from each running account bill.
- (iii) 5% Retention money deposit (RMD) to be retained from each running account bill.

(b) Release of SD/RMD

- (i) The 2% Initial security deposit **in form of Cash or Demand Draft/ Pay Order** shall be released after clearance of Final bill by Audit Dept and completion of defect liability period.
- (ii) Whereas, the 2% security deposit recovered from the each running account bills Shall be released along with Final Bills according to Work Quality..

(iii) 5% Retention money deposit (RMD) to be released along with final bill.

Tender costing Rs.2.00 Crore. & more than Rs.2.00 Crore.

(a) Remittance of SD/RMD

(i) The total security deposit shall be recovered at the rate of 4% from contractor. Out of which, 50% of amount as Initial Security Deposit shall be payable at the rate of 2% of approved tender cost in form of in Cash or Demand Draft/ Pay Order / FDR / Bank Guarantee of any Nationalised Bank (encashable at Surat city).

(ii) The remaining amount of the Security Deposit i.e. 2% to be deducted from each running account bill.

(iii) 5% Retention money deposit (RMD) to be retained from each running account bill.

(b 1) Release of SD/RMD

(i) The 2% Initial security deposit **in form Demand Draft /Pay order / FDR** shall be released after clearance of Final bill by Audit Dept & completion of defect liability period.

(ii) Whereas, the 2% security deposit recovered from the each running account bills Shall be released along with Final Bills according to Work Quality.

(iii) 5% Retention money deposit (RMD) to be released along with final bill.

(b 2) Release of SD/RMD

(i) The 2% Initial security deposit **in form Bank Guarantee** shall be released along with Final Bills according to Work Quality.

(ii) Whereas, the 2% security deposit recovered from the each running account bills Shall be released after clearance of Final bill by Audit Dept & completion of defect liability period.

(iii) 5% Retention money deposit (RMD) to be released along with final bill.

The amount recovered from the running bills as security deposit shall not be allowed to be transferred in the form of Bank Guarantee. However, the remaining 50% (2% of Security Deposit) of the amount so, deducted from running bills will be allowed for conversion in the form of interest bearing fixed deposit receipt, (FDR) issued in favour of the Municipal Commissioner, Surat Municipal Corporation, Surat by a Nationalized Bank located at Surat only. Additional stamp duty payable as per government prevailing rule shall be paid by contractor for remittance of this FDR.

It is clarified that the amount of security deposit shall be collected on the basis of contract price and not on the basis of Estimated Amount put to tender. As initial Security Deposit as mentioned above, accepted by the competent Authority shall have to be paid toward Security Deposit at the time of execution of agreement.

Interest will be payable on FDR (that is deducted from Running Bill and converted in to FDR for initial SD) for One year, after completion of work. After that no further interest shall be paid for any extended period what so ever.

If the Security Deposit is not paid within 15 days from the date of L.O.I. / Work Order than penalty at the rate of 0.065% per day of the amount of Security Deposit will be charged. If the Security Deposit is not paid within one month with interest, necessary actions as per condition of contract will be taken.

Initial Security Deposit (i.e. 2% Of Tender Amount) in form of Bank Guarantee may be accepted as per relevant tender provision, However BG shall be valid till final date of completion of work+1year (Whether final bill is audited and paid or not). It shall be contractor's responsibility to extent the BG On Or Before expiry of time limit of BG. In case of late renewal of BG, penalty of security deposit shall be levied at the rate of 0.065% of per day of BG amount.

The successful tenderer shall have to enter into an agreement on a non-judicial stamp paper of Rs. 300/- if initial Security Deposit paid in form Bank Guarantee or Demand draft as per the form of the agreement approved by the Municipal Corporation, Surat.

If initial Security deposit is paid in form of Fixed Deposit, additional stamp paper amounting As per government's prevailing rule of Security Deposit shall be used to execute the agreement.

The undertaking shall be executed on stamp paper worth Rs. 300/-.

The Surety shall be executed on stamp paper worth Rs. 300/-.

GC-11 INSPECTION OF WORK :

1. The Engineer in charge will have full power and authority to inspect the work at any time wherever in progress either on the site or at the contractor's any other manufacturers workshops or factories wherever situated and the contractor shall afford for Engineer-in-charge every facility and assistance to carry out such inspection. Contractor or his authorised representative shall, at all time during the usual working hours and all other times when so notified, remain present to receive orders and instructions, orders given to Contractor's representative shall considered to have the same force as if they had been given to the contractor himself. Contractor shall give not less than 7 days notice in writing to the Engineer-in-charge before covering up or otherwise placing beyond reach of inspection and measuring any work in order that the same may be inspected and measured. In the event of breach of the above, the same shall be recovered at Contractor's expenses for carrying out such inspection or measurement.

2. No material shall be despatched from contract store on site of work before obtaining approval in writing of the Engineer-in-charge, Contractor shall provide at all time during the progress of work and maintenance period proper means of access with ladders, gangways, etc. and the necessary attendance to move and adopt as directed for inspection or measurement of work by Engineer-in-charge.

GC-12 DEFECT LIABILITY :

1. Contractor shall guarantee the work for a period of **12 months after Completion of Work**. Any damage or defect that may arise or that may remain undiscovered at the time of issue of completion certificate connected in any way with the equipment or materials supplied by him or in the workmanship be rectified or replaced by contractor at his own expenses as desired by Engineer-in-charge or in default may cause the same to be made good by other agency and deduct expenses of which the certificate of Engineer-in-charge shall be final from any sums that may then or any time thereafter become due to contractor of sale thereof or of a sufficient portion thereof.

2. From the commencement to completion of work contractor shall take full responsibility for the case of the work including all temporary works and in case any damage, loss or injury shall happen to work or any part thereof or to any temporary works from any cause whatsoever and shall at his own cost repair and make good the same so that at completion work shall be in good order and in conformity in every respect with the requirements of contract and as per the instructions of the Engineer-in-charge.

3. If at any time before the work is taken over, the Engineer-in-charge shall -

(a) Decide that any work done or materials used by the contractor are defective or not in accordance with contract or that work of any portion thereof is defective or do not fulfill the requirements of contract (all such materials being hereinafter called defects in this clause and (b) as soon as reasonably practicable given to contractor notice in writing of the said defect specifying particulars of the defects alleged to exist or to have occurred, then contractor shall at his own expenses and with all speed make good the defects so specified.

(b) In case contractor fails to do so, owner may take at the cost of the contractor, such steps as may in all circumstances, be reasonable to make good such defects. The expenditure so incurred by S.M.C. will be recovered from the amount due to contractor. The decision of Engineer-in-charge with regard to the amount to be recovered from contractor will be final and binding on the contractor.

GC-13 POWER OF ENGINEER TO GIVE FURTHER INSTRUCTIONS :

The Engineer shall have the power and authority from time to time and at all times to give further instructions and directions as may appear to him necessary or proper for the guidance of contractor and the works and efficient execution of the works according to the terms of the specifications, and the

contractor shall receive, execute, obey and be bound by the same, according to the true intent and meaning thereof, as fully and effectually as though the same had accompanied or had been mentioned or referred to in the specifications. No work which radically changes the original nature of the contract shall be ordered by the Engineer and in the event of any deviation being ordered, which in the opinion of the contractor changes the original nature of the contract, the contractor shall nevertheless carry it out and any disagreement as to the nature of the work & the rate to be paid thereof shall be resolved. The time of completion of works, in the event of any deviations, resulting in additional cost over the contract sum being ordered, then be extended or reduced reasonable by the Engineer. The Engineer's decision in the case shall be final and binding.

GC-14 PROGRAMME :

The time allowed for execution of works shall be essence of the contract. The contract period shall commence from date of Notice of intimation to proceed. The tenderer at the time of submitting his tender shall indicate the construction or pipeline schedule, the month-wise programme required for the execution of the works and shall confirm the same within fourteen (14) days of the acceptance of his Tender. The contractor shall provide to the Engineer-in-charge a detailed programme of time schedule for execution of the works in accordance with the specifications & the completion date. The entire programme to be finalised by the Contractor, has to confirm to the execution period mentioned along with the Bill of Quantities in the Tender Documents. The Engineer upon scrutiny of such submitted programme by contractor, shall examine suitability of it to the requirement of contract and suggest modifications, if found necessary.

GC-15 SUBLETTING OF WORKS :

No part of the contract nor any share or interest thereon shall in any manner or degree be transferred, assigned or sublet by the contractor directly or indirectly to any firm or Corporation whatsoever except as provided for in the succeeding sub clause without the consent in writing of the owner.

GC-16 SUB-CONTRACTORS FOR TEMPORARY WORKS ETC. :

The owner may give written consent to sub-contractors for execution of any part of the work at the site being entered upon by the contractors provided each individual contractor is submitted to the Engineer-in-charge before being entered into and is approved by him. List of Sub-Contractors is to be supplied. Notwithstanding any subletting with such approval as aforesaid and notwithstanding the Engineer-in-charge shall have received copies of any sub-contractors, the contractors shall be and shall remain solely responsible for the quality and proper expenditures and execution of the works and the performance of all the conditions of contract in all respects as if such submitting or sub-contracting had not taken place and as if such work had been done directly by the Contractor.

GC-17 TIME FOR COMPLETION:

1. The work covered under this contract shall be commenced from the date of contract is served with a notice to proceed with the work and shall be completed before the date as mentioned in the time schedule of work. The time is the essence of the contract and unless the same is extended as mentioned in clause No. GC-18 (Extension of time) the contractor will be penalised for the delay.

2. The general time schedule for work is given in the tender document. Contractor shall prepare a detailed weekly or monthly programme of work in consultation with Engineer-in-charge soon after the agreement and the work shall be strictly executed accordingly. The time for construction of road given includes, the time required for testing, rectification if any, retesting and completion in all respects to the entire satisfaction of the Engineer-in-charge.

GC-18 EXTENSION OF TIME :

Time shall be considered as the essence of the contract. If however, the failure of the Contractor to complete the work as per the stipulated dates referred to above arises from delays on

the part of Municipal Corporation in supplying the materials of equipment it has undertaken to supply under the contract or from delays in handing over sites or from increase in the quantity of work to be done under the contract, or force Majeure an appropriate extension of time will be given. The Contractor shall request such extension within one month of the cause of such delay and in any case before expiry of the contract period.

GC-19 CONTRACT AGREEMENT :

The successful tenderer shall when called upon to do so, enter into and execute the Contract Agreement within (15) fifteen days of the Notice of Award, in the form shown in tender documents with such modifications as may be necessary in the opinion of the Municipal Commissioner. It should be incumbent on the contract to pay the stamp duty and the legal charges for the completion of the contract agreement.

GC-20 (A)PENALTY FOR DELAY :

If the contractor fails to complete the work within the stipulated completion date for the work or he shall pay liquidated damages at one tenth of Two percent of contract value per day of delay in completion and handing over the work or part thereof as the case may be to the Municipal Commissioner. The amount of liquidated damages shall, however, be subjected to a maximum of ten (10) percent of the contract value. Delays in excess of one hundred days will be a cause for termination of the contract and forfeiture of all security for performance.

(B)BAR CHART:

The successful tenderer shall have to submit the progress bar-chart within fifteen days after the contract, and the contractor should work as per the approved bar-chart, failing the contractor shall have to pay the compensation for delay as per the decision of Municipal Commissioner.

GC-21 FORFEITURE OF SECURITY DEPOSIT :

Whenever any claim arises against the contractor for the payment of a sum of money out of or under the contract, the owner shall be entitled to recover such sum by appropriating in part or whole, the security deposit of the contractor. In case the Security deposit is insufficient the balance recoverable shall be deducted from any sum then due or which at any time thereafter may become due to the contractor shall pay to the owner on demand may balance remaining due.

GC-22 ACTION OF FORFEITURE OF SECURITY DEPOSIT :

In any case in which under any clause or clauses of the contract, the contractor shall have forfeited the whole of his Security deposit or have committed a breach of any of the terms contained in this contract, the owner shall have power to adopt any of the following courses as he may deem best suited to his interest -

(a) To rescind the contract (of which rescission notice in writing to the contractor under the hand of the owner shall be conclusive evidence) in which case, the security deposit of the contractor shall stand forfeited and be absolutely at the disposal of the owner.

(b) To employ labour and to supply materials to carry out the balance work debiting contractor with the cost of labour employed and the cost of materials supplied for which a certificate of the Engineer-in-charge shall be final and conclusive against the contractor and 10% costs on above to cover all departmental charges and crediting him with the value of work done at the same rates as if it has been carried out by the contractor under the terms of his contract. The certificate of Engineer-in-charge as to the value of the work done shall be final and conclusive against the contractor.

(c) To measure up the work of the contractor and to take such part hereof as shall be unexecuted out of his hand to give it to another contractor to complete. In this case the excess expenditure incurred than what whole have been paid to the original contractor, if the would work had been executed by him, shall be earnest and paid by the original contractor and shall be deducted from any money due

to him by the owner under the contract or otherwise and for the excess expenditure, the certificate of the Engineer-in-charge shall be final and conclusive.

In the event any of the above course being adopted by the owner, the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any agreement so or made by advance on account of or with a view to the execution of the work of the performance of the contract. In such case the contractor shall not be entitled to recover or be paid by sum for any work actually performed under this contract unless the Engineer-in-charge will certify in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified. In the event of the owner putting in force the powers as stated in a, b, c, above vested in him under the preceeding clause, he may, if he so desire, take possession of all or any tools and plant, materials and stores in or upon the work or the site thereof belonging to the contractor, or procured by him and intended to be used for the execution of the work or any part thereof paying or allowing for the same in account at the contract rates to be certified by the Engineer-in-charge whose certificate thereof shall be final otherwise the Engineer-in-charge may give notice in writing to the contractor or his representative requiring him to remove such tools plant materials or stores from the premises within the time specified in the notice and in if the contractor fails to comply with any such notice, the Engineer-in-charge may remove them at the Contractor's expenses or sell them by auction or private sale on account of the contractor and his risks in all respects without any further notice as to the date, time to place of the sale and the certificate of Engineer-in-charge as to the expenses of any such removal and the amount of the proceeds and the expenses of any such sale shall be final and conclusive against the contractor.

GC-23 NO COMPENSATION FOR ALTERATION IN OR RESTRICTION OF WORK :

If at any time from the commencement of work, the owner shall for any reasons whatsoever not require the whole or part thereof as specified in the tender to be carried out, the Engineer-in-charge shall give notice in writing of the contractor, who shall have no claim to any payment or compensation whatsoever on account of any profit or advantage which he might have derived from execution of work in full, but which he did not derive in consequence of the full amount of the work not having been carried neither shall he have any claim for compensation by reason if any alterations having been made in original specifications, drawings, designs and instructions which shall involve any curtailment of the work as originally contemplated.

When the contractor is a partnership firm, the prior approval in writing of the S.M.C. shall be obtained before any change is made in the constitution of the firm, where the contractor is an individual or a Hindu Undivided Family business concern, such approval as aforesaid shall, likewise be obtained before sub-contractor enters into any agreement with other parties where under the reconstituted firm would have the right to carry out the work hereby undertaken by the contractor. In either case if prior approval as aforesaid is not obtained, the contract shall be deemed to have been allotted in contravention of sub-letting clause hereof and the same action may be taken and the same consequence shall ensue as provided in the sub-letting clause.

GC-24 IN EVENT OF DEATH OF CONTRACTOR :

Without prejudice to any of the right or remedies under the contract, if the contractor dies, the owner shall have the option of terminating the contract without compensation to the contractor.

GC-25 MEMBER OF THE OWNER NOT INDIVIDUALLY LIABLE :

No official or employee of the owner shall in any way be personally bound or liable for the acts or obligations of the owner under the contract or answerable for any default or omission in the observance or performance of the acts, matters or things which are herein contained.

GC-26 OWNER NOT BOUND BY PERSONAL REPRESENTATIONS :

The contractor shall not be entitled to any increase on the Schedule of rates or any other rights or claims whatsoever by reason of representation, explanation or statement or alleged representation, promise or guarantees given or alleged to have been given to him by any person.

GC-27 CONTRACTOR'S OFFICE AT SITE

The Contractor shall provide and maintain an office at the site for the accommodation of his agent and staff and such office shall be opened at all reasonable hours to receive instructions, notice or other communications.

GC-28 CONTRACTOR'S SUBORDINATE STAFF AND THEIR CONDUCT :

1. The contractor on award of the work shall name and depute a qualified Engineer, having experience of carrying out work of similar nature, to whom equipment's, materials, if, any, shall be issued and instructions for work given. The contractor shall also provide to the satisfaction of Engineer in-charge sufficient and qualified staff to superintend the execution of the work, competent sub- agents, foremen and leading hands including those specially qualified by previous expeditions to supervise the type of works comprised in the contract in such manner as will ensure work of the best quality and expeditions working, it, in the opinion of the Engineer-in-charge, additional properly qualified supervision staff is considered necessary, if shall be employed by the contractor without additional charge on account thereof. The contractor shall ensure to the satisfaction of the Engineer- in-charge that sub - contractors, if any shall provide competent and efficient supervision over the work entrusted to them.
2. If and whenever any of the contractor's or sub-contractor agents, sub-agents, assistance, foremen or other employees shall, in the opinion of Engineer-in-charge, be guilty of any misconduct or be incompetent or insufficiently qualified or intelligent in the performance of their duties or that in opinion of the owner or Engineer-in-charge, it is undesirable for administrative or any other reason for person or persons to be employed in the works, the contractor, if so directed by the Engineer-in-charge, shall at once remove person or persons from employment thereon. Any person or persons so removed shall not again be reemployed in connection with the works without the written permission of the Engineer-in-charge. Any person so removed from the works shall be immediately replaced at the expenses of the contractor by a qualified and competent substitute. Should the contractor be required to repatriate any person removed from the works he shall do so and shall bear all costs in connection therewith.
3. The contractor shall be responsible for the proper behavior of all the staff, foremen, workmen and others shall exercise proper control over them and in particular and without prejudice to the same. Generally, the contractor shall be bound to prohibit, and prevent any employee from trespassing or acting in any way detrimental or prejudicial to the interest of the community or of the properties or occupiers of land and properties in the neighbourhood and in the event of such employees so trespassing, the contractor shall be responsible therefore and relieve the owner of all consequent claims, actions for damages or injury or any other grounds whatsoever. The decision of the Engineer-in- charge upon any matter arising under this clause shall be final.
4. If and required by the owner, the contractor's personnel entering upon the owner's premises shall be properly identified by badges of a type acceptable to the S.M.C. which must be worn at all times on owner's premises.

GC-29 TERMINATION OF SUB-CONTRACTOR BY OWNER :

If any sub-contractor engaged upon the works at the site executes any work which in the opinion of Engineer-in-charge is not in accordance with the contract documents, the S.M.C. may give written notice to the contractor request him to terminate such sub-contract and the contractor upon the receipt of such notice shall terminate such sub-contract and the latter shall forthwith leave the works failing which the owner shall have the right to remove such sub-contractors from the site.

No action taken by the owner under the above clause shall relieve the contractor of his liabilities under the contract or give rise to any right to compensation, extension of time or otherwise.

GC-30 POWER OF ATERNY :

If the contractor shall not commence the work in the manner previously described in the contract documents or if he shall, at any time, in the opinion of Engineer-in-charge.

- (i) Fail to carry out works in conformity with the documents or
- (ii) Fail to carry out the works in accordance with the time schedule.
- (iii) Substantially suspend work or the works for a period of fourteen days without authority from Engineer-in-charge or
- (iv) Fail to carry out and execute the work to the satisfaction of the Engineer-in-charge or
- (v) Fail to supply sufficient or suitable construction plant temporary works, labour materials or things or
- (vi) Commit breach of any other provisions of the contract on his part to be performed or observed or persist in any of the above mentioned breached of the contract for fourteen days after notice in writing shall have been given to the contractor by the Engineer-in-charge requiring such breach to be remedied or
- (vii) Abandon the work or
- (viii) During the continuance of the contract becomes bankrupt, make any arrangement or compromise with his creditors, or permit any execution to be levied or go into liquidation whether compulsory or voluntary not being merely a voluntary liquidation for the purpose of amalgamation or reconstruction then in any such case.

The owner shall have the power to enter upon the works and take possession thereof and of the materials, temporary works, constructional plant and stock therein, and to revoke the contractor's licence to use the same and to complete the works by his agents, other contractor or workman or to relate the same upon any terms and to such other person, firm or corporation as the owner in his absolute discretion may think proper to employ, and for the purpose aforesaid to use or authorize the use of any materials, temporary works, constructional plant, and stock as aforesaid, without making payment or allowance to the Contractor for the said materials other than such as may be certified in written by the Engineer-in-charge to be reasonable and without making any payment or allowance to the contractor for the use of said temporary works, constructional plant and stock or being liable for any loss or damage thereto. If the owner shall be reason of his taking possession of the works or of the work being got completed by other contractor incur excess certified by the Engineer-in-charge shall be deducted from any money which may be due for the work done by the contractor under the contract and not paid for. Any deficiency shall forthwith be made good and paid to the owner by the contractor and the owner shall have power to sell in such manner and for such price as he may think fit all or any of the constructional plant, materials etc. constructed by or belonging to and recoup and retain the said deficiency or any part thereof out of the proceeds of the sale.

GC-31 CONTRACTOR'S RESPONSIBILITY WITH THE OTHER CONTRACTOR & AGENCIES:

Without repugnance to any other condition, it shall be the responsibility of the contractor executing the work of civil construction to work in close co-operation and co-ordinate the work with other contractors or their authorised representative and the contractor will put a joint scheme with the concurrence of other contractors showing the arrangements for carrying his portion of the work to the Engineer-in-charge and get the approval. The Engineer-in-charge before approving the joint scheme will call the parties concerned and modify the scheme if required. No claim will be entertained on account of the above. The contractor shall confirm in all respects with the provisions of any statutory regulations, ordinances or by laws of any local or locally constituted authorities or public bodies which may be applicable from time to time to works or any temporary works. The contractor shall keep the owner indemnified against all penalties and liabilities of every kind arising out of non-adherence to such statutes, ordinance, laws, rules, regulations, etc.

GC-32 OTHER AGENCIES AT SITE :

The Contractor shall have to execute the work in such place and condition where other agencies will also be engaged for other works, such as site grading, filling and levelling, electrical and mechanical

engineering works, etc. No claim shall be entertained for works being executed in the above circumstances.

GC-33 NOTICES :

Any notice under this contract may be served on the contractor or his duly authorized representative at the job site or may be served by registered post direct to the official address of the contractor proof of issue of any such notice could be conclusive of the contractor having been duly informed of all contents therein.

GC-34 RIGHT OF VARIOUS INTERESTS :

The owner reserves the right to distribute the work between more than one contractor. Contractor shall co-operate and afford reasonable opportunity to other contractors for access to the works for the carriage and storage of materials and execution of their works.

Wherever the work being done by any department of the owner or by other contractor employed by the owner is contingent upon work covered by this contract, the respective rights of the various interests shall be determined by Engineer-in-charge to secure the completion of various portions of the work in general harmony.

GC-35 PRICE ADJUSTMENT :

No adjustment in price shall be allowed as the time limit for completion of the project is less than 12 months.

Moreover the Price adjustment shall not be made even if extension of time limit given for the work.

GC-36 TERMS OF PAYMENT :

The payment of Bills shall be made progressively according to the rules and practice followed by the Municipal Corporation. The progressive payment unless otherwise provided in the Contract Agreement or subsequently agreed to by the parties, shall be made generally monthly on submission of a bill by the Contractor in prescribed form in an amount according to the value of the work performed less the aggregate of previous progressive payments and as required by clause GC-37 (Retention money) herein. All such progressive payment shall be regarded as payment by way of advance against final payment.

Payment for the work done by the contractor will be based on the measurement at various stages of the work, in accordance with the conditions at Clause GC-77 (Measurement of Work in Progress)

GC-37 RETENTION MONEY :

Pursuant to Clause GC-36 Terms of Payment) on all money due to the contractor for work done, Municipal Corporation will hold as retention money of Seven percent (7%) of the value of work. The retention money will not normally be due for payment until the completion of the entire work and till such period the work has been finally accepted by the Municipal Corporation and completion certificate issued by the Municipal Corporation in pursuant to Clause No.GC-83 (Completion Certificate).

However, after the assurance of completion certificate, and Municipal Commissioner may at its own discretion and having considered the Contractor's performance and diligence during the contract time allow the retention money to be converted into a Bond as stipulated in the Clause GC-10 (Performance Bond Security Deposit).

GC-38 PAYMENT DUE FROM THE CONTRACTOR :

All costs, damages or expenses, for which under the Contract the Contractor is liable to the Municipal Corporation deducted by the Municipal Corporation from any money due or becoming due to the Contractor under the contract or from any other contract with the Municipal Corporation or may be recovered by action at law or otherwise from the Contractor.

GC-39 CONTINGENT FEE :

1. The Contractor warrants that he has not employed any person to solicit or secure the contract upon any agreement for a commission, percentage, brokerage or contingent fee. Breach of this warranty shall give the Municipal Commissioner the right to cancel the contract or to take any other measure as the Municipal Commissioner may deem fit. The warranty does not apply to commissions payable by the contractor to establish commercial or selling agent for the purpose of securing business.
2. No officer, employer of the Municipal Corporation be admitted to any share or part of this contract or to any benefit that may rise therefrom.

GC-40 BREACH OF CONTRACT BY CONTRACTOR :

If the contractor fails to perform the work under the contract with due diligence or shall refuse or neglect to comply with instruction given to him in by the Engineer-in-charge accordance with the contract, or shall contravene the provisions of the contract, the S.M.C. may give notice in writing to the contractor to make good such failure, neglect or contravention. Should the Contractor fail to comply with such written notice within twenty eight (28) days or receipt, if the Municipal Commissioner shall think fit, it shall be lawful for the Municipal Corporation, without prejudice to any other rights, the contractor may have under the contract, to terminate the contract for all or part of the works, and to make any other arrangements it shall deem necessary to complete the work outstanding under the contract at the time of termination. In this event Article GC-15 (Subletting of work) and GC-16 (Sub-Contracts for Temporary Works etc.) hereof shall be invoked and the performance Bond shall immediately become due and payable to the Municipal Commissioner the value of the work done on the date of termination and not paid for shall stand forfeited to the Municipal Corporation and the Municipal Corporation shall have free use of any works which the contractor may have at the site at the time of termination of the contract.

GC-41 DEFAULT OF CONTRACTOR :

1. The Municipal Corporation may upon written notice of default to the contractor terminate the contract in circumstance detailed here under :
 - (a) If in the judgment of the Municipal Corporation the contractor fails to make completion of works within the time specified in the completion schedule or within the period for which extension has been granted by the Municipal Corporation /Engineer to the Contractor.
 - (b) If in the judgment of the Municipal Corporation the contractor fails to comply with any of the provisions of this contract.
2. In the event the Municipal Commissioner terminates the contract in whole or in part as provided in Article GC-48 (Termination of Contract), the Municipal Corporation reserves the right to purchase upon such terms and in such manner as it may deem appropriate, plant similar to that terminated and the

contractor will be liable to the Municipal Corporation for any additional costs for such similar and / or for liquidated damages for delay until such reasonable time as may be required for the final completion of works.

3. If this contract is terminated as provided in this paragraph GC - 30 (Power of entry) (1) the Municipal Corporation in addition to any other rights provided in this clause, may require the Contractor to transfer title and deliver to the Municipal Corporation under any of the following cases in the manual and as directed by the Municipal Corporation. (a) Any partially completed information and contract rights as the contractor has specifically produced or acquired for the performance of the contract so terminated.

4. In the event the Municipal Corporation does not terminate the contract as provided in the paragraph GC- 48 (Termination of Contract) the Contractor shall continue performance of the contract, in which case the shall be liable to the Municipal Corporation for liquidated damages for delay until the works are accepted.

GC-42 BANKRUPTCY :

If the Contractor shall become bankrupt or insolvent or have a receiving order made against him, or compound with the creditors, or being the Municipal Corporation commence to be wound up, not being a member's Voluntary winding up for the purpose of amalgamation or reconstruction, or carry on its business under a receiver for the benefit of his creditors or any of them, the owner shall be at liberty to either (a) terminate the contract forthwith by giving notice in writing to the contractor or to the receiver or liquidator or to any person or organization in whom the contract may become vested and to act in the manner provided in Article GC-41 (Default of Contractor) as though the last mentioned notice had been the notice referred to in such Article of (b) to give such receiver liquidator or other person in work the contract may become vested the option of carrying out the contract subject to his providing a satisfactory guarantee for the due and faithful performance of the contract subject to his providing a satisfactory guarantee for the due and faithful performance of the contract up to an amount to be agreed. In the event that the Municipal Corporation terminates the Contract in accordance with this article, the performance Bond shall immediately become due and payable on demand to Municipal Corporation.

GC-43 OWNERSHIP :

Works supplied pursuant to the Contract shall become the property of the Municipal Corporation from whichever is the earlier of the following times, namely,

(a) When the works are completed pursuant to the Contract.

(b) When the Contractor has been paid any sum to which he may become entitled in respect thereof pursuant to clause GC-36 (Terms of Payment).

GC-44 DECLARATION AGAINST WAIVER :

The condonation by the Municipal Corporation of any breach of breaches by the stipulations and conditions contained in the contract shall in no way prejudice or effect to the constructed as a waiver of the Municipal Corporation rights, powers and remedies under the contract in respect of any breach or breaches.

GC-45 LAWS GOVERNING THE CONTRACT :

The contract shall be constituted according to and Subject to the laws of India and the State of Gujarat and under the jurisdiction of the courts of Gujarat at Surat.

GC-46 OVERPAYMENT AND UNDERPAYMENT :

Whenever any claim forths payment of a sum to the Municipal Corporation arises out of or under this Contract against the contractor the same may be deducted by the Municipal Corporation from any sum then due or which at any time thereafter may become due to the contractor under this contract and failing that under any other contract with the Municipal Corporation or from any sum due to the contractor

with the Municipal Corporation (which may be available with Municipal Corporation), or from his retention money, or he shall pay the claim on demand. The Municipal Corporation reserves the right to carry out post payment audit and technical examination of the final bill including all supporting vouchers, abstracts, etc.

The Municipal Corporation further reserves the right to enforce recovery of any over payment when detected notwithstanding the fact that the amount of the final bill may be included by the Contractor.

If as a result of such audit and technical examination any over payment is discovered in respect of any work done by the Contractor or alleged to have been done by him under the contract, it shall be recovered by the Municipal Corporation from the contractor by way of all the means prescribed above or if any under payment is discovered by the Municipal Corporation, any amount due to the contractor under this contract or under payment may be adjusted against any amount then due or which may at any time thereafter become due before payment is made to the contractor from him to the Municipal Corporation on any other contract account whatsoever.

GC-47 SETTLEMENT OF DISPUTES :

Except or otherwise specifically provided in the contract, all disputes concerning question of fact arising under the contract shall be decided by the Engineer-in-charge, subjected to a written appeal by the Contractor to the Engineer and these decisions shall be final and binding on the parties hereto. Any disputes or difference including those considered as such by only one of the parties arising out of or in connection with this contract shall be to the extent possible settled amicably between the parties. If amicable settlement cannot be reached then all dispute issues shall be settled as provided in (a).

(a)DISPUTES OR DIFFERENCE TO BE REFERRED TO:

If at any time, any question, disputes or differences of any kind whatsoever shall arise between the Engineer-in-charge and the Contractor upon or in relation to or in connection with this contract, either party may forthwith give to the other, notice in writing of the existence of such question, dispute or difference as to any decision, opinion, instruction, direction certificate or evaluation of the Engineer.

The question or difference shall be settled by the Municipal Commissioner, who shall state his decision in writing and give notice of same to the Engineer and to the Contractor such decision shall be final and binding upon both parties to the contract and work on contract if not already breached or abandoned shall proceed normally unless and until the same shall be revised (or upheld) due to any judicial proceeding.

Should the Municipal Commissioner fail to give a decision within three (3) calendar months after issuance of notice of a question, dispute or difference or if the Contractor is dissatisfied with any such decision of the Municipal Commissioner, then the matter may be referred to Standing Committee. Then also, if the said question of difference or dispute remains unsolved / unsettled and if the contractor is dissatisfied with any such decision of the Standing

Committee, then the matter may be referred to the court of law subject to SURAT JURISDICTION.

GC-48 TERMINATION OF THE CONTRACT:

1. If the Contractor finds it impracticable to continue operation owing to Force Majeure reasons or for any reason beyond his and/or the Municipal Commissioner find site impossible to continue operation when prompt notification in writing shall be given by the party affected to the other.

2. If the delay or difficulties so caused can not be expected to cease or become unavoidable or if operations can not be resumed within six(6) months the party shall have the right to terminate the contract upon Ten (10) days written notice to the other. In the event of such termination of the contract, payment to the Contractor will be made as follows :

a) The Contractor shall be paid for all works approved by the Engineer and for any other legitimate expenses due to him.

b) If the Municipal Commissioner terminates the contract owing to Force Majeure or due to any cause beyond its control, the contractor shall additionally be paid for any work done during the said Six (6) months period including any financial commitment made for the proper performance of the Contract and which are not reasonably defrayed by payment under (a) above;

c) The Municipal Commissioner also release all bonds and guarantees at its disposal except in a case where the total amount of payments made to the contractor exceeds the final amount due to him in which case the contractor shall refund the excess amount within Sixty (60) days after termination and the Municipal Commissioner thereafter shall release all bonds and guarantees, should the contractor fail to refund the amount received in excess within the said period such amounts shall be deducted from the bonds or guarantees provided.

3. On the termination of the contract for any cause the contractor shall see the orderly suspension and termination of operations, with due consideration to the interests of the Municipal Corporation with respect to completion, safeguarding or storing of materials procured for the performance of the contract and the salvage and resale thereof.

GC-49 CHANGES IN CONSTITUTION :

Where the contractor is a partnership firm, the prior approval in writing of the Municipal Commissioner shall be obtained any change is made in the constitution of the firm. Where the contractor is an individual or an undivided family business concern such approval as aforesaid shall likewise be obtained before the contractor enters into any partnership agreement where under the partnership firm would have the right to carry out the works hereby undertaken by the contractor. If prior approval as aforesaid is not obtained the contract shall be deemed to have been assigned in contravention of Article thereof.

GC-50 SUB-CONTRACTUAL RELATIONS :

All work performed for the contract by sub-contractor shall be pursuant to an appropriate agreement between the contractor and sub-contractor which shall contain provisions to :

a) Protect and preserve the rights of the Municipal Corporation and the Engineer with respect to the work to be performed under the sub-contract so that the sub-contractor thereof will not prejudice such rights.

b) Require that such work be performed in accordance with requirements of the Contract documents.

c) Require under such contract of which the contractor is a party, the submission to the contractor of application for payment and claims for additional costs, extension of time, damages for delay or otherwise with respect to the sub-contracted portions of the work in sufficient time, that the contractor may apply for payment and comply in accordance with the contract Documents for like claim by the Contractor upon the Municipal Corporation.

d) Waive all rights the contracting parties may have against one another for damages caused by fire or other perils covered by the property insurance except such rights as they may have to the proceeds so such insurance held by the Municipal Corporation as trustee and,

e) Obligate each sub-contractor specifically to consent to the provisions of this Article.

GC-51 LIEN :

If, at any time, there should be evidence of any lien or claim for which owner might have become liable and which is chargeable to the contractor, the owner shall have the right to retain out of any payment then due or thereafter to become due an amount sufficient to completely indemnify the owner against such lien or claim or if such lien or claim be valid the owner may be or become due and payable to the contractor. If any lien or claims remaining, unsettled after all payments are made, the contractor shall refund or pay to the owner all money that the latter may be compelled to pay in discharging such lien or claim including all cost and reasonable expenses.

GC-52 EXECUTION OF WORK :

The whole work shall be carried out in strict conformity with the provisions of the Contract Documents, detailed drawings, specifications and the instructions of the Engineer-in-charge from time to time. The Contractor shall ensure that the whole work is executed in the most substantial, proper and best workmanship using materials of best quality in strict accordance with the specifications to the entire satisfaction of the Engineer-in-charge.

GC-53 WORK IN MONSOON :

When the work continues in monsoon, the contractor shall maintain minimum labour force required, for the work and plan and execute the construction and erection work according to the prescribed schedule. No extra rate will be considered for such work in monsoon. During monsoon and entire constructing period the contractor shall keep the site free from water at his own cost.

GC-54 WORK CLOSED ON SUNDAYS & HOLIDAYS & BETWEEN SUNSET AND SUNRISE:

No work shall be carried out on Sundays and Corporation Holidays and no work shall be carried out between sunset and sunrise. Except with the special permission of Engineer-in-charge in writing previously obtained and with holding such permissions shall be no ground of complaint on the part of contractor or cause for compensation to them. Working period shall be maximum eight (8) hours per days.

GC-55 EXTRA SUPERVISION CHARGES TO BE BORNE BY CONTRACTOR :

Further to clause No.GC-54 when Engineer-in-charge feels necessary to give permission to contractor for carrying out work for period of more than Eight hours working period in a day and/or to continue work on Sunday and Corporation holidays. Extra Supervision charges arising due to overtime working of Corporation's staff shall be borne by the contractor at prevailing rates from time to time. Such extra supervision charges shall be deducted by Corporation from the running bill/s of the contractor at Surat Municipal Corporation's description.

GC-56 DRAWING TO BE SUPPLIED BY THE OWNER :

The drawings attached with the tender documents shall be for general guidance of the contractor to enable him to visualize the type of work contemplated and scope of work involved. Detailed working drawings according to which the work is to be done shall be furnished from time to time as the work progresses. The contractor shall study the drawings thoroughly in connection with other connected details and discrepancy if any bring to the notice of the Engineer-in-charge before actually carrying out the work.

GC-57 DRAWINGS TO BE SUPPLIED BY THE CONTRACTOR :

Where drawings, date are to be furnished by the contractor they shall be as enumerated in special condition of contract and shall be furnished within the specified time. Where approval of drawings has been specified it shall be the Contractor's responsibility to have these drawings got approved before any work is taken up with regard to the same. Any changes becoming necessary in these drawings during the execution of the work shall have to be carried out by the contractor at no extra cost. All final drawings shall bear the certification stamp as indicated below duly signed by both the contractor and Engineer-in-charge.

"Certified true for _____ project Agreement
No. _____ Signed _____

Contractor Engineer-in-charge Drawings will be approved within three (3) weeks of the receipt of the same by the Engineer-in-charge.

GC-58 SETTING OUT WORK :

The contractor shall set out the work on the site handed by the Engineer-in-charge and shall be responsible for the correctness of the same. The work shall be carried out to the entire satisfaction of Engineer-in-

charge. The approval thereof or partaking by Engineer-in-charge in setting out work shall not relieve contractor of any of his responsibilities.

The contractor shall provide at his own cost all necessary level posts, pegs, bamboos, flage, ranging, rods, strings and other materials and labourers required for proper setting out of the work. The Contractor shall provide, fix and be responsible for the maintenance of all stakes, temples level marks profiles and similar other things and shall take and necessary precautions to prevent their removal or disturbance and shall be responsible for the consequence for such removal or disturbance. The contractor shall also be responsible for the maintenance of all existing Survey Marks, Boundary Marks, Distance Marks and Centre line marks either existing or fixed by the Contractor. The Centre, longitudinal or face lines and cross lines shall be marked by small masonry pillars. Each pillar shall have distance mark at the centre for setting up the theodolite. The work shall not be started unless the setting out is checked by Engineer-in-charge in writing but such approval shall not relive the contractor of his responsibilities. The contractor shall provide all materials, labour and other facilities necessary for checking at his own cost.

Pillars bearing geodetic marks on site shall be protected by the Contractor. On completion of the work the contractor shall submit the Geodetic documents according to which the work has been carried out.

GC-59 RESPONSIBILITIES OF CONTRACTOR FOR CORRECTNESS OF WORK:

The contractor shall be entirely and exclusively responsible for the correctness of every part of the work and shall rectify completely and errors thereon at his own cost when so instructed by Engineer-in-charge.

1. Materials to be supplied by Contractor :

Contractor shall procure and provide all the materials required for the execution and maintenance of work including M.S. rods, all tools, tackle, construction plant and equipment except the materials to be supplied by the owner detailed in the contract documents and for the transport thereof, owner, shall made recommendations to the respective authorities if designed by the contractor but assumes no responsibility or any nature. Owner shall insist for procurement of materials with ISI Marks supplied by reputed firms on the DGS & D List. 2. If however the Engineer-in-charge feels that work is likely to be delayed due to contractor's inability to procure the materials, the Engineer-in-charge shall have the right to procure materials from the market and the contractor will accept these materials at the rates decided by Engineer-in-charge.

GC-60 MATERIALS TO BE SUPPLIED BY THE OWNER :

1. If the contract provides certain materials or stores to be supplied by the S.M.C. such materials and stores shall be transported by the contractor at his cost from S.M.C's stores or Railway Station. The sum due from contractor for the value of materials supplied by the owner will be recovered from the R.A.Bill on the basis of actual consumption of materials in the work covered and for which R.A.Bill has been prepared. After completion of the work contract has to account for the full quantity of materials supplied to him.

2. The value of store materials supplied by the S.M.C. to the contract shall be charged at rates shown in the contract document and in case any other material not listed in the schedule of materials is supplied by the S.M.C., the same shall be charged at cost price including carting and other expenses incurred in procuring the same. All materials so supplied shall remain the property of the owner and shall not be removed from the site on any account. Any material remaining unused at the time of completion of work or termination of contract shall be returned to S.M.C.'s store or any other place as directed by the Engineer-in-charge in perfectly good condition at contractor's cost. When materials are supplied free of cost for use in work and surplus and unaccounted balances thereof are not returned to the Municipal Corporation, recovery in respect of such balance will be effected at double the applicable issue rate of the materials or the market rate whichever is higher.

GC-61 CONDITIONS OF ISSUE OF MATERIALS BY THE S.M.C.:

- a) The materials specified to be issued by the S.M.C. to the contractor shall be issued by the S.M.C.'s store or at Railway Station and all expenses for its shifting to site shall be borne by the contractor. The materials will be issued during working hours and as per rules of S.M.C. from time to time.
- b) Contractor shall bear all expenses for storage and safe custody at site of materials issued to him before use in work.
- c) Material shall be issued by the S.M.C. in Standard/non-standard sizes as obtained from manufacturer.
- d) Contractor shall construct suitable godowns at site for storing the materials to protect the same from damage due to rain, dampness, fires, theft etc.
- e) The contractor should take the delivery of the materials issued by the S.M.C. after satisfying himself that they are in good conditions. Once the materials are issued, it will be the responsibility of the Contractor to keep them in good condition and in safe custody. If the materials get damaged or if they are stolen, it shall be the responsibility of the contractor to replace them at his according to the instructions of the Engineer-in-charge.
- f) For delay in supply or for non supply of materials to be supplied by the S.M.C., on account of natural calamities, act of enemies, other difficulties beyond the control of the S.M.C., the S.M.C. carries non-responsibilities. In no case the contractor shall be entitled to claim any compensation for loss suffered by him on this account.
- g) None of the materials issued to the contractor, shall be used by the Contractor for manufacturing items which can be obtained from manufacturer. The materials issued by the owner shall be used for the work only and no other purpose.
- h) Contractor shall be required to execute indemnity bond in the prescribed form for the same custody and account of materials issued by the owner.
- i) Contractor shall furnish sufficiently in advance a Statement of his requirements of quantities of materials to be supplied by the S.M.C. and the time when the same will be required for the work, so as to enable Engineer-in-charge to make arrangements to procure and supply the materials.
- j) A daily account of materials issued by the owner shall be maintained by the Contractor showing receipt, consumption and balance in hand in the form laid down by Engineer-in-charge with all connected paper and shall be always available for inspection in the site office.
- k) Contractor shall see that only the required quantities of materials are got issued and no more. The contractor shall be responsible to return the surplus materials in good condition at S.M.C.'s store at his own cost.

GC-62 MATERIALS PROCURED WITH ASSISTANCE OF THE OWNER :

Notwithstanding anything contained to the contrary in any of the clauses of this contract, where any materials for the execution of the contract are procured with the assistance of the S.M.C. either by issue from S.M.C. stock or purchase made under orders or permits or licences issued by the Government, the contractor shall hold the same materials as trustees for owner and use such materials economically and solely for the purpose of contract and not dispose them off without the permission of S.M.C. and return, if required by Engineer-in-charge, all surplus or unserviceable materials that may be left with him after the completion of the contract or at its termination for any reason whatsoever on his being paid or credited such prices as Engineer-in-charge shall determine having due regard to the conditions of the materials. The price allowed to contractor shall not exceed the amount charged to him excluding the storage charges if any. The decision of Engineer-in-charge shall be final and conclusive in such matters. In the event of breach of the aforesaid condition, the contractor shall in terms of licence of permits and/or for criminal breach of trust be liable to compensate S.M.C. at double rate or any higher rates. In the event of these materials at that time having higher rate or not being available in the market then any other rate to be determined by the Engineer-in-charge and his decision shall be final and conclusive.

GC-63 MATERIALS OBTAINED FROM DISMANTLING :

If the contractor, in the course of execution of work is called upon to dismantle any part for reasons other than on account of bad or imperfect work, the materials obtained from dismantling will be the property

of the S.M.C. and will be disposed of as per instruction of Engineer-in-charge in the best interest of the S.M.C.

GC-64 ARTICLE OF VALUE OR TREASURE FOUND DURING CONSTRUCTION:

All gold, silver and other minerals of any description and all precious stones, coins, treasures, relics, antiquities and other similar things which shall be found in under or upon site shall be the property of the owner and the contractor shall property preserve the same to the satisfaction of Engineer-in-charge and shall hand over the same to the owner.

GC-65 DISCREPANCIES BETWEEN INSTRUCTIONS :

If there is any discrepancy between the various stipulations of the contract documents of instructions to the contractor or his authorised representative or if any doubt arises as in the meaning of such stipulation or instructions, the contractor shall immediately refer in writing to the Engineer-in-charge whose decision shall be final and conclusive and no claim for losses caused by such discrepancy, shall in any event be admissible.

In case there is any discrepancy in measurements shown in drawing and specifications, the same shown in drawing shall be considered as final and will be binding upon the contractor.

GC-66 SCHEDULE OF QUANTITIES AND EXTRA ITEMS :

A. Schedule of Quantities :

Variations in the quantities of work in schedule of quantities shall not vitiate the contract. The rates quoted for the individual items shall apply for the quantities of work increased or decreased by not more than twenty percent for each of the items, should the quantities of work actually involved under any item vary by more than Thirty (30%) percent, the rate for such item of work shall be revised in accordance with the procedures indicated under clause "Extra Items". The payment for the items will, however, continue to be at the original rate till the revised rate decided.

B. Extra Items :

Extra Items of work shall not vitiate the contract. The contractor shall be bound to execute extra items of work as directed by the Engineer-in-charge. The rates for extra items shall be derived from the S.O.R.(R&B Division) Year 2023-2024 and quoted premium of tender. If the rate of extra item is not available in S.O.R. it will be derived on prevailing market rate.

GC-67 ACTION WHEN NO SPECIFICATION IS ISSUED :

In case of any class of work for which no specification is supplied by the S.M.C. in the tender documents, such work shall be carried out in accordance with I.S.S. do not cover the same, the work should be carried out as per standard Engineering practice subject to the approval of Engineer-in-charge.

GC-68 ABNORMAL RATES :

Contractor is expected to quote rate for each item after careful analysis of cost involved for the performance of the completed item considering all specifications and conditions of contract. This will avoid loss of profit or gain in case of curtailment or change or specification for any item. In case it is noticed that the rates quoted by a tenderer for any item is usually high or unusually low, it will be sufficient cause for rejection of tender unless the S.M.C. is convinced about the reasonableness of the rates on scrutiny of the analysis for such rate to the furnishing by the tenderer or demand.

GC-69 ASSISTANCE TO ENGINEER-IN-CHARGE :

Contractor shall make available to Engineer-in-charge free of cost all necessary instruments and assistance in checking of any work made by the contractor for taking measurement of work.

GC-70 TEST OF QUALITY OF WORK :

1. All workmanship shall be of the best kind described in the contract document and in accordance with the instructions of Engineer-in-charge and shall be subjected from time to time to such test at contractor's cost as the Engineer-in-charge may direct at the place of manufacture of fabrication or on site or at any such place. Contractor shall provide assistance, instruments labour and materials as are normally required for examining measuring and testing any work workmanship as may be selected and required by Engineer-in-charge.
2. All tests will be necessary in connection with the execution of work as decided by Engineer-in-charge shall be carried out at an approved laboratory at contractor's cost.
3. The contractor shall furnish to Engineer - in - charge for approval when requested or if required by the specification adequate samples of all materials and finished goods to be used in work and sufficiently in advance to permit test and examination thereof. All materials furnished and finished goods applied in work shall be exactly as per the approved samples.
4. All the testing charges shall be borne by the Contractor.

GC-71 ACTION AND COMPENSATION IN CASE OF BAD WORKMANSHIP :

If it shall appear to the Engineer-in-charge that any work has been executed with materials of inferior description, or quality or are unsound or with unsound imperfect or unskilled workmanship or otherwise not in accordance with the contract shall, no demand in writing from Engineer-in-charge or his authorised representative specifying the work, materials or articles complained of, notwithstanding that the same may have been inadvertently passed, certified and paid for forthwith rectify or remove and reconstruct the work, specified and in the event of failure to do so within a period to be specified by Engineer-in-charge in his aforesaid demand, contractor shall be liable to pay compensation at the rate of one (1) percent of the tendered cost of work for every Ten (10) days limited to a maximum of Ten (10%) Percent of the value of work while his failure to do so continues and in the case of any such failure the Engineer-in-charge may on expiry of the notice period rectify and remove and re-execute the work or remove and replace with other at the risk and cost of the Contractor. The decision of the Engineer-in-charge as to any question arising under this clause shall be final and conclusive.

GC-72 SUSPENSION OF WORK :

Contractor shall, if ordered in writing by Engineer-in-charge or his representative temporarily suspended the work or any part thereof for such time (not exceeding two months) as ordered and shall not after receiving such written order proceed with the work until he shall have received a written order to proceed therewith the contractor shall not be entitled to claim compensation for any loss or damage sustained by him by reason of temporary suspension of work as aforesaid. An extension of time for completion of work will be granted to the contractor corresponding to the delay caused by such suspension of work if the applied for the same provided the suspension was not consequent upon any default or failure on the part of the contractor.

GC-73 OWNER MAY DO PART OF THE WORK :

When the contractor fails to comply with any instructions given in accordance with the provisions of this contract, the S.M.C. has the right to carry out such parts of work as the S.M.C. may designate whether by purchasing materials and engaging labour or by the agency of another contractor. In such case the S.M.C. shall deduct from the amount which otherwise might become due to contractor the cost of such work and materials with Ten (10%) percent added to cover all departmental charges and should the total amount thereof exceed the amount due to contractor, contractor shall pay the difference to S.M.C.

GC-74 POSSESSION PRIOR TO COMPLETION :

The Engineer-in-charge shall have the right to take possession of or to use any completed or partly completed work or part of work, such possession or use shall not be deemed to be an acceptance of any work completed in accordance with the contract. If such prior possession or use by Engineer-in-charge delays the progress of work, equitable adjustment in the time of completion will be made and the contract shall be deemed to be modified accordingly.

GC-75 COMPLETION CERTIFICATE :

As soon as the work has been completed in accordance with contract (except in minor respect that do not effect their use for the purpose for which they are intended and except for maintenance thereof) as per general conditions of contract and has passed the tests on completion, the Engineer-in-charge shall issue a certificate (hereinafter called completion certificate) in which he shall certify the date on which work has been completed and has passed the said tests and S.M.C. shall be deemed to have taken over work on the date so certified. If work has been divided in various groups in contract, S.M.C. shall be entitled to take over any group or groups before the other or others and there-upon the Engineer-in-charge will issue a completion certificate which will, however, be for such group or groups so taken over only. In order that contractor could obtain a completion certificate, he shall make good, with all speed any defect arising from the defective materials supplied by contractor or workmanship or any act or omission of contract that may have been discovered or developed after the work or group of works has been taken over. The period allowed for carrying out such work will be normally, one month. If any defect be not remedied within a reasonable time, S.M.C. may proceed to do work at contractor's risk and expenses and deduct from the final bill such amount as may be decided by S.M.C. If by reason of any default on the part of the contractor, a completion certificate has not been issued in respect of every portion of work within one month after the date fixed by contractor for completion of work, S.M.C. shall be at liberty to use work or any portion thereof in respect of which a completion-certificate has been issued, provided that work or the portion thereof so used as aforesaid shall be afforded reasonable opportunity for completion of this work for the issue of completion certificate.

GC-76 SCHEDULE OF RATES :

1. The price/rates quoted by the contractor shall remain firm till the issue of final certificate and shall be subject to price ADJUSTMENT CLAUSE GC-35. Schedule of rates shall be deemed to include and cover all costs expenses and liabilities of every description and all risks of every kind to be taken in executing, completing and handling overwork to owner by contractor. Contractor shall be deemed to have known the nature, scope, magnitude and the extent of work and materials required through contract documents may not fully and precisely furnish them. He shall make such provision in the schedule of rates as he may consider necessary to cover the cost of such items of work and materials as may be reasonable and necessary to completion work. The opinion of Engineer-in-charge as to the item of work shall be final and binding on Contractor although the same may be not shown on or described specifically in contract documents.
2. The Schedule of rates shall be deemed to include and cover the cost of all constructional plant, temporary work, pumps, materials, labour and all other materials in connection with each item in schedule of rates and the execution of work or any portion thereof furnished complete in every respect and maintained as shown or described in the contract document or as may be ordered in writing during the continuance of the contract.
3. The Schedule of rates shall be deemed to include and cover the cost of all royalties and free for the articles and processes, protected by letters patent or otherwise incorporated in or used in connection with work, also all royalties, and other payments in connection with materials of whatsoever kind for work and shall include an indemnity to-owner which contractor hereby gives against all action, proceeding, claims, damages, costs and expenses arising from the incorporation in use of work of any such articles, processes or materials. Octroi of other Municipal or Local Board charges if levied on materials equipment of machineries to be brought to site for use on work shall be borne by the contractor.

4. No exemption or reduction of custom duties excise duties, sales-tax or any other taxes or charges of the Central or State Government any local body whatsoever will be granted to obtained. All of such expenses shall be deemed to have been included in and covered by schedule of rates. Contractor will also obtained and pay for all permits or other privileges necessary to complete work.
5. The schedule of rates shall be deemed to include and cover risk on account of delay or interference with contractor's conduct of work which may occur from any cause including orders of S.M.C. in the exercise of his power and no account of extension of time granted due to various reasons.
6. For work under unit rate basis no alteration will be allowed in the schedule of rates by reason of work or any part of them being field, altered extended, diminished or omitted.

GC-77 PROCEDURE FOR MEASUREMENT OF WORK IN PROGRESS :

1. All measurements shall be in metric system. All the work in progress will be jointly measured by the representative of Engineer-in-charge and contractor's authorised agent. Such measurements will be got recorded in the measurement book by the Engineer or his authorised representative and signed by contractor or his authorised agent in token of acceptance. If the contract or his authorised agent fails to be present when even required by the Engineer-in-charge for taking measurements for any reasons whatsoever, the measurement will be taken by the Engineer - in - charge or his authorised representative notwithstanding the absence of contract and these measurement will be deemed to be correct and binding on contractor.
2. Contractor will submit a bill in approved proforma in duplicate to the Engineer - in - charge of the work giving abstract and detailed measurements of various items executed during a month as mutually agreed. The Engineer-in-charge shall verify the bill and the claim, far as admissible, adjusted if possible, within 10 days of presentation of the bills.
3. In case of Tenders for completed items of work, contractor may be allowed 'Secured Advance' on the Security of materials brought to site for execution of the constructed items of work the extent of 75% of the value of materials of unperishable nature and an agreement bedrawn up with contractor under which the owner secured a lien on these materials and is safe guarded against losses due to any reasons whatsoever. Recoveries of advance paid would not be post-poned till the whole work is completed but shall be adjusted from his work done or the materials used, the necessary deductions being made when the items of work in which they are used and are billed for. When the mode of measurement is not covered by contract for any item of work it shall be as per latest I.S.I.

GC-78 RUNNING ACCOUNT PAYMENT TO BE RECOVERED AS ADVANCES :

1. All running account payments shall be regarded as payments by way of advance against the final payment only and not as payment for work actually done and completed and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be removed and taken away and reconstructed or to be considered as an admission of the due performance of contract or any part thereof.

GC-79 NOTICE FOR CLAIM FOR ADDITIONAL PAYMENT :

If the contractor considers that he is entitled to extra payment or compensation or any claim whatsoever in respect of work, he shall forthwith give notice in writing to the Engineer-in-charge about his extra payment and/or compensation. Such notice shall be given to the Engineer-in-charge within Ten (10) days from the happening of any event upon which contractor basis such claims and such notice shall contain full particular of the nature of such claim with full details and amount claimed. Failure on the part of the contractor to put forward any claim with the necessary particulars as above within the time above specified shall be an absolute waiver thereof. No commission by S.M.C. to reject any such claim and no delay in dealing therewith shall be waiver by S.M.C. of any rights in respect thereof.

GC-80 PAYMENT OF CONTRACTOR'S BILL :

1. The price to be paid by the S.M.C. to contractor for the work to be done and for the performance of all the obligations under taken by the contractor under contract shall be based on the contract price and payment to be made accordingly for the work actually executed and approved by the Engineer-in-charge.
2. No payment shall be made for work costing less than Rs.5,000/-till the work is completed and a certificate of completion given. But in case of work estimated to cost more than Rs.5,000/- contractor on submitting the bill thereof will be entitled to receive a monthly payment, proportionate to the part thereof, approved and passed by Engineer-in-charge whose certificate of such approval and passing of the sum so payable shall be final and conclusive against contractor. This payment will be made after making necessary deductions as stipulated elsewhere in the contract documents for materials, security deposit, etc. The payment shall be released to the contractor within Thirty (30) days of submission of the bill in case of running bill and within two (02) months in case of final bill, contractor shall present the bill duly pre-receipted on proper revenue stamp.

Payment due to Contractor shall be made by the by crossed Accounts payee cheque in Indian currency forwarding the same to the registered office of the contractor. Owner shall not be responsible if the cheque is mislaid or misappropriated by unauthorised person.

GC-81 FINAL BILL :

The final bill shall be submitted by Contractor within two (02) month of the date of physical completion of work, Otherwise the Engineer-in-charge certificate of the measurement and of total amount payable for work shall be finalised binding on all parties.

GC-82 RECEIPT FOR PAYMENT :

Receipt for payment made on account of work when executed by a firm must be signed by a person holding power of attorney in this respect on behalf of contractor except when described in the tender as a limited company in which case the receipt must be signed in the name of the company by one of its principal officers or by some other person having authority to give effectual receipt for the Company.

GC-83 COMPLETION CERTIFICATE :

1. When the contractor fulfil his obligation as per terms of contract he shall be eligible to apply for completion certificate. Contractor may apply for separate completion certificate in respect of each such portion of work by submitting the completion documents along with such application for completion certificate.

The Engineer-in-charge shall normally issue to contractor the completion certificate within 2 (Two) month after receiving an application thereof from contractor after verifying from the complete documents and satisfying himself that work has been completed in accordance with and as set out in the construction and erection drawings and the contract document. Contractor after obtaining the completion certificate is eligible to present the final bill for work executed by him under the terms of contract.

2. Within 2 (Two) month of completion of work in all respect contractor shall be furnished with a certificate by the Engineer-in-charge of such completion but no certificate shall be given nor shall work be deemed to have been executed, until all (1) scaffolding, surplus materials and rubbish is clearing off site completely (2) until work shall have been measured by the Engineer-in-charge whose measurement shall be binding and conclusive and (3) until all the temporary works, labour and staff colonies etc. constructed are removed and the work site cleaned to the satisfaction of the Engineer-in-charge. If contractors shall fail to comply with the requirements as aforesaid or before date fixed for the completion of work, the Engineer-in-charge may at the expenses of contractor remove such scaffolding, surplus materials and rubbish and dispose of the same he thinks fit.

3. The following documents will form the completion documents :

- (a) Technical documents according to which work was carried out.
- (b) Construction drawings showing therein the modifications and corrections made during the course of execution signed by Engineer-in-charge.

- (c) Completion certificate for "Embedded" or "Covered" up work.
- (d) Certificate of final levels as set out for various works.
- (e) Material appropriation statement for the materials issued by owner for work and list of surplus materials returned to S.M.C.'s store duly supported by necessary documents.

4. Upon expiry of the period of defects liability and subject to Engineer-in-charge being satisfied that work has been duly maintained by contractor during the defects liability period as fixed originally, or as external subsequently and the contractor has in all respects made up by subsidence and performed all his obligations under contract, the Engineer-in-charge shall (without prejudice to the rights of owner in any way) give final certificate to that effect. The Contractor shall not be considered to have fulfilled the whole of his obligation until final certificate shall have been given by the Engineer-in-charge notwithstanding previous entry upon and taking possession, working or using of the same or any part thereof by owner.

5. Final Certificate only Evidence of Completion :

Except the final certificate no other certificate or payments against a certificate or an general account shall be taken to be an admission by owner of the due performance of contract or any part thereof or of occupancy validity of any claim by the contractor.

GC-84 TAXES, DUTIES, OCTROI, ETC :

GST(goods and service tax) has come in existence from 1st July. 2017 contractor / successful bidder is bound to pay any amount of GST prescribed by the Govt. of india as per the term of contract agreed upon during the course of execution of this contract.

During the course of execution of contract, if there is any change in rate of GST (Goods & Service Tax) by the Government, The same shall be reimbursed / recovered separately by SMC. Subject to the submission of original Receipt / Proof for the amounts actually remitted by the successful Tenderer / contractor to the competent Authority along with a Certificate from Chartered Accountant of Contractor / Successful Bidder certifying that the amount of GST paid to the Government and the same shall be intimated / submitted / claimed within 30 (Thirty) Days from the date of payment Remittance of GST within stipulated period shall be the sole responsibility of the successful Bidder / Contractor, Failing which, SMC may recover the amount due, From any other payable dues with SMC and decision of Municipal Commissioner shall be final and binding on the Contractor / Successful Bidder in this regard further, the non-payment of GST to the Government may lead to the termination of contract and forfeiture of Security deposit / Performance Guarantee Amount.

If imposition of any other new Taxes / Duties / Levies / Cess or any other incidentals etc. or any increase in the existing Taxes / Duties / Levies / cess or any other incidentals etc. (Excluding GST) are imposed during the course of the contract. The same shall be borne by the Contractor / Successful Bidder only. In no case SMC shall be liable for the same.

1% Construction Cess will be deducted from respective R.A. Bill and Final bill in accordance with the prevailing norms of Govt. of Gujarat.

GC-85 INSURANCE :

Contractor shall at his own expenses carry and maintain with reputable Insurance Companies to the satisfaction of owner as follows :

1. Employees State Insurance Act :

Contractor agrees to and does hereby accept full and exclusive liability for compliance with all obligations imposed by the Employees' State Insurance Act 1948, and Contractor further agree to defend, indemnify and hold owner harmless from any liability or penalty which may be imposed by the Central or State Government of Local authority by reasons of any asserted violation by contractor or Sub-Contractor of the Employees' State Insurance Act, 1948 and also from all claims, suits or proceedings that may be brought against owner arising tender, growing out of or by reasons of the work provided for by this contract whether brought by employees of Contractor, by third parties or by Central or State Government authority or any administrative Sub-division thereof. Contractor agrees to fill in with the Employees

State Insurance Corporation, the declaration from and all forms which may be required in respect Contractor's or Sub-contractor's employees these aggregate remuneration is Rs. 400/-p.m.or less and who are employed in work provided for or those covered by E.S.I from time to time under the agreement. The Contractor shall deduct and secure the agreement of the Sub-contractor to deduct the employees' contribution as per the first Schedule of the Employees' State Insurance Act from wages. Contractor shall remit and secure the agreement of Sub-contractor to remit to the State Bank of India Employees' State Insurance Corporation Accounts, the employees contribution as required by the Act Contractor agrees to maintain all cares and record as required under the Act in respect of employees and payments and contractor shall secure the agreements of the sub-contractors to maintain such records, any expenses incurred for the contributions or maintaining records shall be to contractor's or sub-contractor' account. Owner shall retain such sum as may be necessary from the contract value until contractor shall furnish satisfactory proof that all contribution as required by the Employees' State Insurance Act 1948 have been paid.

2. **Workman's Compensation And Employees Liability Insurance :**

Insurance shall be effected for all contractors employees engaged in the performance of this contract. If any part of work is sublet, contractor shall require the sub-contractor to provide workmans' compensation and employer's liability insurance which may be required by owner.

3. **Other Insurance required under law or regulation by owner :**

Contractor shall also carry and maintain any and all other insurance which may be required under any law or regulation from time to time. He shall also carry and maintain any other insurance which may be required by owner.

GC-86 DAMAGE TO PROPERTY :

1. Contractor shall be responsible for making good to the satisfaction of owner any loss of and any damage to all structures and properties belonging to owner or being executed or Procured by owner or of other Agencies within the premises of all work of owner, if such loss or damage is due to fault and / or the negligence or will full act or omission of contractor, his employees, agent representatives or Sub-contractors.

2. Contractors shall indemnify and keep owner harmless of all claims for damage to properties other than S.M.C's property arising under or by reasons of this agreement if such claims result from the fault and / or negligence or willful act of omission of contractor,his employees, agents, representatives or sub-contractors.

GC-87 LABOUR LAWS AND REGULATIONS :

1. The contractor shall be responsible for the strict compliance of and shall ensure strict compliance by his sub contractor employees and agents of all labours and others laws, rules or regulations having the force of law affecting the relationship of employer and employee between the contractor/ sub-contractor and their respective employees.

2. No labour below the age of eighteen (18) year be employed on work.

3. Contractor shall pay to the labours engaged on work according the law.

4. The Contractor and sub-contractors of the contractor shall obtain proper authority designated in this behalf under any application law, rules or regulations (including but not restricted to the factories Act and Contract Labour Abolition and Regulation Act 1970,) in so far as applicable) any and all such licences, consents, Registration and / or other authorisation as shall from time to time be or become necessary for relatint to the execution of work or any part of portion thereof or the storage or supply of any materials or otherwise in connection with the performance of the contract and shall at all times observance by the sub- contractors, employees and agents of all terms and conditions of the said licences,consents, regulation and other authorisation and laws, rules and regulations applicable thereto.

GC-88 CONTRACTOR TO INDEMNIFY OWNER :

1. The Contractor shall indemnify and keep indemnified the owner and every member, officer and employee of owner from and against all action, claims, demands and liabilities whatsoever and in respect of the breach of any of the above clauses and/or against any claim, action or demand by any workman/employee of the contractor or any sub-contractor and or from any liability and way to any workman/employee of the contractor or any sub-contractor under any law, rule or regulations having the force of law, including but not limited to claims against the owner under the workman compensation Act 1923. The employees' Provident Funds Act 1952 and/or the Contract Labour (Abolition and Regulations) Act, 1970.

2. Payment of claims and damages :

If owner has to pay any money in respect of such claims or demands as aforesaid, the amount so paid and the cost incurred by the owner shall be charged to and paid by contractor without any dispute notwithstanding the same may have been paid without the consent or authority of the Contractor.

3. In every case in which by virtue of any provision applicable in the workman's Compensation Act 1923 or any other Act, be obliged to pay compensation to workman employed by Contractor the amount of compensation so paid, and without prejudice to the rights of S.M.C. under sec.(12) Sub-section (2) of the said Act, S.M.C. shall be at liberty to recover such amount from any surplus due to the contractor or the security deposit. S.M.C. will not be bound to contest any claim made under section (12) Sub-section (2) of the said Act except or written request of Contractor and upon the contesting of such claim.

4. The Contractor shall protect adjoining sites against structural decorative and other damages that could be caused to adjoining premises by the execution of these works and made good at his cost, any such damage, so caused.

GC-89 IMPLEMENTATION OF APPRENTICE ACT 1964 :

Contractor shall comply with the provisions of the Apprentice Act 1964 and the orders issued there under from time to time. If the fails to do so, it will be a breach of contract. Contractor shall also be liable for any particular liability arising on account of any violation of the provisions of the Act by him.

GC-90 HEALTH AND SANITARY ARRANGEMENTS FOR WORKERS :

Contractor shall comply with all the rules and regulations of the local sanitary authorities or as framed by owner from time to time for the protection of health and sanitary arrangements of all labour directly or indirectly employed on the work of this contract.

GC-91 SAFETY CODE :**GENERAL :**

Contractor shall adhere to safe construction practice and guard against hazardous and unsafe working conditions and shall comply with owner's safety rules and set fourth herein.

1. First Aid and Industrial Injuries :

1.1 Contractor shall maintain first aid facilities for its employees and chose of his sub-contractor.

1.2 Contractor shall make outside arrangements for ambulance service and for the treatment of industrial injuries. Name of those providing these services shall be furnished to Engineer-in-charge prior to start of construction, and their telephone numbers shall be prominently posted in contractor's field office.

1.3 All injuries shall be reported promptly to Engineer- in-charge, and a copy of Contractor's report covering each personal injury requiring the attention of a physician shall be furnished to owner.

2. General Rules :

2.1 Carrying, striking, matches, lighters inside the project area & smoking within the job site is strictly prohibited Violators of smoking rules shall be discharged immediately. Within the operation area, not hot work shall be permitted without valid gas safety, fire permits. The Contractor shall also be held liable and responsible for all lapses of his sub-contractors/ employees in this regards.

3. Scaffolding :

3.1 Suitable scaffolding shall be provided for workmen for all works that can not safely be done from the ground or from solid construction except such short period work as can be done safely from ladders. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder and if the latter is used for carrying materials as well, suitable foothold and handholds shall be provided on the ladder and the same shall be given inclination not steeper than 1 to 4 (1 horizontal and 4 vertical).

3.2 Scaffolding or staging more than 3.6 M (12') above the ground or floor, swing or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise fixed at least 1.0 M (3') high above the floor or platform of scaffolding or staging and extending along the entire length of the outside ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

4. Maintenance of Safety Devices :

4.1 All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in some conditions and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near place of work.

5. Display of Safety Instructions :

5.1 These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at the work-spot. The person responsible for compliance of the safety code shall be named therein by the Contractor.

6. Enforcement of Safety Regulations :

6.1 To ensure effective enforcement of the rules and regulations relating safety precautions, the arrangements made by the contractor shall be open to inspection by the welfare Officer, Engineer-in-charge of safety Engineer of the owner or their representatives.

7. No Exemption :

7.1 Notwithstanding the above clause 1.0 to 13.0 there is nothing to exempt the contractor from the operations of any other Act or rules in force in the Republic of India.

7.2 In addition to the above, the Contractor shall abide by the safety code provision as per C.P.W.D. Safety Code framed from time to time.

GC-92 ACCIDENTS :

It shall be the contractor's responsibility to protect against accidents on the work. He shall indemnify the Municipal Corporation against any claim for damage or for injury to persons or property resulting from, and in the course of work and also under the provision of the Workman's Compensation Act. On the occurrence of an accident arising out of the works which results in death or which is so serious as to be likely to result in death, the contractor shall within twenty four hours of such accident, report in writing to the Engineer-in-charge, the facts stating clearly and in sufficient details the circumstances of such accident and the subsequent action. All other accidents on the works involving injuries to persons or damage to property other than that of the contractors shall be promptly reported to the Engineer-in-charge stating clearly and in sufficient details and facts and circumstances of the accidents and the action taken. In all cases the contractor shall indemnify the Municipal Corporation against all loss of damage resulting directly or indirectly from the Contractor's failure to report in the manner aforesaid. This includes penalties or fine consequence of failure to give notice under the workman's compensation Act or failure to conform to the provisions of the said Act in regard to such accidents. In the event of an accident in respect of which compensation may become payable under the workmen's compensation Act VIII of 1923 including all modification thereof whether such compensation may become payable by the contractor only.

GC-93 WATER SUPPLY & ELECTRIC SUPPLY

FOR WATER CHARGE (As per City Engineer Note No.386, dtd.30/7/2012)

In case of Municipal Network or distribution center available or not at near by area

OPTION-1:

Contractor has to make his own arrangement for construction work whether from private boring or tankers. Contractor has to submit test report of water whether it is of good quality for construction work or not and contractor has to inform about it within 30 days of starting the work. If the contractor makes his own arrangement for water required for construction and labour camp etc. by drilling own bore or tankers, no water charges will be recovered from the contractor.

OPTION-2:

If contractor wants to use Municipal Water he has to follow procedure within below:

- 1. Contractor has to apply for water connection by Municipal Licensed plumber in prescribed form.**
 - 2. Contractor has followed all procedure with his own expenses.**
 - 3. According to rule Municipal Corporation issue bill to contractor for consumption of water and contractor has to pay it within stipulated time and contractor has to submit one copy of bill and payment receipt to concern department. If contractor fails to pay the bill the amount of bill/paid receipt can be recovered from contractor's bill.**
 - 4. If Municipal Corporation network is not available then Contractor can make arrangement of water tanker from nearby distribution center after depositing required amount.**
 - 5. After completion of work contractor has to cancel the water connection and inform the concern department.**
 - 6. If network and distribution center/network are both not available in that case contractor has to make his own arrangement for good quality construction water and has to follow the option-1.**
 - 7. If contractor is taking water connection or even if the contractor is not taking connection and makes other arrangement to use Municipal Water by tanker or tapping water from near private connection, water charges shall be recovered at the rate of 3% (THREE Percent) of the civil items in which water consumed.**
- (2) The contractor shall make his own arrangement at his cost for electric supply required for operating various plants and machineries required for the works and for general lighting purpose for site, office labour colony etc. The energy bills shall also be paid by the contractor.**

GC-94 SECURED ADVANCES:

No Secured advances shall be paid.

GC-95 STAR / BASIC RATE :

No Star / Basic Rate shall be considered for any item procured by the contractor at his own cost for this work.

GC-96 SUBMISSION / COMPULSION BY CONTRACTOR:

The contractor registered with S.M.C. or any other Govt. organisation is required to employ minimal technical staff as detailed in the certificate issued to him. If contractor does

not employ same technical staff over works entrusted to him, should submit photo-identity and education qualification of technical staff appointed at site."The contractor shall have to keep the record of the labourers employed for the concerned work. The contractor should provide attendance card, identification card, pay slip etc to the labourers employed. Further, the amount of E.S.I. & Provident Fund should be deducted from the salary of the labourers employed and such amount should invariably be deposited to the concerned Government Departments. In addition, the amount of social security under E.P.F. & M.P. act 1952 shall be recovered every month & such amount should invariably be deposited directly to the concern Government Departments. In the same context, the details regarding such amount deposited to the concern Govt. Deptt. and labourers employed shall be furnished to the office of Slum Upgradation Department of S.M.C. every month. In case of failure, such amount shall be deducted/recovered from the running bill directly in accordance with the details given by contractor regarding labourers employed and as per the prevailing rules of Government. In absence of detail, an adhoc suitable amount of the total amount of work done shall be recovered directly from the running bills. On submission of evidence of recovery of such amount, the amount recovered/deducted shall be released in the next bill after due sanction of Competent Authority of S.M.C."

GC-97 Removal of contractor's Employees :

The contractor shall employ in and about the execution of the works only such persons as are careful, skilled, competent and experienced in their several trades and shall on the direction of the Engineer-in-charge forthwith cease to employ in and about the execution of the works any person who in the opinion of the client or Engineer-in-charge, misconducts himself, or is incompetent or negligent in the proper performance of his duties or whose continued employment is undesirable for any reason. Such persons shall not be again employed upon the works without the written permission of the client / Engineer-in-charge.

GC-98 SPECIAL RISK

If during the contract, there shall be outbreak of war (whether war is declared or not), major epidemic, earthquake, or similar occurrence in any part of the world beyond the control of either party to the contract which whether financially or otherwise materially affects the execution of the contract, the contractor shall unless and until, the contract is terminated under the provisions of this article, use his best endeavors to complete the execution of the contract, provided always that the Corporation shall be entitled at any time after the onset of such special risks, to terminate the contract by giving written notice to the contractor and upon such notice being given this contract shall terminate but without prejudice to the rights of either party in respect of any antecedent breach thereof. If any of the works, or materials to be delivered subjected to damage or destruction by reasons for the special risks, the contractor shall be entitled to payment for such damage or destroyed materials and to any costs involved in making good damages or destroyed materials as may be required by the Municipal Corporation.

The contractor shall not be liable for payment of compensation for delay or for failure to perform the contract for reasons of Force Majeure such as acts of public enemy, acts of Government fires, floods, cyclone, epidemics, quarantine restrictions, lockouts, strikes, freight embargoes and provided that the contractor shall within Ten (10) days from the beginning of such delay notify the Engineer-in-charge in writing the cause of delay. The Municipal Commissioner shall verify the facts and grant such extension as the facts justify.

The person/persons whose tender may be accepted (hereinafter called the contractor, which expression shall unless excluded by or repugnant to the context include his heirs, executors, administrators and assignees) shall (within 15 days of the receipt by him of the notification of the acceptance of his tender otherwise 0.065% per day of S.D. amount will be charged as penalty) deposit with Municipal Commissioner in cash or Government securities endorsed to the Commissioner sum sufficient which will make up the security deposit specified in the tender.

If the amount of the security deposit to be paid in lump sum within the period specified above is not paid the tender contract already accepted shall be considered as cancelled. The security deposit lodged by contractor shall be refunded after the expiry of the Defects Liability period as

shown in the attached Memorandum after deducting dues, if any, which become liable to be recovered from the contractor under the terms and conditions of this Agreement.

GC-99 COMPENSATION OF THE DELAY

The time allowed for carrying out the work as entered in the tender shall be strictly observed by the contractor and shall be reckoned from the date on which the order to commence work is given to the contractor. The work shall through out the stipulated period of the contract be proceeded with, all due diligence (time being deemed to be the absence of the contract on the part of the contractor) and the contractor shall pay as compensation a percentage amount (shown in the attached Memorandum) of the tendered cost of the whole work as shown by the tender for every day that the work remains uncommenced or unfinished after the proper days, And further to ensure good progress during the execution of the work the contractor shall be bound, in all cases in which the time allowed for any work exceeds one month, to complete parts of the work during the period shown in the attached Memorandum.

In the event of the contractor failing to comply with these conditions he shall be liable to pay as compensation, the amount mentioned above for every day that the due quantity of work remained incomplete provided always that the total amount of compensation to be paid under the provision of this clause shall not exceed 10 percent of the Tendered cost of the work as shown in the tender.

GC-100 ACTION WHEN WHOLE OF SECURITY DEPOSIT IS FOREFITED

In any case in which under any clause of or clauses this contract the contractor shall have tendered himself liable to pay compensation amounting to the whole of this security deposit (whether paid in one sum or deducted by instalments) or in the case of abandonment of the work owing to serious illness or death of the contractor or any other causes, the Commissioner on behalf of the Corporation shall have power to adopt of the following courses, as he may deem best suited to the interest of Municipal Corporation .

(a) To rescind the contract (of which rescission notice in writing to the contractor under the hand of the Commissioner shall be conclusive evidence) and in that case that security deposit of the contractor shall stand forfeited and be absolutely at the disposal of Municipal Corporation .

(b) To employ labour paid by the Varachha Zone and to supply material to carry out the works, or any part of the work debiting, the contractor with correctness of which cost and price the certificate of Executive Engineer shall be final and conclusive against the contractor and crediting him with the value of the work done, in all respects in the same manner and at the same rates as if it had been carried out by the contractor under the terms of his contract, and in that case the certificate of the Executive Engineer as to the value of the work done shall be final and conclusive against the contractor.

(c) To order that the work of the contractor be in measured up and to take such part thereof as shall be unexecuted out of his hands, and to give it to another contractor to complete, in which case any expenses which may be incurred in excess of the sum which would have been paid to original contractor, if

the whole work had been executed by him (as to the amount of which excess expenses the certificate in writing of the Executive Engineer shall be final and conclusive) be borne & paid by the original contractor shall be deducted from any money due to him by Municipal Corporation under the contract or otherwise from his security deposit or the proceeds of sale thereof, or a sufficient part thereof.

Action when the progress of any particular portion of the work is unsatisfactory

In the event of any of the above courses being adopted by the Commissioner the contractor shall have no claim to compensation for any loss sustained by him by reason of his purchasing or procuring any materials or entering into any engagements, or made any advances on account of or with a view to the execution of the work or the performance of the contract. And in case the contract shall be re-tendered under provision aforesaid, the contractor shall not be entitled to recover, or be paid any sum for any work thereto actually performed by him under this contract unless and until the Executive Engineer shall have certified in writing the performance of such work and the amount payable to him in respect thereof, and he shall only be entitled to be paid the Particular amount so certified.

GC-101 COMPENSATION TO LOSS

Contractor remains liable to pay compensation if action not taken under clause(3)

If the progress of any particular portion of the work is unsatisfactory the Commissioner shall notwithstanding that the general progress of the work is satisfactory in accordance with clause 2, be entitled to take action under clause 3 (b) after giving the contractor 10 day's notice in writing and contractor will have no claim for compensation for any loss sustained by him owing to such action.

GC-102 Power to take possession of, require removal of, or self contractor's plant

In any case in which any of the powers conferred upon the Commissioner by clause 3 and 4 hereof shall have become exercisable and same shall not have been exercised the non-exercise thereof shall not constitute a waiver of any of the conditions hereof such powers shall notwithstanding be exercisable in any future case of default by the contractor for which by any clause or clauses hereof he is declared liable to pay compensation amounting to the whole of his security deposit required or and the liability of the contractor for past and future compensation shall remain unaffected.

In the event of the Commissioner taking action under sub-clause (a) or (c) of clause 3, he may, if he so desire to take possession of all or any tools, plant materials and stores in or upon the works, or the site thereof or belonging to the contractor, or procured by him and intended to be used for the execution of the work of any part thereof, paying or allowing for the same in account at the contract rates, or in the case of contract rates not being applicable, at current market rates, to be certified by the Executive Engineer whose certificate thereof shall be final. In the alternative the Commissioner may by notice in writing to the contractor or his clerk of the works. Foremen or other authorised agent require him to remove such tools, plant, materials, or stores from the premises within a time specified in such notice; & in the event of the contractor failing to comply with any such requisition, the Commissioner may remove them at the contractor's expense or sell them by action or private sale at the risk and account of the contractor in all respects, and certificate of the Executive Engineer as to the expense of any such removal, and the amount of the proceeds and expense of any of any sale shall be final and conclusive against the contractor.

GC-103 EXTENSION OF TIME:

If the Contractor shall desire an extension of the time for completion of the work on the ground of his having been unavoidably hindered in its execution or on any other ground, he shall apply in writing to the Commissioner within 30 days from the date on which he was hindered as aforesaid on or which the cause for asking for extension occurred and the Commissioner may, if in his opinion, there are reasonable grounds for granting an extension, grant such extension as he thinks necessary or proper. The decision of the Commissioner in this matter shall be final.

GC-104 FINAL CERTIFICATION:

On completion of the work the contractor shall be furnished with a certificate by the Executive Engineer (hereinafter called the Engineer-in-charge) of such completion, but no such certificate shall be given nor shall the work be considered to complete until the contractor shall have removed from the premises on which the work shall have been executed all scaffolding, surplus materials and rubbish, and shall have cleaned of the dirt from all woodwork, doors, windows, walls, floors or other parts of any building, in or upon which the work has been executed, or of which he may have had possession for the purpose of executing the work, nor until the work shall have been measured by the Engineer-in-charge or where the measurement have been taken by his subordinates until they have received the approval of the Engineer-in-charge, the said measurement being binding and conclusive against the contractor.

If the contractor shall fail to comply with the requirements of this clause as to the removal of scaffolding, surplus materials and rubbish. And cleaning off dirt on or before the date fixed for the completion of the work, the Engineer-in-charge may, at the expense of the contractor remove such scaffolding surplus material and rubbish, and dispose off the same as he thinks fit and clean off such dirt as aforesaid; and contractor shall forthwith pay the amount off all expenses so incurred, but shall have no claim in respect of any such scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.

GC-104 PAYMENT ON INTERMEDIATE CERTIFICATE TO BE REGARDED AS ADVANCE.

No payment shall be made for any work, on estimated to cost less than rupees one thousand, till after the whole of the said work shall have been completed & a certificate of completion given. But in the case of works estimated to cost more than rupees one thousand, the contractor shall, on submitting a monthly bill therefore be entitled to received payment proportionate to the percentage shown in the attached Memorandum of the part of the works than approved and passed by the Engineer-in-charge, whose certificate of such approval and passing of the sum so payable shall be final and conclusive against the contractor.

All such intermediate payment shall be regarded as payment by way of advance against the final payments only & not as payments for work actually done and completed and shall not preclude

the Engineer-in-charge from requiring bad, unsound imperfect or unskilful work to be removed & taken away & reconstructed, or re-erected. nor shall any such payment be considered as an admission of the due performance of the contract or any part thereof in any respect of the accruing of and claim; nor shall it conclude, determine or affect in any way the Powers of the Engineer-in-charge as to the final settlement and adjustment of the accounts or otherwise, or in any other way vary or affect the contract. The final bill shall be submitted by the contractor within one month of the date fixed for the completion of the work, otherwise the Engineer-in-charge's certificate of the measurement and of the total amount payable for the work shall be final and binding on all parties.

GC-105: PAYMENT AT REDUCED RATE ON ACCOUNT OF ITEM OF WORK NOT ACCEPTED AS COMPLETED TO BE THE DISCRETION OF THE ENGINEER-IN-CHARGE

The rates for several items of the work agreed to within, shall be valid only when the item concerned is accepted as having been completed fully in accordance with the sanctioned specifications. In cases where the items of works are not accepted as so completed the Engineer-in-charge may make payment on account of such items at such reduced rates as he may consider reasonable in the preparation of final or on account bills.

CLAUSE-10 Time for Bills to be submitted

A bill may be submitted by the contractor once in each month on or before the date fixed by the Engineer-in-charge for all works executed in the previous months, and the Engineer-in-charge shall take or cause to be taken the requisite measurement for the purpose of having the same verified, and the claim, so far as it is admissible shall be adjusted if possible within fifteen days from the presentation

of the bill. If the contractor does not submit the bill within the time fixed as aforesaid, Engineer-in-charge may depute a subordinate to measure up the said work in the presence of the contractor or his duly authorised agent whose counter signature to the measurement list shall be sufficient warrant, and the Engineer-in-charge may prepare a bill from such list which shall be binding on the contractor in all respects.

GC-106:BILLS TO BE ON PRINTED FORMS

The contractor shall submit all bills on the printed forms to be had on application at the office of the Engineer-in-charge. The charges to be made in the bills shall always be entered at the rates specified in the tender or in the case of any extra work ordered in pursuance of these conditions, and not mentioned or provided for in the tender at the rates hereinafter provided for such work.

GC-106:STORES SUPPLIED BY SMC.

If the specification or estimate of the work provides for the use of any special description of materials to be supplied from the Municipal Store or if it is required that the contractor shall use certain stores to be provided by the Engineer-in-charge (such materials and stores and the prices to be charged thereof as hereinafter mentioned being so far as practicable for the convenience of the contractor but not so as in any way to control meaning or effect of the contract specified in the schedule or memorandum hereto annexed) the contractor shall be supplied with such materials

and stores as may be required from time to time to be used by him for the purpose of the contract only and the value of the full quantity of materials and stores so supplied shall be set off deducted from any sums then due, or thereafter to become due to the contractor under the contract, or otherwise or from the security deposit, or the proceeds of sale thereof shall be deposit is held in Government securities the same or a sufficient portion thereof shall in that case be sold for the purpose. All material supplied to the contractor shall remain the absolute property of Municipal Corporation and shall on no account be removed from the site of the work, and shall at all times be opened to inspection by the Engineer-in-charge. Any such materials unused and in perfectly good condition at the time of completion or determination of the contract shall be returned to the East Zone (Varachha) store, if the Engineer-in-charge so requires by a notice in writing given under his hand, but the contractor shall not be entitled to return any such materials except with such consent and he shall have no claim for compensation on account of any such materials supplied to him as aforesaid but remaining unused by him or for any wastage in or damage thereto.

GC-107:WORKS TO BE EXECUTED IN ACCORDANCE WITH SPECIFICATIONS, DRAWINGS ORDERS ETC.

The contractor shall execute the whole and every part of the work in the most substantial and workman like manner, and both as regards materials and in every other respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to designs, drawings and instructions in writing relating to the work signed by the Engineer-in-charge and lodged in his office and to which the contractor shall be entitled to have access for the purpose of inspection at such office, or on the site of the work during office hours, and the contractor shall, if he so requires, be entitled at his own expense to make or cause to be made copies of the specifications and of all such designs, drawings and instruction on aforesaid.

GC-108 : ALTERNATION ON SPECIFICATIONS AND DESIGN NOT TO INVALIDATE CONTRACTORS. RATES FOR WORKS NOT ENTERED IN ESTIMATE OR SCHEDULE TO RATES OF THE SMC

The Engineer-in-charge shall have power to take any alteration in, or addition to the original specifications, drawings, designs and instruction that may appear to him to be necessary or advisable during the progress of the work, and the contractor shall be bound to carry out the work in accordance with any instructions in this connection which may be given to him in writing signed by the Engineer-in-charge and such alteration shall not invalidate the contract and any additional work which the contractor may be directed to do in the manner above specified as part of the work shall be carried out by the contractor on the same conditions in all respect on which he agreed to do the main work and at the same rates as are specified in the tender for the main work. And if the additional and altered work includes any class of work for which on rates is specified in this contract than such class of work shall be carried out at the rates entered in the schedule of rates of Municipal Corporation or at the rates mutually agreed upon between the Engineer-in-charge and the contractor whichever are lower if the additional or altered work for which no rate is entered in the schedule of Rates of Municipal Corporation is ordered to be carried out before the rates are agreed upon then the contractor shall, within seven days of the date of receipt by him of the order to carry out the work, inform the Engineer-in-charge of the rate which it is his intention to charge for such class of work and if the Engineer-in-charge does not agree to this rate he shall by notice in writing be at liberty to cancel his order to carry out such class of work, and arrange to carry it out in such manner as he may consider advisable provided always that if the contractor shall commence the work or incur any expenditure in regards thereto before the rates shall have been determined as lastly herein before mentioned, then in such case he shall only be entitled to be paid in such case he shall only be entitled to be paid in respect of the work carried out or expenditure incurred by him prior to the date of the determination of the rate as aforesaid according to such rate or rates as shall be fixed by the Engineer-in-charge. In the event of a dispute, the decision of the Commissioner will be final.

Where, however, the work shall have to be executed according to the designs; drawings and specifications recommended by the contractor and accepted by the competent authority the alteration above referred to shall within the scope of such designs drawings and specification appended to the tender.

Extension of time in consequence of additions or alterations. The time limit for the completion of work shall be extended in the proportion that the increase in its cost occasioned by alterations or addition the cost of the original contract work, and the certificate of the Engineer-in-charge as to such proportion shall be conclusive.

GC-109: NO COMPENSATION FOR ALTERATION IN OR RESTRICTION OF WORKS TO BE CARRIED OUT

If at any time after the execution of the contract documents the engineer-in-charge shall for any reason whatsoever, require the whole or any part of the work as specified in the tender to be stopped for any period or shall not require the whole or part of the work to be carried out at all or to be carried out by the contractor, he shall give notice in writing of the fact to the contractor who shall thereupon suspend or stop, the work totally or partially, as the case may be. In any such case, except as provided hereunder, the contractor shall have no claim to any payment or compensation whatsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not so derive in consequence of the full amount of the work nor having been carried out, or on account of any loss that he may be put to on account of materials purchased or agreed to be purchased, or for unemployment of labour recruited by him. He shall not also have any claim for compensation by reason of any alteration having been made in the original specifications, drawings, designs and instructions may involve any curtailment of the work as originals contemplated. Where which however, materials have already been purchased or agreed to be purchased by the contractor, before receipt by him of the said notice, the contractor shall be paid for such materials at the rate determined by the Engineer-in-charge, provided they are not in excess of requirements and are of

approved quality and/or shall be compensated for the loss, if any that he may be put to in respect of materials agreed to be purchased by him, the amount of such compensation to be determined by the Engineer-in-charge, whose decision shall be final. If the contractor suffers any loss on account of his having to pay labour charges during the period during which stoppage of work has been ordered under this clause the contractor shall on application be entitled to such compensation on account of labour charges as the Engineer-in-charge, whose decision shall be final, may consider reasonable, provided that the contractor shall not be entitled to any compensation on account of labour charges if, in the opinion of the Engineer-in-charge, the labour could have been employed by the contractor elsewhere for the whole or part of the period during which the stoppage of the work has been ordered as aforesaid.

GC-110: ON CLAIM TO COMPENSATION ON ACCOUNT OF LOSS DUE TO DELAY IN SUPPLY OF MATERIALS BY SMC.

The contractor shall not be entitled to claim any compensation from Municipal Corporation for the loss suffered by him on account of delay by Municipal Corporation in the supply of materials entered in schedule A' where such delay is caused by

- (1) Difficulties relating to the supply of Railway wagons & availability of Government controlled materials-
- (2) Force Majeure.
- (3) Act of God.
- (4) Act of the Nation's enemies or any other reasonable cause beyond the control of Municipal Corporation .

In the case of such delay in the supply of material the Municipal Corporation shall grant such extension of time for the completion of the work as shall appear to the Commissioner to be reasonable in accordance with the circumstances of the case. The decision of the Commissioner as to the extension of time shall be accepted as final by the contractor.

GC-111

The contractor is to set out and level the work & will be responsible for the accuracy of same. He is to provide and maintain measuring and surveying instruments including steel tapes, theodolite and dumpy level at all times for proper carrying of the work and for the use of Executive Engineer and his representative including skilled attendance.

GC-112

The Contractor is to cover up and protect the works from the weather, and is suspend all 'wet' operations during weather which, in the Executive Engineer opinion, will be detrimental to the work.

GC-113

Samples of each class of material and workmanship shall be submitted by the Contractor for the approval of Executive Engineer and after such approval these samples shall be deposited at any place the Executive Engineer may appoint and the Contractor shall be required to perform all the works of this contract in accordance with the samples.

GC-114

On completion, all work must be cleaned down; rubbish removed and the works and land cleaned of rubbish; surplus materials and other accumulations, and everything left in a clean and ordinary condition.

GC-115

The contractor shall provide, erect and maintain proper sheds and temporary buildings for the storage and protection of materials and goods and for the execution of work which may be fabricated or brought on the site.

GC-116

The contractor is to set out and level the works and will be responsible for the accuracy of the same. He shall also be responsible for the correctness of the positions, levels, dimensions and alignment of all parts of the structures as shown in the drawings supplied to him. If at any time any error shall appear during the progress of any part of the work, the contractor shall at his own expense rectify such error if called upon to the satisfaction of the Executive Engineer.

GC-117

The contractor shall permit the execution of the work not provided for in the tender by artists; tradesman, or others engaged by the Municipal Corporation. The contractor shall allow all reasonable facilities and the use of his scaffolding and water for the execution of such work, but is not required to provide any special scaffolding for the execution of such work except by special arrangement with Municipal Corporation.

GC-118: TIME LIMIT FOR UNFORESEEN CLAIM

Under no circumstance whatsoever shall the contractor be entitled to any compensation from Municipal Corporation on any account unless the contractor shall have submitted a claim in writing to the Engineer-in-charge within one month of cause of such claim occurring.

GC-119: ACTION AND COMPENSATION PAYABLE IN CASE OF BAD WORK:

If at any time before the security deposit is refunded to the contractor, it shall appear to the Engineer-in-charge or his subordinate in charge of the work that any work has been executed with unsound imperfect, or unskillful workmanship or with materials of inferior quality; or that any materials or articles provided by him for the execution of the work are unsound, or of a quality inferior to that contracted for, or otherwise not in accordance with the contract, it shall be lawful for the Engineer-in-charge to intimate this fact in writing to the contractor and then notwithstanding the fact that the work, materials or articles complained of may have been inadvertently passed, certified and paid for, the contractor shall be bound forthwith to rectify, or remove and reconstruct the work so specified in whole or in part as the case may require, or if so required shall remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost; and in the event of his failing to do so within a period to be specified by the Engineer-in-charge in the written intimation aforesaid, the contractor shall be liable to pay compensation at the rate of one percent on the amount of the tender for every day not exceeding ten days, during which the failure so continue and in the event of any such failure as aforesaid the Engineer-in-charge may rectify or remove and execute the work or remove and replace the materials or articles complained of or as the case may be at the risk and expense in all respects of the contractor, should the Engineer-in-charge consider that any such inferior work or materials as described above may be accepted or made use of it; shall be within his discretion to accept the same at such reduced rates along with the appropriate penalty as the Commissioner may deem fit.

The period to be counted from that date of final completion and handing over of the work to the Municipal Corporation during which the contractor is so liable for any defects in the work shall be the Defects Liability Period shown in the attached Memorandum.

GC-120: WORK TO OPEN BE INSPECTION

Contractor is responsible agent to be present.

All works under in course of execution or executed in pursuance of the contract shall at all time be open to the inspection and supervision of the Engineer-in-charge and his subordinates, and the contractor shall at all times during the usual working hours, and at all other times at which reasonable notice of the intention of the Engineer-in-charge or his subordinate to visit the work shall have been given to the contractor, either himself be present to receive orders and instructions, or have a responsible agent duly accredited in writing present for that purpose. Orders given to the contractor's duly authorised agent shall be considered to have the same force and effect as if they had been given to the contractor himself.

GC-121: NOTICE TO BE GIVEN BEFORE WORK IS COVERED UP

The contractor shall give not less than five day's notice in writing to the Engineer-in-charge or his subordinate in charge of the work before covering up or other wise placing beyond the reach of measurement any work in order that the same may be measured; and correct dimensions thereof taken before the same is so covered up or placed beyond the reach of measurement any work without the consent in writing of the Engineer-in-charge or his subordinate in charge of the work, and if any work shall be covered up or placed beyond the reach of measurement without such notice having been given or consent obtained, the same shall be uncovered at the contractor's expense, and in default thereof no payment or allowance shall be made for such work or for the materials with which the same was executed.

GC-122: Contractor Liable For Damage Done, And Or Imperfection For Three Months After Certificate.

If the contractor or his workmen; or servants shall break, deface injure or destroy any part of a building in which they may be working, or any building, road, fence enclosure or grass land or cultivated ground continuous to the premises on which the work of any part thereof is being executed; or if any damage shall be done to the work for any cause whatever while it is in progress or if any imperfection become apparent in it within the Defect liability period mentioned above by Engineer-in-charge the contractor shall make good the same at his own expense, or in default the Engineer in charge may cause the same to be made good by other workmen and deduct the expenses (of which certificate of Engineer-in-charge shall be final) from any sum that may be due or thereafter become due to the contractor or from his security deposit or the proceed of sale thereof or of a sufficient portion thereof.

GC-123: CONTRACTOR TO SUPPLY PLANT, SCAFFOLDING ETC.

And if liable for damages arising from a provision of light fencing etc.

The contractor shall supply at his own cost all materials (except such special materials, if any, as may be supplied from the Pubub works department Stores in accordance with the contract). plant tools, appliances implements, ladders, cordage, scaffolding and any temporary works which may be required for the proper execution of the work, in the original; altered or substituted from, and whether included in these specification or, other documents forming part of the contract or referred to in these conditions or not and which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in-charge as to any matter on which under these conditions he is entitle to be satisfied, or which he is entitled to require together with carriage thereof. To and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials necessary for the purpose of setting out works and counting, weighing and assisting in the measurement or examination at any time and from time to time of the work or materials, Failing this the same may be provided by the Engineer-in-charge at the expense of the contractor and the expense

may be deducted from any money due to the contractor under the contract, or from his security deposit or the proceeds of sale thereof or of a sufficient portion thereof. The contractor shall provide all necessary fencing and lights required to protect the public from accident; and shall also be bound to bear the expenses of every suit. Action or other legal proceedings, at law, that may be brought by any person for Injury sustained owing to negligence of the above precautions, and to pay damages and costs which may be awarded in any such suit action or proceedings, to any such person, or which may with the consent of the contractor be paid in compromising any claim by any such person.

GC-124:

The contractor shall make his own arrangement for drinking water for the labour employed by him.

GC-125: LIABILITY OF CONTRACTOR FOR ANY DAMAGE DONE IN OR OUTSIDE WORK AREA.

Compensation for all damage done intentionally or unintentionally or by contractor's labourers whether in or beyond the limits of municipal property shall be estimated by the Engineer-in-charge or such other office as he may appoint & estimates of Engineer-in-charge subject to the decision of the Commissioner on appeal be final & the contractor shall be bound to pay the amount of the assessed compensation of demand failing which the same will be recovered from the contractor as damage from the security deposit or deducted by the Engineer-in-charge from any sum that may be due or become due from Mahanagar Seva Sadan to the contractor under this contract or otherwise.

The contractor shall bear the expenses of defending any action or other legal proceedings that may be brought by any person from injury sustained by him owing to negligence of precautions to prevent the spread of fire & he shall also pay any damages and cost that may be awarded by the court in consequence.

GC-126: WORK ON SUNDAY

No. work shall be done on Sunday without the sanction in writing of the Engineer-in -charge.

GC-127: Contract may be rescinded by and security deposit forfeited for subletting it without approval or for being a public officer or if contractor becomes insolvent:

The contract shall not be assigned or subject without the written approval of the Engineer-in-charge, and if the contractor shall assign or sublet his contract or attempt to do so or become insolvent or commence any proceedings to be adjudicated insolvent or make any composition with his creditors, or attempt to do the Engineer-in-charge may, by notice in writing rescind the contract. Also if any bribe, gratuity gift, loan, perquisite, reward or directly advantage, pecuniary or otherwise, shall either or indirectly be given, promised, or offered by the contractor, or any of his servants agents to any public officer or person in the employ of Municipal Corporation in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract the Engineer-in-charge may by notice in writing rescind the contract. In the event of contract being rescinded, the security deposit of the contractor shall thereupon stand forfeited and be absolutely at the disposal of the Mahanagar Seva Sadan & the same consequences shall ensue as if the contract had been rescinded under clause-3 hereof and in addition the contractor, shall not be entitled to recover or be paid for any work thereto for, actually performed under the contract.

GC-128: SUM PAYABLE BY WAY OF COMPENSATING TO BE CONSIDERED AS REASONABLE COMPENSATION WITHOUT REFERENCE ACTUAL LOSS.

All sums payable by a contractor by way of compensation under any of these conditions shall be considered as a reasonable compensation to be applied to the use of Municipal Corporation without reference to the actual loss or damage sustained and whether any damage has or has not been sustained.

GC-129: CHANGES IN THE CONSTITUTION OF FIRM TO BE NOTIFIED.

In the case of a tender by partners any change in the constitution of a firm shall be forthwith notified by the contractor to the Engineer-in-charge for his information.

GC-130: WORKS TO BE UNDER THE DIRECTION OF EXECUTIVE ENGINEER

All works to be executed under the control shall be executed under the directions and subject to the approval in the respects of the Executive Engineer who shall be entitled to direct at what point or points and in what manner they are to be commenced, and from time to time carried on.

GC-131: DECISION OF THE COMMISSIONER TO BE FINAL

Except where otherwise specified in the contract decision of the Commissioner shall be final conclusive and binding on all parties to the contract upon all questions relating to the meaning of the specification designs, drawings and instructions here in before mentioned and as to the quality of workmanship, or materials used on the work, or as to any other question, claim, right, matter, or thing whatsoever in any way arising or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions, or otherwise concerning the works or the execution or failure to execute the same, whether arising, during the progress of the work or after the completion or abandonment thereof.

GC-132: LUMP SUM IN ESTIMATES:

When the estimate on which a tender is made includes lump sums in respect of parts of the work the contractor shall be entitled to payment in respect of the item of work involved or the part of the work in question at the same rates as are payable under this contract of such items or if the part of the work in question is not in the opinion of the Engineer-in-charge capable of measurement the Engineer-in-charge may at his discretion pay the lump sum amount entered in the estimate, and the certificate in writing of the Engineer-in-charge shall be final and conclusive under the provision of the clause.

GC-133: ACTION WHERE NO SPECIFICATION

In the case of any class of work of which there are no such specifications as are mentioned in Rule 1 such work shall be carried out in accordance with the Municipal or Gujarat Government P.W.D. specifications, and in event of there being no Municipal or Government P.W.D. specifications, then in such case the work shall be carried out in all respects in accordance with the instructions & requirement of the Engineer-in-charge.

GC-134: DEFINITION OF WORKS

The expression "works" or "Work" where used in these conditions shall, unless there be something in the subject or context repugnant to such construction be construed to mean the work of works the contracted to be executed under or in virtue of the contract, whether temporary or permanent, and whether original altered, substituted or additional.

GC-135: REFUND OF QUARRY FEES AND ROYALTIES:

All quarry fees and royalties shall be paid by the contractor All octroi taxes shall also be paid contractor according to the Municipal rules in force at the time and no refund shall be given Certificate for refund of quarry fees and royalties in admissible under existing rules shall be given by the Municipal to the contractor after successful completion of the contract. For the levy of water charges for construction work, please see the attached Memorandum.

GC-136: COMPENSATION UNDER WORKMEN'S COMPENSATION ACT:

The contractor shall be responsible for and shall pay any compensation to his workmen payable under the workmen's Compensation Act 1923 (VIII of 1923) or any statutory modification thereof for injuries caused to workmen.

GC-137: CLAIM FOR QUANTITIES OF WORK ENTERED IN THE TENDER ESTIMATE:

Quantities shown in the tender are approximate and no claim shall be entertained for quantities of work executed being either more or less than those entered in the tender of estimate.

GC-138: CLAIM FOR COMPENSATION DELAY IN STARTING THE WORK:

No. compensation shall be allowed for any delay caused in the starting of the work on account of any acquisition of land and in the case of clearance work, for any delay in accordance to estimate.

GC-139: CLAIM FOR COMPENSATION FOR DELAY IN THE EXCAVATION OF WORK.

No compensation shall be allowed for any delay in execution of the work on account of water standing in borrow pits or compartments. The rates are inclusive for hard or cracked soil, excavation in mud, sub-soil water or water standing in borrow pits, and no claim for an extra rate shall be entertained, unless otherwise expressly specified.

GC-140: ENTERING UPON OR COMMENCING ANY PORTION OF WORK:

The contractor shall not enter upon or commence any portion of work except with the written authority and instructions of the Engineer-in-charge or of his subordinate in charge of the work failing such authority the contractor shall have no claim to ask for measurements for payment of work,

GC-141: MINIMUM AGE OF PERSONS EMPLOYED THE EMPLOYMENT OF DONKEYS AND OR OTHER ANIMALS & THE PAYMENT OF FAIR WAGES:

- (i) No contractor shall employ any person who is under the age of 12 years.
- (ii) No contractor shall employ donkeys or other animals with breching of string or thin rope. The breeching must be atleast three inches wide and should be of tape (Nawar).
- (iii) No animals suffering from sores, lameness or emaciation or which is immature shall be employed on the work.
- (iv) The Engineer-in-charge or his agent is authorised to remove from the work any person or animal found working which does not satisfy these conditions and no responsibility shall be accepted by Municipal Corporation for any delay caused in the completion of the work by such removal.
- (v) The contractor shall pay fair & reasonable wages to the workmen employed by him in the contract undertaken by him in the event of any dispute arising between the contractor and his workmen on the grounds that the wages paid are not fair and reasonable, the dispute shall be referred without delay to the Executive Engineer who shall decide the same.

The decision of the Executive Engineer shall be conclusive and binding.

On the contractor but such decision shall not in any way affect the condition in the contract regarding the payment to be made by Municipal Corporation at the sanctioned tender rates.

GC-142: METHOD OF PAYMENT.

Payment to contractors shall be made by cheques drawn on any Bank in Surat, provided the amount exceeds Rs.10. Amounts not exceeding Rs.10 will be paid in cash.

GC-143: ACCEPTANCE OF CONDITION COMPULSORY BEFORE TENDERING FOR WORK.

Any contractor who does not accept these conditions shall not be allowed to tender for works.

GC-144: CLAUSE HEADINGS

The clause headings in these conditions are for purposes of reference only and are not to be deemed to form part of this contract.

Disputes if any, shall be discussed and mutually settled and in case of disagreement the same shall be referred to Commissioner/Standing Committee. After referring to Commissioner/Standing Committee if the said dispute is not solved, the same shall be referred to the court subject to Surat Jurisdiction only.

GC-145: THE FOLLOWING CONDITION ARE BEING INCLUDED IN THIS TENDER AND SHALL BE CONSIDERED AS A PART OF TENDER DOCUMENT.

(i) In case the total amount of work done is less than 5% of the contract value, prorata S.D. to that extent may be refunded to the contractor while releasing the payment of final bill. In short, the S.D. to be retained by the Corporation after payment of final bill shall be equal to 2% of the amount of final bill as per the prevailing norms or as per the norms decided from time to time.

(ii) If there is increase in amount of work more than 5% of the Contract value. The Additional S.D. shall be recovered from the running bill. When the total of any of work done by the Contractor up to running bills under consideration is more than 5% of the contract value. However, such S.D. shall be recovered in the round figure of Rs. 1000/- i.e. the amount of work done when it exceeds 5% of the contract value it shall be refunded of to the nearest multiple of Rs.25000/- such additional S.D. shall be recovered for the works amount to Rs. 5 Lacs or more at the rate of 4% of the additional amount.

(iii) In many cases, the contractors are stopping the work half-way due to number of reason and when the department has to take actions in accordance to clause 3(a) or (b) or (c) of the contract the remaining work has to be carried out by advertising the tender for the remaining work and the whole administrative process right from inviting tenders to finalising the tender etc.

In such cases a fixed amount of Rs.1000/- should be reversal from the original contract towards the cost of advertisement and other administrative charges incurred by the department in finalising the contract for the remaining work. In case a separate advertisement is issued for a single work actual cost of advertisement shall be recovered such recovery shall be in addition to the recovery to be made under clause-3 or such other relevant clauses.

GC-146: In continuation of clause No.46(i) if any contractor found employing person or persons under the age of 12 years, during course of the construction at any stage, legal actions shall be taken against him as stipulated in Child Labour (Prohibition & Regulation) Act 1986 and also, a penalty of Rs.20,000/-(Rupees Twenty thousand) shall be imposed which shall be deposited with District Collector in Child Labour Rehabilitation cum Welfare Fund.

GC-147 EVALUATION OF SUBMITTED QUALIFICATION OFFER BASED ON SUBMISSIONS MADE BY THE TENDERER.

The tenderer shall be fully responsible for correctness of submissions made whether same has been examined and approved by employer or not. In the event of misrepresentation or suppression of the matter/ fact by the tenderer, the action will be taken on the wrong tenderer as per procedure/ provision outlined in the tender document. Price bid will be opened of those tenderers, whose post qualification bids meet requirements of the qualifying criteria as laid down in tender.

GC-147 RESPONSIBILITY OF CONTRACTOR UNDER CONSTRUCTION AND DEMOLITION WASTE (C & D WASTE) RULES 2016

- Contractor shall remove all construction and demolition waste (C & D waste) and clean the area every day, or depending upon (1) The type & schedule of the work, (2) The quantity and type of waste generated, appropriate storage and collection facility shall be developed at site. Reasonable timeframe shall be worked out in consultation with engineer in charge of the project, for storage & usage of C & D waste.
- If it's found that contractor is irregular and showing negligence to management of C & D waste, then if deem fit, engineer in charge would arrange to dispose the said C & D waste through an authorized C & D waste contractor/agency of surat municipal corporation and all the expenditure made towards disposal of this C & D waste shall be recovered from the contractor as per the prevailing charges.
- Contractor shall have to bear the expenses towards management of C & D waste as per the prevailing norms, no extra payment shall be entertained for the same.
- Contractor shall keep record of generation and disposal of construction and demolition waste (C & D waste) and proof of its disposal as per the provision of C & D waste rules and he has to submit alone with running bills.

- If contractor fails to upkeep and maintain records of C & D waste generation- disposal records etc., Than it shall be calculated as per the provision of the standing committee resolution no 1621/2016, dt.01/10/2016 and charges shall be recovered from due of contractor with surat municipal corporation.

Contractor shall also ensure use of recycled products made from SMC authorized C & D waste agency as far as possible to promote the C & D waste management project.

GC-148 GOODS AND SERVICE TAX (GST):

GST CLAUSE FOR CONSTRUCTION / ERECTION / COMMISSIONING / INSTALLATION / REPAIRS / MAINTENANCE / RENOVATION / FABRICATION OF STRUCTURE INCLUDING BUILDING (MEANS ALL WORKS CONTACT / TURN KEY PROJECTS / SUPPLY OF MATERIAL / GOODS)

GST (Goods & Service Tax) has come in existence from 1st July 2017. Contract / Successful Bidder is bound to pay any amount of GST prescribed by the Govt. of India as per the Terms of Contract agreed upon during the course of execution of this Contract.

During the course of execution of contract. if there is any change in Rate of GST (Goods & Service Tax) by the Government the same shall be reimbursed / recovered separately by S.M.C. subject to the submission of Original Receipt / proof for the amounts actually remitted by the successful Tenderer / Contractor to the competent authority along with a certificate from Chartered Accountant of Contractor / Successful Bidder certifying that the amount of GST paid to the Government and the same shall be intimated / submitted / claimed within 30 Days from the date of payment Remittance of GST within stipulated period shall be the sole responsibility of the Successful Bidder / Contractor, failing which S.M.C. and decision of the Municipal Commissioner shall be final and binding on the Contractor / Successful Bidder in this regard Further the non-payment of GST to the Government may lead to the termination of contract and forfeiture of security Deposit / Performance Guarantee Amount.

If imposition of any other new Taxes / Duties / Levies / Cess or any other incidentals etc. or any increase in the existing Taxes / Duties / Levies / Cess or any other incidentals etc. (Excluding GST) are imposed during the course of the contract the same shall be borne by the Contractor / Successful Bidder only in no case Municipal Corporation shall be liable for the same. The Contractor will submit the invoice to the Municipal Corporation having GSTIN of Municipal Corporation mentioned therein and the taxes shall be shown separately on the face of the invoice so as to claim as ITC by Municipal Corporation.

Note :- The Rates mentioned in BOQ are excluding GST. GST will be reimbursed separately (if applicable as per the opinion of Account department of SMC / GST Consultant of SMC) as per the prevailing GST Rates decided by the Government. The contractor is invariably bound to any changes in GST Rates made during the course of the work. The payment (if applicable) for GST will be only released only after the applicable Amount reflects on Government portal. Decision of Account Department of SMC regarding applicable GST Rates will be final.

EXECUTIVE ENGINEER,
SOUTH-EAST ZONE,
SURAT MUNICIPAL CORPORATION.

SIGNATURE OF THE CONTRACTOR.

SCHEDULE – A

The Surat Municipal corporation shall not issue cement and reinforcement steel Contractor shall make his own arrangement to procure all materials, cement and reinforcement steel.

The cement to be used shall be 53 grade Cement (Ordinary Portland Cement OPC) and out of following brands only:	The reinforcement steel i.e. HYSD bars shall be only of following makes and shall be Thermo-Mechanically treated (TMT).
<ol style="list-style-type: none">1. Ultratech2. Sanghi3. Hathi4. Siddhi5. J.K.laxmi6. Ambuja7. Wonder8. JK Cement Ltd	<ol style="list-style-type: none">1. SAIL2. Rastriya Ispat Nigam Ltd. (RINL)3. TATA4. Electrotherm5. National6. JSW7. Ramasroop8. Gallantt9. Pollad10. Welspun Shield TMT

The test certificates regarding its property including indication of its Thermo-Mechanically treated must accompany every lot and shall be submitted to Surat Municipal Corporation before utilizing the same. Unless and until such certificate is submitted, the steel procure at site will not be allowed to be used.

Cement, Reinforcement steel and other materials:

The cement and steel shall not be issued by SMC.

(1) Penalty for cement shall be levied as below against variation than the actual consumption:

(a) No penalty if actual total consumption is equal to or more than standard theoretical total consumption. For over consumption of cement no extra payment shall be made.

(b) **Twice the Basic Rate of Rs. 5,600/-(Without GST) per** MT for the variation in cement consumption less than standard theoretical consumption.

(c) **Twice the Basic Rate of Rs. 50,500/-(Without GST) per** MT for variation in High Strength TMT Fe-500 steel consumption less than standard theoretical consumption.

(2) The payment for reinforcement bar will be made on theoretical weight basis but not exceeding actual procurement at site. The weight shall be computed on the basis of the length of the steel used in the work multiplied by the standard unit weight of MS/HYSD (TMT) bar as mentioned in IS Code No. 1786/85.

(3) No separate payment shall be made for any kind of wastage/excess consumption in the materials.

(4) Ultimately the liability for assurance of the good quality work as per tender provision lies with the contractor.

Testing of Cement, Steel and other materials:

It should be specifically noted that the Cement, Steel, etc. brought by the contractor at site of work shall be used only after the same is tested at the approved laboratory as per the direction of Engineer-in-charge. The testing of all the materials shall be carried out as per relevant codes of I.S. All the charge for the transport and testing of the samples etc. shall have to be borne by the contractor. The frequency of testing such material shall be in accordance to the relevant Indian Standards as directed by Engineer-in charge. The contractor shall have to make his own arrangement for transportation of inspecting authorities/agencies/PMC at his own cost.

Signature of the Contractor:-

EXECUTIVE ENGINEER
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION

MEMORANDUM

(1)	General Description of the Work	:	Repairing and Maintenance work of School building In T.P.S. No. 19 (Parvat-Magob), T.P.S. No. 35 (Kumbhariya) and T.P.S. No. 64 (Dumbhal-Magob) in South East zone (Limbayat), Surat.
(2)	Estimated Cost	:	Rs. 37,51,760.63
(3)	Earnest Money Deposit	:	Rs. 37,600.00
(4)	Security Deposit		
	(i) Initial Security Deposit	:	As per IT-27
	Percentage to be retained from running bills	:	As per IT-27
	Time allowed for the completion of the Work from date fixed in Work Order Letter to commence	:	12 (Twelve) Months , as per GC-17.
	Percentage to be retained from Final Bill	:	As per IT-27
(5)	Penalty for delayed Work	:	0.2 % (Zero point Two percent) of the Tender Value per day, maximum up to 10 % (Ten percent) of the Tender Value.
(6)	The progress of the Work shall confirm to the following schedule		-
(7)	¼th of the Work in	:	-
(8)	½ of the Work in	:	-
	¾th of the Work in	:	-
	Defect Liability Period	:	As per GC-12 of this Tender.
(9)	Water Charges	:	As per GC-91 of this Tender
(10)	Construction Cess	:	Applicable at 1% on Amount of Work Done

SIGNATURE OF THE CONTRACTOR.

NAME AND ADDRESS :-

EXECUTIVE ENGINEER
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION

IMPORTANT INSTRUCTION-A TO THE CONTRACTOR

- (1) This tender document containing Page No.01 to 260 duly signed by the tenderer, should be furnished to Corporation treasury along with the amount of earnest money deposit as mentioned in tender notice. If any of the drawings or papers removed from the tender, the tender shall be rejected and E.M.D. shall be forfeited.
- (2) The tenderer who wants to propose something in written, he should write it on his letter pad or another paper. Anything written on tender papers shall not be considered by Corporation and Contractor shall not be intend to do so.
- (3) Following Certificate shall be enclosed with tender.
 - (a) Solvency Certificate amounting of 20% of Estimated amount.
 - (b) Registration Certificate of required class given by Government or Semi-Government firm.
 - (c) Income-Tax clearance certificate.
 - (d) List of work done by Contractor with its volume.
- (4) This is annual rate contract, It the work given to one or more Contractors, the time limit shall be as per memorandum of the tender.

EXECUTIVE ENGINEER,
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION,

SIGNATURE OF THE CONTRACTOR.

IMPORTANT INSTRUCTION-B TO TENDERER

1.

Affix latest passport size photo of tenderer duly signed
--

Specimen Signature of the Contractor

2.

(1)	(2)	(3)	(4)
AFFIX LATEST PASSPORT SIZE PHOTOGRAPH OF ALL PARTNERS IN CASE OF PARTNERSHIP AGENCY			

Specimen signature of all partners incase of partnership agency.

- | | | |
|-----|--|--|
| (1) | | Submission of Registered Agreement is compulsory in case of partnership agency. |
| (2) | | |
| (3) | | |
| (4) | | |

3. Submission of audited account balance sheet of last three years is compulsory for tenderer submitting agency.
4. Submission of sale tax certificate, with proof of residence is compulsory for tenderer.
5. In case of Government royalty applicable to tenderer, it is compulsory to submit a receipt of royalty payment with tender.
6. The Photograph and specimen signature of contractor will be cross checked, whenever contractor receives payment in account section of S.M.C.
7. The specimen signature of contractor will be cross checked by Account Department of S.M.C., in case of representative of Contractor alongwith letter of authority of a person who signed an agreement, receives payment.

SIGNATURE OF THE CONTRACTOR.

EXECUTIVE ENGINEER,
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION,

SPECIAL NOTE

- (1) The work shall be carried out strictly according to the specifications given in Bombay Public Works Department Hand Book Vol.1 and II (The latest edition) whenever applicable as directed by Executive Engineer.
- (2) The work shall have to be started by the contractor at as many places as ordered by the Executive Engineer.
- (3) If during excavation or carrying out of any item of the work, any electric pole, electric cable, telephone cables, telegraph cable, gas line, drain connection pipeline, water service pipeline, sewer main, water mains, etc. is/are damaged by the contractor shall be liable to pay the full expenditure required and to repair the same or charges for the same (as the case may be) decided by the electric company, Gas Company, Government Authority or the Surat Municipal Corporation which ever may be.
- (4) The work shall be carried out in workman like manner, and best skilled worker should be employed. If any defect in the work is found out the contractor shall have to rectify within the time fixed by Executive Engineer. If he fails to rectify the defect Executive Engineer after giving due notice shall rectify the defect at the risk and cost of the contractor.
- (5) All the work shall be done strictly according to the instruction of Executive Engineer.
- (6) No compensation shall be paid if the work is stopped due to defective work or as per the instruction from Engineer-in-charge due to any reasons.
- (7) The rates given in the schedule shall hold good for all works done under this contract without reference to quantities or location of work.
- (8) The contractors are particularly directed to observe from the specification what is to be included in the items and rates for the several portion of the work frame out all their rates for items accordingly.
- (9) The date of starting of the work is considered to be the date specified in the final work order.
- (10) If any Clause of Arbitration is there in tender document is deleted here with.
- (11) The project under this tender may be executed under strict supervision of P.M.C. if deployed by S.M.C. Contractor shall carry out the instructions of P.M.C.
- (12) Third Party Inspection shall be deployed by S.M.C.
- (13) The contractor shall submit the advance Pour Card in prescribed form for the type of work which he planned to carry out with the skilled / unskilled labour deployed by him for the work.
- (14) The contractor shall establish concrete cube testing machine and other equipments required for quality checking of materials as per instructions of PMC/ Engineer-In-charge.
- (15) The contractor shall use the materials of the specified brands only. Request for equivalent brands will be considered only if specified brand is not available in market.
- (16) ACCIDENT LIABILITIES:

The Contractor shall be responsible for all liabilities under workman compensation act, as under:

- (a) On occurrence of accident, resulting in death of workman employed by the Contractor which is so serious as is likely to result in death of such workman who meet with accident, the Contractor shall within 24 hours of accident, will intimate in writing to Engineer-in-charge of such incidence. The Contractor shall indemnify client, against all losses/damages sustained by the client resulting directly or indirectly from his failure to give such intimation to client including penalties/fines if any, payable by client as a consequence of client's failure to give notice under workman's compensation act or otherwise to conform the provision of this act in regard to such accidents.
- (b) In case when such compensations as above becomes payable under workman's compensation act, whether by contractor or by client as principal employer, it shall be law full for the Engineer-in-charge to retain out of money due and payable to the Contractor, such sum or sums of money as may in the opinion

of the Engineer-in-charge be sufficient to meet such a liability, the opinion of the Engineer-in-charge shall be final in regard to all matters arising under this clause.

(17) INSURANCE:

The Contractor shall take "All Contract Risk Insurance Policy" for the estimated cost of this work "Work's Man Compensation Policy" for all workers and labours of contractor and client working at site and "Third Party Insurance Policy" to fully cover all third party type risk. The insurance policy so taken by the Contractor for such purposes shall be in the joint name of the Contractor and the client and the policy shall be deposited with the client.

Contractors shall have to use maximum machinery for the work as per the direction of Engineer-In-Charge. If possible, space for stacking the surplus excavated earth will be provided by SMC. Otherwise the contractor shall arrange for the same at no extra cost to SMC.

(18) Contractor has to fixed display board describing the necessary information / particulars of work at specific location and shall submit the evidence to engineer-in-charge along with photographs. otherwise , 0.25% to 1.0% of tender amount as per description of engineer-in-charge shall be kept hold, while making payment to the contractor until the evidences as stated above is submitted. No extra payment shall be payable for fixing display boards.

(19) The Contractor shall paint building numbers & Flat numbers as per guideline of SMC without any extra payment.

(20) PLEASE READ CAREFULLY

Following details pertaining to work progress is mandatory.

(A) Bar chart: Contractor shall submit barchart showing schedule of execution of various activities within stipulated time limit

(B) Material Management : Contractor shall provide following details

- Source of materials i.e. yellow earth, Coarse aggregate, Grit, fine aggregates, bricks, cement, steel etc.
- Supply schedule : According to bar chart, the flow diagram of materials.

(C) Man power management :

The contractor shall submit details of manpower of various categories (skilled & unskilled labours) to be deployed for the work as under.

- Minimum no. of skilled and unskilled labors to be deployed on the work
- List of supervisors & engineers for supervision & quality control of the work.

(21) All the applicant contractors are required to have their own employers code number under EPF Act, 1952 and are required to comply the applicable provisions of said statute regularly and totally.

(22) Further the contractors for services are required to produce the certified copies of paid challans in respect of employees/workers employed by said contractor in respect of work allotted by Surat Municipal Corporation, along with copies of Pay Roll and Muster Roll. If the same are not produced, the bills will not be released.

SIGNATURE OF THE CONTRACTOR.

EXECUTIVE ENGINEER
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION

SPECIAL CONDITIONS OF CONTRACT

1.1 GENERAL :

Clause given under these special conditions shall be read in conjunction with conditions of the contract and in case of any conflict the provisions of special conditions will override the provisions of general conditions of contract.

The tenderer shall acquaint himself with the access to site, availability of local facilities such as transport, materials, labour and shall price his tender accordingly.

1.2 ROAD INFRA STRUCTURE :

The bidder shall acquaint himself with the access to site. The successful tenderer shall have make road and other infrastructure facility for the easy access to the site at his own cost.

1.3 SAFETY :

All the safety and entry rules shall be strictly followed. The contractor is fully responsible for the safety of his staff and workmen and must equip them with safety appliances and tools.

1.4 TIME SCHEDULE :

The work shall be executed strictly as per the time schedule/bar chart submitted along with price bid offer. The entire job/project has to be completed within a **Period of 01 (One) Year Including Moonsoon** from the Date of placement of order. The time limit includes the time limit required for testing, rectification, if any, retesting and completion in all respect to the entire satisfaction of the Engineer-in-charge. The timely completion of this project is very very important for the citizen of Surat City, and hence weightage will be given on strict compliance of work as per the sanctioning schedule of work/bar chart.

1.5 Penalty for delay :

If the contractor fails to complete the whole project by the stipulated completion date, he shall also pay liquidated damages at one fifth of one percent i.e. 0.2% of tender amount per day of delay in completion and handing over the work to the Surat Municipal Corporation. The amount of liquidated damages shall however be subjected to maximum of ten (10) percent of the tender amount. Delays in excess of one hundred days will be a cause for termination of contract and for forfeiture of all performance security.

1.6 Scope of Supply of material :

(a) Supply of material :

All materials, consumables, testing appliances, tools, tackles and spares etc. necessary for the successful execution completion, and maintenance till handing over to S.M.C. shall be procured and provided by the tenderer. No materials will be supplied by the owner. Except mention in Schedule - 'A.

(b) Water :

Contractor shall have to make his own arrangement for water required for construction, testing and for his labour/employees too.

(c) Power :

Power required for the constructions, erection and other allied job shall be arranged by the contractor at his own cost.

The Contractor shall have to make his own arrangement for getting electric power. The S.M.C. will issue only recommendation letter to the contractor if required. No compensation shall be paid for delay in getting power supply.

(d) Cement :

Cement required for the construction shall be arranged by the contractor at his own cost.

(e) Steel :

All types of TMT reinforcement steel shall be arranged by the contractor at his own cost.

1.7 Construction of Stores and site office :

Suitable areas will be allocated by the S.M.C. to the Contractor to build storages for storing his equipments, plant, materials etc. and also to build his site offices. He will be solely responsible for watching and guarding of his stores, offices etc.

The contractor shall cover all his equipments and materials at site with requisite insurance against theft, larceny, decoity, fire tempest, flood earthquake etc.

On completion of the works undertaken by the contractor, he shall remove all temporary works erected by him and have the site cleaned as directed by the Engineer. The S.M.C. reserves the right to ask the contractor any time during the tenure of the contract to vacate the land by giving 7 day's notice on security reasons or on national interest or otherwise.

1.8 Labour and supervisory Camps:

No land will be provided by the S.M.C. to the Contractor for constructing his labour and supervisory camps and other service facility. Contractor shall make his own arrangements outside the site boundary.

1.9 Construction Equipments :

The contractor shall make his own arrangement to procure all constructional plant and equipments for his own. He shall also state the type and number of different equipments with their capacities in good working conditions which he will use on the site to ensure completion of the work in the specified time.

All materials, construction plants and equipments once brought by the contractor to site are not to be removed from there without the written authority of the Engineer-in-charge. Also, the Contractor shall have adequate stock of spare parts for the equipment on the site and work shall not be delayed on this account. Similarly all temporary works built by the Contractor for the main construction undertaken by him, are not be dismantled and removed without the written authority of the the Engineer-in- charge.

1.10 Co-operation with other contractors :

The contractor shall execute his work in phased manner as directed by the Engineer from time to time so as not to obstruct or retard the work being executed simultaneously by other agencies.

1.11 Safety :

The contractor shall be responsible for provision of safety arrangement and protective clothing for all operators on the site whether or not engaged in actual operation of supervision. The contractor shall also be responsible for safety arrangements of all equipment used for construction and shall employ trained workmen conversant with safety regulation. The contractor shall use only tested equipment and tools and shall periodically renew tests to the satisfaction of the Engineer. All test certificate shall be made available to the Engineer at the site of the work. If at any time, in the opinion of the Engineer, this provision is not completion with, the Contractor shall forthwith replace such equipment and tools.

The contractor shall display notices and arrange proper fencing at such places where hazardous work is being carried out. The contractor shall provide at his own expense on the works to the satisfaction of the Engineer at such places, proper and sufficient fire fighting, first aid appliances etc. which shall at all times be available for use.

- 1.12 The contractor shall have to take photographs during various stages of construction activity for each of the work at no extra cost. The photograph shall be of size 4" x 6" on mat paper. The number of photographs shall be not be less than 200.
- 1.13 No mobilisation advance will be paid.
- 1.14 It is further to clarify that, the retention money deducted from each running bill will be released at the time of final bill. The security deposit remitted by the contractor will be released after the completion of defect liability period.
- 1.15 No compensation of any item shall be paid in case any of the item is omitted i.e. not executed at all.
- 1.16 It is clarify once again that, the serviceable materials obtained during dismantling/clearing of the site or the extra excavated stuff shall have to be carted by the contractor at the places shown by the Engineer-in-charge any where within city limit.
- 1.17 Out of the amount payable/creditable to contractor's account, the Central Government/State Government tax/taxes shall be deducted at source in accordance with the relevant laws/rules from time to time prevailing.
- 1.18 Surat Municipal Corporation shall not provide 'C' form for tax purpose.

SIGNATURE OF THE CONTRACTOR.

EXECUTIVE ENGINEER
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION

SPECIFICATIONS OF MATERIALS

Note:- Consider latest revision of the said I.S. wherever its applicable.

M-1 WATER :

- 1.1 Water shall not be salty or brackish and shall be clean, reasonably clear and free from objectionable quantities of silt and traces of oil and injurious alkalies, salts, organic matter and other deleterious material which will either weaken the mortar or concrete or cause efflorescence or attack the steel in R.C.C. Container for transport, storage and handling of water shall be clean. Water shall conform to the standards specified in I.S. 456-1978.
- 1.2 If required by the Engineer-in-charge it shall be tested by comparison with distilled water. Comparison shall be made by means of standard cement tests for soundness, time of setting and mortar strength as specified in I.S. 269-1976. Any indication of unsoundness, change in time of setting by 30 minutes or more or decrease of more than 10 percent in strength of mortar prepared with water sample when compared with the results obtained with mortar prepared with distilled water shall be sufficient cause for rejection of water under test.
- 1.3 Water for curing mortar, concrete or masonry should not be too acidic or too alkaline. It shall be free of elements which significantly affect the hydration reaction or otherwise interfere with the hardening of mortar or concrete during curing or those which produce objectionable stains or other unsightly deposits on concrete or mortar surfaces.
- 1.4 Hard and bitter water shall not be used for curing.
- 1.5 Portable water shall generally be found suitable for curing mortar or concrete.

M-2 LIME :

- 2.1 Lime shall be hydraulic lime as per I.S. 712-1973. Necessary tests shall be carried out as per I.S. 6932 (Parts I to X) 1973.
- 2.2 The following field tests for limes are to be carried out ---
 - a] A very rough idea can be formed about the type of lime by its visual examination i.e. fat lime bears pure white colour, lime in form of porous lumps of dirty white colour, indicates quick lime, and solid lumps the unbrunt lime stone.
 - b] Acid tests for determining the carbonate content in lime. Excessive amount of impurities and rough determination of class of lime.
- 2.3 Storage shall comply with I.S. 712-1973. The slaked lime, if stored, shall be kept in a weather proof and damp proof shed with impervious floor and sides to protect it against rain, moisture, weather and extraneous materials mixing with it. All lime that has been damaged in any way shall be rejected and all rejected materials shall be removed from site of work.
- 2.4 Field testing shall be done according to I.S. 162-1974 to show the acceptability of materials.

M-3 CEMENT :

- 3.1 Cement shall be ordinary portland cement of 53 grade as per I.S. 12269/87 (with latest ammendment) namely Ambuja, Ultra tech, Sanghi, Hathi, Sidhdhi, J.K.Laxmi.

M-4 WHITE CEMENT :

- 4.1 The white cement shall conform to I.S. 8042-1978.

M-5 COLOURED CEMENT :

- 5.1 Coloured cement shall be with white or grey portland cement as specified in the item of the work.
- 5.2 The pigments used for coloured cement shall be of approved quality and shall not exceed 10% of cement used in the mix. The mixture of pigment and cement shall be properly ground to have a uniform colour and shade. The pigments shall have such properties as to provide for durability under exposure to sun-light and weather.
- 5.3 The pigment shall have the properly such that it is neigher affected by the cement not detrimental to it.

M-6 SAND :

- 6.1 Sand shall be natural sand, clean, well graded, strong, durable and gritty particles free from injurious amounts of dust, clay, kankar nodules, soft or flaky particles, shale, alkaly, salts, organic mater, loam, mica or other deleterious substances and shall be got approved from the Engineer-in-charge. The sand shall not contain more than 8% of silt as determined by field tests. If necessary the sand shall be washed to make it clean.
- 6.2 Coarse Sand : The fineness modulus of coarse sand shall not be less than 2.5 and shall not exceed 3.0. The sieve analysis of coarse shall be as under ---

I.S.Sieve Designation	% by weight passing sieve	I.S.Sieve Designation	% by weight passing sieve
4.75 mm	100	600 Micron	30-100
2.36 mm	90-100	300 Micron	5-70
1.18 mm	70-100	150 Micron	0-60

- 6.3 Fine Sand : The finess modulus shall not exceed 1.0. The sieve analysis of fine sand shall be as under -
--

I.S.Sieve Designation	% by weight passing thru'	I.S.Sieve Designation	% by weight passing thru'
4.75 mm	100	600 Micron	40-85
2.36 mm	100	300 Micron	5-50
1.18 mm	70-100	150 Micron	0-10

M-7 STONE DUST :

- 7.1 This shall be obtained from crushing hard black tray or equivalent, it shall not contain more than 8% of silt as determined by field test with measuring cylinder. The method of determining silt contents by field test is given as under.
- 7.2 A sample of stone dust to be tested shall be placed without drying in 200 mm measuring cylinder. The quantity of the sample shall be such that it files the cylinder upto 100 mm mark. The clean water shall be added upto 150 mm mark. The mixture shall be stirred vigorously and the content allowen to settle for 3 hours.
- 7.4 The height of silt visible as settled layer above the stone dust shall be expressed as percentage of the height of the stone dust below. The stone dust containing more than 8% silt shall be washed so as to bring the silt content within the allowable limit.
- 7.5 The fineness modulus of stone dust shall not be less than 1.80.

M-8 STONE GRIT :

- 8.1 Grit shall consist of crushed or broken stone and be hard, strong, dense, durable, clean, of proper gradation and free from skin or coating likely to prevent proper adhesion of mortar.

Grit shall generally be cubical in shape and as far as possible flaky elongated pieces shall be avoided. It shall generally comply with the provisions of I.S. 383-1970. Unless a special stone of a particularly quarry is metnioned, grit shall be obtained from the best black trap or equivalent hard stone as approved by the Engineer-in-charge. The grit shall have no deleterious reaction with cement.

- 8.2 The grit shall conform to the following gradation as per sieve analysis :

I.S.Sieve Designation	% passing thru' sieve	I.S.Sieve Designation	% passing thru' sieve
12.50 mm	100%	4.75 mm	0.20%
10.00 mm	85-100%	2.36 mm	0.25%

- 8.3 The crushing strength of grit will be such as to allow the concrete in which it is used to build-up the specified strenght of concerte.
- 8.4 The necessary tests for grit shall be carried out as per the requirements of I.S. 2338 (Parts I to VIII)1963, as per instruction of the Engineer-in-charge. The necessity of test will be decided by the Engineering-in-charge.

M-9 CINDER :

- 9.1 Cinder is well brunt furnace residue which has been fused or ssintered into lumps of varying sizes.
- 9.2 Cinder aggregates shall be well burnt furnace residue obtained from furnace using coal fuel only. It shall be sound clead and free from clay, dirt, ash or other deleterious matter.

9.3 The average grading for cindar aggregates shall be as mentioned below :-

20 mm	100
10 mm	86
5.75 mm	70
2.36 mm	52

M-10 LIME MORTAR :

- 10.1 LIME : Shall conform to specification M-2. WATER : Water shall conform to specification M-1. SAND : Sand shall conform to specification M-6.
- 10.2 PROPORTION OF MIX Mortar shall consist of such proportions of slaked lime and sand as may be specified in the item. The slaked lime and shall be measured by volume.
- 10.3 PREPARATION OF MORTAR Lime mortar shall be prepared by wet process as per I.S. 1625-1971. Power driven mill shall be used for preparation of lime mortar. The slaked lime shall be placed in the mill in an even layer and ground for 180 revolutions with sufficient water. Water shall be added as required during grinding (care being taken not to add more water) that will bring the mixed material to a consistency of stiff paste. Thoroughly wetted sand shall then be added evenly and the mixture ground for another 180 revolutions.
- 10.4 STORAGE : Mortar shall always be kept damp, protected from sun and rain till used up, covering it by trapaulin or open sheds.
- 10.5 USE : All mortar shall be used as soon as possible after grinding. It should be used on the day on which it is prepared. But in no case mortar made earlier than 36 hours shall be permitted for use.

M-11 CEMENT MORTAR :

- 11.1 Water shall conform to specification M-1. Cement shall conform to specification M-3. Sand shall conform to M-5.
- 11.2 PROPORTION OF MIX : 11.2.1 Cement and sand shall be mixed to specified proportions, sand being measured by measuring boxes. The proportion of cement shall be by volume on the basis of 50 Kg./Bag of cement being equal to 0.0342 cu.m. The mortar may be hand mixed or machine mixed as directed.
- 11.3 PREPARATION OF MORTAR : 11.3.1 In hand mixed mortar, cement and sand in the specified proportions shall be thoroughly mixed dry on a clean impervious platform by turning over atleast 3 times or more till a homogeneous mixture of uniform colour is obtained. Mixing platform shall be so arranged that no deleterious extraneous material shall get mixed with mortar or mortar shall flow out. While mixing, the water shall be gradually added and thoroughly mixed to form a stiff plastic mass of uniform colour so that each particle of sand shall be completely covered with a film of wet cement. The water cement ratio shall be adopted as directed.
- 11.4 The mortar so prepared shall be used within 30 minutes of adding water. Only such quantity of mortar shall be prepared as can be used within 30 minutes.

M-12 STONE COARSE AGGREGATE FOR NOMINAL MIX CONCRETE :

- 12.1 Coarse aggregate shall be of machine crushed stone of black trap or equivalent and be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar.
- 12.2 The aggregate shall generally be cubical in shape. Unless special stones of particular quarries are mentioned aggregates shall be machine crushed from the best black trap or equivalent hard stone as approved. Aggregate shall have no deleterious reaction with cement. The size of the coarse aggregate for plain cement concrete and ordinary reinforced cement concrete shall generally be as per the table given below. However, in case of reinforced cement concrete the maximum limit may be restricted to 6 mm. less than the minimum lateral clear distance between bars or 6mm. less than the cover whichever is smaller.

TABLE

I.S. Sieve Designation	Percentage passing for single sized aggregates of nominal size			I.S. Sieve Designation	Percentage passing for single sized aggregates of nominal size		
	40 mm	20 mm	16 mm		40 mm	20 mm	16 mm
80 MM	--	--	--	12.5 MM	---	--	---
63 MM	100	--	--	10 MM	0.5	0.20	0.30
40 MM	85-100	100	--	4.75 MM	--	0.50	0.50
20 MM	0-20	85-100	100	2.35 MM	--	--	--
16 MM	--	--	85-100				

NOTE:- This percentage may be varied somewhat by the Engineer-in-charge when considered necessary for obtaining better density and strength of concrete.

- 12.3 The grading test shall be taken in the beginning and at the change of source of materials. The necessary tests indicated in I.S. 383-1970 and I.S. 456-1978 shall have to be carried out to ensure the acceptability. The aggregates shall be stored separately and handled in such a manner as to prevent the intermixing of different aggregates. If the aggregates are covered with dust, they shall be washed with water to make, them clean.

M-13 BLACK TRAP OR EQUIVALENT HARD STONE COARSE :

- 13.1 Aggregate for Design Mix Concrete : Coarse aggregate shall be of machine crushed stone of black trap or equivalent hard stone and be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar.
- 13.2 The aggregates shall generally be cubical in shape, unless special stones of particular quarries are mentioned, aggregates shall be machine crushed from the best, black trap or equivalent hard stones as approved. Aggregate shall have no deleterious reaction with cement.
- 13.3 The necessary tests indicated in I.S. 383-1970 and I.S. 456-1978 shall have to be carried out to ensure the acceptability of the material.
- 13.4 If aggregate is covered with dust it shall be washed with water to make it clean.

M-14 BRICK BATS AGGREGATE :

- 14.1 Brick bat aggregate shall be broken from well burnt or slightly over burnt and dense bricks. It shall be homogeneous in texture, roughly cubical in shape, clean and free from dirt of any other foreign material. The brick bats shall be of 40 mm to 50 mm size unless otherwise specified in the item. The underburnt or overburnt brick bats shall not be allowed.
- 14.2 The brick bats shall be measured by volume by suitable boxes as directed.

M-15 BRICKS :

- 15.1 The bricks shall be hand or machine moulded and made from suitable soils and kiln burnt. They shall be free from cracks and flaws not nodules of free lime. They shall have smooth rectangular faces with sharp corners and shall be of uniform colour. The bricks shall be moulded with a frog of 100mm x 40 mm and 10mm to 20mm deep on one of its flat sides. The bricks shall not break when dropped on the ground from a height of 600 mm.
- 15.2 The size of modular bricks shall be 190mm x 90mm x 90mm.
- 15.3 The size of conventional bricks shall be as under --- 225 x 110 x 75mm.
- 15.4 Only bricks of one standard size shall be used on one work. The following tolerances shall be permitted in the conventional size adopted in a particular work.
- Length : 3.00 mm
 - Width : 1.50 mm
 - Height : 1.50 mm
- 15.5 The crushing strength of the bricks shall not be less than 35 Kg./Sq.Cm. The average water absorption shall not be more than 20% by weight. Necessary tests for crushing strength and water absorption etc. shall be carried out as per I.S. 3495 (Part I to IV)-1976.

M-15A FLYASH BUILDING BRICKS :

The Flyash building bricks shall conform to Grade-5 of IS-13757. The frog of the 80 to 100 mm x 40 mm x 10 to 20 mm size.

The size of modular bricks shall be 190 mm x 90 mm x 90 mm.

The size of conventional brick shall be 230 mm x 110 mm x 70 mm. Only bricks of one standard size shall be used on one work. The following tolerances shall be permitted in the conventional size adopted in a particular work:

- Length : + 4 mm
- Width : + 2 mm
- Height : + 2 mm

The physical characteristic of bricks shall be as follows.

The minimum compressive strength of Flyash building bricks shall not be less than 70 Kg/Sq.Cm. and the test shall be conform to IS-3495 (Part-I).

The averages water absorption not more than 20 percentage by weight and the test shall conform to IS-3495(Part-3). Sampling of Flyash building bricks and criteria for conformity shall be as per I.S.:5454.

M-16 STONE :

- 16.1 The stone shall be of the specified variety such as Granite/Trap stone/Quartzite or any other type of good hard stones. The stones shall be obtained only from the approved quarry and shall be hard, sound, durable and free from defects like cavities, cracks, sand holes, flaws, injurious veins, patches of loose or soft materials etc. and weathered portions and other structural defects or imperfections tending to affect their soundness and strength. The stone with round surface shall not be more than 5% of dry weight. When tested in accordance with I.S. 1134-1974. The minimum crushing strength of the stone shall be 200 Kg./Sq.Cm. unless otherwise specified.
- 16.2 The samples of the stone to be used shall be got approved before the work is started.
- 16.3 The khanki facing stone shall be dressed by chisel as specified in the item for khanki facing in required shape and size. The face of the stone shall be so dressed that the bushing on the exposed face shall not project by more than 40 mm. from the general wall surface and on face to be plastered it shall not project by more than 19 mm nor shall it have depressions more than 10 mm from the average wall surface.

M-17 LATERITE STONE :

- 17.1 Laterite stone shall be obtained from the approved quarry. It shall compacted in texture, sound, durable and free from soft patches. It shall have a minimum crushing strength of 100 Kg/Sq.Cm. in its dry condition. It shall not absorb water more 20% of its own weight, when immersed for 25 hours in water. After quarrying, the stone shall be allowed to weather for some time before using in work.
- 17.2 The stone shall be dressed into rectangular blocks so that all faces are free from waviness and unevenness and the edges true and square.
- 17.3 Those type of stone in which white clay occurs should not be used.
- 17.4 Special corner stones shall be provided where so directed.

M-18 MILD STEEL BARS/TMT BARS :

- 18.1 Mild steel bars reinforcement TMT Bars for R.C.C. work shall FE 415/500 conform to I.S. 1786/85 (with latest amendment) and shall be of tested quality. It shall also comply with the relevant part of I.S. 456-1978 and revised latest I.S. Code.
- 18.2 All the reinforcement shall be clean and free from dirt, paint, grease, mill scale or loose or thick rust at the time of placing.
- 18.3 For the purpose of payment the bar shall be measured correct upto 10 mm length and weight payable worked out as per the rate specified below :

i] 6mm	0.22 Kg/Rmt.	viii]	20mm	2.47 Kg/Rmt.
ii] 8mm	0.39 kg/Rmt.	ix]	22mm	2.98 kg/Rmt.

iii] 10mm	0.62 kg/Rmt.	x]	25mm	3.85 kg/Rmt.
iv] 12mm	0.89 kg/Rmt.	xi]	28mm	4.83 kg/Rmt.
v] 14mm	1.21 kg/Rmt.	xii]	32mm	6.31 kg/Rmt.
vi] 16mm	1.58 kg/Rmt.	xiii]	36mm	7.31 Kg/Rmt.
vii] 18mm	2.00 Kg/Rmt.	xiv]	40mm	9.86 Kg/Rmt.

M-19 HIGH YIELD STRENGTH STEEL DEFORMED BARS :

- 19.1 High yield strength steel deformed bars shall be either cold twisted or hot rolled and shall conform to I.S. 1786/85 (with latest ammendment) and following makes TATA, SAIL, RINL, Electrotherm,Ramasroop,National,JSW.
- 19.2 Other provision and requirements shall conform to specification No. M-18 for Mild Steel Bars.

M-20 HIGH TENSILE STEEL WIRES :

- 20.1 The high tensile wires for use in prestressed concrete shall conform to I.S. 2090-1983.
- 20.2 The tensile strength of the high tensile steel bars shall be as specified in the item. In absence of the given strength and minimum strength shall be taken as per para 6-1 of the I.S. 1785-1962. Testing shall be done as per I.S. requirements.
- 20.3 The high tensile steel shall be free from loose mill scale, rust, oil, grease or any other harmful matter. Cleaning of steel bars may be carried out by immersion in solvent solution, wire brushing or passing through a pressure box containing carborundum.
- 20.4 The high tensile wire shall be obtained from manufactures in coils having diameter not less than 350 times the diameter of wire itself so that wire springs back straight on being uncoiled.

M-21 MILD STEEL BINDING WIRE :

- 21.1 The mild steel wire shall be of 1.63mm or 1.22mm (16 or 18 guage) diameter and shall conform to I.S. 280-1978.
- 21.2 The use of black wire will be permitted for binding reinforcement bars. It shall be free from rust, oil, paint, grease, loose mill scale or any other undesirable coating which may prevent adhesion of cement mortar.

M-22 STRUCTURAL STEEL :

- 22.1 All structural steel shall conform to I.S. 226-1965. The steel shall be free from the defects mentioned in I.S. 226- 1975 and shall hae a smooth finish. The material shall be free from loose mill scale, rust pits or other defects affecting the strength and durability. Rivet bars shall conform to I.S. 1148-1973.
- 22.2 When the steel is supplied by the contractor test certificates of the manufacturers shall be obtained according to I.S. 226-1975 and other relevant Indiand Standards.

M-23 GALVANISED IRON SHEETS :

- 23.1 The galvanised iron sheets shall be plain or corrugated sheets of gauge as specified in item. The G.I. Sheets shall conform to I.S. 277-1977. The sheets shall be undamaged in carriage and handling either by rubbing off of zinc coating or otherwise. They shall have clean

and bright surface and shall be free from dents, bends, holes, rust or white powdery deposit.

23.2 The length and width of G.I. sheets shall be as directed as per site condition.

M-23-A G.I.VALLEYS GUTTER, RIDGES :

23-A.1 The G.I. ridges and hips shall be of plain galvanised sheets class-3 of the thickness as specified in item. These shall be 600 mm width and properly bent up to shape without damage to the sheets in process of bending.

23-A.2 Valleys gutters and flashings shall be also of galvanised sheet of thickness as specified in item. Valleys shall be 900 mm. wide over all and flashing shall be 380 mm wide over all. They shall be bent to the required shape without damage to the sheet in the process of bending.

M-24 ASBESTOS CEMENT SHEETS :

24.1 Asbestos cement sheets plain, corrugated or semi-corrugated shall conform to I.S. 459-1970. The thickness of the sheets shall be as specified in the item. The sheet shall be free from all defects such as cracks, holes, deformities, chipped edges or otherwise damaged.

24.2 Ridges and Hips :

24.2.1 Ridges and hips shall be of same thickness as that of A. C. sheets. The types of ridges shall be suitable for the type of sheets and locations.

24.2.2 Other accessories to be used in roof such as flashing pieces, eaves filler pieces, valley gutters, north light and ventilator curves, barge boards etc. shall be of standard manufacture and shall be suitable for the type of sheets and location.

M-25 MANGALORE PATTERN ROOF TILES :

25.1 The Mangalore pattern tiles shall conform to I.S. 654-1972 for Class 'AA' or 'A' type as specified in item. Samples of the tiles to be provided shall get approved from the Engineer-in-charge. Necessary tests shall be carried out as directed.

M-26 SHUTTERING :

26.1 The shuttering shall be either of wooden planking of 30mm minimum thickness with or without steel lining or of steel plates stiffened by steel angles. The shuttering shall be supported on battens and beams and props of vertical ballies properly cross bracked together so as to make the centering rigid. In places of ballie props, bricks pillar of adequate section built in mud mortar may be used.

26.2 The form work shall be sufficiently strong and shall have camber, so that it assumes correct shape after deposition of the concrete and shall be able to resist forces caused by vibration of concrete, live load of men working with it and other incidental loads associated with it. The shuttering shall have smooth and even surface and its joints shall not permit leakage of cement grout.

- 26.3 If at any stage of work during or after placing concrete in the structure, the form work sags or bulges out beyond the required shape of the structure, the concrete shall be removed and work redone with fresh concrete and adequately rigid form work. The complete form work shall be got inspected by and approved from the Engineer-in-charge, before the reinforcement bars are placed in position.
- 26.4 The props shall consist of bulgies having 100mm minimum diameter measured at mid length and 80mm at thin end and shall be placed as per design requirement. These shall rest squarely on wooden sole plates 40 mm. thick and minimum bearing area of 0-10 sq.m. laid on sufficiently hard base.
- 26.5 Double wedges shall further be provided between the sole plate and wooden props so as to facilitate tightening and easing of shuttering without jerking the concrete.
- 26.6 The timber used in shuttering shall not be so dry so as to absorb water from concrete and swell or bulge nor so green or wet so as to shrink after erection. The timber shall be properly sawn and planed on the sides and the surface coming in contact with concrete. Wooden form work with metal sheet lining or steel plates stiffened by steel angles shall be permitted.
- 26.7 As far as practicable, clamps shall be used to hold the forms together and use of nails and spikes avoided.
- 26.8 The surface of timber shuttering that would come in contact with concrete shall be well wetted and coated with soap solution before the concreting is done. Alternatively coat of raw linseed oil or oil of approved manufacture may be applied in place of soap solution. In case of steel shuttering either soap solution or raw linseed oil shall be applied after thoroughly cleaning the surface. Under no circumstances black or burnt oil shall be permitted.
- 26.9 The shuttering for beams and slabs shall have camber of 4mm per metre (1 in 250) or as directed by the Engineer-in-charge so as to offset the subsequent deflection. For cantilevers, the camber at free end shall be 1/50 of the projected length or as directed by the Engineer-in-charge.

M-27 EXPANSION JOINTS - PREMOULDED FILLER :

- 27.1 The item provided for expansion joints in R.C.C. frame structures for internal joints, as well as exposed joints, with the use of premoulded bituminous joint filler.
- 27.2 Premoulded bituminous joint filler, i.e. performed strip of expansion joint filler shall not get deformed or broken by twisting, bending or other handling when exposed to atmospheric condition. Pieces of joint filler that have been damaged shall be rejected.
- 27.3 Thickness of the pre moulded joint filler shall be 25 mm unless otherwise specified.
- 27.4 Premoulded bituminous joint filler shall conform to IS 1838-1961.

M-28 EXPANSION JOINTS - COPPER STRIPS AND HOLD FASTS :

- 28.1 The item provides for expansion joints in R.C.C. frame structure for internal joints as well as for exposed joints with the use of necessary copper strip and holdfasts.
- 28.2 Copper sheet shall be 1.25 mm thick and of 1.25 mm with 'U' shape in the middle, copper strip shall have holdfast of 3 mm diameter copper rod fixed to the plate soldered on strip at intervals of about 30 cm. or as shown in the drawing or as directed. The width of each flange (horizontal

side) of the copper plate to be embedded in the concrete work shall be 25 mm. Depth of 'U' to be provided in the expansion joint, in the copper plate shall be of 25 mm.

M-29 TEAK WOOD :

29.1 The teak wood shall be of good quality as required for the item to be executed. When the kind of wood is not specifically mentioned, good Indian teak wood as approved shall be used.

29.2 Teak wood shall generally be free from large, loose, dead or cluster knots, flaws, warps, twists, shakes, bends or any other defects. It shall generally be uniform in substance and of straight fibres as far as possible. It shall be free from rot, decay, harmful fungi and other defects of harmful nature, which will affect the strength, durability or its usefulness for the purpose for which it is required. The colour shall be uniform as far as possible. Any effort like painting, using any adhesive or resinous materials made to hide the defects shall render the pieces liable to rejection by the Engineer-in-charge.

29.3 All scantlings, planks etc. shall be sawn in straight lines and planes in the direction of grains and of uniform thickness.

29.4 The tolerances in the dimensions shall be allowed at the rate of 1.5 mm per face to be planed.

29.5 First Class Teak Wood :

First class teak wood shall have no individual hard and sound knots, more than 6 sq.cm. in size and the aggregate area of such knots shall not be more than 1% of area of piece. The timber shall be closed grained.

29.6 Second Class Teak Wood :

No individual hard and sound knots shall be more than 15 sq.cm. in size and aggregate area of such knots shall not exceed 2% of the area of piece.

M-29-A NON-TEAK WOOD :

The non teak wood shall be chemically treated, seasoned as per I.S. Specifications and of good quality. The type of wood shall be got approved before collecting the same on site. Fabrication of wooden members shall be started only after approval. For this purpose wood of Bio, Kalai, Sires, Saded, Behda, Jamun, Sisoo will be used for door frames whereas only Kalai, Siras, Halda, Kalam etc. will be permitted for shutters after proper seasoning and chemical treatment.

The non teak wood shall be free from large, loose dead or cluster knots, flows, shakes, warps, bends, or any other defect. It shall be uniform in substance and of straight fibres as far as possible. It shall be free from rots, decay, harmful fungi and other defects of similar nature which will affect the strength, durability or its usefulness for the purpose for which it is required. The colour of the wood shall be uniform as far as possible. The scantlings, planks etc. shall be sawn in straight lines and planes in the direction of grain and of uniform thickness.

The department will use the Agency to produce a certificate from the Forest Department in the event of a dispute and the decision of the Department shall be final and binding to the contractor.

The tolerance in the dimension shall be allowed at 1.5 mm. per face to be planed.

M-30 WOODEN FLUSH DOOR SHUTTERS (SOLID CORE) :

- 30.1 The solid core type flush door shutters shall be of decorative or non-decorative type as specified in the drawing. The size and thickness of the shutter shall be as specified in drawings or as directed. The timber species for core shall be used as per I.S. 2202-(Part-I)-1980. The timber shall be free from decay and insect attack. Knots and knot holes less than half the width of cross-section of the members, pitch streaks and harmless pin holes shall be permissible except in the exposed edges of the core members. The commercial plywood, cross bands shall conform to I.S. 303-1275.
- 30.2 The face panel of the shutters shall be formed by gluing by the hot press process on both faces of the core with either plywood or cross bands, and face veneers. The lipping, rebating, opening of glazing, venetion etc. shall be provided if specified in the drawing.
- 30.3 All edges of the door shutters shall be square. The shutters shall be free from twist or warp in its plane. Both faces of the shutters shall be sand papered to smooth even texture.
- 30.4 The shutters shall be tested for ---
- i] End Immersion Test : The test shall be carried out as per I.S. 2202 (Part-I) 1980. There shall be no delamination at the end of the test.
- ii] Glue Adhesion Test : The flush door shall be tested for glue adhesive test in accordance with I.S. 2202(Part-I)-1980. The shutters shall be considered to have passed the test if no delamination occurs in the glue lines in the plywood and if no single delamination more than 80 mm. in length and more than 3 mm. in depth has occurred in the assembly glue lines between the plywood face and the style and rail. Delamination at the corner shall be measured continuously around the corner. Delamination at the knots knot, hole and other permissible wood defects shall not be considered in assessing the sample.
- 30.5 The tolerance in size of solid core type flush door as under:-
- In nominal thickness # 1.2 mm. In nominal height # 3 mm. The thickness of the shutters shall be uniform throughout with a permissible variation of not more than 0.8 mm. when measured at any two points.

M-31 ALUMINIUM DOORS, WINDOWS, VENTILATORS :

- 31.1 Aluminium alloy used in the manufacture of extruded window sections shall conform to I.S. designation HEA-WP of I.S. : 733-1975 and also to I.S. Designation WVG - WP OF I.S. : 1285-1975. The sections shall be as specified the drawing and design. The fabrication shall be done as directed.
- 31.2 The hinges shall be cast or extruded aluminium hinges of same type as in window but of large size.
- 31.3 The hinges shall normally be of 50 mm projecting type non projecting type of hinges may also be used if directed. The handles of door shall be of specified design. A suitable lock for the door operable either from outside shall be provided. In double shutter door, the first closing shall have a concealed aluminium alloy bolt at top and bottom.

M-32 ROLLING SHUTTERS :

- 32.1 The rolling shutters shall conform to I.S. 6248-1979. Rolling shutters shall be supplied of specified type with accessories. The size of the rolling shutters shall be specified in the drawings. The shutters shall be constructed with interlocking lath sections formed from cold rolled steel strips not less than 0.9 mm. thick and 80 mm. wide for shutters upto 3.5 m. Width not less than 1.25 mm. thick and 80 mm. wide for shutters 3.5 m. in width and above unless otherwise specified.
- 32.2 Guide channels shall be of mild steel deep channel section and of rolled pressed or built up (fabricated) jointless construction. The thickness of sheet used shall not be less than 3.15 mm.
- 32.3 Hood covers shall be made of M.S. sheets not less than 0.92 mm. thick. For shutters having width 3.5 mts. and above, the thickness of M.S. sheet for the hood covers shall be not less than 1.25 mm.
- 32.4 The spring shall be of best quality and shall be manufactured from tested high tensile spring steel wire or strip of adequate strength to balance the shutters in position. The spring pipe shaft etc. shall be supported on strong M.S. or malleable C.I. brackets. The brackets shall be fixed on the or under the lintel as specified with rawl plugs and screws bolts etc.
- 32.5 The rolling shutters shall be of self rolling type upto 8 sq.m. clear area without ball bearing and upto 12 sq.m. clear area with ball bearing. If the rolling shutters are of larger then gear operated type shutters shall be used.
- 32.6 The locking arrangement shall be provided at the bottom of shutter at both ends. The shutters shall be opened from outside.
- 32.7 The shutters shall be completed with door suspension, shafts, locking arrangements, pulling hooks, handles and other accessories.

M-33 COLLAPSIBLE STEEL GATE :

- 33.1 The collapsible steel gate shall be in one or two leaves and size as per approved drawings or as specified. The gate shall be fabricated from best quality mild steel channels, flats etc. Either steel pulleys or ball bearings shall be provided in every double channel. Unless otherwise specified the particulars of collapsible gate shall be as under ---
- i] Pickets : These shall be of 20 mm. M.S. channels of heavy sections unless otherwise shown on drawings. The distance centre to centre of pickets shall be 12 cms. with an opening of 10 cms.
 - ii] Pivoted M.S. flats shall be 20 mm. x 6 mm.
 - iii] Top and bottom guides shall be from tee or flat iron of approved size.
 - iv] The fittings like stoppers, fixing hold fasts, locking cleats, brass handles and cast iron rollers shall be of approved design and size.

M-34 WELDED STEEL WIRE FABRIC :

- 34.1 Welded steel wire fabric for general purpose shall be manufactured from cold drawn steel 'as drawn' or galvanised steel conforming to I.S. 226-1975 With longitudinal and transverse

wire securely connected at every intersection by a process of electrical resistance welding and conforming to I.S. 4948-1974. It shall be fabricated and finished in a workman like manner and shall be free from injurious defects and shall be rust proof. The type of mesh shall be oblong or square as directed. The mesh sizes and sizes of wire for square as well as oblong welded steel wire fabric shall be as directed. The steel wire fabric in panels shall be in one whole piece in each panel as far as stock sizes permit.

M-35 EXPANDED METAL SHEETS :

- 35.1 The expanded metal sheets shall be free from flaws, joints, welds, broken, stands, laminations and other harmful surface defects. Expanded metal steel sheet shall conform to I.S. 412 -1975 except that blank sheets need not be with guaranteed mechanical properties. The size of the diamond mesh of expanded metal and dimensions of strands (width and thickness) shall be as specified. The tolerance on nominal weight of expanded metal sheets shall be of + 10 per cent.
- 35.2 Expanded metal in panels shall be in one whole piece in each panel as far as stock sizes permit. The expanded metal sheets shall be coated with suitable protective coating to prevent corrosion.

M-36 MILD STEEL WIRE (Wire Gauze Jali) :

- 36.1 Mild steel wire may be galvanised, as indicated. All finished steel wire shall be well cleanly drawn to the dimensions and size of wire as specified in item. The wire shall be sound, free from slits, surface flaws, rough jagged and imperfect edges and other harmful surface defects and shall conform to I.S. 280-1978.

M-37 PLYWOOD :

- 37.1 The Plywood for general purpose shall conform I.S. 303-1975. Plywood is made by cementing together thin boards or sheets of wood into panels. There are always an odd number of layers 3, 5, 7, 9 ply etc. The plies are placed so that the grain of each layer is at right angles to the grain in the adjacent layers.
- 37.2 The chief advantage of plywood over a single board of the same thickness is the more uniform strength of the plywood along the length and width of the plywood and greater resistance to cracking and splitting with change in moisture content.
- 37.3 Usually synthetic resins are used for glueing. Phenolic resins are usually cured in a hot press which compresses and simultaneously heats the plies between hot plates which maintain a temperature of 90 degree C. to 140 degree C. and a pressure of 11 to 14 Kg./Sq.cm. on the wood. The time of heating may be anything from 2 to 60 minutes depending upon thickness.
- 37.4 When water glue are used the wood absorbs so much Water that the finished plywood must be dried carefully, When synthetic resins are used as adhesive the finished plywood must be exposed to atmosphere of controlled humidity until the proper amount of moisture has been absorbed.
- 37.5 According to I.S. : 303-1975 the plywood for general purpose shall be of three grades namely BWR, WWR and CWR depending upon the adhesives used for bonding the veneers and it will be further classified into six types namely AA, AB, AC, BB, BC and CC based on the quality of the two faces, each face being of three kinds namely A, B and C. After pressing, the finished

plywood should be reconditioned to a moisture content not less than 8 percent and not more than 16 percent.

37.6 THICKNESS OF PLYWOOD BOARDS

TABLE

Board	Thickness
3 Ply	3 mm
	4 mm
	5 mm
	6 mm
5 Ply	5 mm
	6 mm
	8 mm
	9 mm
7 Ply	9 mm
	13 mm
	16 mm
9 Ply	13 mm
	16 mm
	19 mm
11 Ply	19 mm
	22 mm
	25 mm

M-38 GLASS :

38.1 All glass shall be of the best quality, free from specks, bubbles, smokes, veins, air holes blisters and other defects. The kind of glass to be used shall be as mentioned in the item or specification or in the special provisions or as shown in detailed drawings. Thickness of glass panes shall be uniform. The specifications for different kinds of glass shall be as under ----

38.2 Sheet Glass :

38.2.1 In the absence of any specified thickness or weight in the item or detailed specifications of the item of work, sheet glass shall be weighing 7.5 Kg./Sq.m. for panes upto 600 mm. x 600 mm.

38.2.2 For panes larger than 600 mm. x 600 mm. and upto 800 mm. x 800 mm. glass weighing not less than 8.75 Kg./Sq.m. shall be used. For bigger panes upto 900 mm. x 900 mm. glass weighing not less than 11.25 Kg./Sq.m. shall be used.

38.2.3 Sheet glass shall be patent flattened glass of best quality and for glazing and framing purposes shall conform to I.S. 761-1960. Sheet glass of the specified colours shall be used, if so shown on detailed drawings or so specified. For important buildings and for panes with any dimensions over 900 mm. plate glass of specified thickness shall be used.

38.3.0 Plate Glass :

38.3.1 When plate glass is specified it shall be "Polished Patent Plate Glass" of best quality. It shall have both the surface ground flate and parallel and polished to obtain clear undistured vision and reflection. The plate glass shall be of the thickness mentioned in the item or as shown in the detailed drawing or as specified. In the absence of any specified thickness,

the thickness of plate glass to be supplied shall be 6 mm. and a tolerance of 0.20 mm. shall be admissible.

38.4.0 Obscured Glass :

- 38.4.1 This type of glass transmits light so that vision is partially or almost completely obscured. Glass shall be plain rolled, figured, ribbed or fluted, or frosted glass as may be specified as required. The thickness and type of glass shall be as per details on drawings or as specified or as directed.

38.5.0 Bajari Glass :

Glass shall be with bajari pattern embedded in a sheet of plane glass. It should be of best quality as approved by Engineer-In-Charge. Thickness of glass shall not be less than 4 mm. bajari glass shall be of type and thickness as specified.

M-39 ACRYLIC SHEETS :

- 39.1 Acrylic sheets shall be of thickness as specified in the item and of a specified shape and size as the case may be. Panels may be flat or curved. It should be light in weight. It shall be colourless or coloured or opaque as specified in the item. Colourless sheet shall be as transparent as the finest optical glass. Its light transmission rate shall be about 95%. Transparency shall not be affected for the sheets of larger thickness. It shall be extremely resistant to sunlight, weather and low temperatures. It shall not show any significant yellowing or change in physical properties or loss of light transmission over a longer period of use.
- The sheet shall be impact resistant also. Sheets should be available in complete range of standard transparent, translucent and opaque colours. Sheets should be available in complete range of standard transparent, translucent and opaque colours. Sheets shall be of such quality that they can be cut, bent and jointed as desired. Solution for the joints shall be used as per the requirement of manufacture.

M-40 (A) PARTICLE BOARD :

- 40.1 The particle boards used for face panels shall be of best quality free from any defects. The particle boards shall be made with phenolmaldehyde adhesive. The particle boards shall conform to I.S. 3087-1965. "Specification for wood particle board for general purpose." The size and the thickness of the particle board shall be as specified.

M-40 (B) CEMENT BONDED PARTICLE BOARD :

1. The particle board should conform to IS-14276-1995 or latest.
2. It should be free from any cracks and flacks.
3. Cement bonded Particle board may be replaced by any other equivalent material as suggested by Engineer-In-Charge

M-41 EXPANDED POLYSTYRENE OR FRAMES STYROPER SLEBS :

- 41.1 The expanded polystyrene ceiling boards and tiles shall be of approved make and shall be of size, thickness, finish and colour as indicated. It shall be of high density and suitable for use as insulating material. The insulating material shall be like slab of thermocole etc.

M-42 RESIN BONDED FIBRE GLASS :

- 42.1 The resin bonded fibre glass tiles or rools shall be of approved make and shall be sizes, thickness and finish as indicated.
- 42.2 For test of Mineral wood thermal insulation Blanket I.S. 3144-1965 followed.
- 42.3 Insulation wool blanket shall be with the following coverings on one or both sides as indicated.
- (1) Bituminised bessian kraft paper suitable for use in position where moisture has to be excluded.
 - (2) Hessain cloth or Kraft paper for keeping out dust.
 - (3) G. I. wire netting, suitable or surfaces to be plastered over.

M-43 FIXTURES & FASTENINGS :**General ---**

- i] The fixtures and fastenings, that is, butt, hingers, tee and strap hinges, sliding door bolts, tower bolts, door latch, bath-room latch, handles, door stoppers, casement window fasteners, casement stays and ventilator catch shall be made of the metal as specified in the item or its specifications.
- ii] They shall be of iron, brass, aluminium, chromium plated iron, chromium plated brass, copper oxidised iron, copper oxidised brass or anodised aluminium as specified.
- iii] The fixtures shall be heavy, medium or light type. The fixtures and fastenings shall be smooth finished and shall be such as will ensure ease of operation.
- iv] The samples of fixtures and fastenings shall be got approved as regards quality and shape before providing them in position.
- v] Brass and anodised aluminium fixtures and fastenings shall be bright finished.

Holdfasts :

- i] Holdfasts shall be made from mild steel flat 30 cm. length and one of the holdfasts shall be bent at right angle and two nos. of 6 mm. dia. hooles shall be made in it for fixing it to the frame with screws. At the other end, the holdfast shall be forked and bent at right angles in opposite directions.

Butt Hinges :

- i] Railway standard heavy type butt hinges shall be used when so specified.
- ii] Tee and strap hinges shall be manufactured from M.S. sheet.

Sliding Door Bolts (Aldrops) :

- i] The aldrops as specified in the item shall be used and shall be got approved.

Tower Bolts (Barrel Type) :

- i] Tower bolts as specified in the item shall be used and shall be got approved.

Door Latch :

- i] The size of door latch shall be taken as the length of latch.

Bathroom Latch :

- i] Bathroom latch shall be similar to tower bolt.

Handle :

- i] The size of the handles shall be determined by the inside grip length of the handles. Handles shall have a base plate of length 50 mm. more than the size of the handle.

Door Stoppers :

- i] Door stoppers shall be either floor door stopper type or door catch type. Floor stopper shall be of overall size as specified and shall have a rubber cushion.

Door Catch :

- i] Door catch shall be fixed at a height of about 900 mm. from the floor level such that one part of the catch is fitted on the inside of the shutter and other part is fixed in the wall with necessary wooden plug arrangements for appropriate fixity. The catch shall be fixed 20 mm. inside the face of the door for easy operation of catch.

Wooden Door Stop With Hinge :

- i] Wooden door stop of size 100 mm. x 60 mm. x 40 mm. shall be fixed on the door frame with a hinge of 75 mm. size and at a height of 900 mm. from the floor level. The wooden door stop shall be provided with 3 coats of approved oil paint.

Casement Window Fastner :

- i] Casement window fastener for single lead window shutter shall be left or right handed as directed.

Casement Stays (Straigot Peg.Stay) :

- i] The stays shall be made from a channel section having three holes at appropriate position so that the window can be opened either fully or partially as directed.

Size of the stay shall be 250 mm. to 300 mm. as directed.

Ventilator Catch :

- i] The pattern and shape of the catch shall be as approved.

Pivot :

- i] The base and socket plate shall be made from minimum 3 mm. thick plate, and projected pivot shall not be less than 12 mm. dia. and 12 mm. length and shall be firmly riveted to the base plate case of iron pivot and in single piece base in the case of brass pivot.

M-44 PAINTS :**44.1 Oil Paints :**

Oil paints shall be of the specified colour and shade, and shall be of Asian, ICI, Nerolac, Dulux or equivalent as approved by Engineer-In-Charge. The ready mixed paints shall only be used. However, if ready mixed paint or specified shade or tint is not available white ready mixed paint with approved stainer will be allowed. In such a case, the contractor shall ensure that the shade of the paint so allowed shall be uniform. All the paints shall meet with the following general requirements ---

- i] Paint shall not show excessive setting in a freshly opened full can and shall easily be redispersed with paddle to a smooth homogeneous state. The paint shall show no curdling, livering, caking or colour separation and shall be free from lumps and skins.
- ii] The paint as received shall brush easily, possess good levelling properties and show no running or sagging tendencies.
- iii] The paint shall not skin within 48 hours in a three quarters filled closed container.
- iv] The paint shall dry to a smooth uniform finish free from roughness, grit unevenness and other imperfections.
Ready mixed paint shall be used exactly as received from the manufacturers and generally according to their instructions and without any admixtures whatsoever.

44.2 Enamel Paints :

The enamel paint shall satisfy in general requirements as mentioned in specification of oil paints. Enamel paints shall conform to I.S. 2933-1975.

M-45 FRENCH POLISH :

The french polish of required tint and shade shall be prepared with the below mentioned ingredients and other necessary materials :

- i] Denatured spirit of approved quality.
- ii] Shellac.
- iii] Chandras.
- iv] Pigment.

The french polish so prepared shall conform to I.S. 348- 1968.

M-46 MARBLE CHIPS FOR MARBLE MOSAIC TERRAZZO :

- 46.1 The marble chips shall be of approved quality and shades. It shall be hard, sound, dense and homogeneous in texture with crystalline and coarse grains. It shall be uniform in colour and free from stains, cracks, decay and weathering.
- 46.2 The size of various colours of marble chips ranging from the smallest upto 20 mm. shall be used where the thickness of top wearing layers is 6 mm. in size. The marble chips of approved quality and colours only as per grading as decided by the Engineer-in-charge shall be used for marble mosaic tiles or works.
- 46.3 The marble chips shall be machine crushed. They shall be free from foreign matter, dust etc. Except as above the chips shall conform to I.S. 2114-1962.

M-47 FLOORING TILES :

A] Plain Cement Tiles –

- 47.1.1 The plain cement tiles shall be of general purpose type. These are the tiles in the manufacture of which no pigments are used. Cement used in the manufacture of tiles shall be as per Indian Standards.

- 47.1.2 The tiles shall be manufactured from a mixture of cement and natural aggregates by pressure process. During manufacture, the tiles shall be subjected to a pressure of not less than 140 Kg./Sq.cm. The proportion of cement to aggregate in the backing of the tiles shall be not leaner than 1:3 by weight. The wearing face, though the tiles are of plain cement, shall be provided with stone chips of 1 to 2 mm size. The proportion of cement to the marble chips aggregate in the wearing layer of the tiles shall be three parts of cement to one part of chips by weight. The minimum thickness of wearing layer shall be 3 mm. The colour and texture of wearing layer shall be uniform throughout its face and thickness. On removal from mould, the tiles shall be kept in moist condition continuously at least for seven days and subsequently, if necessary, for such long period as would ensure their conformity to requirements of I.S. 1237- 1980 requiring resistance to wear and water absorption.
- 47.1.3 The wearing face of the tiles shall be plain, free from projections, depressions and cracks and shall be reasonably parallel to the back face of the tile. All angles shall be right angle and all edges shall be sharp and true.
- 47.1.4 The tile sizes shall generally be square shape 24.85cm. x 24.85cm. or 25cm. x 25cm. The thickness of the tiles shall be 20 mm.
- 47.1.5 The tolerance of length and breadth shall be plus or minus 5 mm. The tolerance on thickness shall be plus 1 mm.
- 47.1.6 The tiles shall satisfy the tests as regards transverse strength, resistance to wear and water absorption as per I.S. 1237-1980.

47.2 B] Plain Coloured Tiles :

- 47.2.1 These tiles shall have the same specifications as for plain cement tiles as per (A) above except that they shall have a plain wearing surface wherein pigments are used. They shall conform to I.S. 1237-1980.
- 47.2.2 The pigment used for colouring cement shall not exceed 10% by weight of cement used in the mix. The pigments, synthetic or otherwise, used for colouring tiles shall have permanent colour and shall not contain materials detrimental to concrete.
- 47.2.3 The colour of the tiles shall be specified in the item or as directed.

47.3 C] Marble Mosaic Tiles :

- 47.3.1 These tiles have the same specifications as per plain cement tiles except the requirements as stated below ---
- 47.3.2 The marble mosaic tiles shall conform to I.S. 1237-1980. The wearing face of the tiles shall be mechanically ground and filled. The wearing face of tiles shall be free of projections, depressions and cracks and shall be reasonably parallel to the back face of the tiles. All angles shall be right angles and all edges shall be sharp and true.
- 47.3.3 Chips used in the tiles be from smallest upto 20 mm. size. The minimum thickness of wearing layer of tiles shall be 6 mm. For pattern of chips to be laid on the wearing face, a few samples with or without their full size photographs as directed shall be presented to the Engineer-in-charge for approval.

47.3.4 Any particular samples, if found suitable shall be approved by the Engineer-in-charge, of he may ask for particular sized chips to be more or less in the sample presented. The samples shall have to be made by the contractor till a suitable sample finally approved for use in the work. The contractor shall ensure that the tiles supplied for the work shall be in conformity with the approved sample only, in terms of its dimensions, thickness of backing layer and wearing surface, materials, ingredients, colour shade, chips, distribution etc. required.

47.3.5 The tiles shall be prepared from cement conforming to Indian Standards or coloured portland cement generally depending upon the colour of tiles to be used or as directed.

47.4 D] Chequered Tiles :

47.4.1 Chequered tiles shall be plain cement tiles or marble mosaic tiles. The former shall have the same specification as per (A) above and the latter as per marble mosaic tiles as per (C) except as mentioned below.

47.4.2 The tiles shall be of nominal size of 250mm. x 250mm. or as specified. The centre to centre distance of the chequer shall not less than 25mm. and not more than 50mm. The overall thickness of the tile shall be 22mm.

47.4.3 The grooves in the chequers shall be uniform and straight. The depth of the grooves shall not be less than 3mm. The chequered tiles shall be plain, coloured or mosaic as specified. The thickness of the upper layer measured from the top of the chequers shall not be less than 6mm. The tiles shall be given the first grinding with machine before delivery to site.

47.4.4 Tiles shall conform to relevant I.S. 1237-1980.

47.5 E] Chequered Tiles for Staircases & Parking :

47.5.1 The requirements of these tiles shall be the same as chequered tiles as per (D) above except in following respects :

- i] The length of a tile including nose shall be 330 mm.
- ii] The minimum thickness shall be 28 mm.
- iii] The nosing shall have also the same wearing layer at the top.
- iv] The nosing edge shall be rounded.
- v] The front portion of the tile for a minimum length of 75mm. from and including the nosing shall have grooves running parallel to nosing and at centres not exceeding 25mm.

Beyond that the tiles shall have normal chequer pattern.

M-48 ROUGH KOTAH STONE :

48.1 The kotah stones shall be hard, even, sound and regular in shape and generally uniform in colour. The colour of the stone shall generally be green. Brown coloured stones shall not be allowed for use. They shall be without any soft veins, cracks or flaws.

48.2 The size of the stones to be used for flooring shall be size 600mm. x 60mm. and/or size 600mm. x 450mm. as directed. However, smaller sizes will be allowed to be used to the extent of maintaining the required pattern. Thickness shall be as specified.

- 48.3 Tolerance of minus 30 mm on account of chisel dressing of edges shall be permitted for length as well as breadth. Tolerance in thickness shall be plus 3mm.
- 48.4 The edges of stones shall be truly chiselled and table rubbed with coarse sand before paving. All angles and edges of the stone shall be true, square and free from chipping and the surface shall be true and plain.
- 48.5 When machine cut edges are specified, the exposed edges and the edges at joints shall be machine cut. The thickness of the exposed machine cut edges shall be uniform.

M-49 POLISHED KOTAH STONES :

- 49.1 Polish kotah stone shall have the same specifications as per rough kotah stone except as mentioned below.
- 49.2 The stone shall have machine polished smooth surface. When brought on site, the stones shall be single polished or double polished depending upon its use. The stones for paving shall generally be single polished. the stones to be used for dado, skirting, platforms sink, veneering, sills, steps etc. where machine polishing after the stones are fixed in situ is not possible shall be double polished.

M-50 DHOLPUR STONE SLAB :

- 50.1 Dholpur stone slab shall be of best quality as approved by the Engineer-in-charge. The stone slab shall be without any veins, cracks, and flaws. The stone slab shall be even, sound and durable, regular in shape and uniform colour.
- 50.2 The size of the stone shall be as specified in the item or detailed drawing or as approved by the Engineer-in-charge. The thickness of the stone shall be as specified in the item of work with the permissible tolerance of plus or minus 2 mm. The provisions in respect of polishing as for polished kotah stone shall apply to polished Dholpur stone also. All angles and edges of the face of stone slab shall be fine chiselled or polished as specified in the item of work and all the four edges shall be machine cut. All angles and edges of the stone slab shall be true and plane.
- 50.3 The sample of stone shall be got approved from the Engineer-in-charge for shade and tint for a particular work. It shall be ensured the stones to be used in a particular work shall not differ much in shade or tint from the approved sample.

M-51 MARBLE SLAB :

Marble slabs shall be white or of other colour and of best quality as approved by the Engineer-in-charge. Slab shall be hard, close, uniform and in texture. They shall also be free defects and cracks. The surface shall be machine polished to an even and perfectly plane surface and the edges, machine cut true and square. The rear face shall be rough enough to provide key for the mortar.

Marble slabs with natural veins, if selected shall have to be laid as per the pattern given by the Engineer-in-charge. Size of the slabs shall be minimum 450mm. x 450mm. and preferably 600mm. x 600mm. However, smaller sizes will be allowed to be used to the extent of maintaining required pattern.

The slab shall not be thinner than the specified thickness at its thinnest part. A few specimen of finished slab to be used shall be deposited by the contractor in the office for reference.

Except as above, the marble slabs shall conform to I.S. 1130-1969 or as revised from time to time.

M-52 GRANITE STONE SLAB :

- 52.1 Granite shall be of approved colour and quality, The stone shall be hard even, sound and regular in shape and generally uniform in colour. It shall be without and soft veins, cracks or flaws.
- 52.2 The thickness of the stone shall be specified in the item.
- 52.3 All exposed faces shall be double polished to tender truly smooth and even reflecting surface. The exposed edges and corners shall be rounded off as directed. The exposed edges shall be machine cut and shall have uniform thickness.

M-53 P.V.C. FLOORING :

- 53.1 P.V.C. sheets for P.V.C. floor covering shall be homogenous flexible type, conformint to I.S. 3462-1966. The P.V.C. covering shall neither develop any toxic effect while put to use not shall give off any disagreeable odour.
- 53.2 Thickness of flexible type covering or tiles shall be as specified in the description of the item.
- 53.3 The flexible type shall be backed with hessain or other woven fabric. The following tolerance shall be applicable on the nominal dimensions of the sheet rolls or tiles :
- | | | |
|-----|-------------------------|-------------------|
| (a) | Thickness | +/- 0.15 mm |
| (b) | Length or width | |
| | 1. 300 mm Square tiles | +/- 0.20 mm |
| | 2. 600 mm Square tiles. | +/- 0.40 mm |
| | 3. 900 mm Square tiles. | +/- 0.60 mm |
| | 4. Sheets and rolls. | +/- 0.10 percent. |
- 53.4 Adhesive :
- 53.4.1 The adhesive for PVC flooring shall be of the type and make recommended by the manufacturers of PVC sheets tiles.

M-54 FACING TILES :

- 54.1 The facing tiles (burnt clay facing bricks) shall be free from cracks, flaws, and nodules of free lime. They shall be thoroughly burnt and shall have plane rectangular faces with parallel sides and sharp stright right angled faces. The texture of the finished surface that will be exposed when in place, shall conform to an approved sample consisting not less than four stretcher bricks each representing resistance to penetration by rain and greater durability than common bricks. The tiles shall conform to I.S. 2691-1972.
- 54.2 The standard size of facing brick tiles shall be 19 x 9 x 4 cms. The facing brick tiles shall be provided with frog which shall conform to I.S. 1077-1976.

54.3 The permissible tolerance in dimensions specified above shall be as follows.

<u>Size</u>	<u>Tolerance for</u>	
	<u>1st class Brick</u>	<u>2nd Class Brick</u>
19 cm	+/- 6 mm	+/- 10 mm
9 cm	+/- 2 mm	+/- 7 mm
4 cm	+/- 1.5 mm	+/- 3 mm

The tolerance for distortion or warpage of face or edges of individual brick from a plane surface and from a straight line respectively shall be as follows :

<u>Facing dimensions.</u>	<u>Permissible tolerance.</u>
Max. below 19 cms.	Max. 2.5 mm.
Max. above 19 cms.	Max. 3.0 mm

54.5 The average compressive strength obtained as a sample of five tiles when tested in accordance with the procedure as per I.S. 1077-1976 shall be not less than 175 Kg/Sq.cm. The average compressive strength of any individual brick shall not less than 160 Kg/Sq.cm.

54.6 The average water absorption for five brick tiles shall not be exceed 12 percent of average weight of brick before testing. The absorption for each individual brick shall not exceed 25 percent.

54.7 The brick tiles when tested in accordance with I.S. 1077-1976 the rate of efflorescence shall not be more than "Slightly effloresced".

M-55 White Glazed Tiles :

55.1 The tiles shall be of best quality as approved by the Engineer-in-charge. They shall be flat and true to shape. They shall be free from cracks, crazing, spots, chipped edges and corners. The glazing shall be of uniform shade.

55.2 The tiles shall be of nominal size of 150mm. x 150mm. unless otherwise specified. The maximum variation from the stated sizes, other than the thickness of tile, shall be plus or minus 1.5mm. The thickness of the tile shall be 6mm. except as above the tiles shall conform to I.S. 777-1970.

M-56 (A) GALVANISED IRON PIPES AND FITTINGS :

Galvanized iron pipe shall be of the medium type and of required diameter and shall comply with I.S. 1239-1979. The specified diameter of the pipes shall refer to the inside diameter of the bore. Clamps, screw and all galvanized iron fittings shall be of the standard 'R' or equivalent make.

M-56 (B) U-P.V.C. PIPES & FITTINGS :

1. All soil, waste and vent pipes & fittings shall conform to I.S. 4985-1988 & I.S. 13592:1992. The pipes are provided with an integral rubber ring type socket at one end while the other end is kept plain, smooth & free from burrs. The pipes and fittings shall be true to shape, smooth & cylindrical. They shall be free from cracks, laps, pinholes or other imperfection and shall be neatly dressed and carefully fettled.

2. The P.V.C. Pipes shall be of the diameter as specified in the description and shall be in length of 6.0, 3.0 & 1.8 m including socket ends of the pipe unless shorter length are either specified or required at junction etc. Tolerances on specified length shall be + 10 mm and - 0 mm.
3. Rubber real rings for joints and Access Doors shall be manufactured in accordance with IS: 5382. There are made out of natural rubber with a shore 'A' hardness of 40+5.
4. The thickness of fittings and their socket & spigot dimensions shall conform to the thickness and dimensions specified for the corresponding sizes of straight pipes.

M-56 (C) C-P.V.C. PIPES & FITTINGS :

C-PVC (Chlorinated Poly Vinyl Chloride) SDR II should conform to ASTM F 442, specific to C-PVC in Iron Pipe size (IPS) dimension, which also can be applied to C-PVC pipe in Copper Tube Size (CTS) dimension. Fitting should conform to ASTM D 2846. Pipes and Fittings should be of ASTRAL make or as approved by Engineer-In-Charge.

M-57 BIB COCK AND STOP COCK :

- 57.1 A bib cock is a draw off tap with a horizontal inlet and a free outlet. A stop cock is a valve with a suitable means of connection for insertion in a pipe line for controlling or stopping the flow.
- 57.2 They shall be of screw down type and of brass chromium plated and of diameter as specified in the description of the item. They shall conform to I.S. 781-1977 and they shall be of best Indian make. They shall be polished bright.
- 57.3 The minimum finished weight of bib cock and stop shall be as given below ---

<u>Dia.</u>	<u>Bib Cock</u>	<u>Stop Cock</u>	<u>Dia.</u>	<u>Bib Cock</u>	<u>Stop Cock</u>
8 mm.	0.25 Kg.	0.25 Kg.	15 mm.	0.40 Kg.	0.40 Kg.
10 mm.	0.30 Kg.	0.35 Kg.	20 mm.	0.75 Kg.	0.75 Kg.

M-58 GUN METAL WHEEL VALVE :

- 58-1 The gun metal wheel valve shall be of approved quality. These shall be of gun metal fitted with wheel and shall be of gate valve opening full way and of the size as specified. These shall conform to I.S. 778-1971.

M-59 WHITE GLAZED PORCELAIN WASH BASIN :

- 59.1 Wash basin shall be of white porcelain first quality best Indian make and it shall conform to I.S. 2556-(Part-IV)-1972 and I.S. 771-1979. The size of the wash basin shall be as specified in the item. The wash basin shall be of one piece construction with continued over-flow arrangements. All internal angles shall be designed so as to facilitate cleaning. Wash basin shall have single tap hole or two holes as specified. Each basin shall have a circular waste hole which is either rebated or bevelled internally with 65 mm. dia. at top and 10 mm. depth to suit the waste fitting. The necessary stud slot to receive the bracket on the under side of the basin shall be provided. Basin shall have an internal soap holder recess which shall fully drain into the bowl.
- 59.2 White glazed pedestal of the quality and colour as that of 59.2 White glazed pedestal; of the quantity and colour as that of the basin shall be provided where specified in the item. It shall be completely recessed at the back for reception of supply and water pipe. It shall be capable of supporting the basin rigidly and adequately and shall be so

designed as to make the height from the floor to top of the rim of basin 750 mm. to 800 mm. as directed.

M-60 EUROPEAN TYPE WATER CLOSET/WITH LOW LEVEL FLUSHING :

- 60.1 The European type water closet shall be white glazed conforming to I.S. 2556-1973 and I.S. 771-1679.
- 60.2 'S' trap shall be provided as required with water seal not less than 50 mm. The solid plastic seat and cover shall be of the best Indian make conforming to I.S. 2548-1980. They shall be made of moulded synthetic materials which shall be tough and hard with high resistance to solvents and shall be free from blisters and other surface defects and shall have chromium plated brass hinges and rubber butter of suitable size.

M-61 ORISSA TYPE WATER CLOSET :

- 61.1 The specification of Orissa type white glazed water closet of first quality shall conform to I.S. 2556 (Part-III) 1981 and relevant specification of Indian type water closet except that pan will be with the integral squaring pan of size 580 mm x 440 mm. with raised footrest.

M-62 INDIAN TYPE WATER CLOSET :

The Indian type white glazed water closet of first class quality, size as specified in the item and conforming to I.S. 771-1979 and I.S. 2556-(Part-II)-1981. Each pan shall have integral flushing ring of suitable type with adequate number of holes all around as directed to have satisfactory flushing. It shall also have an inlet at back of front for connecting flush pipe as directed. The inside of the bottom of the pan shall have sufficient slope from the front towards the outlet and the surface shall be uniform and smooth. Pan shall be provided with 100 mm. diameter 'P' or 'S' trap with approximately 50 mm. water seal and 50 mm. diameter vent horn.

M-62 (A) FOOT RESTS :

A pair of white glazed earthen ware rectangular foot rests of minimum size 250 mm. x 130 mm. x 20 mm. shall be provided with the water closet.

M-63 GLAZED EARTHEN WARE SINK :

The glazed earthenware sink shall be of specified size, colour and quality. The sink shall conform to I.S. 771- Part-II-1979. The brackets for sinks shall conform to I.S. 775-1970.

The pipes shall conform to I.S. 1239-Part-I-1973 and I.S. 404-1962 for steel and lead pipes respectively. 32 mm. brass waste coupling of standard pattern with brass chain and rubber plug shall be provided with sink.

M-64 GLAZED EARTHEN WARE LIPPED TYPE FLAT BACK URINAL/CORNER TYPE URINAL :

The lipped type urinal shall be flat back or corner type as specified in the item and shall conform to I.S. 771-1979. It shall be of best Indian make and size as specified and approved by the Engineer-in-charge. The flat back or corner type urinal must be of first class quality, free from any defects, cracks etc.

M-65 LOW LEVEL ENAMEL FLUSHING TANK :

- 65.1 The low level enamel flushing tank shall be of 15 litres capacity. It shall conform to I.S. 774-1971. The flushing cistern shall be of best quality and free from any defects. The flushing tank shall have outlet 32 mm diameter. The outlet shall be connected with W.C. Pan by lead pipe of P.V.C. pipe as specified. The flushing tank shall be provided with inlet and outlet for fixing G.I. inlet pipes and over flow pipes. The flushing cistern shall be provided with chromium plated handle for flushing. The flushing tank shall be provided with bracket of cast iron so that it can be fixed on wall at specified height. The brackets shall conform to I.S. 775-1970.

M-66 CAST IRON FLUSHING CISTERN :

- 66.1 The cast iron flushing cistern shall be of 15 litres capacity. It shall conform to I.S. 774-1971. The flushing cistern shall be of best quality free from any defects.
- 66.2 The flushing cistern shall have outlet of 32 mm diameter. The outlet shall be connected to lead pipe of 32 mm diameter. The lead pipe shall conform to I.S. 404 (Part-I) 1962. For fixing G.I. inlet pipes and overflow pipe 20 mm dia. inlet and outlet shall be provided. The flushing cistern shall be provided with galvanised iron chain and pull of sufficient length and shall be got approved from the Engineer-in-charge. The cast iron flushing cistern shall be painted with one coat of anticorrosive paint and two coats of paints. The flushing cistern shall be fixed on to C.I. brackets. The brackets shall conform to I.S. 775-1970.

M-67 FLUSH COCK :

Half turn flush cock (heavy weight) shall be of gun metal chromium plated of diameter as specified in the description of the item. The flush cock shall conform to relevant Indian Standards.

M-68 CAST IRON PIPES AND FITTINGS :

- 68.1 All soil, waste, vent and antisiphonage pipes and fittings shall conform to I.S. 1729-1964. The pipes shall have spigot and socket ends with head on spigot end. The pipes and fittings shall be true to shape, smooth, cylindrical their inner and outer surfaces being as nearly as practicable concentric. They shall be sound and nicely cast and shall be free from cracks, laps, pin holes or other imperfections and shall be neatly dressed and carefully fettled.
- 68.2 The end of pipes and fittings shall be reasonably square to their axis.
- 68.3 The sand cast iron pipes shall be of the diameter as specified in the description and shall be in length of 1.5 M., 1.8 M. & 2.0 M. including socket ends of the pipe unless shorter length are either specified or required at junction etc. The pipes and fittings shall be supplied without ears unless specified or directed otherwise.
- 68.4 Tolerances : The standard weights and thickness of pipes shall be as shown in the table below. A tolerance upto minus 10% may however be allowed against these standard weights.

Sr.No.	Nominal Dia. Of bore	Overall thickness	Weight of pipes excluding Ears		
			1.5 M.long	1.8 M.long	2 M.long
1.	75 mm	5.0 mm.	12.83 Kg.	16.52 Kg.	16.37 Kg.
2	100 mm	5.0 mm	19.14 Kg.	21.67 Kg.	24.15 Kg.
3	150 mm				
4	250 mm				

A tolerance upto minus 15% in thickness and 20 mm. in length will be allowed. For fittings tolerance in lengths shall be plus 25 mm. and minus 10 mm. The thickness of fittings and their socket and spigot dimensions shall conform to the thickness and dimensions specified for the corresponding sizes of straight pipes. The tolerance in weights and thickness shall be the same as for straight pipes.

M-69 NAHNI TRAP :

Nahni trap shall be of cast iron and shall be sound and free from porosity or other defects which affect serviceability. The thickness of the base metal shall not be less than 6.5 mm. The surface shall be smooth and free from crack, chips and other flaws or any other kind of defects which affect serviceability. The size of nahni trap shall be as specified and shall be of self cleansing design.

The nahni trap shall be of quality approved by the Engineer- in-charge and shall generally conform to the relevant Indian Standards.

The nahni trap provided shall be with deep seal, minimum 50 mm. except at places where trap with deep seal can not be accommodated. The cover shall be cast iron. Perforated cover shall be provided on the trap of appropriate size.

M-70 GULLY TRAP :

Gully trap shall conform to I.S. 651-1960. It shall be sound, free from defects such as fire cracks or hair cracks. The glaze of the traps shall be free from crazing. They shall give a sharp clear note when struck with light hammer. There shall be no broken blisters. The size of the gully trap shall be as specified in the item.

Each gully trap shall have one R.C.C. grating of square size corresponding to the dimensions, of inlet of gully trap. It will also have a water tight R.C.C. cover with frame inside dimensions 300mm. x 300mm. The grating cover and frame shall be of sound and heavy duty and shall have truly square machined seating faces.

M-71 GLAZED STONE WARE PIPE AND FITTINGS :

The pipes and fittings shall be of best quality as approved by the Engineer-in-charge. The pipe shall be of best quality manufactured from stone-ware of fire clay, salt glazed thoroughly burnt through the whole thickness, of a close even texture, free from air blows, fire blisters, cracks and other imperfections, which affect the serviceability. The inner and outer surfaces shall be smooth and perfectly glazed. The pipe shall be capable to withstand pressure of 1.5 m. head without showing signs of leakage. The thickness of the wall shall not be less than (1/12)th of the internal dia. The depth of socket shall not be less than 38 mm. The socket shall be sufficiently large to allow a joint of 6 mm. around the pipe. The pipes shall generally conform to relevant I.S. 651-1980.

M-72 WALL PEG SAIL :

- 72.1 The aluminium wall peg rail shall have three aluminium pegs of approved quality and size. It shall be fixed on teakwood plank of size 450 mm x 75 mm x 20 mm. The teak wood shall be french polished or oil painted as specified.

M-73 C-PVC WATER SPOUT :

- 73.1 The C-PVC pipes of 40 mm dia shall be of medium quality and specials shall be of 'R' brand or equivalent brand of best quality.
- 73.2 The pipe shall have length as required for the thickness of well in which it is fixed, and at the outside end tee and bend cut at half the length shall be provided and at either end coupling shall be provided and the have better fixing. The water spout shall be provided as per detailed drawings or as directed.

M-74 ASBESTOS CEMENT PIPE (A.C. PIPE) :

- 74.1 The asbestos cement pipe of diameter as specified in the description of the item shall conform to I.S. 1926-1980. Special like bends, shoes cowl, etc. shall conform to relevant Indian Standards. The interior of pipe shall have a smooth finish, regular, surface and regular internal diameter. The tolerance in all dimensions shall be as per I.S. 1926-Part-I-1980.

M-75 ABONITE BALL COCK :

Ball cock of screwed type including polythene/ abonite float and necessary lever etc. shall be of the size as mentioned in the description of item and shall conform to I.S. 1703-1977.

M-76 BITUMEN FELT FOR WATER PROOFING AND DAMP PROOFING :

- 76.1 Bitumen felt shall be on the fibre bases and shall be of type 2, self finished felt grade-2 and shall conform to I.S. 1322-1970.

M-77 SELECTED EARTH :

- 77.1 The selected earth shall be that obtained from excavated material or shall have to be brought from outside as indicated in the item. If item does not indicate anything, the selected earth shall have to be brought from outside.
- 77.2 The selected earth shall be good yellow soil and shall be got approved from the Engineer-in-charge. In no case black cotton soil or similar expansive and shrinkable soil shall be used. It shall be clean and free from all rubbish and perishable materials, stones or brick bats. The clods shall be broken to a size of 50 mm. or less. Contractor shall make his own arrangements at his own costs for land for borrowing selected earth. The stacking of materials shall be done as directed by the Engineer-in-charge in such a way as not to interfere with any constructional activities and in proper stacks.
- 77.3 When excavated material is to be used, only selected stuff got approved from the Engineer-in-charge shall be used. It shall be stacked separately and shall comply with all the requirements of selected earth mentioned above.

M-78 CRACKSEAL :

Crackseal manufactured by Chemistic/Chemisol Indian Ltd., is an acrylic base ready application compound.

M-79 CAST IRON STEPS :

The cast iron steps shall be clean, well-cast and they shall be free from air and sand holes, cold shuts and warping which are likely to impair the utility of the castings. The portion of the step which projects from walls of the manhole shall have a raised required designed above the general plane of the top surface of the step along the edges of the tread to provide adequate non-slip grip. The steps shall be of dimensions 375 mm x 150 mm x 25 mm with necessary holding arrangement and carting minimum weight of 4.5 Kg. confirming to I.S. 5455-1969 or its latest version..

The cast iron steps shall be coated with a material having tar base or a place bituminous composition of cashew-nut shall liquid. The coating shall be smooth and tenacious. It shall not flow when exposed to a temprature of 63 degree C and shall not be brittle as to chip of at temperature of 0 degree C.

M. 80. CERAMIC TILES :

- 80.1 Ceramic tiles shall be of commercial quality from manufacturers such as Orient, Kajaria, Johnson, Nitco, Somani, Bell as approved by the Engineer incharge.
- 80.2 Ceramic tiles shall be lighlweight, with 6 mm. thickness with +- 5.0 % deviation. Therefore, they require thinner floor bedding compare to mosaic/stone flooring. Onlaying, they reqi ire no further polishing making the floor ready to live and use.
- 80.3 Ceramic tiles shall be of dimensions of 300 mm. x 300 mm. with +- 0.50 % deviation. All the sides shall be straight & square and the deviation allowed shall be maximum + - 0.40 %.
- 80.4 Ceramic tiles shall have plain and smooth surface quality, free of visual defects to the extent of minimum 95 % of tiles.
- 80.5 Ceramic tiles shall have no warping; their surface shall be flat, with maximum +- 0.5% deviation allowed.
- 80.6 Ceramic tiles shall have water absorption of no more than 4.0 %.
- 80.7 The bending strength of the ceramic tiles above 300 Kgs./Cm2.
- 80.8 The scratch resistant as per Moh's scale shall be minimum 5. The tiles shall be of group III qualify abrasion resistant.
- 80.9 The crazing resistance of the ceramic tiles shall be in conformity with norms.
- 80.10 The resistance fo staining of the ceramic tiles shall be minimum class II.
- 80.11 Ceramic tiles shall be resistant to all acids and alkalis except hydrofluoric acid and its compounds.
- 80.12 The thermal shock resistance shall be up to 10 cycles.

M. 81. VITRIFIED FLOOR TILES :

- 81.1 Vitrified floor tiles shall be of the best quality from manufacturers such as Orient, Kajaria, Johnson, Nitco, Somani, Bell, Asian, Euro as approved by the Engineer incharge. They shall conform to the IS 4457.
- 81.2 They shall be monolithic and available in anti-skid finish, having the size of 300 mm. x 300 mm. x 10 mm. thick.
- 81.3 They shall be rectified, which is the process of sizing & squaring, leading to almost perfect edges and enabling tile installation with very minor joints, giving the installed tiles a joint-free look. They shall be pre-sized and pre-polished.
- 81.4 Maximum deviation in length $\pm 0.3\%$, maximum deviation in thickness $\pm 2.0\%$, maximum wedging allowed $\pm 0.27\%$, maximum surface flatness shall be $\pm 0.2\%$, water absorption capacity $< 0.5\%$, maximum Mohs hardness 8.0, flexural strength shall be $> 45 \text{ N/mm}^2$, maximum Abrasion resistance 144 mm^3 , maximum thermal expansion $< (1 \times 10^{-5})$, maximum thermal shock resistance shall be of no damage, resistance to acid (wt. loss) $< 0.4\%$, Skid resistance (friction coefficient) > 0.6 , breaking strength shall be 2600 N , density of (g/cm^3) shall be 2.4 & no moisture expansion.

M. 82. CONCRETE TILES :

- 82.1 The plain cement concrete tiles shall be manufactured using the basic raw material of white cement with the addition of special chemical & quartz chips, which give the tiles extra strength. The concrete tiles shall be highly durable having very superior structure properties such as high transverse and compressive strength, very low water absorption and very low surface abrasion, supplied by manufacturer such as Roughwalk series, "Mozzattera" by "Vyara Tiles", or Terrarock Tiles by Super Tiles & Marble Pvt. Ltd. or equivalent, as approved by the Architect and Engineer-in-Charge.

The tiles shall be manufactured using a vibration system and rubber moulds, under pressure. The tiles shall be subjected to a pressure of not less than 140 Kg./Cm^2 . The proportion of cement to aggregate, in the backing of the tiles shall be not less than 1 : 3, by weight.

The tiles shall be hot blasted to give it a special texture. The top shall be treated with two coats of acrylic coating, and factory polished and honed, ready to be fixed in the exterior.

- 82.2 The concrete tiles shall be generally square in shape having all angles at perfect right angles and all the edges being sharp & true, having a size of 400 mm. x 400 mm. x 34 mm. thick. The tolerance allowed in length & breadth shall be $\pm 1.0 \text{ mm.}$ & tolerance allowed in thickness shall be $\pm 5 \text{ mm.}$
- 82.3 The tiles shall satisfy the test as regards transverse strength, resistance to wear absorption as per IS : 1237.
- Water' Absorption :
- Sampling : 6 tiles out of every 3,000 tiles are taken for testing.
- Result : Absorption permissible, shall be at the most 1C) %.
- Transverse strength test :
- Sampling : 12 tiles out of every 3,000 tiles are taken for testing.
- Result : When wet : 80 Kg./Cm^2 .

When dry : 120 Kg./Cm².

Abrasion test:

Sampling : 6 tiles out of every 3,000 tiles are taken for testing.

Result : Average abrasion shall not be more than 3.5 mm.

These tiles shall have plain wearing surface, wherein pigments are used. They shall conform to IS : 1237. The pigments used for coloring cement shall not exceed 10 % by weight of cement used in the mix. The pigments, synthetic or otherwise, used for coloring tiles shall have permanent color and shall not contain Materials: detrimental to concrete.

M. 83 ACRYLIC EMULSION PAINTS :

- 83.1. It shall be from ICI, Nerolac, Asian Paints, Berger or equivalent, as approved by the Architect and Engineer-in-Charge. It shall conform to the relevant IS codes.
- 83.2. It shall be used on both interiors and exteriors, on all different types of plaster, wooden surfaces, stone, brickwork, asbestos cement sheets, hard and soft boards, etc. It shall render rich smooth finish and shall provide a tough film that forms a suitable protection against all elements.
- 83.3. It shall be water thinnable. It shall require no primer. On a well prepared surface, it shall be applied, after one coat of cement primer, in case it is an interior surface and waterproof cement coating, in case it is an exterior surface. On a new but highly absorbent surface, a thin coat of the same shall be applied by adding two parts of water by volume to two parts of acrylic emulsion by volume. On previously painted surfaces, one coat of the same shall be applied by thinning four parts of the emulsion with one or two parts of water. It shall be applied by brush, roller or spray. It shall have a covering capacity of 25 - 30 S.Mts./Liter, depending on the surface and shade used. It can be washed to remove the day-to-day dirt, after the surface has been painted, minimum for a month.

SIGNATURE OF THE CONTRACTOR.

EXECUTIVE ENGINEER
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION

SCHEDULE FOR TESTING OF MATERIALS

Sr.No.	Brief description of materials to be tested	Prescription of test which shall be carried out	Frequency @ which test shall be carried out (As per GERI Q.C. Vol-12002)
1.	Sand	(1) Gradation	1/150 Cmt for concrete or as per requirement of relevant specification.
		(2) Fineness Modulus	
		(3) Specific Gravity	
		(4) Water Absorption	
		(5) Silt Content	
2.	Coarse Aggregate	(1) Gradation	1/150 Cmt for concrete or as per requirement of relevant specification.
		(2) Impact Value	
		(3) Flakiness Index	
		(4) Water Absorption	
		(5) Stripping Value	
3.	C.C.Cube	(1) Compressive Strength	1-5 Cmt. 1-Test 6-15 Cmt. 2-Test 16-30 Cmt. 3-Test 31-50 Cmt. 4-Test 51 & above 4 + 1 for each addl. 50 Cmt or part of thereof.
4.	Flush Door	(1) End Immersion Test	Randomly as per IS:7638: 1975
		(2) Glue Adhesion Test	
5.	Tiles	(1) Wet Transverse Strength (2) Water Absorption	Randamly as per Strength IS:4905:1968
6.	Flyash Brick	(1) Compressive Strength (2) Water Absorption	As per IS:5454:1978
7.	Cement	(1) Consistency test (2) Initial Setting time (3) Final setting time (4) Compressive Strenght (5) Fineness by Dry Sieving (6) Fineness by Specific Surface (7) Soundness by Le-Chatelier (8) Specific Gravity	Every 50 Tons or part thereof
8.	Steel	(1) Weight per meter (2) Yeild Stress / 0.2 % Proof stress (3) % Elongation (4) Tensile Strenght	(a) For Consigment below 100 tons (i) Under 10 mm dia One sample for each 25 tons or part thereof (ii) 10 mm to 16 mm dia One Sample for each 35 tones or part thereof (iii) Over 16 mm dia One Sample for each 45 tons or part thereof. (b) For Consigment over 100 tons (i) Under 10 mm dia One sample for each 40 tons or part thereof (ii) 10 mm to 16 mm dia One Sample for each 45 tones or part thereof

Note:-

- (1) For Sand and Coarse aggregate two Nos. of full bag for one sample shall be supplied by agency.
- (2) For water test 5:00 liters of water shall be supplied by agency in plastic container for each sources.
- (3) Sample from the lot shall be selected by authorized representative along with representative of Project Management Consultant (PMC).
- (4) Selected sample shall be handed over personally by representative of S.M.C. and PMC in sealed condition with letter containing sample No. and sampling date.
- (5) Test report should be received by the department containing reference of department's letter, sample No. sampling date and date of testing.

SIGNATURE OF THE CONTRACTOR.

EXECUTIVE ENGINEER
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION

GENERAL TECHNICAL SPECIFICATION FOR BUILDING WORKS

GENERAL :

1. In the specification "as directed"/"Approved" shall be taken to mean "as directed"/approved by the Engineer-in-charge.
2. Wherever a reference to any Indian Standard appears in the specifications, it shall be taken to mean as a reference to the latest edition of the same in force on the date of agreement.
3. In "Mode of Measurement" in the specification wherever a dispute arises in the absence of specific mention of a particular point or aspect, the provisions on these particular point or aspects in the relevant Indian Standards shall be referred to.
4. All measurements and computations, unless otherwise specified, shall be carried out nearest to the following limits :
 - (i) Length, width and depth (height) 0.01 Mt.
 - (ii) Areas 0.01 Sq.Mt.
 - (iii) Cubic Contents 0.01 Cu.Mt.

In recording dimensions of work.

The sequence of length, width and height (depth) or thickness shall be followed.

5. The distance which constitutes lead shall be determined along the shortest partial route and not necessarily the route actually taken. The decision of the Engineer-in-charge in this regard shall be taken as final.
6. Where no lead is specified, it shall mean "all leads".
7. Lift shall be measured from plinth level.
8. Definite particulars covered in the items of work, though not mentioned or elucidated in its specifications shall be deemed to be included therein.
9. Reference to specifications of materials as made in the detailed specification the items of works is in the form of a designation containing the number of the specification of the material and prefix 'M' e.g. 'M-s'.
10. Approval of the samples of various materials given by the Engineer-in-charge shall not absolve the contractor from the responsibility of replacing defective material brought on site or materials used in the work found defective at a later date. The contractor shall have no claim to any payment or compensation whatsoever on account of any such materials being rejected by the Engineer-in-charge.
11. The contract rate of the item of work shall be for the work completed in all respects .
12. No collection of materials shall be made before it is got approved from the Engineer-in-charge.
13. Collection of approved materials shall be done at site of work in a systematic manner. Materials shall be stored in such a manner as to prevent damage, deterioration or intrusion of foreign matter and to ensure the preservation of their quality and fitness for the work.

14. Materials, if and when rejected by the Engineer-in-charge, shall be immediately removed from the site of work.
15. No materials shall be stored prior to, during and after execution of a structure in such a way as to cause or lead to damage on overloading of the various components of the structure.
16. All work shall be carried out in a workmanlike manner as per the best techniques for the particular item.
17. All tools, templates, machinery and equipment for correct execution of the work as well as for checking lines, levels, alignment of the works during execution shall be kept in sufficient numbers and in good working condition on the site of the work.
18. The mode procedure and manner of, execution shall be such that it does not cause damage or over-loading of the various components of the structure during execution of after completion of the structure.
19. Special modes of construction not adopted in general Engineering practice, if proposed to be adopted by the Contractor, shall be considered only if the contractor provides satisfactory evidence that such special mode of construction is safe, sound and helps in speedy construction and completion of work to the required strength and quality. Acceptance of the same by the Engineer-in-charge shall not, however, absolve the contractor of the responsibility of any adverse effects and consequences of adopting the same in the course of execution of completion of the work.
20. All installations pertaining to water supply and fixtures thereof as well as drainage lines and sanitary fittings shall be deemed to be completed only after giving satisfactory tests by the Contractor.
21. The contractor shall be responsible for observing the rules and regulations imposed under the "Minor Minerals Act", and such other laws and rules prescribed by Government from time to time.
22. All necessary safety measures and precautions (including those laid down in the various relevant Indian Standards) shall be taken to ensure the safety of men, materials and machinery on the works as also of the work itself.
23. The testing charges of all materials shall be borne by the Contractor.
24. Approval to any or the executed items for the work does not in any way relieve the contractor of his responsibility for the correctness, soundness and strength of the structure as per the drawings and specifications.

SIGNATURE OF THE CONTRACTOR.

EXECUTIVE ENGINEER
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION

ITEM WISE DETAILED TECHNICAL SPECIFICATIONS

DTS No. 1:-

Excavation for foundation includ.sorting out & stacking of useful materials & disposing of the excavated stuff upto 50 mt. Lead & all lift, watering etc. Comp. (A) Loose or Soft soil With Machinaries.

1.1.0 GENERAL

1.1.1 Any soil which generally yields to the application of pickaxes and shovels or jumpers or scarifiers phawaras rakes or any such excavation implement or organic soil, gravel, silt, sand turf loam, clay, peat etc. fall under this category.

1.2.0 CLEARING THE SITE

1.2.1 The site on which the structure is to be built shall be cleared, and all obstructions, loose stone, materials and rubbish of all kind, bush, wood and trees shall be removed as directed. The materials so obtained shall be the property of the Corporation and shall be conveyed and stacked as directed within 50 Mts. lead. The roots of the trees coming in the sides shall be cut and coated with a hot asphalt.

1.2.2 The rate of site clearance is deemed to be included in the rate of earth work for which no extra amount will be paid.

1.3.0 SETTING OUT

After clearing the site, the centre lines will be given by the Engineer-in-charge. The contractor shall assume full responsibility for alignment, elevation and dimension of each and every part of the work. The contractor shall supply labour, materials etc. required for setting out the reference marks and bench marks and shall maintain them as long as required and directed.

1.4.0 EXCAVATION

The excavation in foundation shall be carried out in true line and level and shall have the width and depth as shown in the drawings or as directed. The contractor shall do the necessary shoring and shuttering at his own cost and as approved by the Engineer or his Consultant. The payment for such precautionary measures shall be included in this work. The bottom of the excavated area shall be levelled both longitudinally & transversely as directed by removing and watering as required. No earth filling will be allowed for bringing it to level, if by mistake or any other reason excavation is made deeper or wider than that shown on the plan or as directed. The extra depth or width shall be made up with concrete of the same proportion as specified for the foundation concrete at the cost of the contractor. The excavation upto 3.0 Mts. depth shall be measured under this item. The site conditions may require excavation in parts as per schedule of excavation. No extra payment will be claimed for this operation schedule.

1.5.0 DISPOSAL OF EXCAVATED MATERIALS

1.5.1 No materials excavated from the foundation trenches, of whatever kind they may be, are to be placed even temporarily upto 1.5 Mts. or at the distance prescribed by the Engineer, from the outer edge of excavation. All materials excavated shall remain the property of the Corporation. Rate of excavation shall include sorting out of useful materials and stacking them separately as directed within the specified lead. Materials suitable and useful for backfilling or other use shall be stacked in convenient places but not in such a way as to obstruct free movement of men, animals and vehicles or encroach upon the area required for constructional purposes. The site shall be left clean of all debris on completion.

1.5.2 Disposal of excavated materials is subject to the following - Unsuitable materials obtained from clearing site and excavation shall be disposed off within a lead or 50 Mts. as directed. Useful materials obtained from clearing site & excavation shall be stacked within lead of 50 Mts. beyond the building area as directed. Materials suitable for back-filling shall be stacked at convenient places within a lead of 50 Mts. and will be allowed to be used by the contractor on payment at rates laid down in the contract or if not so laid down, at scheduled rates of the Division or at mutually agreed rates if there are no such rates in the schedule of rates.

1.6.0 MODE OF MEASUREMENT AND PAYMENT

1.6.1 The measurement of excavation in trenches for foundation shall be made according to the sections of trenches shown on the drawing or as per sections given by the Engineer-in-charge or as directed. No payment shall be made for surplus excavation made in excess or above requirements or due to stopping and sloping back as found necessary on account of conditions of soil and requirements of safety or construction schedule requiring excavation to be done in parts.

1.6.2 No extra payment shall be made for temporary pumping of water / sewage due to abnormal adverse conditions / climate.

1.6.3 The rate shall be for a unit of one cubic meter.

DTS No. 2:-

'Excavation for foundation including sorting out and stacking off useful materials and disposing of the excavated stuff up to 50 mt. lead and all lift, watering etc.comp. (A) Loose or Soft soil With Machinaries.

1.1.0 WORKMANSHIP

1.1.1 The relevant specification of DTS No.1 shall be followed except that the excavation work shall be carried out in all sorts of soil with lift 1.5 Mts. to 2.0 Mts. & 2.0 to 2.5 mt depth.

1.2.0 MODE OF PAYMENT

1.2.1 The relevant specifications of DTS No.1 shall be followed.

1.2.2 The excavation work of lift 1.5 Mts. to 2.0 Mts. and 3.0 to 3.0 mt depth shall be measured under this item.

1.2.3 The rate shall be for a unit of one cubic metre.

DTS No. 3:- Boring holes 3.5 mt.deep in ordinary soil (for cast in situ piles) & disposal of the surplus excavated soil as directed within a lead of 50 M. For following diameter of piles.

(1) 200 mm.

(2) 250 mm.

(3) 300 mm.

Workmanship:

The ground shall be roughly leveled and after making the position of piles, the holes shall be bored with a spiral angle to the 1.8 M depth and specified diameter using boring guide.

The bore holes shall be truly vertical and uniform bore through cut of specified diameter. After boring to the required depth, the bore shall be cleared off the loose soil and disposal of surplus excavated stuff as directed within a lead of 50 M.

Mode of Measurement & Payment : The rate for boring holes shall include :

[a] Roughly leveling the ground in positions where piles are to be provided [b] Making the position of piles by pegs and boring guide and also for shifting of boring guide [c] Bailing out water, if any met with during boring [d] Disposal of surplus excavated soil within a lead of 50 M. and [e] All tools, plants, equipments and labour required for satisfactory completion of work.

The rate shall be for a unit of one Running metre.

DTS No. 4 :-

Providing and laying cement concrete 1:4:8 (1cement : 4 sand : 8 graded stone aggregates 40mm nominal size)/ (1 cement : 4 sand : 8 graded stone aggregates 40mm nominal size) and curing complete including cost of formwork in (a) foundation & Plinth

4.1.0 Materials:-

Water shall conform to M-1. Cement shall conform to M-3.Sand shall conform to M-6.Stone aggregate 40 mm nominal size shall conform to M-12.

4.2.0 WORKMANSHIP :

4.2.1 General :-

Before starting concreting the bed of foundation trenches shall be cleared of all loose materials, levelled, Waterred and rammed as directed.

4.2.2 Proportion of Mix :-

The proportion of cement, sand coarse aggregate shall be one part of cement, 3 parts of sand 6 parts of stone aggregate shall be measured by volume.

4.2.3 Mixing :-

The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may however be allowed for smaller quantity of work if approved by Engineer-in-charge. When hand mixing is permitted by the Engineer-in-charge in case of break down of machineries and in the interest of the work, it shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. However in such case 10% more cement than otherwise required shall have to be used without any extra cost. The mixing in mechanical mixer shall be done for a period

- 1 1/2 to 2 minutes. The quantity of water shall be just sufficient to produce dense concrete of required workability for the purpose.
- 4.2.4 Transporting and placing the concrete :-
The concrete shall be handed from the place of mixing to the final position in not more than 15 minutes by the method as directed and shall be placed into its final position, compacted and finished within 30 minutes of mixing with water i.e. before the setting commences.
The concrete shall be laid in layers of 15 cms to 20 cms.
- Compacting :-The concrete shall be rammed with heavy iron rammer and rapidly to get the required compaction and to allow the interstices to be filled with mortar.
- 4.2.5 Curing :-
After the final set, the concrete shall be kept continuously wet, if required by ponding for a period of not less than 7 days from the date of placement.
- 4.3.0 Mode of measurements and payment :-
The concrete shall be measured for its length breadth and depth, limiting dimensions to those specified on plan or as directed. The rate shall be for a unit of one cubic meter.

DTS No. 5:-

- Providing and laying cement concrete work 1:1.5:3 [1 cement : 1.5 coarse sand: 3 graded stone aggregates 20 mm nominal size]** and curing complete including cost of form work and excluding cost of reinforcement for reinforced concrete work in **[a] foundation footing, Base of columns and mass concrete [b] independent piers, columns and pillars [c] staircase [d] vertical and horizontal fins.**
- 5.1.0 Materials :-
Water shall conform to M-1, Cement shall conform to M-3. Sand shall conform to M-6. Grit shall conform to M-8. Graded stone aggregate 20 mm nominal size shall conform to M-12.
- 5.2.0 General :-
- 5.2.1 The concrete mix is not required to designed by preliminary tests. The proportion of the concrete mix shall be 1:1.5:3 [1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size] by volume Concrete work shall have exposed concrete surface or as specified the item.
- 5.2.2 The designation ordinary M-100, M-150, M-200, M-250 specified as per I.S.corresponding approximately to 1:3:6 1:2:4, 1:1:1, 1/2: 3 and 1:1:2 nominal mix of ordinary concrete by volume respectively with conforming to IS:456.
- 5.2.3 The ingredients required for ordinary work, containing one bag of cement of 50 kg. by weight [0.0342 cu.m.] for differ-ent proportion of mix shall be as under.

Grade	Total quantity of dr aggregate by volume per 50 Kg. of cement t be taken as the sume of individual volume of fine and coarse aggregate maximum	Proportion of fine aggregate of coarse aggregate	quantity of water per 50 Kg. of cement maximum
M-100 (1:3:6)	300 Liters	Generally 1:3 for fine aggregate to coarse aggregate by volume but subject to and upper limit	35 Liters
M-150 (1:3:6)	220 Liters		32 Liters
M-150 (1:1.5:3)	160 Liters		30 Liters
M-250 (1:1:2)	100 Liters		27 Liters

- 5.2.4 The water cement ratios shall not be more then those specified in the table. The cement content of the mix specified in the table shall be increased if the quantity of water in a mix has to be increased to overcome the diffi-culties of placement and compaction so that the water cement ratio specified in the table is not exceeded.
- 5.2.5 Workability of the concrete shall be controlled by maintaining a water cement ratio that is found to give a concrete mix which is just sufficiently wet to be placed and compacted without difficulty with the means available.

- 5.2.6 The maximum size of coarse aggregate shall be as large as possible within the limits specified but in no case greater than one fourth of the minimum thickness of the member, provided that the concrete can be placed without difficulty so as to surround all reinforcement thoroughly and to fill the corners of the form.
- 5.2.7 For reinforced concrete work, coarse aggregates having a nominal size of 20 mm generally considered satisfactory.
- 5.2.8 For heavily reinforced concrete members as in the case of the ribs of main beams the nominal maximum size of coarse aggregate should usually be restricted to 5 mm, less than the minimum clear distance between the main bars, or 5 mm, less than the minimum cover to the reinforcement whichever is smaller.
- 5.2.9 Where the reinforcement is widely spaced as in solid slabs, limitations of size of the aggregate may not be so important and the nominal maximum size may some times be as great as or greater than the minimum cover.
- 5.2.10 Admixture may be used in concrete only with approval of Engineer-in-charge based upon the evidence that with the passage of time; neither the compressive strength of concrete is reduced nor are other requisite qualities of concrete and steel impaired by the use of such admixtures.
- 5.3.0 **WORKMANSHIP :**
- 5.3.1 **General :-** The bars shall be kept in position by the following method:
- In case of beam and slab construction, sufficient number of precast cover blocks in cement mortar 1:2 [1 cement 2 coarse sand] about 4 x 4 cms. section of thickness equal to the specified cover shall be placed between the bars and shuttering as to secure and maintain the requisite cover of concrete over the reinforcement.
- In case of cantilevered or doubly reinforced beams or slabs, the main reinforcing bars shall be held in position by introducing chair spacers or supports bars at 1.0 to 1.2 metres centres.
- In case of columns and wall, the vertical bars shall be kept in position by means of timber templates with slots accurately cut in them, the templates shall be removed after concreting has been done below it. The bars may also be suitably tied by means of annealed steel wires to the shuttering to maintain their position during concreting.
- All bars projecting from pillars, columns, beams, slabs etc. to which other bars and concrete are to be attached or bounded to later on, shall be protected with a coat of thin neat cement grout, if the bars are not likely to be incorporated with succeeding mass of concrete within the following 10 days. This coat of thin neat cement shall be removed before concreting.
- 5.3.2 **Proportioning :-**
- Proportioning shall be done by volume, except cement which shall be measured in terms of bags of 50 kg. weight. The volume of one such bag being taken as 0.0342 cu. metre. Boxes of suitable sizes shall be used for measuring sand and aggregate. The size of the boxes [internal] shall be 35x25 cms. and 40 cms. deep. While measuring the aggregate and sand, the boxes shall be filled without shaking, ramming or hammering. The proportioning of sand shall be on the basis of its dry volume and in case of damp sand, allowances for bulking shall be made.
- 5.3.3 **Mixing :-**
- 5.3.3.1 For all work, concrete shall be mixed in a mechanical mixer which along with other accessories shall be kept in first class working condition and so maintained throughout the construction. Measured quantity of aggregate, sand and cement required for each batch shall be poured into the drum of the mechanical mixer while it is continuously running. After about half a minute of dry mixing measured quantity of water required for each batch of concrete mix shall be added gradually and mixing continued for another one and half minute. Mixing shall be continued till materials are uniformly distributed and uniform colour of the entire mass is obtained and each individual particle of the coarse aggregate shown complete coating of mortar containing its proportionate amount of cement. In no case shall the mixing be done for less than two minutes after all ingredients have been put into the mixer.
- 5.3.3.2 When hand mixing is permitted by the Engineer-in-charge for small jobs or for certain other reasons, it shall be done on the smooth watertight platform large enough to allow efficient turning over the ingredients of concrete before and after adding water. Mixing platform shall be so arranged that no foreign material gets mixed with concrete nor the mixing water flow out. Cement in required number of bags shall be placed in a uniform layer on top of the measured quantity of fine and coarse aggregate, which shall also be spread in a layer of uniform thickness on the mixing platform. Dry coarse and fine aggregate and cement shall then be mixed thoroughly by turning over to get a mixture of uniform colour. Specified quantity of water shall then be added gradually through a rose can and the mass turned over till a mix of required consistency is obtained. In hand mixing, quantity of cement shall be increased by 10 percent above that specified.

- 5.3.3.3 Mixer which have been out of use for more than 30 minutes shall be thoroughly cleaned before putting in a new batch, unless otherwise agreed to by the Engineer-in-charge. The first batch of concrete from the mixture shall contain only two thirds of normal quantity of coarse aggregate. Mixing plant shall be thoroughly cleaned before changing from one type of cement concrete to another.
- 5.3.4 Consistency :
The degree of consistency which shall depend upon the nature of the work and methods of vibration of concrete, shall be determined by regular slump test in accordance with I.S. 1199 : 1959. The slump of 10 mm to 25 mm shall be adopted when vibrators are used and 80 mm when vibrators are not used.
- 5.3.5 Inspection :
- 5.3.5.1 Contractor shall give the Engineer-in-charge due notice before placing any concrete in the forms to permit to inspect and accept the false work and forms as to their strength, alignment and general fitness but such inspection shall not relieve the contractor of his responsibility for the safety of men, machinery, materials and for results obtained. Immediately before concreting, all forms shall be thoroughly cleaned.
- 5.3.5.2 Centring design and its erection shall be got approved from the Engineer-in-charge. One carpenter with helper shall invariably be kept present throughout the period of concreting. Movement of labour and other persons shall be totally prohibited for reinforcement laid in position. For access to different parts suitable mobile platform shall be provided so that steel reinforcement in position is not disturbed. For ensuring proper cover, mortar blocks of suitable size shall be cast and tied to the reinforcement. Timber, kapachi or metal pieces shall not be used for this purpose.
- 5.3.6 Transporting and laying :-
- 5.3.6.1 The method of transporting and placing concrete shall as approved. Concrete shall be so transported and placed that no contamination segregation or loss of its constituent material takes place.
- 5.3.6.2 All form work shall be cleaned and made free from standing water dust snow or ice immediately before placing of concrete. No concrete shall be placed in any part of structure until the approval of Engineer-in-charge.
- 5.3.6.3 Concreting shall proceed continuously over the area between construction joints. Fresh concrete shall not be placed against concrete which has been in position for more than 30 minutes unless a proper construction joint is formed. Concrete shall be compacted in its final position within 30 minutes of its discharge from the mixer. Except where otherwise agreed to by the Engineer-in-charge concrete shall be deposited in horizontal layers to a compacted depth of not more than 0.45 metre when internal vibrators are used and not exceeding 0.30 metre in all other cases.
- 5.3.6.4 Unless otherwise agreed to by the Engineer-in-charge, concrete shall not be dropped into place from a height exceeding 2 meters.
- 5.3.6.5 When trunking or chutes are used they shall be kept close and used in such a way as to avoid segregation. When concreting has to be resumed on a surface which has hardened, it shall be roughened, swept clean, thoroughly wetted, and covered with a 13 mm thick layer of mortar composed of cement and sand in the same ratio as in the concrete mix itself, this 13 mm layers of mortar shall be freshly mixed and placed immediately before placing of new concrete. Where concrete has not fully hardened, all laitance shall be removed by scrubbing the wet surface with wire or bristle brushes, care being taken to avoid dislodgement of any particles, of coarse aggregate. The surface shall then be thoroughly wetted, all free water removed, and then coated with neat cement grout, The first layers of concrete to be placed on this surface shall not exceed 150 mm in thickness and shall be well rammed against old work, particular attention being given to corners and close spot.
- 5.3.6.6 All concrete shall be compacted to produce a dense homogeneous mass with the assistance of vibrators, unless otherwise permitted by the Engineer-in-charge for exceptional cases such as concreting under water where vibrators cannot be used. Sufficient vibrators in serviceable condition shall be kept at site so that spare equipment is always available in the event of breakdowns.
- 5.3.6.7 Concrete shall be judged to be compacted when the mortar fills the spaces between the coarse aggregate and begins to cream upto form an even surface. Compaction shall be completed before the initial setting starts i.e. within 30 minutes of addition of water to dry mixture. During compaction. It shall be observed that needle vibrators are not applied on reinforcement which is likely to destroy the bond between concrete and reinforcement.
- 5.3.7 Curing :-**
Immediately after compaction, concrete, weather including rain, running water, shocks, vibration, traffic, rapid temperature changes frost and drying out process it shall be covered with wet sacking, hessian or other similar absorbent material approved, soon after the initial set and shall be kept

continuously wet for a period of not less than 14 days from the date of placement. Masonry work over foundation concrete may be started after 48 hours of its laying but curing of concrete shall be continued for a minimum period of 14 days.

5.3.8 Sampling and Testing of concrete :-

5.3.8.1 Samples from fresh concrete shall be taken as per IS 1199:1999 and cubes shall be made, cured and tested at 7 days and 28 days as per requirements in accordance with IS 516:1959. A random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested i.e. the sampling should be spread over the entire period of concreting and cover all mixing units. The minimum frequency of sampling of concrete of each grade shall be in accordance with following.

5.3.8.2 Quantity of concrete in the work	No. of samples
1-5 Cmt.	1
6-15 Cmt.	2
16-30 Cmt.	3
31-50 Cmt.	4
51-and above	4+one additional sample for each additional 50 cmt.or part there of.

Note:- Atleast one sample shall be taken from shift. The test specimens shall be made from each sample, five for testing at 7 days and the remaining five at 28 days. The samples of concrete shall be taken on each day of the concreting as per above frequency. The number of specimens may be suitably increased as deemed necessary by the Engineer-in-charge when procedure of tests given above reveals a poor quality of concrete and in other special cases.

5.3.8.3 The average strength of the group of cubes cast for each day shall not be less than the specified cube strength of 150 kg/cm² at 28 days. 20% of the cubes cast for each day may have value less than the specified strength provided the loSOUTH value is not less than 85% of the specified strength. If the concrete made in accordance with the proportion given for a particular grade does not yield the specified strength such concrete shall be classified as belonging to the appropriate lower grade. Concrete made in accordance with the proportions given for a particular grade shall not, however, be placed in a higher grade on the ground that the test strength are higher than the minimum specified.

5.3.9 Stripping :

5.3.9.1 The Engineer-in-charge shall be informed in advance by the contractor of his intention to strike the form work. While fixing the time for removal of form work, due consideration shall be given to local conditions, character of the structure, the weather & other conditions that influence the setting of concrete and of the materials used in the mix. In normal circumstances [generally where temperatures are above 20°C] and where ordinary concrete is used forms may be struck after expiry of period specified in the DTS No.4 for respective item of form work.

5.3.9.2 All form work shall be removed without causing any shock or vibration as would damage the concrete. Before the soffit are removed, the concrete surface shall be exposed, where necessary in order to ascertain that the concrete has sufficiently hardened. Centring shall be gradually and uniformly lowered in such a manner as to permit the concrete to take stresses due to its own weight uniformly and gradually. Where internal metal ties are permitted they or their removeable parts shall be extracted without causing any damage to the concrete and remaining holes filled with mortar. No permanently embedded metal part shall have less than 25 mm cover to the finished concrete surface. Where it is intended to re-use the form work, it shall be cleaned and made good to the satisfaction of the Engineer-in-charge. After removal of form work and shuttering, the Executive Engineer shall inspect the work and satisfy by random checks that concrete produced is of good quality.

5.3.9.3 Immediately after the removal of forms all exposed bolts etc. passing through the cement member and used for shuttering or any other purpose shall be cut inside the cement concrete member to a depth of at least 25 mm. below the surface of the concrete and, the resulting hole shall be filled by cement mortar. All fins caused by form joints, all cavities produced by the removal of form ties and all other holes and depression, honeycomb spots, broken edges or corners and other defects, shall be thoroughly cleaned, saturated with water and carefully pointed and rendered true with mortar of cement and fine aggregate mixed in the proportions used in the grade of concrete that is being finished and so as dry consistency as is possible to use. Considerable pressure shall be applied in filling and pointing to ensure thorough filling in all voids. Surfaces which are pointed shall be kept moist for a period of 24 hours.

5.3.9.4 If rock pockets/honeycombs in the opinion of the Engineer-in-charge are of such an extent or character as to effect the strength of the structure materially or to endanger the life of the steel reinforcement, he may declare portions of the structure affected.

5.4.0 Mode of measurement and payment :

- 5.4.1 The consolidated cubical contents of concrete work as specified in item shall be measured. The concrete laid in excess of section shown on drawings or as directed shall not be measured. No deductions shall be made for.
- [a] Ends of dissimilar materials such as joints, beams, posts, girders, rafters, purline, trusses, corbels and steps etc. upto 500 sq.cm. in section.
- [b] Opening upto 0.1 sq.m.
- [c] The volume occupied by reinforcement shall not be deducted from R.C.C. work.
- 5.4.2 The rate includes cost of all materials labour, tools and plant required for mixing, placing in position vibrating and compacting, finishing as directed, curing and all other incidental expenses for producing concrete of specified strength. The rate excludes the cost of form work.
- 5.4.3 The rate shall be for a unit of one cubic metre.

DTS NO. 6:-

Providing and laying cement concrete 1:1.5:3 [1 Cement, 1.5 coarse sand:3 graded stone aggregates 20 mm nominal size] and finishing smooth with cement plaster in cement mortar 1:3 and curing etc. completing, including the cost of form work but excluding the cost of reinforcement for R.C.C. work[A] Columns: [i] Having cross sectional area 0.05 to 0.08 sq.mt. [ii] Having cross sectional area more than 0.08 sq.mt. and upto 0.12 sq.mt. [iii] Having cross sectional area more than 0.12 sq.mt. and upto 0.18 sq.mt. [B] Beams : [i] Having cross sectional area 0.05 to 0.08 sq. meter. [ii] Having cross sectional area more than 0.08 sq.mt. upto 0.12 sq.meter. [iii] Having cross sectional area more than 0.12 sq.mt. and upto 0.18 sq. mt. [C] Slabs: [i] Slabs upto 8 cms.thickness [ii] Slabs having more than 8 cms. and upto 10 cms.thickness [iii] Slabs having more than 10 cms. and upto 13 cms. thickness [iv] Slab having more than 13 cms and upto 15 cms.thickness [D] Lintels [E] chhajjas etc.comp.

6.1.0 Materials and workmanship:-

- The relevant specifications of DTS No. 6 shall be followed for concrete work and DTS No. 7.1 shall be followed for form work and centering work. The relevant specification DTS No. 15 shall be followed for the finishing work in mortar 1:3 [1 cement:3 fine sand] Before the Plastering is done. The surface of the concrete shall be raked roughened Punch for Proper bond. Except the reinforced concrete works shall be carried out for the columns, beams slabs and lintels.
- [A] The cross sectional area of columns shall be Specified in item.
- [B] The cross sectional area of beam lintel shall be specified in item.
- [C] The thickness of the slabs shall be specified in the item.
- [D] The thickness of the lintel chhajjas shall be specified in the item.

6.2.0 Mode of measurement and payment :-

- 6.2.1 The Consolidated Cubical Contents of Concrete work as Specified in item shall be measured. The concrete laid in excess of sections shown on drawings or as directed shall not be measured. No deductions shall be made for [A] Ends of dissimilar materials such as joints, beams, posts, girders, rafters, purlin trusses, corbels and steps etc. upto 500 sq.cm. in section. [B] Opening upto 0.1 Sq.M.
- 6.2.2 The rate includes cost of all materials labour, tools and plant required for mixing, placing in position, vibrating and compacting, finishing as directed, curing and all other incidental expenses for producing concrete of specified strength. The rate includes the cost of form work. [The rate also includes smooth plaster.]
- 6.2.3 The volume occupied by reinforcement shall not be deducted from R.C.C. work.
- 6.2.4 The rate shall be for a unit of one cubic metre.

DTS NO. 7:-

Providing form work of ordinary timber planking so as to give a rough finish including centering, shuttering strutting and propping etc. Height of propping and centering below supporting floor to ceiling and removal of the same for in site reinforced concrete and plain concrete work in [a] Foundation, footing Bases of columns [b] columns, [c] Beams [d] Slabs [e] Lintels [f] Chhajjas [g] Staircases [h] Staircases Landings [i] Vertical and Horizontal fins [j] Mass concrete etc.comp.

1.0 Materials :

The shuttering to be provided shall be of ordinary timber planks and shall conform to M-26. The dimensions of scantlings and battens shall conform to the design. The strength of the wood shall not be less than that assumed in the design.

2.0 Workmanship :

2.1 The form work shall conform to the shape lines and dimensions as shown on the plans and be so constructed as to remain sufficiently rigid during the placing and compacting of the concrete. Adequate arrangements shall be made by the contractor to safe-guard against any settlement of the formwork during the course of concreting and after concreting. The form work of shuttering, centering, scaffolding, bracking etc. shall be as per design.

2.3 Cleaning and Treatment of forms :

2.3.1 All rubbish, particularly chippings shaving and saw dust shall be removed from the interior of the form before the concrete is placed and the form work in contact with concrete shall be cleaned and thoroughly wetted or treated. The surface shall be then coated with soap solution applied before concreting is done. Soap solution for the purpose shall be prepared by dissolving Yellow soap in water to get consistency of paint. Alternatively a coat of raw linseed oil/or form oil of approved manufacturer may be applied in case steel shuttering is used. Soap solution or raw linseed oil shall be applied after thoroughly cleaning the surface.

2.3.2 Care shall be taken that the coating does not get on construction joint surface and reinforcement bars.

2.4 Stripping Time :

In normal circumstances and where ordinary cement is used forms may be struck after expiry of following period :

(a)	Side of wall columns and vertical faces of beam	24 to 48 hours
(b)	Beams soffits (Props. left under	7 days
(c)	Removal of props under slabs	
	(i) Slabs spanning upto 4.5 m.	7 days
	(ii) Spanning over 4.5 mt.	14 days
(d)	Removal of props to beams and arches	
	(i) Spanning upto 6 mt.	14 days
	(ii) Spanning over 6 mt.	21 days

2.5 Procedure when removing the form work :

All form work shall be removed without such shock or vibrations as would damage the reinforced concrete surface. Before the soffit form work and struts are moved, the soffits and the concrete surface shall be exposed where necessary in order to ascertain that the concrete has sufficiently hardened.

2.6 Centering :-

2.6.1 The centering to be provided shall be got approved. It shall be sufficiently strong to ensure absolute safety of the form work and concrete work before, during and after pouring concrete. Watch should be kept to see that behaviour of centring and form work is satisfactory during concreting. Erection should also be such that it would allow removal of forms in proper sequence without damaging either the concrete or the forms to be removed.

2.6.2 The props of centring shall be provided on firm foundation or base of sufficient strength to carry the loads without any settlement.

2.6.3 The centring and form work shall be inspected and approved by the Engineer-in-charge before concreting. But this will not relieve the contractor of his responsibility for strength, adequacy and safety of form work and centering.

2.6.4 If there is a failure of form work or centering, contractor shall be responsible for the damages to the work, injury to life and damage to property

2.7 Scaffolding :-

2.7.1 All scaffolding, hoisting arrangement and ladders etc. required for the facilitating of concreting shall be provided and removed on completion of work by contractor at his own expense. The scaffolding hoisting arrangement and ladders etc. shall be strong enough to withstand all live, dead and impact loads expected to act and shall be subject to the approval of the Engineer-in-charge. However, contractor shall be solely responsible for the safety of the scaffolding, hoisting arrangements, ladders, work and workmen etc.

2.7.2 The scaffolding, hoisting arrangements and ladders shall allow easy approach to the work spot and afford easy inspection.

2.7.4 The rate is applicable to all conditions of working. The rate shall include the cost of materials and labour for various operations involved such as

[a] Splayed edges, notching, allowance for overlaps and passing at angle, battens centring, shuttering, propping bolting, Nailing, wedging, easing, striking and removal.

- [b] Filletting to form stop chamfered edges of splayed external angles not exceeding 20 mm width to beams, columns and the like.
- [c] Temporary openings in the forms for pouring concrete, if required, removing rubbish etc.
- [d] Dressing with oil to prevent adhesion of concrete with shuttering, and
- [e] Raking or circular cutting.

2.8 Re-Use:- Before re-use all forms shall be inspected by Engineer-in-charge and their suitability ascertained. The forms shall be scarred, cleaned and joints gone over, repaired. Inside surface shall be retreated to prevent adhesion of concrete.

3.0 Mode of measurement and payment :

Form work shall be measured as the area in square metres of shuttering in contact with concrete except in the case of inclined member and portion curved profile and upper side in which case only area of underside shall be measured for payment.

Form work to secondary beams shall be measured upto the side of main beams but no deduction shall be made from the work of the main beams at the intersection point.

No deduction shall be made from the form work of a column at intersection of beams. The rate is for the completed item.

The rate shall be for a unit of one sq. metre.

DTS No 8:-

Providing & laying C.C 1:3:6 (1cement :3 coarse sand :6 crushed stone agg. 20 mm Nominal size) & curing comp. incl. cost of form work in: wall caps/ copings.

All specifications same as per DTS No. 6.

DTS No. 9:-

Providing and laying cement concrete 1:3:6 (1cement : 3 sand : 6 graded stone aggregates 40mm nominal size)/ (1cement : 3 sand : 6 graded stone aggregates 40mm nominal size) and curing complete including cost of formwork in (a) foundation & Plinth

9.1.0 Materials:-

Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Stone aggregate 40 mm nominal size shall conform to M-12.

9.2.0 WORKMANSHIP :

9.2.1 General :-

Before starting concreting the bed of foundation trenches shall be cleared of all loose materials, levelled, watered and rammed as directed.

9.2.2 Proportion of Mix :-

The proportion of cement, sand coarse aggregate shall be one part of cement, 3 parts of sand 6 parts of stone aggregate shall be measured by volume.

9.2.3 Mixing :-

The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may however be allowed for smaller quantity of work if approved by Engineer-in-charge. When hand mixing is permitted by the Engineer-in-charge in case of break down of machineries and in the interest of the work, it shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. However in such case 10% more cement than otherwise required shall have to be used without any extra cost. The mixing in mechanical mixer shall be done for a period 1 1/2 to 2 minutes. The quantity of water shall be just sufficient to produce dense concrete of required workability for the purpose.

9.2.4 Transporting and placing the concrete :-

The concrete shall be handed from the place of mixing to the final position in not more than 15 minutes by the method as directed and shall be placed into its final position, compacted and finished within 30 minutes of mixing with water i.e. before the setting commences.

The concrete shall be laid in layers of 15 cms to 20 cms.

Compacting :- The concrete shall be rammed with heavy iron rammer and rapidly to get the required compaction and to allow the interstices to be filled with mortar.

9.2.5 Curing :-

After the final set, the concrete shall be kept continuously wet, if required by ponding for a period of not less than 7 days from the date of placement.

9.3.0 Mode of measurements and payment :-

The concrete shall be measured for its length breadth and depth, limiting dimensions to those specified on plan or as directed. The rate shall be for a unit of one cubic meter.

DTS No. 10:-

Providing & fixing IS Mark TMT Bar FE 500 / FE 500D reinforcement for R.C.C. work incl. bending, binding & placing in position etc. comp.

1 MATERIALS

1.1 Mild steel bars shall conform to M-18 Thermo Mechanically Treated steel bars (high yield strength steel deformed bars) shall conform to M-18, Mild steel binding wires shall conform to M-21.

2 WORKMANSHIP

2.1 The work shall consist of furnishing and placing reinforcement to the shape and dimensions shown as on the drawings or as directed.

2.2 Steel shall be clean and free from rust and loose mill scale at the time of fixing in position and subsequent concreting.

2.3 Reinforcing steel shall conform accurately to the dimensions given in the bar bending schedules shown on relevant drawings. Bars shall be bent cold to specified shape and dimensions or as directed, using a proper bar bender, operated by hand or power to attain proper radius of bends, bars shall not be bent or straightened in a manner that will injure the material. Bars bent during transportation or handling shall be straightened before being used on the work. They shall not be heated to facilitate bending. Unless otherwise specified for mild steel a "U" type hook at the end of each bar shall invariably be provided to main reinforcement. The radius of the bend shall not be less than straight part of the bar beyond the end of the curve shall be at least four times the diameter of the bar. In case which are not round and in case of deformed bars, the diameter shall be taken as the diameter of the circle having an equivalent effective area. The hooks shall be suitably encased to prevent any splitting of the concrete. The cold twisted steel bars shall be used without hooks at the ends. Deformed bars without hooks shall, however, comply with relevant anchorage requirements.

2.4 All the reinforcement bars shall be accurately placed in exactly the same position as shown on the drawings, and shall be securely held in position during placing of concrete by annealed binding wire not less than 1 mm. in size, and by using stay blocks or metal chair spacers, metal handers, supporting wires or other approved devices at sufficiently close intervals. Bars shall not be allowed to sag between supports nor displaced during concreting or any other operations of the work. All devices used for positioning shall be of non-corrodible material. Wooden and metal supports shall not extend to the surface of the concrete, except where shown on the drawings. Placing bars on layers of freshly laid concrete as the work progresses for adjusting bar spacing shall not be allowed. Pieces of broken stone or brick wooden blocks shall not be used. Layers of bars shall be separated by spacer bars, precast mortar blocks or other approved devices. Reinforcement after being placed in position shall be maintained in a clean condition until completely embedded in concrete. Special care shall be exercised to prevent any displacement of reinforcement in concrete already placed. To prevent reinforcement from corrosion, concrete cover shall be provided as indicated on drawings. All the bars are to be spliced and which are likely to be exceeding 10 days shall be protected by a thick coat of neat cement grout.

2.5 Bars crossing each other where required shall be secured by binding wires (annealed) of size not less than 1 mm. in such a manner that they do not slip over each other at the time of fixing and concreting.

2.6 As far as possible, bars of full length shall be used, in case this is not possible, overlapping of bars shall be done as directed. When practicable, overlapping bars shall not touch each other, but be kept apart by 25 mm. or 125 times the maximum size of the coarse aggregate whichever is greater between them. Where not feasible, overlapping bars shall be bound with annealed wires, not less than 1 mm. thick twisted tight. The overlaps shall be staggered for different bars and located at points, along the span where neither shear nor bending moment is maximum.

2.7 Wherever indicated on the drawings or desired by the Engineer-in-charge, bars shall be joined by couplings which shall have a cross section sufficient to transmit the full stresses of bars. The ends of the bars that are joined by coupling shall be upset for sufficient length so that the effective cross section at the base of threads is not less than the normal cross section of the bar. Threads shall be standard threads. Steel for coupling shall conform to I.S-226.

2.8 When permitted or specified on the drawings, joints of reinforcement bars shall be welded so as to transmit their full stresses. Welded joints shall preferably be located at points when steel will not be subjected to more than 75% of the maximum permissible stresses and welds so staggered that at any

one section not more than 20% of the rods are welded. Only electric welding using a process which excludes air from molten and conforms to any or all other special provisions for the work shall be accepted. Suitable means shall be provided for holding bars securely in position during welding. It shall be ensured that no voids are left in welding and when welding is done in two or three stages, previous surface shall be cleaned properly. Ends of the bars shall be cleaned of all loose scale, rust, grease, paint and other foreign matter before welding. Only competent welders shall be employed on the work. The M.S. electrodes used for welding shall conform to I.S. 814. Welded pieces of reinforcement shall be tested. Specimen shall be taken from the actual site and their number and frequency of test shall be as directed.

3 MODE OF MEASUREMENT & PAYMENT

- 3.1 For the purpose of calculating consumption, wastage shall not be permitted beyond 7.5%. Excess consumption over 7.5% will be charged at penalty rate.
- 3.2 Reinforcement shall be measured in length including overlaps, separately for different diameters as actually used in the work. Where welding or coupling is resorted to, in place of lap joints, such joints shall be measured for payment as equivalent length of overlap as per design requirement. From the length so measured, the weight of reinforcement shall be calculated in tonnes on the same basis as per M-14 even though steel is supplied to the contractor by the department on actual weight. Length shall include hooks at the ends. Wastage and annealed steel wire for binding shall not be measured and the cost of these items shall be deemed to be included in the rate for reinforcement.
- 3.3 The rate for reinforcement includes cost of steel binding wires, its transporting from departmental store to work site, cutting, bending, placing and fixing in position as shown on the drawings and as directed. It shall also include all devices for keeping reinforcement in approved position, cost of joining as per approved method and all wastage and spacer bars.
- 3.4 The rate shall be for unit of one Kg.

DTS NO. 11:-

Providing and constructing brick work using fly ash building bricks having crushing strength not less than 35 kg/sqcm. in foundation and plinth in cement mortar 1:6 (1 cement :6 fine sand) etc. comp.

1.0 MATERIALS

Water shall conform to M-1, Cement shall conform to M-3, Sand shall conform to M-6, Flyash Building Bricks shall conform to M-15(A), Cement mortar shall conform to M-11.

2.0 WORKMANSHIP

- 2.1 Proportion : The proportion of cement mortar shall be 1:6 (1 cement, 6 fine sand) by volume.
- 2.2 Wetting of bricks : The bricks required for masonry work shall be thoroughly wetted with clean water for about two hours before use or as directed. The cessation of bubbles, when the bricks are wetted with water, is an indication of thorough wetting of bricks.
- 2.3 Laying : Bricks shall be laid in English bond unless directed otherwise. Half or cut bricks shall not be used except when necessary to complete the bond. Closures in such case shall be cut to required size and used near the ends of the walls.

A layer of mortar shall be spread on full width for suitable length of the lower course. Each brick shall first be properly bedded and set home by gently tapping with handle of trowel or wooden mallet. Its inside face shall be flushed with mortar before the next brick is laid and pressed against it. On completion of course, the vertical joints shall be fully filled from the top with mortar.

The walls shall be taken up truly in plumb. All courses shall be truly horizontal and all vertical joint shall be truly vertical. Vertical joints in alternate course shall generally be directly one over the other. The thickness of brick course shall be kept in uniform.

The brick shall be laid with frogs up wards. A set of tools comprising of wooden straight edges, mason's spirit level, square half metre rule, and pins, string and plumb shall be kept on the site of work for frequent checking during the progress of work.

Both the faces of walls of thickness greater than 23 cms. shall be kept in proper place. All the connected brick work shall be kept not more than one metre over the rest of the work. Where this is not possible, the work shall be raked back according to bond (and not left toothed) at an angle not steeper than 45 degrees.

All fixtures, pipes, outlet of water, hold fasts of doors and windows etc. which are required to be built in wall shall be embedded in cement mortar.

- 2.4 Joints : Bricks shall be so laid that all joints are quite flush with mortar. Thickness of joints shall not exceed 12 mm. The face joints shall be raked out as directed by raking tool daily during the progress of work, when the mortar is still green so as to provide key for plaster or pointing to be done. The face of brick shall be cleaned the very day on which the brick work is laid and all mortar dropping removed.
- 2.5 Curing : Green work shall be protected from rain suitably. Masonry work shall be kept moist on all the faces for a period of seven days. The top of masonry work shall be kept well wetted at the close of the day.
- 2.6 Preparation of Foundation Bed : If the foundation is to be laid, directly on the excavated bed, the bed shall be levelled, cleared of all loose materials, cleaned and wetted before starting masonry. If masonry is to be laid on concrete footing the top of concrete shall be cleaned and moistened. The contractor shall obtain the engineer's approval for the foundation bed, before foundation masonry is started. When pucca flooring is to be provided flush with the top to plinth, the inside plinth offset shall be kept lower than the outside plinth top by the thickness of the flooring.
- 2.7 Fixtures - The frames of doors, windows, cup-boards etc. shall be housed into the brick work at the correct location and level as directed. The heavy steel doors, window frames etc. shall be built in with brick work, but for ordinary steel doors and windows required opening for frames, hold-fasts etc. shall be left in the wall and frames embedded later on in order to avoid damage to the frames.
- 2.8 Scaffolding - Necessary scaffolding shall be provided. The supports of the scaffolding shall be sound and strong tied together with horizontal pieces, over which the scaffolding plunks shall be fixed. Simple scaffolding shall be allowed normally. In this case scaffolding hole shall rest in hole header horizontal course only. Minimum number of holes shall be left in brick work for supporting horizontal scaffolding poles. The contractor is responsible for providing and maintaining sufficiently strong scaffolding so as to withstand all loads likely to come upon it.
- 2.9 Packing out of Joints - For the face of brick work, where plastering is to be done, joints shall be raked out to a depth not less than thickness of joints. The face of brick work shall be cleaned and mortar dropping removed on very same day that brick work is laid.
- 3.0 MODE OF MEASUREMENTS & PAYMENT :
- 3.1 The measurements of this item shall be taken for the brick masonry fully completed for limiting dimensions not exceeding those shown on the plans or as directed shall be final.
- 3.2 No deductions shall be made from quantity of brick work. No extra payment will be made for embedding in masonry holes in respect of the following items ---
- i] Ends of joints, beams, posts, girders, rafters, purlins trusses corbel, steps etc. where cross sectional area does not exceed 500 Sq.Cm.
 - ii] Opening not exceeding 1000 Sq.Cm.
 - iii] Wall plate sand bed plates, bearing of slab, chajjas, and like whose thickness does not exceed 10 Cms. and the bearing does not extend the full thickness of wall.
 - iv] Drainage holes and recesses for cement concrete blocks to embed hold fasts for doors, windows etc.
 - v] Iron fixtures; pipes upto 300 mm. dia. hold fasts of doors and windows built into masonry and pipes etc. for concealed wiring.
 - vi] Forming charges of section not exceeding 350 Sq.Cm. in masonry.
 - vii] Apertures for fire places, shall not be deducted nor shall extra labour required to make splaying of jams, throating and making arches over the aperture be paid for separately.
- 3.3 The rate shall be for a unit of one cubic metre.

DTS NO. 12:-

Filling in trenches with available excavated earth in layer not exceeding 20 cm in depth consolidating each deposited layer by ramming & watering

12.0 FILLING AND DISPOSAL OF THE EXCAVATED STUFF :

The excavated stuff of the selected type shall be used in filling the trenches and plinth or leveling the ground in layers. Under no circumstances black cotton soil shall be used for filling the trenches and plinth. The earth to be used for filling shall be free from salts organic or other foreign matter. All clods of earth shall be broken. As soon as the work in foundation has been completed and measured the site of foundation shall be cleared of the debris, brick bats, mortar dropping and filled with earth in-layers not exceeding 20cms. Each layer shall be adequately watered, rammed and consolidated before the succeeding layer is laid. The earth shall be rammed with iron rammers where feasible and with the butt

ends of crow-bere where rammers cannot be used. When filling reaches finished level. The surface shall be flooded with water for atleast 24 hours and allowed to dry and then rammed and consolidated. The blance of the excavated quantity shall be removed by the contractor from the site of work to a place as directed with lead upto 50 M. and all lift.

12.1 MODE OF MEASUREMENTS AND PAYMENT :

The payment shall be made for filling in plinth and trenches. No deduction shall be made for shrinkage or voids. If consolidated as instructed above.

The rate shall be for a unit of one cubic metre.

DTS NO. 13:-

Providing & filling in plinth with Mix soil or selected soil in layers of 20 cm. Th'. Incl. watering, ramming & consolidation etc. complete.

13.1.0 Materials :-

Murum shall be cleaned, of good binding quality, and of approved quality obtained from approved pots/quarries of disintegrated rock which contain silicious material and natural mixture of clay of calcarious origin. The size of murum shall not be more than 20 mm.

13.2.0 Workmanship:-

13.2.1 The murum to be used for filling shall be free from salts, organic or other foreign matter. All clods of murum shall be broken.

13.2.2 As soon as the work in foundation has been completed and measured the site of foundation shall be cleared of all debris, brick bats, mortar dropping etc. and filled with murum in layers not exceeding 20 Cms. Each layers shall be adequately watered, rammed and consolidated before the succeeding layer is laid. The murum shall be rammed with iron rammers where feasible and with the butt ends of crowbars, where rammer cannot be used.

13.2.3 The plinth shall be similarly filled with murum in layers not exceeding 20 cms. adequately watered and consolidated by ramming with iron or wooden rammers. When filling reaches finished level, the surface shall be flooded with water for atleast 24 hours and allowed to dry and then rammed and consolidated.

13.2.4 The finished level of filling shall be kept to shape intended to be given to the floor.

13.2.5 In case of large heavy duty flooring like factory flooring, the consolidation may be done by power rollers, where so specified. The extent of consolidation shall also be as specified.

13.2.6 The excavated stuff of the selected type shall be allowed to be used in filling the trenches and plinth. Under no circumstances black cotton soil shall be used for filling the plinth.

13.3.0 Mode of measurement and payment :-

13.3.1 The payment shall be made for filling in plinth and trenches. No deduction shall be made for shrinkage of voids if consolidated as instructed above.

13.3.2 The rate includes cost of collecting and carting murum or selected murum of approved quality with all lead and labour required for filling in trenches and plinth.

13.3.3 The rate shall be for a unit of one cubic metre.

DTS NO 14 :-

Providing & filling in plinth with yellow soil or selected soil in layers of 20 cm. Th'. Incl. watering, ramming & consolidation etc. complete.

14.1.0 Materials :-

Murum shall be cleaned, of good binding quality, and of approved quality obtained from approved pots/quarries of disintegrated rock which contain silicious material and natural mixture of clay of calcarious origin. The size of murum shall not be more than 20 mm.

14.2.0 Workmanship:-

14.2.1 The murum to be used for filling shall be free from salts, organic or other foreign matter. All clods of murum shall be broken.

14.2.2 As soon as the work in foundation has been completed and measured the site of foundation shall be cleared of all debris, brick bats, mortar dropping etc. and filled with murum in layers not exceeding 20 Cms. Each layers shall be adequately watered, rammed and consolidated before the succeeding layer is laid. The murum shall be rammed with iron rammers where feasible and with the butt ends of crowbars, where rammer cannot be used.

- 14.2.3 The plinth shall be similarly filled with murrum in layers not exceeding 20 cms. adequately watered and consolidated by ramming with iron or wooden rammers. When filling reaches finished level, the surface shall be flooded with water for atleast 24 hours and allowed to dry and then rammed and consolidated.
- 14.2.4 The finished level of filling shall be kept to shape intended to be given to the floor.
- 14.2.5 In case of large heavy duty flooring like factory flooring, the consolidation may be done by power rollers, where so specified. The extent of consolidation shall also be as specified.
- 14.2.6 The excavated stuff of the selected type shall be allowed to be used in filling the trenches and plinth. Under no circumstances blackcotton soil shall be used for filling the plinth.
- 14.3.0 Mode of measurement and payment :-
- 14.3.1 The payment shall be made for filling in plinth and trenches. No deduction shall be made for shrinkage of voids if consolidated as instructed above.
- 14.3.2 The rate includes cost of collecting and carting murrum or selected murrum of approved quality with all lead and labour required for filling in trenches and plinth.
- 14.3.3 The rate shall be for a unit of one cubic metre.

DTS NO. 15:-

Carring out plinth treatment to post construction / existing structure by spraying chemical solution for termite control treatment including labour and material consistment with ISI specification. Using Chlordene and Chiorpurfiles 20 EC. As per 6131_paret-II Consentration Weight one percent is recommended i.e. one litre 20 EC chemical emulsion with 19 liter give 1% concentration inclusive of one litre chemical emulsion appication at the rate of 5 litre chemical / Sqm of surface is recommended as per IS.

15.1 SCOPE:

- 15.1.1 The work of pre-constructional anti-termite treatment covered under this specification consists of the soil treatment with approved chemicals in water emulsion in foundation trenches for columns. In beams, brick wall, lift pits, steps, ramps etc. and in top surface of plinth filling, at junction of walls and floors, in expansion joints etc. in stages as detailed in this specification and drawing.

15.2 APPLICABLE CODES & SPECIFICATIONS:

- 15.2.1 The relevant I.S specifications, standards and codes given below are made apart of this specification. All standards, specifications, code of practices referred to herein shall be the latest edition including all applicable amendments, revisions and additional publications.

15.2.2 List of Indian Standards:

No. I.S. No. I.S. Particulars.

- 1. IS: 6313 (Part I) Code of Practice for Anti-termite Measures in Buildings Constructional Measures
- 2. IS: 1200 (Part I) Method of measurement of buildings and civil engineering works.
- IS: 6313 (Part II) Pre-constructional Chemical Treatment Measures
- IS: 8944 Specification for Chloropyrifos Emulsifiable Concentrates
- IS: 4015 (Part I) Guide for Handling cases of Pesticide Poisoning First Aid Measures
- IS: 4015 (Part II) Symptoms, Diagnosis and Treatment

15.3 GENERAL:

- 15.3.1 Pre-constructional anti-termite treatment is a process in which soil treatment is applied to a building in early stages of its construction. The purpose of anti-termite treatment is to provide the building with a chemical barrier against the sub-terranean termites.
- 15.3.2 Anti-termite treatment being a specialized job, calls for thorough knowledge of the chemicals, soils, termite to be dealt with and the environmental conditions. In order to give effective treatment and lasting protection to the properly underground treatment. It is, therefore, imperative that the works of anti-termite treatment should be got executed through specialized agencies only. The specialized agency should be preferably a member of the Indian Pest Control Association and shall have sufficient experience of carrying out similar works of magnitude envisaged in this tender.
- 15.3.3 The pre-constructional soil treatment is required to be applied during the construction stages of the sub-structure up to plinth level. The contractor has to be watchful of the various stages of sub-structure

works and arrange to carry out the soil treatment in time after proper co-ordination with department and other contractors if any, working at site.

- 15.3.4 Unless otherwise stipulated, the anti-termite treatment will be carried out as per I.S 6313 (Part-II) and / or as per direction of the Engineer-in-Charge.

15.4.0 SITE PREPARATION:

- 15.4.1 In order to ensure uniform distribution of the chemical emulsion and to assist penetration, the following site preparation shall be carried out:

15.4.1.1 Remove all trees, stumps, logs or roots from the building site.

15.4.1.2 Remove all concrete formwork if left anywhere, leveling pegs, timber off cuts and other building debris from the area to be treated.

15.4.1.3 If the soil to be treated is sandy or porous, preliminary moistening will be required to fill capillary spaces in and in order to prevent the loss of emulsion through piping or excess percolations.

15.4.1.4 In the event of water logging of foundation, the water shall be pumped out before application of chemical emulsion and it should be applied only when the soil is absorbent.

15.4.1.5 On clays and other heavy soil where penetration is likely to be slow and on sloping sites, where runoff of the treating solution is likely to occur, the surface of the soil should be scarified at least to a depth of 25mm.

15.4.1.6 All sub-floor leveling and grading should be completed, all cutting, trenches and excavation should be completed with backfilling in place. Borrowed fill must be free from organic debris and shall be well compacted. If this is not done, supplementary treatments should be made to complete the barrier.

15.5.0 CHEMICAL TO BE USED:

15.5.1 The effectiveness of chemical depends upon the choice of the chemical, the dosage adopted and the thoroughness of application. The chemical solutions or emulsions are required to be spread uniformly in the soil and to the required strength so as to form an effective chemical barrier that is lethal and repellent to termites.

15.6.0 MOUND TREATMENT:

15.6.1 For a mound volume of about one cubic metre, four litres of an emulsion in water with one of the following may be used:
0.50 percent Chloropyrifos.

15.7.0 SOIL TREATMENT:

15.7.1.1 Any one of the following chemicals in water emulsion is effective when applied uniformly over the area:

Sl.No.	Chemical	Concentration	By weight
1.	Chlorpyrifos emulsifiable concentrates	(IS: 8944)	1.0 %

1.8.0 MODE AND RATE OF APPLICATION:

15.8.1 The chemical emulsion as stated above will be applied uniformly by spraying at the prescribed rates as detailed below in all the states of the treatment:

15.8.1.1 Treatment in Foundation Trenches:

15.8.1.1.1 In case of normal wall load bearing structure, column pits, wall trenches and basement, the treatment shall be @ 5 (five) litres per square metre of surface area of the bottom and sides to a height of at least 300 mm. After the foundation works, the sides shall be treated @ 15 (fifteen) litres per square metre at vertical surface of sub-structure on each side.

- 15.8.1.1.2 After the earth filling is done, treatment shall be done by rodding the earth at 150 mm center to center close to wall surface and spraying the chemical with the above dose i.e., 15 (fifteen) litres per square metre. In case of framed structure, the treatment shall start at a depth of 500 mm below ground level. From this depth the backfill around the columns, beams and R.C.C basement walls shall be treated @ 15 (fifteen) litres per square metre of the vertical surface and @ 5 (five) litres per square metre for the horizontal surface at the bottom in the trenches/pits.
- 15.8.1.2 Treatment on Top Surfaces of Plinth Filling:
- 15.8.1.2.1 The top surface of the filled earth within plinth walls shall be treated with chemical emulsion at the rate of 5 (five) litres/square metre of the surface area before sub-base to floor is laid. If filled earth has been well rammed and the surface does not allow the emulsion to seep through; holes up to 50 mm to 75 mm deep 150mm centre to centre both ways shall be made with crowbars on the surface to facilitate saturation of the soil with the emulsion.
- 15.8.1.3 Treatment at Junction of Walls and Floors:
- 15.8.1.3.1 Special care shall be taken to establish continuity of the vertical chemical barrier on the inner wall surfaces from the finished ground level (or from level where the treatment had stopped) up to the level of the filled earth surface. To achieve this a small channel 30 x 30 mm shall be made at all the junctions of wall / column with floor (before laying sub-grade) and rod holes made in the channel up to the finished ground level at 150 mm apart and the iron rod moved backward to forward to break the earth and chemical emulsion poured along the channel @ 15 (fifteen) litres (or as recommended quantity) per square metre of the vertical wall / column surfaces so as to soak the soil right up to the bottom. The soil shall be tamped back into place after this operation.
- 15.8.1.4 Treatment for Expansion Joints:
- 15.8.1.4.1 The soil beneath the expansion joints shall receive special attention when the treatment under 15.8.1.1 above is in progress. This treatment shall be Supplemented by treating through the expansion joint after sub-grade has been laid at the rate of 2 (two) litres per metre length of expansion joint.
- 15.9.0 PRECAUTIONS DURING TREATMENT:
- 15.9.1 Utmost care shall be taken to see that the chemical barrier is complete and continuous. Each part of the area shall receive the prescribed dosage of chemical emulsion.
- 15.9.2 The treatment should not be carried out when it is raining or when the soil is wet with rain or sub-soil water.
- 15.9.3 Once formed, the treated soil barrier shall not be disturbed. If by chance, treated soil barriers are disturbed, immediate steps shall be taken to restore the continuity and completeness of the barrier system.
- 15.10.0 PRECAUTIONS FOR HEALTH HAZARDS AND SAFETY MEASURES:
- 15.10.1 All the chemicals mentioned above are poisonous and hazardous to health. These chemicals can have an adverse effect upon health when absorbed through the skin, inhaled as vapors or spray mist or swallowed. Persons handling or using these chemicals should be warned of these dangers and advised that absorption through the skin is the most likely source of accidental poisoning. They should be cautioned to observe carefully the safety precautions given below particularly when handling these chemicals in the form of concentrates.
- 15.10.2 These chemicals are usually brought to the site in the form of emulsifiable concentrates. The containers should be clearly labeled and should be stored carefully so that children and pets cannot get at them. They should be kept securely closed.
- 15.10.3 Particular care should be taken to prevent skin contact with concentrates. Prolonged exposure to dilute emulsions should also be avoided. Workers should wear clean clothing and should wash thoroughly with soap and water especially before eating and smoking. In the event of severe contamination, clothing should be removed at once and the skin washed with soap and water. If chemicals splash into the eyes, they shall be flushed with plenty of soap and water and immediate medical attention should be sought.
- 15.10.4 The concentrates are oil solutions and present a fire hazard owing to the use of petroleum solvents. Flames should not be allowed during mixing.

15.10.5 Care should be taken in the application of soil toxicants to see that they are not allowed to contaminate wells or springs, which serve as sources of drinking water.

15.11.0 GUARANTEE:

15.11.1 The contractor has to furnish the guarantee for 10 (ten) years from the date of completion of work stating that in case of re-appearance of termites within the building area due to defective materials or workmanship or due to any other reasons, the contractor will carry out the necessary post constructional treatment to keep the entire area free from termite once again, without any extra cost to the department during the guarantee period.

15.12.0 MODE OF MEASUREMENT:

15.12.1 The payment will be made on the basis of plinth area measurements at ground floor only for all the stages of treatment in square metre rounded off to two places of decimals.

15.12.2 Rate includes the cost of materials, labour and all tools, consumables, spares for complete operation.

DTS No. 16 :-

Providing and applying 20mm. thick Heavy Roller sand faced cement plaster on walls or similar surfaces at all floor levels, consisting of 12mm average thick backing coat of C.M. 1:3 (1 cement :3 sand) and 8mm thick finishing coat of C.M. 1:1(1 cement :1sand).

16.1.0 Materials :-

Water shall conform to M-1 cement mortar shall conform to M-11.

16.2.0 Workmanship :-

16.2.1 The work shall be carried out in two coats. The backing coat [basecoat] shall be 12 mm. thick in C.M. 1:3. The relevant specifications of Item No.17 shall be followed except that the thickness of back coat shall be 12 mm. average and the proportion shall be of cement mortar 1:3 [1 cement:3 sand]. Before the first coat hardens its surface shall be beaten up by edges of wooden tappers and close dents shall be made on the surface subsequent coat shall be applied after this coat has been allowed to set for 3 to 5 days, depending upon the weather conditions. The surface shall not be allowed to dry during this period. The second coat shall be completed to 8 mm thickness in C.M. 1:1 as described above, including raising sand facing by bushing. The sample of sand face shall be got approved before the work is started. The whole work shall be carried out uniformly as per sample approved.

16.2.2 Curing :-

The curing shall be started overnight after finishing of plaster. The plaster shall be kept wet for a period of 7 days. During this period, it shall be protected from all damages.

16.3.0 Mode of Measurements and payment :-

16.3.1 The rate shall be for a unit of one sq.metre.

DTS No. 17:-

Providing and applying two coats of weather shield max paint (3 coats may be required in case of darker colors) of ICI Dulex or Apex Ultima of asian paints including applying exterior acrylic primer coat as per manufactures specification and directions in shade and color approved by architects on exterior surface of the building including scaffolding, preparing the surface watering, curing etc. complete and as directed by architect and manufactures.

Surface Preparation :

surface is thoroughly clean, dry and free from all loose dirt, chalk, grease, fungi, algae and flaking paint. This can be achieved by brushing with a wire/ stiff coir brush, followed by water jetting if required. Fill up all minor cracks and defects with white cement and sand mixture in the ratio 1:3. For application on previously painted wall, previous coatings of paint must be thoroughly scraped off and Clean the surface thoroughly using wire brushes.

Priming:

Apply a liberal coat of exterior acrylic primer and allow it to dry for 4-5 hours.

Application of putty is not recommended. Minimum 4-6 hours duration is required between each coat of weather shield max paint

17.1.0. MATERIALS

The water shall conform to Material Specification. Water Proofing Cement paint shall conform to I.S. 5410-1969

17.2.0 WORKMANSHIP

17.2.1. SCAFFOLDING

Wherever scaffolding is necessary it shall be erected in such a way that as far as possible on part of scaffolding shall rest against the surface to be white or colour washed. A properly secured strong and well tied suspended platform (Zoola) may be used for white washing. Where ladders are used, pieces of old gunny bags shall be tied at top and bottom to prevent scratches to the floors and walls. For white washing of ceilings proper stage scaffolding shall be erected where necessary.

17.2.2. PREPARATION OF SURFACE

17.2.2.1 The surface shall be thoroughly cleaned of all dust, dirt, mortar cropping and other foreign matter before white wash is to be applied.

17.2.2.2. The surface spoiled by smoke soot shall be scraped with steel wire brushes or steel scrapers or shall be rubbed with over-burnt surkhi or brick bats. The surface shall be then broomed to remove all dust, dirt and shall be washed with clean water.

17.2.2.3. Oil or grease spots shall be removed by suitable chemical and smooth surface shall be rubbed with wire brushes.

17.2.2.4. All unsound portion of the surface plaster shall be removed to full depth of plaster rectangular patches and plastered again after raking the masonry joints properly. Such portion shall be wetted and allowed to dry. They shall then be given one coat of white wash.

17.2.2.5. All unnecessary nails shall be removed; the holes cracks patches etc. shall be made good with materials similar in composition to the surface to be prepared. The relevant specifications of shall be followed except that the word white wash colour wash shall be substituted with water proofing cement paint. The surface shall be thoroughly wetted with clean water before cement water proofing paint is applied.

17.2.3. PREPARATION OF PAINT

Portland cement shall be prepared by adding paint powder to water and stirring to obtain a thick paste, which shall then be diluted to a brush-able consistency. Generally, equal volumes of paint powder and water make a satisfactory paint'. In all cases, the manufacturer's instructions shall be followed. The paint shall be mixed in such quantities as can be used up within an hour of mixing as otherwise the mixture will set and thickness, affecting flowing and finish. The lids of cement paint drums shall be kept tightly when not in use.

17.2.4 APPLICATION OF PAINT

17.2.4.1. No painting shall be done when the paint is likely to be exposed to a temperature of below 7° C within 48 hours after application.

17.2.4.2. When weather conditions are such as to cause damage the work shall be carried out "in the shadow" as far as possible; This helps the proper hardening of the paint film by keeping the surface moist for a longer period.

17.2.4.3. To maintain the uniform mixture and to prevent segregation, the paint shall be stirred frequently in the bucket.

17.2.4.4. For under-rooted surfaces. The surfaces shall be treated with minimum two coats of water proof cement paint. Not less than 4 hours shall be allowed between two coats. Next coat shall not be started until the preceding first coat has been dried sufficiently hard to resist marking; by the brush being used. In hot dry weather, the preceding coat shall be allowed between two coats. Next 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.

17.2.4.5 The finished surface shall be even and uniform in shade, without patches, brush marks, paint drops, etc.

17.2.4.6 The cement paint shall be applied with a brush with short stiff hog or fibre bristles. The paint shall be brushed in uniform thickness and shall be free from excessive heavy brush marks. The lamps shall be well brushed out.

17.2.4.7. Water proof cement paint shall not be applied on surfaces already treated with white wash colour wash, distemper dry or oil bound varnishes, paint etc. It shall not be applied on gypsum, wood and metal surfaces.

17.2.5. CURING

Painted surfaces shall be sprinkled with water two or three times a day. This 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 sprinkling of water say about 12 hours after the application.

17.3.0. MODE OF MEASUREMENTS & PAYMENT

17.3.1. All the work shall be measured in the decimal system as under:

(a) Dimensions shall be measured to the nearest 0.01 M.

(b) Area in individual items shall be worked out to the nearest 0.01 Sq. M.

All the work shall be measured in sq. mt. Deductions for jambs, soffits, sills etc. for opening not exceeding 0.5 sq. mt. each in area for ends of joints, posts, beams, girders, steps etc. not exceeding 0.5 sq. mt. each in: area and for opening exceeding 0.3 sq. mt. and not exceeding 3.0 sq. mt. each in area deductions and additions shall be made as under :-

17.3.2 No deductions shall be made for ends of joints beams, posts etc. and openings not exceeding 0.5 sq. mt each. No addition shall be made for reveals, jambs, soffits, sills etc. of these openings nor for finish around ends of joints, beams, posts etc.

17.3.3. Deductions for openings exceeding 0.5 sq. mt. but not exceeding 3 sq. mt. each shall be made follows and no addition shall be made for reveals, jambs, soffits etc. of these openings:

(a) When both the faces of walls are provided with finish, deduction shall be made for one face only.

(b) When each faces of wall is provided with different finish deduction shall be made for that side of frame for door, windows etc. on which width of reveals is less than that of the other side, where width of reveals on both faces of wall are equal, deduction of 50% of area of opening on each face shall be made from total area of finish.

(c) When only one face of wall is treated and the other face is not treated, full deduction shall be made if the width of reveal on the treated side is less than that on the untreated side, but if the width of the surface is equal or more than on the untreated side neither deductions nor additions be made for reveals, jambs, soffits, sills etc.

17.3.4. In case of area of opening exceeding 3 sq. mt. each, deduction shall be made for openings but jambs, soffits, shall be measured.

17.3.5. No deduction shall be made for attachment such as casing, conducts, pipe, electric wiring and the like.

17.3.6. Corrugated surfaces shall be measured flat as fixed and not girth. The quantities so measured shall be increased by the following percentage and the resultant shall be included with the general areas.

(a) Corrugated steel sheets 14%

(b) Corrugated A. C. Shed 20%

(c) Semi corrugated A. C. Sheets 10%

(d) Nainital pattern roof (Plain sheeting with roils) 10%

(e) Nainital pattern roof (with corrugated sheets) 25%

17.3.7. Cornices and other wall features, when they are not picked out in a different finish/colour shall be girthed and included in the general area.

17.3.8. The rate shall include the cost of all materials, labour, scaffolding, protective measures etc. involved in all the operations described above.

17.3.9. The rate shall be for a unit of one sq. meter.

DTS No. 18:-

Providing and constructing brick work using Fly ash bricks having Crushing Strength not less than 35 kg./ sq.cm. in super structure in cement mortar 1:6 (1 cement :6 fine sand) etc. comp.

18.1.0 MATERIALS

Water shall conform to M-1, Cement shall conform to M-3, Sand shall conform to M-6, Flyash building Bricks shall conform to M-15(A). Cement mortar shall conform to M-11.

18.2.0 WORKMANSHIP

18.2.1 Proportion: The proportion of cement mortar shall be 1:6 (1 cement, 6 fine sand) by volume.

18.2.2 Wetting of bricks : The bricks required for masonry work shall be thoroughly wetted with clean water for about two hours before use or as directed. The cessation of bubbles, when the bricks are wetted with water, is an indication of thorough wetting of bricks.

18.2.3 Laying : Bricks shall be laid in English bond unless directed otherwise. Half or cut bricks shall not be used except when necessary to complete the bond. Closures in such case shall be cut to required size and used near the ends of the walls.

A layer of mortar shall be spread on full width for suitable length of the lower course. Each brick shall first be properly bedded and set home by gently tapping with handle of trowel or wooden mallet. Its inside face shall be flushed with mortar before the next brick is laid and pressed against it. On completion of course, the vertical joints shall be fully filled from the top with mortar.

The walls shall be taken up truly in plumb. All courses shall be truly horizontal and all vertical joint shall be truly vertical. Vertical joints in alternate course shall generally be directly one over the other. The thickness of brick course shall be kept in uniform.

The brick shall be laid with frogs up wards. A set of tools comprising of wooden straight edges, manson's spirit level, square half metre rub, and pins, string and plumb shall be kept on the site of work for frequent checking during the progress of work.

Both the faces of walls of thickness greater than 23 cms. shall be kept in proper place. All the connected brick work shall be kept not more than one metre over the rest of the work. Where this is not possible, the work shall be raked back according to bond (and not left toothed) at an angle not steeper than 45 degrees.

All fixtures, pipes, outlet of water, hold fasts of doors and windows etc. which are required to be built in wall shall be embedded in cement mortar.

18.2.4 **Joints** : Bricks shall be so laid that all joints are quite flush with mortar. Thickness of joints shall not exceed 12 mm. The face joints shall be raked out as directed by raking tool daily during the progress of work, when the mortar is still green so as to provide key for plaster or pointing to be done. The face of brick shall be cleaned the very day on which the brick work is laid and all mortar dropping removed.

18.2.5 **Curing** : Green work shall be protected from rain suitably. Masonary work shall be kept moist on all the faces for a period of seven days. The top of masonry work shall be kept well wetted at the close of the day.

18.2.6 **Preparation of Foundation Bed** : If the foundation is to be laid, directly on the excavated bed, the bed shall be levelled, cleared of all loose materials, cleaned and wetted before starting masonry.

If masonry is to be laid on concrete footing the top of concrete shall be cleaned and moistened. The contractor shall obtain the engineer's approval for the foundation bed, before foundation masonry is started. When pucca flooring is to be provided flush with the top to plinth, the inside plinth offset shall be kept lower than the outside plinth top by the thickness of the flooring.

18.2.7 **Fixtures** - The frames of doors, windows, cup-boards etc. shall be housed into the brick work at the correct location and level as directed. The heavy steel doors, window frames etc. shall be built in with brick work, but for ordinary steel doors and windows required opening for frames, hold-fasts etc. shall be left in the wall and frames embedded later on in order to avoid damage to the frames.

18.2.8 **Scaffolding** - Necessary scaffolding shall be provided. The supports of the scaffolding shall be sound and strong tied together with horizontal pieces, over which the scaffolding plunks shall be fixed. Simple scaffolding shall be allowed normally. In this case scaffolding hole shall rest in hole header horizontal course only. Minimum number of holes shall be left in brick work for supporting horizontal scaffolding poles. The contractor is responsible for providing and maintaining sufficiently strong scaffolding so as to withstand all loads likely to come upon it.

18.2.9 **Packing out of Joints** - For the face of brick work, where plastering is to be done, joints shall be raked out to a depth not less than thickness of joints. The face of brick work shall be cleaned and mortar dropping removed on very same day that brick work is laid.

18.3.0 MODE OF MEASUREMENTS & PAYMENT :

18.3.1 The measurements of this item shall be taken for the brick masonry fully completed for limiting dimensions not exceeding those shown on the plans or as directed shall be final.

18.3.2 No deductions shall be made from quantity of brick work. No extra payment will be made for embedding in masonry holes in respect of the following items ---

- i] Ends of joints, beams, posts, girders, rafters, purlins, trusses, corbel, steps etc. where cross sectional area does not exceed 500 Sq.Cm.
- ii] Opening not exceeding 1000 Sq.Cm.
- iii] Wall plate, sand bed plates, bearing of slab, chajjas, and like whose thickness does not exceed 10 Cms. and the bearing does not extend the full thickness of wall.
- iv] Drainage holes and recesses for cement concrete blocks to embed hold fasts for doors, windows etc.
- v] Iron fixtures; pipes upto 300 mm. dia. hold fasts of doors and windows built into masonry and pipes etc. for concealed wiring.
- vi] Forming charges of section not exceeding 350 Sq.Cm. in masonry.
- vii] Apertures for fire places, shall not be deducted nor shall extra labour required to make splaying of jambs, throating and making arches over the aperture be paid for separately.

18.3.3 The rate shall be for a unit of one cubic metre.

DTS No -19: Providing & constructing Half brick masonry in Fly Ash bricks having crushing strength not less than 70 kg/sq.cm in c.m 1:4 (1 cement: 4 sand) curing etc complete.

19.1.0 MATERIALS

19.1.1 Flyash building Bricks shall conform to M-15(A). Water shall conform to M-1, Cement shall conform to M-3, Sand shall conform to M-6, Cement mortar shall conform to M-11.

19.2.0 WORKMANSHIP

19.2.1 Relevant specifications of bricks, wetting and laying of bricks, joints, curing etc. shall conform to Item No.15 except the brick work of half bricks shall be carried out.

19.2.2 Cement mortar used in masonry work shall be in proportion of 1 part of cement and 3 parts of sand by volume.

19.2.3 All bricks shall be laid stretcher wise, breaking joints with those in the upper and lower courses. The wall shall be taken truly plumb. All courses shall be laid truly horizontal and all vertical joints shall be truly vertical. The bricks shall be laid with frogs upwards. A set of masons tools shall be maintained on work as required for frequent checking.

19.3.0 MODE OF MEASUREMENTS & PAYMENTS

19.3.1 The half brick masonry work in foundation and plinth shall be measured under this item, the limiting dimensions shall not exceed those shown in the plan or as directed. Any work done extra over the specified dimensions shall be ignored.

19.3.2 The relevant specifications of Item No.17 shall be followed. The length shall be measured nearest to 1 Cm.

19.3.3 The rate shall be for a unit of 1 Sq.Mts.

DTS No. 20 :-

Providing and applying 10mm. thick cement plaster in single coat on brick/concretewalls for plastering and finished even and smooth with a floating coat of near cement slurry mixed with proportion etc. complete in cement mortar 1:3 (1 cement : 3 sand). (A) For wall and similar surfaces (B) for ceilings and soffits of stairs.

20.1.0 MATERIALS

Water shall conform to M-1. The cement mortar of proportion 1:3 shall conform to M-11.

20.2.0 WORKMANSHIP

20.2.1 Scaffolding - Wooden ballies, bamboos, planks, treatles and other scaffolding shall be sound. These shall be properly examined before erection and use. Stage scaffolding shall be provided for ceiling plaster which shall be independent of the walls.

20.2.2 Preparation of Background - The surface shall be cleaned of all dust, loose mortar droppings, traces of algae, afflorescence and other foreign matter by water or by brushing. Smooth surface be roughened by wire brushing if it is not hard and hacking if it is hard. In case of concrete surface, if a chemical retarder has been applied to the form work, the surface shall be roughened by wire brushing and all the resulting dust and loose particles cleaned off and care shall be taken that none of the retarders is left on the surface. Trimming of projections on brick/concrete surfaces where necessary shall be carried out to get an even surface.

Raking of joints in case of masonry work where necessary, shall be allowed to dry out for sufficient period before carrying out the plaster work.

The work shall not be soaked but only damped evenly before applying the plaster. If the surface becomes dry, such areas shall be moistened again.

For external plaster, the plastering operation shall be started from top floor and carried downwards. For internal plaster, the plastering operations may be started wherever the building frame and cladding work are ready and the temporary supports of the ceiling resting on the wall of the floor have been removed. Ceiling plaster shall be completed before starting plaster to walls.

20.2.3 APPLICATION OF PLASTER

The plaster about 15 x 15 Cms. shall be first applied horizontally and vertically at not more than 2 metres intervals over the entire surface to serve as gauge. The surface gauges shall be truly in place of the finished plastered surface. The mortar shall then be applied in uniform surface slightly more than the specified thickness then brought to a true surface by working a wooden straight edge reaching across the gauges with small upward and sideways movements at a time. Finally, the surface shall be finished off true with a trowel of wooden flat according as a smooth or a sandy granular texture is required. Excessive trowelling or overworking the float shall be avoided. All corners, arises, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chamfering, corners, junctions etc. shall be carried out with proper templates to the size required.

Cement plaster shall be used within half an hour after addition of water. Any mortar or plaster which is partially set shall be rejected and removed forthwith from the site. In suspending the work at the end of the day, the plaster shall be left out clean to the line both horizontally and vertically. When recommencing the plaster, the edges of the old work shall be scrapped clean and wetted with cement putty before plaster is applied to the adjacent areas to enable the two to properly join together. Plastering work shall be closed at the end of the day on the body of the wall and nearer than 15 cms. to any corners or arises. It shall not be closed on the body of features such as plaster bands and cornices not at the corners or arrises. Horizontal points in plaster work shall not also occur on parapet tops and copings as those invariably lead to leakage. No portion of the surface shall be left out initially to be packed up later on.

Each coat shall be kept damp continuously till the next coat is applied for a minimum period of 7 days. Moistening shall commence as soon as plaster is hardened sufficiently. Soaking or walls shall be avoided and only as much water as can be readily absorbed shall be used, excessive evaporation on the sunny or windward side of building in hot air to dry weather shall be prevented by hanging mattings or gunny bags on the outside of the plaster and keeping them wet.

20.3.0 MODE OF MEASUREMENTS & PAYMENT

- 20.3.1 The rate shall include the cost of all materials, labour and scaffolding etc. involved in the operations described under workmanship.
- 20.3.2 All plastering shall be measured in square metres unless otherwise specified. Length, breadth or height shall be measured correct to a centimetre.
- 20.3.3 Thickness of the plaster shall be exclusive of the thickness of the key i.e. grooves or open joints in brick work, stone work etc. or space between laths. Thickness of plaster shall be average thickness with minimum 10 mm. at any point on this surface.
- 20.3.5 The measurement of wall plastering shall be taken between the walls or partition (dimensions before plastering being taken) for length and from the top of floor or skirting to ceiling for height. Depth of cover of cornices if any, shall be deducted.
- 20.3.6 Soffits of stairs shall be measured as plastering on ceilings. Blowing soffits shall be measured separately.
- 20.3.7 For jambs, soffits, sills etc. for openings not exceeding 0.5 Sq.Mts. each in area for ends of joints, beams, posts, girders, step etc. not exceeding 0.5 Sq.Mts. each in area for and for openings exceeding 0.5 Sq.Mts. and not exceeding 3 Sq.Mts. in each area deductions and additions shall be made in the following manner ---
- a] No deductions shall be made for ends of joints, beams, posts etc. and openings not exceeding 0.5 Sq.Mts. each and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings for finish to plaster around ends of joints, beams, posts etc.
 - b] Deduction for openings exceeding 0.5 Sq.Mts. but not exceeding 3 Sq.Mts. each shall be made as follows and no additions shall be made for reveals, jambs, soffits sills etc. of these openings ---
 - i] When both faces of all wall are plastered with same plaster, deduction shall be made for one face only.
 - ii] When two faces of wall are plastered with different types of plaster or if one face is plastered and the other pointed, deductions shall be made from the plaster or pointing on the side of frame for doors, windows etc. on which width of reveals is less than that on the other side but no deduction shall be made on the other side. Where width of reveals on both faces of all are equal, deductions of 50% of area of opening on each face shall be made from areas of plaster and/or pointing as the case may be.
- 20.3.8 For openings having door frames equal to projecting beyond the thickness of wall, full deductions for opening shall be made from each plastered face of the wall.
- 20.3.9 In case of opening of area above 3 Sq.Mts. each deductions shall be made for opening but jambs, soffits and sills shall be measured.
- 20.3.10 The rate shall be for a unit of one Sq.Mts.

DTS No. 21:-

Providing & Applying 15mm.th.cement plaster in single coat on brick/ concrete walls similar surfaces for plastering & finished even & smooth with a floating coat of cement slurry mixed with admixture of lime or neeru in required proportion etc. comp. in C.M 1:3 (1 cement : 3 sand) (A) For wall and similar surfaces.

Other specification Same as DTS No:-20 (10 mm plaster)

DTS No. 22:-

Providing 35 mm wide throating of plaster drip etc.

As the item itself is logical and self explanatory it should be carried out as per the instruction of Engineer-In-Charge.

DTS No. 23 :-

Providing 20 mm deep finished groove in plaster in line and level etc. Comp.

As the item itself is logical and self explanatory it should be carried out as per the instruction of Engineer-In-Charge.

DTS No. 24:-

Providing & Laying green polished kota stone slab flooring at all floor levels, over 20 mm av.th.base of C.M. 1:6(1cement: 6 sand) laid over&joined with grey cement slurry incl. Rubbing & polishing etc. comp. (A) 25 mm. thick For all Floor

24.0. MATERIALS:

1.1 Water shall conform to M-I. Lime mortar shall conform to M-10. Cement mortar shall conform to M 11. Polished kota stone shall conform to M-49

24.1 SCOPE:

24.1.1 The work covered under this specification consists of providing and laying atall levelsandfloors kota stone tiles in flooring, skirting, dado and Sills inaccordance with these specifications and relevant drawings.

24.2 APPLICABLE CODES & SPECIFICATIONS:

24.2.1 The relevant I.S. specifications, standards and codes given below are made apart of this specification. All standards, specifications, code of practices referred to herein shall be the latest edition including all applicable amendment, revisions and additional publications.

24.2.2 List of Indian Standards :

No. I.S. No. I.S. Partculars

1. I.S. 1200 (Part-XI) Method of measurements building and civilengineering work.

24.3 KOTA STONE FLOORING:

24.3.1 Kota stone shall be of best quality and of thickness specified and obtained from approved sources. Kota stone shall be of sizes stipulated in the items ofschedule of quantities.

24.3.2 The stone shall have to be machine cut/ hand cut as specified and doublemachine polished wherever required as per item. The edges to be pointedshall be true to line and dressed to the depth all around.

24.3.3 The stones shall be hard, sound, free from cracks, veins and other defect sand of uniform colour.

24.3.4 The sample of stone shall be submitted for approval of Engineer-In-charge and all the stonesincorporated in the work shall conform to the approved samples.

24.3.5 Before laying the flooring surface to be paved shall be thoroughly hacked, cleaned of all mortar scales, concrete lumps, loose materials etc. Unless and until the surface is approved by the Engineer-n-charge the paving shall not be taken in hand.

24.3.6 If found necessary the permission shall be given by the Engineer-In-charge todress the stone at site.

24.3.7 A bedding of 20 mm thick with cement mortar (1:4) shall be laid evenly and to the required slope as directed. The stones shall then be truly and evenly set in a thin paste of neat cement applied to sides, bottom and to the prepared base. The stone shall then be tamped down with wooden mallet until they are exactly in true plane and line with the adjacent stone.

24.3.8 All stones shall be extended up -to the masonry wall and under side of theplaster. The stone shall be close jointed and joints shall be as thin as possible.

24.3.9 The cement that oozes out through the joints to the surface shall be immediately wiped clean. The joints shall then be filled with matching cement and finished neatly.

24.3.10 The entire surface of flooring shall be re-polished with machine to satisfaction of the Engineer- In-charge. The edges of stones wherever exposed shall be machine cut.

24.3.11 The flooring shall be cured for 7 days.

24.4.0 KOTA STONE SKIRTING:

24.4.1 They shall be laid against a bedding of cement mortar 1:3 to the full height to a true plane, level and plumb. The workmanship shall be similar to flooring.

24.4.2 The skirting shall be laid projected beyond the finished plastered surfaces as directed.

24.4.3 The continuous horizontal grooves at the top of skirting shall be provided if specified in the drawing or as directed by the Engineer-In-charge. No extra will be paid for grooves.

24.4.4 The skirting surfaces shall be re-polished with hand to satisfaction of the Engineer-In-charge.

24.4.5 The skirting shall be cured for 7 days.

24.5.0 KOTA STONE SILLS AND COPING AND COUNTER TOPS :

24.5.1 The stones shall be cut to the required size as approved by the Engineer-Incharge. The stones shall have to be machine cut and double machine polished wherever specified. The edges to be pointed shall be true to line and dressed to the required depth all around.

24.5.2 All the exposed edges shall be neatly polished to give a neat appearance.

24.5.3 These items shall be laid on a bedding of 20 mm thick cement mortar 1:4 to a true plane, level or slopes all as per relevant drawings.

24.5.4 The workmanship shall be similar to Kota stone flooring described above. The sills and copings should project beyond the finished plastered surface as show in drawing.

24.5.5 Continuous horizontal grooves wherever specified shall be provided as per drawings and quoted rate is deemed to include for the same.

24.5.6 The surface shall be re polished with hand to entire satisfaction of the

Engineering-In-charge. The entire work shall be cured for 7 days.

24.6.0 KOTA STONE CLADDING :

- 24.6.1 Only approved quality, size and colour machine cut and machine polished Kota stone 40 mm thick and 100 mm wide shall be used.
- 24.6.2 Maximum thickness of joints shall be 15 mm thick for horizontal as well as vertical and the joints shall be filled with cement mortar 1:4.
- 24.6.3 Vertical joints shall be staggered and both vertical and horizontal shall be finished by making 15 mm x 15 mm grooves.
- 24.6.4 Brass clamps and pins of approved quality size and make shall be provided at the meeting of two horizontal Kota stone slabs both way horizontally and vertically staggered @ one number per square metre.
- 24.6.5 Curing of the joints shall be done with clean water for a minimum period of 10 days.
- 24.6.6 The rate shall be including of cost of material, double scaffolding if required, laying, finishing, making grooves, curing and cleaning of spashes on kota stones.
- 24.7.0 **KOTA STONE TREADS / RISERS:**
- 24.7.1 The specifications mentioned for Kota stone flooring shall be generally applicable for this item.
- 24.8.0 **MODE OF MEASUREMENT:**
- 24.8.1 Unit of measurement shall be square metre.
- 24.8.2 Measurement for flooring shall be for the actual area covered from face of skirting.
- 24.8.3 Deduction will be made for columns, projections, equipment foundations, trenches, openings etc.
- 24.8.4 Measurement shall be for the actual area of skirting, dado, sills, coping etc. and deduction shall be made for the areas not covered by these.

DTS No. 25:-

Providing & Laying polished Kota stone of machine cut edge slab 25 mm. th. in riser of steps, tread, dado & pillars center piece not less than 1.2 mt. in width & side pieces of equal size as per design, laid on 10 mm. th. C.M. 1:3 (1 cement: 3 sand) joined & polishing etc.

25.1.0. Materials

- 1.1 Water shall conform to M-I. Lime mortar shall conform to M-10. Cement mortar shall conform to M 11. Polished Kota stone shall conform to M-49

25.2.0. Workmanship

- 2.1. Each slab shall be cut in the required size and shape and fine chisel dressed at all the edges- The sides thus dressed shall have a full contact if a straight edge is laid along. The sides shall be table rubbed with coarse sand before paving. All angles and edges of the slabs shall be true square and free from chippings and giving a plane surface. The thickness shall be 25 mm. (Average) as specified in the item but not less than 20 mm. at any place of the slab.
- 2.2. Bedding for the Kota stone slabs shall be of cement mortar 1:3 (1 cement : 3 coarse sand) or L.M.I: 1.5. of average thickness 20 mm. as given in the description of the item. Sub grade shall be cleaned, wetted and mopped. Mortar of the specified mix and thickness shall then be spread on an area sufficient to receive the Kota stone, slab. The slab shall be washed clean before laying. It shall be laid on top, pressed, lapped gently to bring it in level with the other slabs. It shall then be lifted and laid aside. Top surface of the mortar shall then be corrected by adding fresh mortar at hollows or depressions. The mortar shall then be allowed to harden bit. Over this surface, cement slurry of honey-like consistency shall be applied. The slab shall then be gently placed in position and tapped with wooden mallet till it is properly padded in level with and close to the adjoining slab. The joint shall be as fine as possible. The slabs fixed in the floor adjoining the walls shall enter not less than 10 mm. under the plaster, skirting or dado. The junction between the wall and floor shall be finished neatly. The finished surface shall be true to levels and slopes as directed.
- 2.3. The floor shall be kept wet for a minimum period of 7 days so that bedding and joints set properly
- 2.4. Polishing shall be normally commenced after 14 days of laying the stone slab. First polishing shall be done with carborundum stones of 120 grade grit fitted in the heavy machine and then second polishing shall be done with carborundum stones of 22 (1 to 350 grade grit fitted in

heavy machine. Water shall be properly used during polishing. The stone shall then be washed clean with water. When directed by the Engineer-in-charge, wax polish of approved quality shall be applied on the surface with the help of soft cloth over a clean undry surface. Then the polishing machine tilted with bobs shall be run over it.

2.5. The holes required for Nahni traps, pipes and any other linings shall be made without any extra cost.

25.3.0. Made of measurements &, payment

3.1. The rate shall include the cost of all materials and labour involved in all the operations described above. The Kola stone flooring shall be measured in square metres correct to two places of decimal. length and breadth shall be measured correct to a centimeter and between the Finished face of skirting dado or wall plaster and no deduction shall be made nor extra paid for any opening in floor of areas up to 0.1. sq. m.

3.2. The rate shall be for a unit of one sq-metre.

DTS No. 26:-

Providing & laying granite slab 18mm thick in flooring, treads of steps and landing laid on bed of 20mm thick cement mortar 1:6 (1 Cement : 6 coarse sand) or lime mortar 1:1.5 laid and finished with flush pointing in white or colour cement including rubbing and polishing complete.

26.1.0 Materials:

Water shall conform to M-1. Cement mortar shall conform to M-11. Granite stone slab shall conform M-52.

26.2.0 Workmanship:

Each slab shall be cut the required size and shape and fine chisel dressed at all the edges. The sides thus dressed shall have a full contract if a straight edge is laid along. The sides shall be table rubbed with on coarse sand before paving. All angles and edges of the slabs shall be true square and free iron chipping and giving a plane surface. The thickness shall be as specified in the item.

Bedding for the granite stone slabs shall be cement mortar 1:6 (1 cement : 6 coarse sand). Subgrade shall be cleaned wetted and description other item. Subgrade shall be cleaned wetted and mopped. Mortar of the specified mix and thickness shall then be spread, on a area sufficient to receive one granite stone slab. The slab shall be washed clean before laying. It shall be laid on top, pressed, tapped genetly to bring it in level with the other slabs. It shall than be corrected by adding fresh mortar in hollows or depressions. The mortar then be allowed to harden bit. Over this surface, cement slurry of honey like consistency shall be applied. The slab shall then be genetly placed in positon and topped with wooden mallet till it is properly bedded in level with and close to the adjoining slab. The joint shall be as fine as possible. The slab fixed in the floor adjoining the wall shall enter not less than 10 mm. under the plaster, skirting or dado.

The junction between the wall and floor shall be finished neatly. The finished surface shall be in true levels and slopes as directed.

Polishing shall be normally commenced after 14 days of laying the stone slab. First polishing shall be done with carborundum stone, of 120 grade grit fitted in the heavy machine and then second polishing shall be done with carborundum stone 220 to 350 grade grit fitted in heavy machine. Water shall properly be used during polishing. The stone shall then be washed clean with water. When directed by the Engineer-in-Charge wax polish of approved quality shall be applied on the surface with the help of soft cloth over clean and dry surface then the polishing machine fitted with beds shall be run over it.

The holes required for Nahni traps, pipes and any other fitting shall be run over it.

26.3.0 Mode of Measurement and payment:

The rate shall include the cost of call materials and labour involved in all the operations described above. The granite stone flooring shall be measured in sqaure metres correct to two places of decimal, length and breadth shall be measured correct to a centimeters and between the finished face of skirting dado or mall plaster and no deduction shall be made nor extra paid for opening in floor of areas upto 0.1 sq.mt.

DTS No. 27:-

Providing & laying granite slab 18mm thick in skirting, risers of steps, dado and pillars laid on 10mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand) and finished with flush pointing in white or colour cement including rubbing & polishing comp.

27.1.0 Materials:

Water shall conform to M-1. Cement mortar shall conform to M-11. Granite stone slab shall conform M-52.

27.2.0 Workmanship:

The relevant specifications of Item No.24 shall be followed except that the granite slab shall be fixed for risers steps, dado or skirting in C.M. 1:4 and the polishing shall be done manually instead of machine polishing, the exposed edge of granite slab shall be machine cut.

27.3.0 Mode of Measurement and payment:

The risers of steps, skirting or dado shall be measured in sq. metre. Length shall be measured along the finished faces of risers, skirting or dado. Height shall be measured from finished level of treads of floor to top. Lining of pillars shall be measured under this item.

The rate shall be for a unit of one sq. metre.

DTS No -28:

Providing & laying granite slab 18mm thick in Window-Door seal Frame Etc laid on 10mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand) with necessary adhesive material and finished with flush pointing in white or colour cement, including rubbing & polishing comp.

All specifications same as per DTS No. 26.

DTS No -29:

Labour Charges for Edge Finished for Granite/ Kota stone.

Detail specification as per manufacture specification and as directed by Engineer-in-charge.

The rate shall be for a unit of one running meter.

DTS No. 31:-

Providing & laying Vitrified tiles of 8mm thick of Orient, Kajaria, Jhonson, Nitco, Somani, Bell, Asian or Euro make in flooring, treads of steps & Landing laid on bed of 20 mm (Average) base of cement mortar 1:6 (1 Cement : 6 Coarse sand) on new surface or fixing on existing flooring by adhesive material including dismantling of existing flooring and jointed with colour cement slurry including finished with flush pointing & cleaning the surface etc. comp. Size 24" x 24".

For Antiskid Tiles

31.1.0 Materials :

Water shall conform to M-1 cement shall conform to M-3. Lime Mortar shall conform to M-10. Cement mortar shall conform to M-11. The tiles conform to M-81.

31.2.0 Workmanship :

31.2.1 The work shall be carried out as per I.S.1443-1972.

31.2.1 Bedding :

Before spreading the mortar, the sub-base of the floor shall be cleaned of all dirt, scum and loose materials and then well wetted without forming any pools of water on the surface.

In case of R.C.C.floors,the top shall be left a little rough, all points,of level for the finished surface shall be marked out. The lime water of proportion 1:8 (1 cement :8 coarse sand) jointed with neat cement slurry mixed with pigment to match the shade of the tiles as directed shall be then evenly and smoothly spread over the base. Bedding layer or mortar shall be not less than 25 mm and average thickness of bedding shall be 25 mm.

31.2.2 Laying :

Before laying the ceramic tiles, the tiles shall be thoroughly wetted with water. Neat cement grout of required consistency at 4.4 kg.cement/sq.mt.shall be spread on the mortar bed. The tiles shall be laid on the neat cement float and shall be evenly and firmly bedded to the required level and slops. There shall be no hollows left. The joints shall be of uniform thickness and in straight line as per the pattern.

The surface of flooring shall be checked frequently with a straight edge at-least two metres long so as to obtain a true surface with required slope.

The tiles which are fixed in the adjoining the wall shall go about 10 mm under plaster. Skirting or dedo shall be left unfinished for about 50 mm above finished floor level and unfinished strip then left earlier shall be finished.

In places where full tiles can not be fixed.The tiles shall be cut to the size and smoothened at edges to give straight and true joints.

After the tiles have been laid, the surplus cement slurry and the joints shall be cleaned and washed fairly deep before cement hardens.

The day after tiles have been laid, the joints shall be cleaned of every cement grout with a wire brush to a depth of about 5 mm and then grouted with white cement with or without pigment to match the shade of the topping of tiler.

31.2.3. Curing :

The flooring shall be kept wet with damp sand or water for seven days.It shall be kept undisturbed atleast for 14 days. The grinding shall normally be commenced after 14 days.

Testing of the tiles shall be carried out by the contractor at his own cost as per I.S.requirement for required tests.

31.3.0 Mode of Measurements and payment :

The ceramic tiles flooring shall be measured in Sq.metre for visible area of work done.

No deductions shall be made nor extra paid for any opening in the floor area upto 0.1 Sq.mt.Nothing extra shall be paid for use of cut tiles or for laying the floors at different levels in the same room or court yard. Mosaic tiles laid in floor borders and bands etc. shall be measured in the same item and nothing extra shall be payable on account of these or similar bonds formed of half or multiples of half size, standard tiles or other uncut tiles.

The treads of stairs and steps paved with tiles without nosing shall also be measured under this item.

Extra rate shall however be paid for such area where width of treads does not exceed 30 cms.

The rate shall include the cost of all materials, labour involved in all the operations as described above.

The rate shall be for a unit of one sq.metre.

DTS No. 31-A:-

Providing and laying Vitrified tiles 8 to 10 mm thick, 24" x 24" in skirting risers of steps and dedo on 10mm thick cement plaster 1:3 (1 cement : 3 coarse sand) and jointed with white cement slurry.

31-A.1.0 Materials :

Water shall conform to M-1 cement shall conform to M-3. Lime Mortar shall conform to M-10. Cement mortar shall conform to M-11. The tiles conform to M-81.

31-A.2.0 Workmanship :

31-A.2.1 The work shall be carried out as per I.S.1443-1972.

31-A.2.1 Bedding :

Before spreading the mortar, the sub-base of the floor shall be cleaned of all dirt, scum and loose materials and then well wetted without forming any pools of water on the surface.

In case of R.C.C. floors, the top shall be left a little rough, all points of level for the finished surface shall be marked out. Cement mortar proportion 1:4 (1 cement : 4 coarse sand) jointed with neat cement slurry mixed with pigment to match the shade of the tiles as directed shall be then evenly and smoothly spread over the base. Bedding layer or mortar shall be not less than 25 mm and average thickness of bedding shall be 25 mm.

31-A.2.2 Laying :

Before laying the ceramic tiles, the tiles shall be thoroughly wetted with water. Neat cement grout of required consistency at 4.4 kg.cement/sq.mt. shall be spread on the mortar bed. The tiles shall be laid on the neat cement float and shall be evenly and firmly bedded to the required level and slopes. There shall be no hollows left. The joints shall be of uniform thickness and in straight line as per the pattern.

The surface of flooring shall be checked frequently with a straight edge at least two metres long so as to obtain a true surface with required slope.

The tiles which are fixed in the adjoining wall shall go about 10 mm under plaster. Skirting or dado shall be left unfinished for about 50 mm above finished floor level and unfinished strip then left earlier shall be finished.

In places where full tiles can not be fixed. The tiles shall be cut to the size and smoothened at edges to give straight and true joints.

After the tiles have been laid, the surplus cement slurry and the joints shall be cleaned and washed fairly deep before cement hardens.

The day after tiles have been laid, the joints shall be cleaned of every cement grout with a wire brush to a depth of about 5 mm and then grouted with white cement with or without pigment to match the shade of the topping of tiles.

31-A.2.3 Curing :

The flooring shall be kept wet with damp sand or water for seven days. It shall be kept undisturbed at least for 14 days. The grinding shall normally be commenced after 14 days.

Testing of the tiles shall be carried out by the contractor at his own cost as per I.S. requirement for required tests.

31-A.3.0 Mode of Measurements and payment :

The ceramic tiles flooring shall be measured in Sq. metre for visible area of work done.

No deductions shall be made nor extra paid for any opening in the floor area upto 0.1 Sq.mt. Nothing extra shall be paid for use of cut tiles or for laying the floors at different levels in the same room or court yard. Mosaic tiles laid in floor borders and bands etc. shall be measured in the same item and nothing extra shall be payable on account of these or similar bonds formed of half or multiples of half size, standard tiles or other uncut tiles.

The treads of stairs and steps paved with tiles without nosing shall also be measured under this item.

Extra rate shall however be paid for such area where width of treads does not exceed 30 cms.

The rate shall include the cost of all materials, labour involved in all the operations as described above.

The rate shall be for a unit of one sq.metre.

DTS No. 31-B:-

Providing and laying Vitrified tiles 8 to 10 mm thick, 24" x 24" in flooring treads of steps and landing laid on a bed of 12mm thick cement mortar 1:3 (1 cement : 3 coarse sand) finishing with flush pointing in white cement. (Basic Rate- Rs. 366.0/S.M.)

In general the work shall be carried out as per the standard specifications of P.W.D/C.P.W.D./GWSSB relevant drawings and as per the instructions of Engineer-in-charge. Work shall be carried out as per item description.

31-B.1.0 Materials

1.1 Water shall conform to M-1 Cement mortar shall conform to M-11 Vitrified tiles shall conform to M-79.

31-B.2.0 Workmanship

2.1 The relevant specifications of DTS NO. 31 shall be followed except that the Vitrified tiles shall be fixed for flooring, treads of steps & Landing in C.M. 1:3. Detail specification as per item description, manufacturer's technical specification and as per instruction by Engineer-in-charge.

31-B.3.0 Mode of measurement and Payment

3.1 Relevant specification of DTS NO. 31 shall be followed.

3.2 The rate shall be for unit of One Sq.mt as per actual work done

DTS No. 32 :- Providing & Laying white glazed tiles 6mm. th. Of Orient, Kajaria, Jhonson, Nitco, Somani, Bell make at all floor levels in skirting risers of steps & dado on 10 mm. th. C.M.1:3(1cement :3 sand) including necessary cement paste for fixing and joined with white cement slurry etc. complete. For all floors.

32.1.0 Materials :

Water shall conform to M-1 cement shall conform to M-3. Lime Mortar shall conform to M-10. Cement mortar shall conform to M-11. The tiles conform to M-81.

32.2.0 Workmanship :

32.2.1 The work shall be carried out as per I.S.1443-1972.

32.2.1 Bedding :

Before spreading the mortar, the sub-base of the floor shall be cleaned of all dirt,scum and loose materials and then well wetted without forming any pools of water on the surface.

In case of R.C.C.floors,the top shall be left a little rough, all points,of level for the finished surface shall be marked out. The lime water of proportion 1:4 (1 cement : 4coarse sand) jointed with neat cement slurry mixed with pigment to match the shade of the tiles as directed shall be then evenly and smoothly spread over the base. Bedding layer or mortar shall be not less than 25 mm and average thickness of bedding shall be 25 mm.

32.2.2 Laying :

Before laying the ceramic tiles, the tiles shall be thoroughly wetted with water. Neat cement grout of required consistency at 4.4 kg.cement/sq.mt.shall be spread on the mortar bed. The tiles shall be laid on the neat cement float and shall be evenly and firmly bedded to the required level and slops. There shall be no hollows left. The joints shall be of uniform thickness and in straight line as per the pattern.

The surface of flooring shall be checked frequently with a straight edge at least two metres long so as to obtain a true surface with required slope.

The tiles which are fixed in the adjoining wall shall go about 10 mm under plaster. Skirting or dado shall be left unfinished for about 50 mm above finished floor level and unfinished strip then left earlier shall be finished.

In places where full tiles can not be fixed. The tiles shall be cut to the size and smoothened at edges to give straight and true joints.

After the tiles have been laid, the surplus cement slurry and the joints shall be cleaned and washed fairly deep before cement hardens.

The day after tiles have been laid, the joints shall be cleaned of every cement grout with a wire brush to a depth of about 5 mm and then grouted with white cement with or without pigment to match the shade of the topping of tiles.

32.2.3 Curing :

The flooring shall be kept wet with damp sand or water for seven days. It shall be kept undisturbed at least for 14 days. The grinding shall normally be commenced after 14 days.

Testing of the tiles shall be carried out by the contractor at his own cost as per I.S. requirement for required tests.

32.3.0 Mode of Measurements and payment :

The ceramic tiles flooring shall be measured in Sq. metre for visible area of work done.

No deductions shall be made nor extra paid for any opening in the floor area upto 0.1 Sq. mt. Nothing extra shall be paid for use of cut tiles or for laying the floors at different levels in the same room or court yard. Mosaic tiles laid in floor borders and bands etc. shall be measured in the same item and nothing extra shall be payable on account of these or similar bonds formed of half or multiples of half size, standard tiles or other uncut tiles.

The treads of stairs and steps paved with tiles without nosing shall also be measured under this item.

Extra rate shall however be paid for such area where width of treads does not exceed 30 cms.

The rate shall include the cost of all materials, labour involved in all the operations as described above.

The rate shall be for a unit of one sq. metre.

DTS No. 33:- Providing & fixing 35mm.th. Flush Door Solid Double Core type Both Face water proof Ply Veneered & 1.5 mm th. laminate shall be pasted on both side with adhesives as specified by the manufacturers. The laminate shall be as per approved shade & texture, of make incl. Sal wood frames of finished size 12cm x 7cm.incl. S.S. Hinges with necessary screws & Anodized aluminum fixtures & fastenings For all Floor. Without Frame- Only Shutter

SELF-EXPLANATORY AND AS DIRECTED BY ENGINEER-IN-CHARGE.

MODE OF MEASUREMENT AND PAYMENT:

The rate shall be for a unit of 1 sq. mt.

DTS No. 35:- Providing and fixing FRP FRAME size 125 x 65 mm and 35 mm thick FRP shutter with wood grain raised paneled design finish shutter having extra reinforcement on sides & edges in Gel coat finish. The core of the shutter & frame is to be filled up with injected polyurethane foam done in situ along with embedded wooden pieces for stiffening & also taking hinges & fixtures. The whole FRP frame & shutter is to be water

proof weather proof, termite proof & resistance to mild acid/alkali. Rates are to be inclusive of S.S.hinges with fastener sleeve & aluminium fixtures & fastenings. Product should have 3 years performance guarantee and company have ISO 9001-2000 certificate.

SELF-EXPLANATORY AND AS DIRECTED BY ENGINEER-IN-CHARGE.

MODE OF MEASUREMENT AND PAYMENT:

The rate shall be for a unit of 1 sq.mt.

DTS No. 36:-Providing & fixing M.S. Grills of required pattern to wooden frames of windows etc. At all floor levels with M.S. flats at required spacing & frame around square or round bars with round headed bolts & round headed bolts and nuts or by screws incl. Priming coat of Red lead paint etc. comp. (A) Plain grill.

36.1.0 MATERIALS:

The structural steel shall conform to M-22.

36.2.0 WORKMANSHIP:-

The M.S. Grill shall be prepared as per the drawings or as directed for fixing to wooden frames of windows etc.

The grill shall be fabricated to the designs and pattern shown in the drawings and the weight shall be as directed, and the joints shall be reverted or welded as shown in the plan or as directed. The grill so formed shall be fixed into the strip frames of the windows etc. before they are erected in position. The outside strip frame of the grill shall be housed to its full thickness into the recess cut into the frame of the windows etc. The grill shall be fixed to the frame with number of bolts and nuts or screws viz. bolt nut/screw per 30 cm. of the length of outer strip subject to a minimum of 2 Nos. on such side of the frame or as indicated in the drawing or as directed.

The bolts and nuts or screws shall be counter sunk and shall be fixed with the top of their heads flush with the face of the frame strips.

36.3.0 MODE OF MEASUREMENT AND PAYMENT:-

No payment shall be made for weight of screws, bolts and nuts etc. only weight of grill shall be paid.

The rate shall be for a unit one Kg.

DTS No. 37:- Providing & fixing in position collapsible steel shutters with vertical channels 20 x10 x 2 mm. Braced with flat iron diagonals 20 x5mm size with top & bottom rails of T-iron 40x40x6mm. with 38mm dia. steel pulleys comp. with bolts, locking arrangements, stoppers, handles incl. applying a priming coat of Redlead paint etc. comp.

37.1.0 MATERIALS :

The collapsible steel gate shall conform to M-33.

37.2.0 WORKMANSHIP :

Rails shall be fixed to the floor and to the lintel at top by means of anchor bolts, embedded in cement concrete of floor and lintel. The anchor bolts shall be placed approximately at 45 mm. centers alternatively in the two flanges of the T-Iron. The bottom runner (T-Iron) shall be embedded in the floor and proper groove shall be formed along the runner for the purpose. The collapsible gate shall be fixed at the sites by fixed the end double channels in the T-Iron rail and also by holdfasts bolted to the end double channel and fixed in the masonry of the side walls or the otherwise.

In case where the collapsible gate is not require to the lintel, beams or slab above a tee iron suitable design may be fixed at the top embedded in masonry and provided mason with necessary clamps and roller arrangement at the top.

All the adjoining work damaged while fixing of gate shall be made good to match the existing work without any extra payment.

All members of the collapsible gate including T-Iron shall be thoroughly cleaned to rust, scales, dust etc. and given a priming coat of red lead, before fixing them in position.

37.3.0 MODE OF MEASUREMENTS & PAYMENT :

The collapsible gate shall be measured in sq.mt.. The height of the gate shall be measured as the length of double channels and breadth from outside to outside of the end fixed double channels in open position of the gate. The rate including providing handles, locking arrangements, stoppers etc.

The rate shall be for a unit of one sq. metre.

DTS NO. 38:- Providing and fixing in position powder coated aluminium windows having Three track with aluminium sections of Hindalco, Jindal, Narmada, Banco or equivalent approved make 92 mm x 31.75 mm (weight bottom section 1.07 kg/mtr., top section 0.933 kg/mtr., shutter section 40 mm x 18 mm (weight of handle section 0.417 kg/mtr), interlock .547 kg/mt mounted on bearing to slide on tracks powder coated of approved shade including 5 mm clear plain sheet glass, PVC track gasket, EPDM rubber gasket on glass of weather tightening along with locks, handles as approved including sealing gap with marble or any other surfaces with silicon sealants making it water proof in all manner, etc. complete at all floor levels. (colour anodized)

Matt anodized aluminium sliding windows shall be made of extruded aluminium sections having thickness not less than 1.5 mm and matt finished colour anodized not less than 20 micron.

The glass 5 mm thick float Saint/Gobain glass white or colour as directed.

At bottom drain section shall be used to drain out rain water. The drain track shall be three track 92 mm x 31.55 weighing not less than 1.070 Kg/mt. The end and side tracks shall not be weighing less than 0.933 Kg/meter and thickness shall not be less than 1.5 mm. The work shall be carried out as directed by Engineer-in-charge or consultants.

Shutter Frame Work :- The fully glazed shutter frame shall be made from top and bottom section weighing not less than 0.464 Kg/meter. having bearing of Durlin or Nylon 66. All the fixture, fastener bearing, locks, handle, gaskets shall be used after getting approved from Engineer-in-charge and architect. The handle section shall be weighing not less than 0.417 Kg/meter. The interlock section shall be weighing not less than 0.464 Kg/mt. and having thickness of 1.5 mm. The glass panel shall be fixed in frame work using EPDM gaskets.

The whole assembly of window shall be fixed in best workman like manner to have smooth operations. All the windows shall be sealed to the R.C.C. or brick work with silicon sealants of Dow Corning or Wacker Germany as approved by Engineer-in-charge or his consultant.

The rate shall be for a unit of one square metre.

DTS NO. 39:-

Providing and fixing window having extruded aluminium Powder Coated section frame main outer size 63.50 x 38.10 x 1.95 mm (of Jindal section no:4605, @ Wt. 1.094Kg/mt) horizontal Two track member size 61.85 mm x 31.75 mm x 1.20 mm (of jindal section no:8687, @ Wt. 0.695 Kg/mt.) vertical member of size 61.85 mm x 31.75 mm x 130 mm (of jindal section no:8758 @ wt. of 0.659 kg/mt) with sliding shutters of horizontal member size 40 mm x 18 mm x 1.29 mm (of jindal section no:8949, @ Wt. of .456 Kg/mt) vertical member of size 40 mm x 18 mm x 1.29 mm (of jindal section no:8947, @ Wt. of 0.456 Kg/mt/section 8948, @ Wt. of 0.457 Kg/mt) with 5 mm thick

transparent bronze colour tinted float glass with powder coated aluminium fittings and fixtures and transparent silicon sealant glass fixing to frame as per details etc. complete for window.

Matt anodized aluminium sliding windows shall be made of extruded aluminium sections having thickness not less than 1.5 mm and matt finished colour anodized not less than 20 micron.

The glass 5 mm thick float Saint/Gobain glass white or colour as directed.

At bottom drain section shall be used to drain out rain water. The drain track shall be two track 92 mm x 31.55 weighing not less than 1.070 Kg/mt. The end and side tracks shall not be weighing less than 0.933 Kg/meter and thickness shall not be less than 1.5 mm. The work shall be carried out as directed by Engineer-in-charge or consultants.

Shutter Frame Work :- The fully glazed shutter frame shall be made from top and bottom section weighing not less than 0.464 Kg/meter. having bearing of Durlin or Nylon 66. All the fixture, fastener bearing, locks, handle, gaskets shall be used after getting approved from Engineer-in-charge and architect. The handle section shall be weighing not less than 0.417 Kg/meter. The interlock section shall be weighing not less than 0.464 Kg/mt. and having thickness of 1.5 mm. The glass panel shall be fixed in frame work using EPDM gaskets.

The whole assembly of window shall be fixed in best workman like manner to have smooth operations. All the windows shall be sealed to the R.C.C. or brick work with silicon sealants of Dow Corning or Wacker Germany as approved by Engineer-in-charge or his consultant.

The rate shall be for a unit of one square metre.

DTS No. 40:-

Providing and fixing standard extruded of aluminium section of size 61 x 37.0 x 0.90 mm (of Jindal section no.14080, @ Wt. 0.471 Kg per mt) with colour powder coated aluminium frame for Louvered Glass ventilation with 4 mm thick Figured glass as details etc. complete for ventilation. (A) Same as above but Colour anodized.

Detail specification as per manufacture specification and as directed by Engineer-in-charge.

The rate shall be for a unit of one square meter.

DTS No. 41:-

Apply two coats of Birla or Asian acrylic lappy (putty) and two coats of primer of approved brand and manufacture on new wall surface to give an even shade including thoroughly brushing the surface free from mortar dropping and other matter and sand papered smooth.

All Floor.

As this item is self Explanatory, it is carried out as directed as per engineer in-charge.

DTS No. 43:-

Wall painting with two coats of Acrylic emulsion plastic paint of Asian, ICI Delux, Berger, Shalimar, Jotun over existing surface to give an even shade & surface free from mortar dropping & other foreign matter & sand papered smooth etc. comp. (A) for wall and similar surfaces. (B) for ceilings.

43.1 Materials :

Water shall be conform to M-1, The plastic emulsion shall conform to I.S : 5411 - 1969(part-I)

43.2 Workmanship :

43.2.1 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 white or colour washed. A properly secured strong and well tied suspended platform (Zoola) may be used for white washing. Where ladders are used, pieces of old gunny bags shall be tied at top and bottom to prevent scratches to the floors and walls. For white washing of ceilings, proper stage scaffolding shall be erected where necessary.

43.2.2 Preparation of surface :

The surface spoiled by smoke soot shall be scrapped with steel wire brushes or steel scrapers or shall be rubbed with over-burnt surkhi or brick bats. The surface shall be then broomed to remove all dust, dirt and shall be washed with clean water.

43.2.3. Oil or grease spots shall be removed by suitable chemical and smooth surface shall be rubbed with wire brushed.

43.2.4 All unsound portion of the surface plaster shall be removed to full depth of plaster in rectangular patches and plastered again after raking the masonry joints properly. Such portion shall be wetted and allowed to dry. They shall then be given one coat. of white wash.

43.2.5. All unnecessary nails shall be removed, the. holes, cracks, patches etc. shall be made good with material similar in composition to the surface to be prepared.

43.3 Preparation of Mix :

This shall be done as per manufactures instructions. The thinning of emulsion is to be done with water and not with turpentine The quantity of thinner to be added shall be as per manufacturer instructions.

Applications :

Before pouring into small containers for use, the paint shall be stirred thoroughly in its container. When applying also, the paint shall be continuously stirred in the smaller container, so that its consistency is kept uniform.

The paint shall be laid on evenly and smoothly by means of crossing and laying off the crossing and consist of covering the area over with paint, brushing the surface hard for the first time over and then brushing alternately in opposite direction two or three times and then finally brushing lightly in a direction at right angles to the same. In this process, no brush marks shall be left the laying off is finished. No hair marks from the brush or clogging of paint puddles in the corners of panels, angles of moldings etc. shall be left on the work. The full process of crossing and laying off will constitute one coat.

The paint shall be applied with brush or rollers. For undecorated surfaces, the surface shall be treated with minimum two coats of cement water proofing paint. The second or subsequent coat shall not be started until the proceeding coat has become sufficiently hard to resist marking by brushing being used.

The surface on finishing shall present a flat velvety smooth finish. It shall be even and uniform in shade without patches, brush marks, paint drops etc.

Precautions :

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

Mode of measurements and payment :

All the work shall be measured in the decimal system as under:

- (a) Dimensions shall be measured to be nearest 0.01. M.
- (b) Area in individual items shall be worked out to the. nearest 0.01 Sq. M.

All the walls shall be measured in sq. mt. Deductions for jambs, soffits, sills etc. for openings not exceeding 0.5 sq. mt. each in area, for ends of joints, posts, beams, girders, steps etc. not exceeding 0.5 sq. mt each in area and for openings exceeding 0.5 sq.mt. and not exceeding 3.0 sq. mt. each in area, deductions and additions shall be made as under:

No deductions shall be made for ends of joists, beams, postes, etc. and openings not exceeding 0.5 sq. mt. each. No addition shall be made for reveals, jambs, soffits, sills etc. of these openings nor for finish around ends of joints, beams, posts, etc.

Deductions for openings exceeding 0.5 sq. mt. but not exceeding 3 sq. nit, each shall be made as follows and no addition will be made for reveals, jambs, soffits, etc. of these openings.

- (a) When both the faces of walls are provided with finish, deduction shall be made for one face only.
- (b) When each face of wall is provided with a different finish, deduction shall be made for that side of frame for door, windows, etc. on which width of reveals is less than that of the other side. Where width of reveals on both faces of wall are equal, deduction of 50% of area of opening on each face shall be made from total area of finish.
- (c) When only one face of wall is treated and the face is not treated, full deduction shall be made if the width of reveal on the treated side is less than that on the untreated side, but if the width of the reveal is equal or more than on the untreated side neither deductions nor additions to be made for reveals, jambs, soffits, sills etc.

In case of area of openings exceeding 3 sq. mt.. each, deduction shall be made for openings but jambs, soffits, sills shall be measured.

No deductions shall be made for attachment such as casing, conducts, pipe, electric wiring and the like.

Corrugated surfaces shall be measured flat as fixed and not girth. The quantities so measured shall be increased by the following percentage and the resultant shall be included with the general areas:

- (a) Corrugated steel sheets. . . 14%
- (b) Corrugated A.C. Sheets. . 20%
- (c) Semi corrugated A.C. Sheets. 10%
- (d) Nainital pattern roof (Plain sheeting with rolls) 10%
- (e) Nainital pattern roof (with corrugated sheets) 25%

Cornices and other wall features, when they are not picked out in a different, finish/colour shall be girthed and included in the general area.

The rate shall include the cost of all Materials :, labour, scaffolding, protective measures etc. involved in all the operations described above.

The rate shall be for a unit of One sq. metre.

DTS No. 44:-

Painting two coat (excluding priming coat) on new steel and other metal surface with synthetic enamel paint, burshing to give an even shade including cleaning the surface of all dirt, dust and other foreign matters. (A) For plain grill For all Floor

44.1.0 Materials :

44.1.1 The ready mixed primer, brushing red lead shall conform to IS 102:1972.

44.1.2 The thinner (linsed oil) shall conform to IS 75:1973 if for any reason, thinning is necessary in a case of ready mix paint, the brand of thinner recommended by manufacturer shall be used.

44.1.3 The enamel paints shall conform to M-44 B.

44.2.0 Workmanship :

44.2.1 Preparation of surfaces :

The surfaces before painting shall be cleaned of all rust, scale, dirt and other foreign matter sticking to it with wire brushes, steel wool, scrapers, sand paper etc. This surface shall then be wiped finally with mineral turpentine which shall also removed greas and perspiration of hand marks. The surface shall then be allowed to dry.

44.2.2 Application of primer :

After the preparation of the surface, the priming coat shall be applied immediately. The brushing operations are to be adjusted to the spreading capacity advised by the manufacturer of the particular primer. The paint shall be applied evenly and smoothly by means of crossing and laying off. The crossing and laying off consists of covering the area over with paint, brushing alternately in opposite directions, two or three times and then finally brushing lightly in a direction at right angles to the same. In this process no brush marks shall be left after the laying off is finished. The full process of crossing and laying will constitute one coat.

During painting, every time, after the priming coat has been worked out of the brush bristles or after the brush has been unloaded the bristles of the brush shall be opened up striking the brush against portion of the unpainted surface with the end of the bristles held at right angles to the surface, so that bristles thereafter will collect the correct amount of paint when dipped again in to a paint container. The primery coat shall be allowed to dry completely before painting is started.

No hair marks from the brush or clogging at paint puddles in the corner or panels angles of mouldings etc. shall be left on the work.

Specials care shall be taken painting over bolts, nuts, rivets overlaps etc.

The container when not in use shall be kept close and free from air so that paint does not thicken and also shall be kept guarded from dust.

44.2.3 General :

The materials required for painting work shall obtained directly from approved manufacturers are approved dealer and brought to the site in maker's drums, bogs etc. with seal unbroken.

All materials not in actual use shall be kept properly protected lid of containers shall be kept closed and surface of paint in open or partially open containers covered with a thin layer of turpentine to prevent formation of skin. The materials which have become state or flat to improper and long storage shall not be used. The paint shall be stirred thoroughly in its container before pouring into and shall be continuously stirred in smaller container. No left over paint shall be put back into stock tins. When not in use the containers shall be kept properly closed.

If for reason, thinning is necessary, the brand of thinner recommended by the manufacturer shall be used.

The surface to be painted shall be thoroughly cleaned and dusted. All dust, dirt and greas shall be thoroughly removed before painting is started. No painting on exterior or other exposed parts of the work shall be carried out in wet, damp or otherwise unfavourable weather and all the surface shall be thoroughly dried before painting work is started.

44.2.4 Application of paint :

Brushing operations are to be adjusted to the spreading capacity advised by the manufacturer of particular paint. The paint shall be applied evenly and smoothly by means of crossing and laying off. The crossing and laying off consists of covering the area over with paint, brushing the surface hard for the first time over and then brushing alternately in opposite directions to or three times and then finally brushing lightly in direction at right angles to the same. In this process no brush marks shall be left after the laying off is finished. The full process of crossing and laying off will constitute one coat.

Each coat shall be allowed to dry completely and lightly rubbed with every fine grade of sand paper and loose particles brushed off before next coat is applied. Each coat shall vary slightly in the shade and shall be get approved from Engineer-in-charge before next coat is started.

Each coat except the last coat shall be lightly rubbed down with sand paper or fine pumicestone and cleaned of dust before the next coat is applied. No hairmarks from the brush or clogging of paint puddles in the corners of panels, angles of moulding etc. shall be left on the work.

Specials care shall be taken while painting over bolts, nuts, rivets, overlaps etc. Approved quality brushes shall be used.

44.3.0 Mode of measurement and payment :

The new steel and other metal surface shall be measured under this item.

All the work shall be measured net in the decimal system as executed subject to the following limits unless otherwise stated hereinafter.

(a) Dimensions shall be measured to the nearest 0.01 mtr.

(b) Areas shall be worked out to the nearest 0.01 sq. metre.

No. deductions shall be made for openings not exceeding 0.5 sq.metre each and no addition shall be made for painting to beadings mouldings, edges, jambs, soffits, sills etc.of such openings.

In case of fabricated structural steel and iron work,priming coat of paint shall be included with fabrication. In case of trusses if measured in sq.m. compound girders, stanchions, lattices, girder and similar work, actual area shall be measured in sq.m.and no extra shall be paid for painting on bolts, heads, nuts, washers, etc. No addition shall be made to the weight calculated for the purpose of measurements of steel and iron works for paint applied on shop or at site.

The different surfaces shall be grouped into one general item. Areas of uneven surface being converted into equivalent paint areas in accordance with the table given as per Annexure-II for payment.

The rate is for complete item as specified i.e. one primer coat and two coats of oil paint.

The rate shall be for a unit of one sq.meter.

ANNEXURE-II

Equivalent plain Area of a uneven surface (Vide specifications for item relevant to paint and polishing)

Sr. No.	Description of work	How measured	Multiplying factor
1.	Pannled or framed and braced of ledged and battened or ledged and braced joinery cleats etc. shall be deemed to be included in the item.	Measured flat (not girthed) including chowkhat or frame. Edges, chocks,	1.30 For each side)
2.	Flush journey	Measured flat (not girthed) including chowkhat or frame, Edges, Chocks, cleats, etc. shall be deemed to be included in the item.	1.20 For each side)
4.	Fully glazed haused joinery	Measured flat (not girthed) including chowkhat or frame, cleats, etc.shall be deemed to be included in the item.	0.80 For each side)
5.	Partly panelled and partly glazed of or glazed journey.	Measured flat (not girthed) including chowkhat or frame etc. shall be deemed cleats, Edges, chocks to be included in the item.	1.0 For each side)
6.	Full Ventilated or or louzered jonery.	Measured flat (not girthed) including chowkhat or cleats etc. shall be deemed to be included in the item.	1.0 For each side)
7.	Weather boarding	Measurement flat (not girthed) supporting frame work shall not be measured separately.	1.2 For each side)
8.	Wood Shingle roofing	Measurement flat (not girthed)	1.0 For each side)
9.	Boarding with cover fillets and match boarding.	Measurement flat (not girthed)	1.05 For each side)
10.	Tile & slate work one way or two way	Measurement flat over all no deduction shall be made painting for open spaces. supporting over) members shall not be measured separately.	0.08 For each side)
11.	Trellies (or Jafri) work one way or two way for the open spaces	Measured flat over all no deduction shall be made supporting members shall not be measured separately.	1.00 for painting cover
12.	Guard bars balustrades, rades, gates gratings, grills, expanded metal and railings	Measured flat over all No deduction shall be made for open spaces, supporting members shall not be measured separately.	1.00 for painting cover
13.	Gates and open palisade fencing including standards.	Measurement flar over all No deductions shall made for open spaces.supporting	1.00 for painting cover

		members shall not be measured separately	
14.	Curved or enriched work	Measured flat over all no no deductions shall be made for open spaces supporting members shall not be measured separately	2.0 (For each side)
15	Steel roller shutters.	Measured flat (size of opening) over all, jamb guides, bottom rails and locking arrangement etc. shall be included in the item (top cover shall be measured separately).	1.10(for each side)
16	Plaing sheet steel door and windows)	Measured flat (not girthed) including frame	1.10(for each side)
17	Fully glazed or gauzed steel door & windows.	Measured flat (not girthed)including frame edges etc.	0.60(for each side)
18	Partly panelled and partly glazed or gauzed steel doors	Measured flat (not girthed) including frame edges etc.	0.80(for each side)
19	Collapsible gate	Measured flat (size of opening No separate measurements shall be taken for the top and bottom guide rails, rolls, fittings etc.	1.0 for painting all over

Note : The height shall be taken from the bottom of the loSOUTH rail if the palisades do not go below it (or from the lowerend of palisades, if they protect below the loSOUTH rail) upto the top of palisades but not upto the top of standards if they are higher than the palisades.

DTS No. 45:-

Providing & applying textured matt paint as per design of ICI Dulux or of Asian paint as per manufacturers specification and directions in shade and colour approved by consultant, on exterior surfaces of the building including scaffolding, preparing the surface, watering, curing etc. complete and as directed by the architects and manufacturers.

As this item is self Explanatory, it is carried out as directed as per engineer in-charge.

DTS No. 46:-

Providing & Fixing kathi around the vertical PVC drainage pipes for concealing with cement plaster 20 mm avg thickness (CM 1:3 [1 cement : 3 coarse sand]) finishing as per instruction given by Eng. Incharge for (A) 75 mm PVC pipe. (B) 100 mm / 110 mm PVC pipe.

46.1 All PVC pipes up to First Floor level shall be encased in plaster by wrapping jute string (Kathi)/ chicken mesh

46.2 See DTS-12 for Relevent Specification of plaster

46.3 Rate shall be for a unit of one running meter.

DTS No. 47:-

Providing & Fixing 3 mm thick metal sheet with CNC cutting to fix it on vertical surface. Steel work welded in built up sections, framed work including cutting, hoisting, fixing in position and applying a priming coat of red lead paint in beams & joists channels angles, tees, flats with connection plates or angle cleats as in main & cross beams, hip & trussed purlins connected to common raffers & the like.

As this item is self Explanatory, it is carried out as directed as per engineer in-charge.

DTS No. 48:-

Steel work welded in built up sections, framed work including cutting, hoisting, fixing in position and applying a priming coat of red lead paint. (a) In beams and joints channels angles, tees, flats with connecting clear as in main and cross bream, hip & jack rafter, purlins connected to common rafter and the like.

LAYING OUT :

The steel structures, as shown in the drawings or as per directions of the Engineer-in-charge, shall be laid out on a level platform to full scale and to full size in parts. A steel type shall be used for measurements to ensure maximum accuracy.

Wooden templates 12 mm to 19 mm thick or steel templates shall be made to correspond to each connecting gusset plate and rivet holes shall be accurately marked on them and drilled. The templates shall be laid on the steel members and holes for rivetting and bolting marked on them. The ends of the steel members shall also be marked for cutting. The base of steel columns and the position of anchor bolts shall be carefully set out.

FABRICATION :

The steel sections as specified shall be straightened and cut square and accurately to correct lengths. The cut ends exposed to view shall be finished smooth. No. two pieces shall be welded or otherwise jointed to make up required length of a member except as indicated in the drawing or otherwise specifically permitted by the Engineer-in-charge. All straightening and shoring to form shall be done by application of pressure and not by hammering. Any bending or cutting shall be carried out in cold condition (unless otherwise directed) in such a manner as not to impair the strength of the metal.

All stiffeners shall be formed by pressure, and where practicable, the metal shall not be cut and welded in making these. In major works or where so specified, shop drawings giving complete details and information for the fabrication of the component parts of the structure, including the locating, type, size, length and details of rivets, bolts or welds shall be prepared in advance of the actual fabrication and approved by the Engineer-in-charge. The drawing shall indicate the shop and field rivets, bolts and welds. The steel members shall be distinctly marked or stencilled with paint with the identification marks as given in the shop drawings.

The bars shall be thickened at the ends so as to provide for screwed threads and gradually tapered off to meet their normal section.

Great accuracy shall be observed in the fabrication of various members. So that these can be assembled without being unduly packed, strained or forced into position and when built-up shall be true and free from twists, buckles or open joints.

Before making holes in individual members, for fabrication the steel work intended to be riveted or bolted together shall be assembled or clamped properly and tightly so as to ensure close abutting or lapping of the surface of the different members. All stiffeners shall be tightly both at top and bottom without being drawn or caulked. The abutting joints shall be cut of dressed true and straight and fitted close together,

We splice plates and fillers under stiffeners shall be cut to fit within 3 mm of flange angles. We plates or girders which have no cover plates shall have their ends flush with the top of angles forming the flanges unless otherwise required. The we plates, when spliced shall have clearance of not more than 6 mm.

The erection clearance for cleated ends of members connecting steel to steel preferably be not greater than 1.5 mm. The erection clearance at the ends of beams without web cleats shall not be more than 3 mm. at each end but where for practical reasons, greater clearance is necessary, suitably designed seating shall be provided.

Pins and rollers shall be accurately turned to gauge. These shall be straight and smooth and free from flaws. The roller bearing shall be provided with adequate arrangement for holding the girders or truss resting on it, from lateral displacement.

Expansion bed plates shall be planed true and smooth. The planing of bed plates shall be done in the direction of the movement of the girder or truss resting on it.

Column splices and butt joints of struts and compression members depending on contract for stress transmission shall be accurately machined and closebutted over the whole section. In column caps and bases, the ends of shafts together with the attached gussets, angles, channels etc. after riveting together shall be accurately machined so that the parts connected butt against each other over the entire surface of contact. Connecting angles or channels shall be fabricated and placed in position with great accuracy so that they are not unduly reduced in thickness by machining.

The ends of all bearing stiffeners shall be machined or ground to fit tightly both at the top and bottom.

All holes shall generally be drilled to the required size and at the required position. Sub-punching shall be permitted, provided it is done 3 mm. less in diameter and reamed thereafter to the required size.

Holes for rivets and black bolts shall be large by 0.4 to 6 mm. as shown in appendix-I under column "Coarse" than the nominal diameter of the rivets or black bolts depending upon the dia of rivets. Holes for turned and fitted bolts shall be drilled or reamed large by 0.2 to 3 mm. depending upon the dia of bolts as shown in Appendix under column "Medium".

When the number of plates or sections to be riveted together exceeds three or when their total thickness is 90 mm or more, holes shall be drilled or reamed in position, after the members are assembled and the parts firmly hold together by clamps. Before riveting or bolting up or welding finally. The members shall be taken part and all burrs removed.

Holes shall have their axis perpendicular to the surface bore through. The drilling or reaming shall be free from burrs and the holes shall be clean and accurate.

The work or fabrication shall be completed in the work shop as far as it is practicable to do so. Site jointing shall be done with rivets or turned and fitted bolts, or black bolts or welding as shown in drawings or as directed by the Engineer-in-charge. Generally, the following principles shall govern the use of rivets, turned and fitted bolts and black bolts :-

[i] Rivets or turned and fitted bolts shall be used where the connection is such that slip under load has to be avoided.

[ii] Black bolts may be used very sparingly where a force is carried through a connection without impact, vibration or reversal of stresses (unless such reversal is due to wind forces.)

In the case of welding, holes shall only be made for the bolts used for temporary fastening as shown in drawings.

WELDING :

Welding shall be generally done by electric process. The electric arc method being economical, is usually adopted. Where public electricity is not available, a suitable generator shall be arranged. Gas welding shall be resorted to using oxyacetylene flame with specific prior approval of the Engineer-in-charge.

Gas welding shall not be permitted for structural steel work. Gas welding requires heating of the members to be welded along with the welding rod and is likely to create temperature stresses in the welded members. Precautions shall therefore be taken to avoid distortion of the members due to these temperature stresses.

The work shall be done as shown in the shop drawings which should clearly indicate various details of the joints to be welded, type of welds, shop and site welds, as well as the types of electrodes to be used. Symbols for welding on plans and shop drawings shall be according to IS : 813-1061. As far as possible, every effort shall be made to limit the welding that must be done after the structure is erected so as to avoid the improper welding that is likely to be done due to heights and difficult positions of scaffolding etc. from the aspect of economy.

PREPARATION OF SURFACE :

Surfaces which are to be welded together, shall be free from loose mill-scale, rust, paint, grease or other foreign matter. A coating of boiled linseed oil shall be permitted.

PRECAUTIONS :

All operations connected with welding and cutting equipment shall conform to the safety requirements given in IS : 818-1968 for "Safety and Health requirements in Electric and Gas welding and Cutting Operations".

The following points shall be borne in mind during the process of welding :-

[a] Welds shall be made in the flat position. Wherever practicable.

[b] Arc length, voltage and amperage shall be suited to the thickness of materials, type of groove and other circumstances of the work.

[c] The sequence of welding shall be such that where possible, the members which offer the greatest resistance to compression are welded first.

All defective welds which shall be considered harmful to the structural strength shall be cut out and rewelded.

Finished welds and adjacent parts shall be protected with clean boiled linseed oil and after all slag has been removed. Welds and adjacent parts shall be painted after they are approved by the Engineer-in-charge. All the members shall be thoroughly cleaned of rust, scales, dust etc. and given a priming coat of lead painting before fixing them in position.

RATE :

Item shall be paid in Kg. basis.

DTS No. 49:-

Providing & fixing colour on galvanised steel, zinc / aluminium alloy coated sheet 0.5 mm. thick roofing fixed with galvanised grom J or L hook bolts and bolt 8mm dia with bituminous and impervious washer filled with white lead etc. Excluding the cost of purlins, rafter and trusses.(TATA or Jindal Make).

As this item is self explanatory, it is carried out as directed as per engineer in-charge.

DTS No. 50:-

Fire extinguisher - ABC powder type 6 Kg.

Supply, installation and testing of ABC powder fire extinguisher necessary hardware and consumables. Stored pressure mechanism. Charged with MAP-50% (ABC) Dry powder. with wall mounting clamp. UOM - Price per each No. Make - Kanex / Safex / Secure Zone.

As this item is self Explanatory, it is carried out as directed as per engineer in-charge.

DTS No. 51:-

Fire extinguisher - CO2 Gas type 4.5 kg.

Supply, installation and testing of CO2 Gas fire extinguisher with necessary hardware and consumables. Standard - Confirming to IS:15683-2006 with ISI mark. UOM - Price per each No. Make - Kanex / Safex / Secure Zone

As this item is self Explanatory, it is carried out as directed as per engineer in-charge.

DTS No. 53:-

Providing & Fixing C.P. brass pressure matic pillar cock with copper connection, C.P., brass screws complete. Make: Cera ; Parry Ware ; Hindware

MATERIALS

15mm. dia. brass screw down shall be brass chromium plated conform to I.S. 781-1977 & M-57. The bib cock shall be best Indian make and quality.

WORKMANSHIP

The screw down bib cock 15mm. dia. as specified above shall be fixed as directed. The threaded portion shall be smeared with white or red, lead and around with a few turns of fine spun yarn round the screwed end of the pipe. The bib cock shall be then screwed and fixed to water tight position.

MODE OF MEASUREMENTS & PAYMENTS

The rate includes cost of all labor, materials, tools and plant etc. Required for satisfactory completion of this item.

The rate shall be for a unit of one number.

DTS No. 54:-

Providing & Fixing 15 mm Dia bib tap with wall Flange at all floor levels, polished bright etc. comp. Make: Cera; ParryWare; HindWare.

MATERIALS

15mm. dia. brass screw down shall be brass chromium plated conform to I.S. 781-1977 & M-57. The bib cock shall be best Indian make and quality.

WORKMANSHIP

The screw down bib cock 15mm. dia. as specified above shall be fixed as directed. The threaded portion shall be smeared with white or red, lead and around with a few turns of fine spun yarn round the screwed end of the pipe. The bib cock shall be then screwed and fixed to water tight position.

MODE OF MEASUREMENTS & PAYMENTS

The rate includes cost of all labor, materials, tools and plant etc. Required for satisfactory completion of this item.

The rate shall be for a unit of one number.

DTS No. 55:-

Providing Flush Cock consisting lever, cartridge sleeve & flange concealed part. Make: Cera ; ParryWare ; Jaquar ; Hindware

55.1. MATERIALS :

Chromium plated brass half turn flush cock shall conform to M-67.

55.2 WORKMANSHIP

The half turn flush cock of specified diameter shall be fixed as directed. The flush cock shall be fixed in G.I. pipe line with necessary fittings. The joints shall be made leak proof by using spun yarn and white zinc.

55.3 MODE OF MEASUREMENTS & PAYMENTS

The rate includes cost of all materials and labour required for satisfactory completion of this item including fittings. The rate shall be for a unit of one number.

Apertures for fire places, shall not be deducted nor shall extra labour required to make splaying of jumps, throating and making arches over the aperture be paid for separately.

55.4 The rate shall be for a unit of one cubic metre / Sq. mt. for 225mm th. and 100mm th. Masonry respectively.

DTS No. 56:-

Providing & fixing 15mm C.P. brass angle valve (Stop Cock) with C.P. copper connecting pipe 450 mm long and nuts, washer and brass flange complete, including cutting and making good the wall where required.

Stopcock shall be of Cera, Parry ware, Jaquar ,HindWare make and the work is to be carried out as directed by the Engineer-in-charge.

DTS No. 57:-

Providing & Fixing Wash Down Water Closet European type W.C. pan with integral P or S trap with normal closing seat cover L bend including jointing the trap with soil pipe in cement mortar 1:1 (1 cement:1 finesand) (seat cover to be considered) (A) Vitrified china pattern –I. Make: cera, Parryware, Jaquar, Hindware

57.1.0 Materials

Wash down water closet (European type W.C. pan shall conform to M-60. Cement mortar shall conform to M-11.

57.2 WORKMANSHIP :

Closet shall be fixed to the floor by means of 75 mm long 6.5 mm diameter center sound bolts and nuts embedded in the floor concrete using rubber or fiber washers so as not to allow any lateral displacement. The joint between the trap of W.C. and soil pipe shall be made with C.M. 1:1 (1 Cement : 1 Fine sand).

57.3 MODE OF MEASUREMENT & PAYMENT :

The rate shall include the cost of all labours for fixing pans and seat and cover, inlet, connections etc. complete including testing the same.

The payment of seat and cover shall be made separately.

The rate shall be for a unit of one number.

DTS No. 58:-

Providing & fixing Under Counter wash basin with single hole for pillar tap , Size- 550 x 400 mm at all floor levels, with C.I. or M.S. Brackets painted white incl. cutting holes & making good the same etc. complete. For all Floor

58.1.0 MATERIALS

58.1.1 The white glazed earthenware wash basin shall be 550 mm. x 400 mm. of 1st quality and make as approved by the Engineer-in-charge. The wash basin shall conform to M-59. The capstan head pillar tap of specified dia. of C.P. over brass shall be of best quality and shall conform to I.S. 1975-1961. The pillar taps shall be of tested quality. The C.P. brass trap and union shall be of 32 mm.dia. and of best quality and make as approved by the Engineer-in-

charge. The brass screw down stop cock of specified dia. shall conform to I.S. 781-1977. The stop cock shall be of tested quality.

58.2.0 WORKMANSHIP

58.2.1 The wash basin shall be fixed on the wall as and where directed. The wash basin shall be supported on a pair of M.S. or C.I. brackets fixed in C.M. 1:3 (1 cement; 3 sand). The bracket shall conform to I.S. 775-1962. The wall plaster on the rear shall be cut to rest the top edge of the wash basin. After fixing the basin, plaster shall be made good and surface finished to match with the existing one.

58.2.2 The bracket shall be painted white with ready mixed paint. The C.P. brass trap and union shall be connected to 32 mm.dia. waste pipe which shall be suitably bent towards the wall and which shall discharge into an open drain leading to a gully trap or direct into the gully trap on the ground floor and shall be connected to a waste pipe through a floor trap on the upper floors. C.P. brass trap and union may not be provided where the surface drain or a floor trap is placed directly under the basin and the waste is discharged into vertically.

58.2.3 The height of the front edge of the wash basin from the floor level shall be 80 cms.

58.2.4 The capstan head pillar tap of specified dia. shall be fixed as directed with required washers of selected leather or rubber asbestos composition or plastic as directed. The cock shall be fixed with pipe line with white zink and spun yarn, to make joint water tight. The work shall be carried out in best workman like manner.

58.2.5 C.P. brass waste trap and union shall be connected to 32 mm.dia. waste pipe which shall be connected suitably towards the wall and which shall discharge into the drain through a floor trap. The C.P. brass waste trap shall be provided for wash basin or sink as the case may be.

58.2.6 The stop cock shall be fixed in position by means of jam, nut & socket. The stop cock shall be fixed near the inlet of the water metre or as directed. The joints shall be done with white zinc and spun yarn. The joint shall be tested for leak proofing.

58.2.7 The necessary inlet, outlet connections and fittings such as pillar cocks, C.P. brass waste trap, waste pipe, stop cock etc. shall be fixed as specified above.

58.2.8 The payment of fittings shall be made under this item.

58.3.0 MODE OF MEASUREMENTS & PAYMENTS

58.3.1 The rate includes cost of all labour, materials, tools and plant etc. required for satisfactory completion of this item as specified in workmanship.

58.3.2 The rate shall be for a unit of one number.

DTS No. 59:-

Providing & fixing white vitreous china urinal of size 450x325mm as per IS-2556 (Part-2) with C.I. hangers and 15mm dia. C.P. spreader, 32mm dia CP bottle trap and pipe to wall with C.P. flange complete including cutting and making good the walls and floors wherever required.

Make- Cera, Parry ware, HindWare, Jaquar

Detail specification as per manufacture specification and as directed by Engineer-in-charge. The rate shall be for a unit of No.

DTS No. 63:-

Providing & Fixing stainless steel recessed type Soap dish of approved make. Including providing & fixing screws, washers, cutting & making good the walls.

Make- Cera, Parry ware ,HindWare,Jaquar

Detail specification as per manufacture specification and as directed by Engineer-in-charge. The rate shall be for a unit of No.

DTS No. 64:-

Prov.& Fixing water closet squatting pan (Orissa type W.C.pan) at all floor levels, size 500mm x 400 mm incl. 100 mm size "P"or "S" trap for water closet squatting pan joining the trap with the pan & soil pipe in C.M. 1:1 (1cement :1 fine sand) etc. Comp.

64.1.0 Materials

Water closet squatting pan (Orissa type W.C. Pan) and 'P' Trap shall conform to M-62, foot rests shall conform to M- 62A. Cement mortar shall conform to M-11.

64.2.0 WORKMANSHIP

- 64.2.1 The pan shall be sunk into the floor and embedded in a cushion of average 15 cms. cement concrete 1:5:10 (1 cement; 5 fine sand; 10 graded stone aggregate or brick aggregate 40 mm. nominal size) or as specified. 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 floor should be suitably sloped so that the waste water is drained into the pan. The pan shall be provided with 100 mm. 'P' or 'S' trap as specified in the item with approximately 50 mm. seal. The joints between the pan and the trap shall be made leak- proof with cement mortar 1:1 (1 cement; 1 fine sand).
- 64.2.2 The 'P' or 'S' trap shall be fixed with pan and cast iron pipe with C.M. 1:1. The pan shall be provided with a 100 mm. 'P' or 'S' trap as specified in the item with an approximately 50 mm. seal. The joint between the pan and the trap shall be made leakproof with cement mortar 1:1 (1 cement; 1 fine sand).
- 64.2.3 After laying the floor, the floor shall be suitably sloped so that the waste water is drained into the pan. A pair of foot-rests of size 250 mm x 130 mm x 30 mm of white vitreous china shall be set in cement mortar 1:3 (1 cement; 3 coarse sand). The foot rests shall be fixed at a distance of 175 mm. from the inner edge of the back side of the pan and shall be fixed at convenient angle.

64.3.0 MODE OF MEASUREMENT & PAYMENT :

- 64.3.1 The rate shall include the cost of all materials and labours involved in all the operations described under workmanship.
- 64.3.2 The rate shall be for a unit of one number.

DTS No. 65:-

**Prov. & Fixing Health Faucet ABS Body with wall Hook and 1 Meter chrome plated PVC Hose Pipe.
Make- Cera, Parry ware ,HindWare,Jaquar**

Detail specification as per manufacture specification and as directed by Engineer-in-charge. The rate shall be for a unit of No.

DTS No. 66:-

Prov. & Fixing S.W. Gully trap with C.I. grating brick masonry (C.M 1:5) chamber & water tight C.I. cover of 300mmx300mm size (inside) includ. plastering smooth inside & outside 15mm. th' in C.M.1:3 etc. comp. (i) Square mouth traps---(A) 100mm x 300mm Size -P type, (B) 150mm x 100mm Size- P Type

66.1.0 MATERIALS :

(1) Water shall conform to M-1. (2) Cement mortar of proportion 1:5 shall conform to M-11. (3) Flyash Building brick shall conform to M- 15(A). (4) The S. W. Gully trap of 100 mm x 100 mm size shall conform to M-70.

66.2.0 WORKMANSHIP :

Excavation for gully trap shall be done true to dimensions and levels as indicated on plans or as directed. The excavation work shall generally be done as per relevant specification of item 1(a) or earth work.

Fixing :

The gully trap shall be fixed over cement concrete 1:5:10 (1 Cement : 5 sand : 10 graded brick bats aggregate 40 mm nominal size) foundation 650 mm square and 100 mm thick. The depth of top of concrete below the ground level shall be 675 mm. The jointing of gully outlet to the branch drain described in Item No.60.

Brick Masonary Chamber :

After fixing and testing gully and branch drain, a brick masonry chamber 300 mm x 300 mm inside with bricks in C.M. 1:5 (1 Cement : 5 sand) shall be built with a 100 mm brick work round the gully trap from the top of bed concrete upto ground level. The space between the chamber walls and trap shall be filled with cement concrete 1:5:10. The upper portion of the chamber i.e. above the top level of the trap shall be plastered inside with cement mortar 1:3 (1 Cement : 3 sand) finished with floating coat of neat cement. The corners and bottom of the chamber shall be rounded off so as to slope towards.

C.I. Cover with frame 300 mm x 300 mm (Inside) size shall then be fixed on the top of the brick masonry with C.C. 1:2:4 (1 Cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) 40 mm thick and rendered smooth. The finished top of the cover shall be left about 40 mm above the adjoining ground level so as to exclude the surface water from entering the gully trap.

66.3.0 MODE OF MEASUREMENTS AND PAYMENT :

The rate includes cost of all labour, materials tools and plant etc. required for satisfactory completion of this item as described above.

DTS No. 67:-

Prov. & Fixing S.W. Gully trap with C.I. grating brick masonry (C.M 1:5) chamber & water tight Pre cast R.C.C. cover of 300mmx300mm size (inside) includ. plastering smooth inside & outside 15mm. th' in C.M.1:3 etc. comp. (i) Square mouth traps---(A) 100mm x 300mm Size -P type, (B) 150mm x 100mm Size- P Type

67.1.0 MATERIALS :

(1) Water shall conform to M-1. (2) Cement mortar of proportion 1:5 shall conform to M-11. (3) Flyash Building brick shall conform to M- 15(A). (4) The S. W. Gulley trap of 100 mm x 100 mm size shall conform to M-70

Detail specification as per Item No. 66.

DTS No. 68:-

Prov. & Fix. 10 cm.x15 cm.(4" x 6") S.W. trap with Inside dimension ,455 x 610 mm & 450 mm deep sewer trap chamber with 23 cm th' B.B. masonry walls in C.M 1:5 with cement plaster 15 mm th' in C.M. 1:3 inside & outside to exposed faces, R.C.C. top slab with 1:2:4 mix (1 cement: 2 Sand : 4 Grade stone aggregate 20mm size) , Foundation concrete 1:5:10 & fixing C.I. cover with frame to be not less than 38 kg. On top etc. comp. For single pipe.

General :-

The item refers to provide and fix 10 cms. x 15cms. S.W.trap with 0.45 x 0.60 mts. clear opening sewer trap chamber with 23 cms. thick B.B. masonry walls in C.M. 1:5 with cement plaster inside and outside to exposed faces including fixing C.I. cover of 38 Kgs. on top sewer trap.

68.1.0 MATERIALS

The stone wall sewer trap shall be of 10cms. x 15cms. size conforming to relevant I.S. 651-1980.

68.2.0 WORKMANSHIP

68.2.1 Necessary excavation shall be done as required. The foundation cement concrete of 1:5:10 shall be laid for a thickness of 15cms. The S.W. trap shall be fixed into the position on the main sewer side of the chamber as directed. Brick masonry chamber of one brick thickness in C.M. 1:8 shall be constructed with the inside dimensions 60cms. x 45cms.

68.2.2 The inside of the chamber shall be plastered in 15mm. thick C.M. 1:3 and shall be finished smooth with cement slurry. The outside of the chamber shall be plastered to a depth of 30 cms. from the top of the chamber. The item also includes providing and laying 1:2:4 cement concrete for fixing the Precast RCC heavy duty frame and cover. The Precast RCC heavy duty frame and cover shall be of the specified size.

68.3.0 MODE OF MEASUREMENTS & PAYMENTS

68.3.1 The rate includes costs of all materials, labour, tools, plants, etc. required for carrying out satisfactory completion of items as described above.

68.3.2 Rate shall be as per number basis.

DTS No. 69:-

Providing & construction simple chamber of 23 cm. th' B.B. Masonry in C.M 1:5 with cement plaster 15 mm th' in C.M. 1:3 inside & outside to exposed faces, R.C.C. top slab with 1:2:4 mix (1 cement: 2 Sand : 4 Grade stone aggregate 20mm size) ,Foundation concrete 1:5:10 & fixing C.I. cover with frame to be not less than 38 kg. On top etc. comp. Inside dimension, 455 x 610 mm & 450 mm deep for single pipe. (A)Precast RCC heavy duty cover instead of C.I.Cover

69.1.0 Materials :

Water shall confirm M-1. Cement shall confirm to M-3. Coarse sand shall confirm to M-6. Flyash Building Brick shall confirm to M-15(A). Cement mortar shall confirm to M-11.

69.2.0 Workmanship :-

69.2.1 The item covers the construction of simple chamber of clear size 0.45 x 0.60 mts. with 23 thick brick wall in C.M.1:5 and smooth plaster 15 mm thick C.M. 1:3 Bedding concrete of C.C. 1:5:10, 150 mm thick, the projected bed concrete beyond chamber wall shall be of 75 mm. The chamber frame & cover shall be of Precast RCC heavy duty cover fixed with C.M. 1:1 etc. comp.

69.2.2 Specification for item No.1[a] shall be read for excavation, & specification for Item No.8 shall be adopted for P.C.C. and specification for Item No.12 shall be read for B.B. Masonary and specification for Item No.14 shall be read for plaster work except that the thickness of plaster shall be 15 mm thick in CM 1:3.

69.3.0 Mode of Measurements and payments :-

The rates including all labours, materials, tools and plats etc. required for satisfactory completion of this work.

The rate shall be for a unit of one number.

DTS No. 70:-

Providing, Lowering & laying joining R.C.C NP2 CLASS pipe in C.M 1:1 of following nominal internal diameters incl. Testing of pipes and joints etc. Comp. (a) 100 mm dia., (b) 150 mm dia., (c) 450 mm dia.

70.1.0 MATERIALS :

70.1.1 The reinforced concrete light duty non-pressure pipes of specified diameter shall confirm to I. S. 458-1971. Cement mortar of required proportion shall conform to M-7.

70.2.0 WORKMANSHIP :

70.2.1 EXCAVATION OF TRENCHES :

70.2.1.1 The width of the trenches shall be 1.05/1.20 metre and depth shall be corresponding to invert level of the screen chamber and required levels as directed.

70.2.1.2 At joints, the trench width shall be widened where necessary. The work of excavation and refilling shall be done true to line and gradient in accordance with general specifications of earth work in trenches.

70.2.2 LAYING :

70.2.2.1 The pipe shall be laid accurately and perfectly true to line, levels and gradients. Great care shall be taken to prevent sand etc. from entering the pipes. The pipes between two manholes shall be laid truly in a straight line without vertical or horizontal undulation. All junctions and changes in direction and diameter shall be made inside manholes by means of curved tapered channels formed in cement concrete finished smooth and benched on both sides. The body of the pipe shall rest for its entire length, on an even level bed grips being made of left on the bed to receive the sockets of the pipes.

70.2.3 JOINTING :

70.2.3.1 Tarred gasking or yarn soaked in neat cement slurry shall first be placed around the spigot of each pipe and spigot shall then be placed well home into the socket of the pipe previously laid.

The pipe shall then be adjusted and fixed in the correct position and gaskin caulked home so as to fill not more than 1/4th of the total depth of (13 mm in depth) the socket.

70.2.3.2 The remainder of the socket shall be filled with stiff mixture of cement mortar in proportion of one part of cement and one part of sharp sand. When the a socket is filled, a fillet shall be formed round the joints forming an angle of 45 degree with the barrle of the pipe.

70.2.3.3 The mortar shall be mised as necessary for immediate use.

70.2.3.4 After the joint is made, any extraneous materials shall be removed from the inside of the joints with a suitable scraper or 'badger'. The newly made joints shall be protected, until set, from the sun, dry winds, rain or frost, sacking or other suitable materials which shall be used for the purpose.

70.2.3.5 The mortar shall be cured for 10 days.

70.3.0 MODE OF MEASUREMENT AND PAYMENT :

70.3.1 Pounding or bottaning of the trenches bed to fit the lower part of the pipe and 'Grips' dug to take socket collars etc. are included in the rate of laying the pipes.

70.3.2 The measurements shall be net without any allowance for cutting and waste. The length of bends, junctions and other connection shall be included in the total length of the pipe drains. Nothing extra shall be paid for the same. The rate excludes necessary excavation, including refilling trenches etc.complete.

70.3.3 The rate shall be for a unit of one running metre.

DTS No. 71:- Providing & Fixing U-PVC pipe (SWR) confirming to IS no. 13592 (Type "B") of Prince /Supreme /Jain /Astral / Tulsi make for soil and waste discharge system at all floor levels incl. All fixtures like bends, tees, shoe etc. jointed with resin of approved brand & manufacture etc. comp. (A) 75 mm dia (B) 110 mm dia. (C) 160 mm dia.

71.1.0 MATERIALS :

The specified dia. U-P.V.C. spigot and socket soil or waste pipe shall conform M-56-B.

71.2.0 WORKMANSHIP :

The U-P.V.C. sprigot and Socket soil or waster pipe shall be joint as per following procedure. Cut the U-P.V.C. pipe with a fine to the saw to the required lenth pipe should be cut square. Chamfer the edge of the pipe to be inserted at an angle of about 15 to about 1/3 rd. the wall thickness, using a coarse file Make sure the spigot and socket are the roughly clean and dry. Insert the pipe into the socket without the seal ring and mark along the pipe, when it is fully inserted. Fix the rubber ring into the groove without rwisting it. Apply jointing lubricant to the chanfered end of the pipe, upto the make made on spigot or to the socket end of the fitting. Push the pipe firmly into the socket till the gap between the mark on the sprigot and socket is about 10mm to allow for thermal expansion.

71.2.1 The pipe clips should be spaced at intervals of no more then ten times the outsidde diameter of pipes for horizontal runs & for vartical lines are spaced at intervals of one meter to a maximum of two moters according to pipe diameter.

71.2.2 All entry to main stacks should be protected with minimum 50mm water seal trap. Wherever there is mixing of soil & waste lines.

71.2.3 Smoke just should be avoided and test plug/ socket plug should be used for testing the lines.

71.2.4 All soil pipes shall be carried up above the roof and shall have a wire ballon guard or a cowl.

71.2.5 The vantilation pipe or shaft shall be carried out to a height of atleast one metre above the outer covering of the roof of the building or in the case of windows in a gable wall or a dormer two meters above the top of the windows. In case of flat roof to which access for use is provided, it shall be carried out upto a height of atleast one meter above the parapet or two meters measured vertically from the top of any windows or opening which may exist upto a horizontal distance of five meters from the vent pipe into such building and in no case shall be carried out to a height less than three meters.

71.2.6 Where ventilating pipes are carried in pipe shafts, the shafts, shall be of a minimum size of one meter. If the shafts are also used to give light and air to rooms, the ventilating pipes must be carried out to a horizontal distance at roof level not less than five meter from the site of the saft.

71.2.7 The connection between the main pipe and branch pipes shall be made by using branches and bends with access doors for cleaning.

71.2.8 The waste from lavatories, kitchens basins, sinks, baths and other floor traps shall be separatly connected to respective stacks of upper floors. The waste stack of lavatories shall be connected directly to main hole while the waste stack of other shall be separatly discharged over gully trap.

71.3.0 MODE OF MEASUREMENTS & PAYMENT :

The length of pipe shall be measured including all fittings along its length in running meters correct to a centimetre. No allowance shall be made for the portion of pipe length entered in the sockets of the adjacent pipe or fittings.

The rate includes all labour and materials, tool and plant etc. required for satisfactory completion of this item.

The rate shall be for a unit of one running meter.

DTS No. 72:-

Providing & fixing U-PVC pipes Confirming to IS no. 13592 (Type "A") of Prince/Supreme/Jain/Astral/Tulsi/Finolex make for rain water at all floor levels incl. fixtures like bends, tees, shoe etc joined with resin of approved brand & manufacture etc. comp. (B) 110mm. dia.

72.0 MATERIALS:

The specified dia. U-P.V.C. spigot and socket soil or waste pipe shall conform M-56-B.

72.1. WORKMANSHIP:

The U-P.V.C. sprigot and Socket soil or waster pipe shall be joint as per following procedure. Cut the U-P.V.C. pipe with a fine to the saw to the required length pipe should be cut square. Chamfer the edge of the pipe to be inserted at an angle of about 15 to about 1/3 rd. the wall thickness, using a coarse file. Make sure the spigot and socket are the roughly clean and dry. Insert the pipe into the socket without the seal ring and mark along the pipe, when it is fully inserted.

Fix the rubber ring into the groove without twisting it. Apply jointing lubricant to the chanfered end of the pipe, upto the make made on spigot or to the socket end of the fitting. Push the pipe firmly into the socket till the gap between the mark on the sprigot and socket is about 10mm to allow for thermal expansion.

72.2. The pipe clips should be spaced at intervals of no more than ten times the outside diameter of pipes for horizontal runs & for vartical lines are spaced at intervals of one meter to a maximum of two meters according to pipe diameter.

72.3. All entry to main stacks should be protected with minimum 50mm water seal trap. Wherever there is mixing of soil & waste lines.

72.4. Smoke just should be avoided and test plug/ socket plug should be used for testing the lines.

All soil pipes shall be carried up above the roof and shall have a wire ballon guard or a cowl.

All soil pipes up to first floor level level shall be encased in plaster C.M. 1:5 by wrapping jute string (Kathi)/Chicken mesh, without any extra cost.

72.6. The vantilation pipe or shaft shall be carried out to a height of atleast one metre above the outer covering of the roof of the building or in the case of windows in a gable wall or a dormer two meters above the top of the windows. In case of flat roof to which access for use is provided, it shall be carried out upto a height of atleast one meter above the parapet or two meters measured vertically from the top of any windows or opening which may exist upto a horizontal distance of five meters from the vent pipe into such building and in no case shall be carried out to a height less than three meters.

72.7. Where ventilating pipes are carried in pipe shafts, the shafts, shall be of a minimum size of one meter. If the shafts are also used to give light and air to rooms, the ventilating pipes must be carried out to a horizontal distance at roof level not less than five meter from the site of the saft.

72.8. The connection between the main pipe and branch pipes shall be made by using branches and bends with access doors for cleaning.

72.9. The waste from lavatories, kitchens basins, sinks, baths and other floor traps shall be separatly connected to respective stacks of upper floors. The waste stack of lavatories shall be connected directly to main hole while the waste stack of other shall be separatly discharged over gully trap.

72.10. MODE OF MEASUREMENTS & PAYMENT :

72.11. The length of pipe shall be measured including all fittings along its length in running meters correct to a centimetre. No allowance shall be made for the portion of pipe length entered in the sockets of the adjacent pipe or fittings.

The rate include all labour and materials, tool and plant etc. required for satisfactory completion of this item.

DTS No. 73:-

Providing & Fixing P.V.C. pipes (SCH-80) of Prince/ Supreme/ Jain/ Astral/ Tulsi/Finolex make for water supply line at all floor levels incl. fixtures like bends, tees, shoe etc joined with resin of approved brand & manufacture etc. comp. Pipe shall be fixed on the wall the help of Z-clamp at every two meter C/C or shall be concealed as directed including necessary fittings etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of all materials.

- A) 15 mm Dia
- B) 25 mm Dia
- C) 40 mm Dia
- D) 50mm. dia.

The relevant specification of U-PVC pipes shall be followed for this item. The P.V.C. pipes shall be of SCH-40 of Prince, Supreme, Jain, Astral or Tulsi make for water supply of required diameter. All the fixtures like bend, tees, shoes etc shall be used for line and jointed with resin of approved brand.

The pipe line shall be fixed on the wall and floor as per detail. The joint shall be leak proof and the test shall be done with required pressure of water. The work shall be carried out as per detail and directed by engineer in charge. The rate shall be for a unit of R.mt.

DTS No. 75:-

Providing and fixing PVC SWR Nahni trap IS 14735 for drain - 75 mm diameter with jali of the following nominal diameter of self cleaning design with C.I. sread down or hinged grating including the cost of cutting and making good the walls.

MATERIALS

The P.V.C.nanhi trap shall conform to M-68-A.

WORKMANSHIP

The nanhi trap with 100 mm.dia. inlet and 50 mm.dia. outlet shall be fixed as per drawings or as directed. The nanhi trap shall be jointed with P.V.C.pipe, 75 mm.dia. with lead joints.

MODE OF MEASUREMENTS & PAYMENTS

The rate includes cost of all labour, materials, tools and plants etc. required for satisfactory completion of this item including jointing and testing.

The rate shall be for a unit of one number.

DTS No. 76:-

Providing & Fixing in position PVC Cowl vent to pipes of Prince/Supreme/Jain/Astral/Tulsi/Finolex make etc. Comp (A) 75 mm dia (B) 110 mm dia.

76.1.0 Workmanship :

Cowl vent diameter size and type shall be specified in the item. All cowl vent shall be fixed at location indicated on drawings or as directed by Engineer-in-charge. Cowl vent shall be secured to face of wall below all joints by M.s.clamps with wooden gutties.

76.2.0 Mode of measurement and payment :

The rate includes all labour materials tools and plants etc. required for satisfactory completion of this item. The rate shall be for a unit of one number.

DTS No. 77:-

Providing and fixing Z-clamp at all floor levels of approval design to C.I. S.C.I. or P.V.C. pipes including the cost of cutting holes and making good the wall etc. Complete - A) 40 to 50 mm dia. B) 75 to 90 mm dia. C) 110 mm dia. D) 150 mm to 200 mm dia.

77.1.0 Materials and Workmanship :-

The Z. clamps of approved design shall be for C.I. S.C.I. or P.V.C. pipes 40 to 50 mm dia. 75 to 90 mm dia. 110 mm dia. 150 mm to 200 mm dia.

The clamps shall consist of a cast iron base with a projecting Z shaped lay, teeth web of which the semi circular halves of the flat iron clamps are bolted. The base on the holder clamp shall be screwed on a pair of wooden plugs fixed in the wall with screw slotted driven through the holes in the base, The screws shall not be less than 75 mm. long for 80 mm. diameter pipes. The plugs shall be fixed in the wall to a depth of 150 mm in cement mortar 1:2 centrally to the holes in the base of the bat clamps and with their front face projecting to such a length from the brick face that when the clamps is fixed, the outer base of its base shall be flush with the plaster face of the wall. The plugs shall be 110 mm. x 50 mm. wide at take increasing to 160 mm. x 70 mm. width at rear and shall be 70 mm. deep through out.

77.2.0 Mode of measurement and payments:-

The Z clamp of M.S. Holder suitable for 35 mm. dia shall measured for finished item.

The rate includes cost of all materials etc. required for satisfactory completion of this item. The rate shall be for a unit of one number.

DTS No. 78:-

Providing erecting and fixing double coated Syntex or equivalent PVC (ISI) mark water tank of required capacity each with all necessary fittings & connection etc. complete on terrace.

MATERIAL :

The readymade water tank shall be of any approved manufacture like Syntex/Super/Reno PVC (ISI) mark product as approved by Engineer-in-charge.

WORKMANSHIP :

The water tank shall be approved and fixed as directed by Engineer-in-charge with all fitting and fixtures like over flow pipe, wash out pipe, inlet pipe etc. complete.

MODE OF MEASUREMENT AND PAYMENT :

The rate should cost of all materials labors, tools, plants etc. required to complete the item.

DTS No. 79:-

Providing and laying Ordinary C.C. 1:1.5:3 Mix for R.C.C. work including boxing centering, vibrating, curing and mixed with approved water proofing cement compound or "CEMWET" or "PIDICRETE LW" integral water proofing add mixture as water proofing agent to be mixed with 50 kgs. cement bags shall be as recommended by the manufacture of the water proofing material, concrete work for top, bottom slab and side pardi for underground tank and item inclusive necessary excavation and refilling the available earth, 15 cm th C.C. 1:4:8 for bedding conc., half B.M. in C.M. 1:4 outside wall, inside pardi as per design, 10 mm th water proofing cement plaster in C.M. 1:3 with smooth finishing, watering etc. comp. to all inner face of tank curing etc. comp. incl. Heavy Duty PVC steps, outlet, inlet, over flow and wash out pipe arrangement as necessary with M.S. Cover of 25 Kgs. with locking arrangement fixing glazed tiles of approved make such as Asian, Euro, Cera, Kajaria, Jhonson, Nitco, Somani, Bell make of commercial quality of approved colour and size to sides and bottom of water tank excluding free board of 20 cm etc. as per structural drawing excl. steel and as directed by Engr. in charge. Under Ground water Tank

79.1.0 Workmanship :-

Item includes necessary excavation and refilling with available excavated earth, 15 C.M. thick C.C. 1:4:8 for bedding concrete, 10 mm. thick water proofing cement plaster in C.M. 1:3 with smooth finishing watering etc. complete to all inner face of tank

Finishing coat of C.M.1:1 on outer surface top of tank, Curing etc. comp. including looking arrangement, outlet, inlet, overflow and washout pipe arrangement as necessary with free board 0.20 mt. etc. comp. as per structural drawing and as directed by Engineer-in-charge etc. comp. For under ground water tank and over head water tank.

providing and fixing glazed tiles 6mm th. of Cera, Euro, Asian, Kajaria, Johnson, Nitco, Somani, Bell make or equivalent make of commercial quality of approved shade to sides and bottom of tank etc complete Approved water proofing cement compound or "CEMWET" or "PIDICRETE LW" integral water proofing admixture as water proofing agent to be mixed with 50kg cement bag shall be as recommended by the manufacture of the water proofing material.

79.2.0 Material :

Water shall conform to M-1. Cement shall conform to M-3. Graded stone aggregates 20 & 40 mm nominal size shall conform to M-12, sand shall conform to M-6, Grit shall conform to M-8. The shuttering to be provided shall be of ordinary timber add shall conform to M-26, cold twisted steel bars (High yield strength deformed steel bars shall conform to M-19. Cement mortar shall conform to M-11. G.I. pipe shall conform to M-56. Mild steel binding wire shall conform to M-21.

General :

The item covers constructing R.C.C., under ground or overhead water tank as detailed specified in the item.

Workmanship :

The relevant specification shall be followed for excavation work except that work shall be carried out for under ground water tank.

The relevant specification shall be followed for 15 cm thick bedding concrete work. Except that the proportion shall be 1:4:8 for under ground water tank.

The relevant specification shall be followed for R.C.C.work. Except that works shall be carried out for water tank in Design Mix M-20 concrete as per IS 456:2000 (latest version) including boxing centering, vibrating curing and mixed with approved water proofing cement compound or CEMWET as water proofing agent to be mixed with 50 Kgs. bags shall be used recommended by the manufactures of the water proofing materials. Concrete work for top, bottom slab and side pardi for under ground and over head water tank.

The relevant specification shall be followed for TMT/CRS/M.S.bars steel reinforcement for underground and overhead water tank R.C.C.work.

The relevant specification shall be followed for 10 mm thick cement plaster in proportion 1:2 except that works shall be carried out for water tank including mixing with approved water proofing cement compound for all inner surface or water tank.

The relevant specification shall be followed for 20 mm thick sand face cement plaster consisting base coat of 12 mm thick in C.M. 1:3 and 8 mm thick finishing coat of 1:1 on outer surface of tank. Except that the work shall be carried out for water tank.

The relevant specification shall be followed for outlet, wash out and over flow pipe as directed by Engineer-in-charge. Looking arrangement or water tank shall be provided as directed by Engineer-in-Charge.

79.3.0 Mode of measurement and payment :

The rate includes cost of all labours, materials tools and plants etc.required to satisfactory completion of this item as specified in detailed. Item also includes providing and laying white commercial glazed tiles to bottom and sides of underground water tank as instruction of Engineer-in-charge.

The rate shall be for a unit of one litre excluding free board of 20 cm. height.

DTS No. 81:-

Providing and fixing C.I. manhole cover 0.60 x 0.45 m. size having weight not less than 35 Kg. etc. comp.

81.1.0 Materials :

C. I. manhole cover 0.60 x 0.45 mts. size shall be of best quality. The weight of C. I. cover and frame shall not be less 35 Kg. The C.I. manhole cover shall be of light duty.

81.2.0 Workmanship :

The C.I. manhole cover shall be fixed as and where directed. The frame of manhole cover shall be embedded firmly in R.C.C. slab. After completion of work, manhole covers shall be sealed by means of thick grease.

81.3.0 Mode of Measurement and payment :

The rate includes cost of all labour and materials required for satisfactory completion of this item.
The rate shall be for a unit of one number.

DTS No. 82:-

(A) Providing and laying water proofing treatment to vertical and horizontal surfaces of depressed portions of W.C., kitchen and the like consisting of :

(a) I course of applying cement slurry @ 4.4 kg/sqm mixed with water proofing compound conforming to IS : 2645 in recommended proportions.

(b) II course of a layer of plaster in C.M. 1:3 with water proofing compound conforming to IS:2645 about 25 mm. th' in the floor of the depression & about 18mm th' On the side walls of the depression up to the floor level, water proofing plaster about 18 mm. th' be continued on the walls above the floor level for a height of 600 mm. with surface suitable to receive further treatment

(c) Finishing top with stone aggregate 10mm to 12mm nominal size spreading @0.008 C.M./S.M., thoroughly embedad in plaster layer.

as per specifications & instructions of Engineer in charge (Cement consumption 0.316 Bags / S.M.)

NOTE :- (1) The whole work is to be executed through specialized agency with a guarantee of 10 (Ten) years given on a prescribed proforma duly stamped (2) The rate shall include for work at all floors & conducting water proof test as directed. (M.R.)

Details specification same as per Item and as instruction by Engineer-in-charge.

The rate shall be for a unit of one Sq.Meter.

DTS No. 83:-

Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces, horizontal and vertical surface of depressed portion of W.C., bath etc.consisting of following operations.

(A) Providing and laying water proofing treatment to vertical and horizontal surface of depressed portion of W.C. kitchen and like consisting of (a) I Course of applying cement slurry @ 4.4 Kg./Sq.m. mixed with water proofing compound like S.B.R., (Styrene Butadine Rubber) like confirming to IS:2645 in recommended proportions. (b) II Course of 20 mm cement plaster 1:3 mixed with water proofing compound in recommended proportion.

(B) Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces, horizontal and vertical surface of depressed portion of W.C., bath etc. consisting of following operations. (a) applying and grouting a slurry coat of neat cement using 2.75 kg/sq.mt. of cement admixed with proportionate water proofing compound conforming to IS:2645 over the R. C.C. slab including cleaning the surface before treatment . (b) Laying cement concrete using broken bricks/brick bats 25 mm to 100mm size with 50% of cement mortar 1:5(1 Cement :5 Coarse sand) admixed with proportionate water cement mortar of mix 1:5 (1 Cement :5 Coarse sand) admixed with proportionate water proofing compound conforming to IS: 2645 to required slope and treating similarly the adjoining walls upto 300mm height including of junctions of walls and slabs.

(C) After two days of proper curing, applying a second coat of cement slurry admixed with proportionate water proofing compound conforming to IS: 2645 and finally finishing the surface with trowel with neat cement slurry and

making of (300x300) mm square. (e) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the engineer –in-charge. With average thickness of 120 mm and minimum thickness at khurra as 65mm.

(1) The whole work is to be executed through specialized agency with a guarantee of 10 years given no a prescribed Performa duly stamped.

(2) The rate shall include for work at all floors and conducting water proof test as directed.

MODE OF MEASUREMENT AND PAYMENT :

Rate including cost of all materials labors, tools, plants etc. required to complete the item.

Horizontal plan area of horizontal surfaces with side adjoining walls upto 300 mm height including of junctions of walls and slabs

Vertical surface area shall be actual work carried out at site. The rate shall be for a unit of one sq. mt.

DTS No. 84:-

Providing and laying broken chine mosaic using 12mm to 20 mm thick broken piece of glazed tiles laid over C.M. 1:3 (1 cement : 3 sand) or L.M. 1:1.5 (1 Lime putty : 1.5 sand) jointed with neat cement slurry with pigments to match the shade of the tiles.

84.1.0 Materials :

Water shall conform to M-1 cement shall conform to M-3. Lime Mortar shall conform to M-10. Cement mortar shall conform to M-11. The precast tiles of 20 mm. thick shall be of conform to M-46.

84.2.0 Workmanhship :

84.2.1 The work shall be carried out as per I.S.1443-1972.

84.2.1 Bedding :

Before spreading the mortar, the sub-base of the floor shall ne cleaned of all dirt,scum and loose materials and then well wetted without fomring any pools of water on the surface.

In case of R.C.C.floors,the top shall be left a little rough, all points,of level for the finished surface shall be marked out. The lime water of proportion 1:3 (1 cement :3 coarse sand) jointed with neat cement slurry mixed with pigment to match the shade of the tiles as directed shall be then evenly and smoothly spread over the base. Bedding layer or mortar shall be not less than 10 mm and average thickness of bedding shall be 25 mm.

84.2.2 Laying :

Before laying the broken chine mosaic tiles, the tiles shall be thoroughly wetted with water. Neat cement grout of required consistency at 4.4 kg.cement/sq.mt.shall be spread on the mortar bed. The broken tiles shall be laid on the neat cement float and shall be evenly and firmly bedded to the required level and slops. There shall be no hollows left. The joints shall be of uniform thickness and in straight line as per the pattern.

The surface of flooring shall be checked frequently with a straight edge at-least two metres long so as to obtain a true surface with required slope.

The broken tiles which are fixed in the adjoining the wall shall go about 10 mm under plaster. Skirting or dedo shall be left unfinished for about 50 mm above finished floor level and unfinished strip then left earlier shall be finished.

In places where full tiles can not be fixed.The tiles shall be cut to the size and smoothened at edges to give straight and true joints.

After the tiles have been laid, the surplus cement slurry and the joints shall be cleaned and washed fairly deep before cement hardens.

The day after tiles have been laid, the joints shall be cleaned of every cement grout with a wire brush to a depth of about 5 mm and then grouted with white cement with or without pigment to match the shade of the topping of tiler.

84.2.4 Curing :

The flooring shall be kept wet with damp sand or water for seven days. It shall be kept undisturbed at least for 14 days. The grinding shall normally be commenced after 14 days.

84.2.5 Polishing :

After the tiles are properly cured, first grinding shall be done with carborundum stone of 48 to 60 grade grit fitted in machine. Water shall be properly used during grinding. When the chips show up and the floor has been uniformly rubbed, it shall be cleaned with water, baring all pin holes. It shall then be covered with a thin coat of white cement mixed with or without pigments to match the colour of the topping of the tiles. Pin holes if any shall thus be filled. This grout shall be kept moist for a week. Thereafter second grinding shall be started with carborundum of 120 grit. Grouting and curing shall follow again. Final grinding shall be done when other works are finished. The machine shall be fitted with carborundum of grit 220 to 350 using water in abundance. The floor shall then be washed clean with water. Oxalic acid powder shall then be dusted at 33 grams per square metre on the surface and the surface rubbed with machine fitted with hessian bobs or rubbed hard with pad of wooden rags. The floor shall then be washed clean and dried with a soft cloth or Linen. The finished floor shall not sound hollow when tapped with a mallet.

If any tile is disturbed or damaged it shall be refitted or replaced properly jointed and polished.

Testing of the tiles shall be carried out by the contractor at his own cost as per I.S. requirement for required tests.

84.3.0 Mode of Measurements and payment :

- The broken chine mosaic tiles flooring shall be measured in Sq. metre for visible area of work done.
- No deductions shall be made nor extra paid for any opening in the floor area upto 0.1 Sq. mt.
- The rate shall include the cost of all materials, labour involved in all the operations as described above.
- The rate shall be for a unit of one sq. metre.

DTS No. 85:-

Providing and fixing 600 mm x 450 mm. bevelled edge mirror of superior glass mounted on 6 mm thick A.C. Sheet or plywood sheet and fixed to wooden plugs with C.P. brass screws and washers etc. complete.

85.1.0 MATERIALS :

The 600 mm x 450 mm size mirror shall be of superior glass with edge rounded off or bevelled as specified. It shall be free from flaws specks, or bubbles and its thickness shall not be less than 6 mm. The glass for the mirror shall be uniformly silver plated at the back and shall be free from silvering defects, silvering shall have a protective uniform covering of red lead paint. The 6 mm. thick plywood shall conform to M-37. The 6 mm. thick A.C. Sheets shall conform to M-24.

85.2.0 WORKMANSHIP :

The mirror of 500 mm x 450 mm size mounted on A. C. Sheet or plywood 6 mm thick with C.P. brass clips shall be fixed as directed by fixing wooden plugs in wall and C.P. brass screws and washers, The work shall be carried out in best workman like manner.

85.3.0 MODE OF MEASUREMENT AND PAYMENT :

The rate includes cost of labour and materials tools and plant etc. required for satisfactory completion of this item. The rate shall be for a unit of one number.

DTS No. 86:-

Providing and filling in depressions of Bath and W.C. at all floor levels, after completing plumbing work of pans, pipes, traps etc., with cinder or fly ash as directed by Engineer in charge etc. comp.

86.1.0 Material :

Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Brick bat shall conform to M-14, Water proofing compound shall be "CEMWET" or shall conform to I.S. 9103- 1979. Mortar shall conform to M-11.

86.2.0 Workmanship :

86.2.1 General :

Before starting the operation of concreting the surface of base shall be well cleaned.

86.2.2 Proportion of Mix and Mixing :

The proportion of cement,sand, aggregate and water proofing power shall be as specified in the item of the work.

The concrete shall be hand mixed over smooth watertight platform, large enough to allow efficient turning over the ingredients of concrete before and after adding water. Platform shall be so arranged that no foreign material get mixed with concrete nor does mixing flow out. Dry coarse and fine aggregate, cement shall water proofing compound shall then be mixed thoroughly by turning over to get a mixture of uniform colour.

Specified quantity of water shall then be added gradually through a rose can and the mass turned over till a mix of required consistency is obtained.

86.2.3 Laying and compacting :

Concrete shall always be used while quite fresh,it shall be laid (not thrown) in layers not exceeding 150 mm in thickness and shall be well and quickly rammed with wooden or iron rammers till the required compaction is achieved. The concrete laid shall not be of too fluid consistency.After it has been mixed,no more water shall be added, but the surface during and after compaction shall be kept damp. In laying consecutive layers, the layer cast shall be well watered and made rough before the upper layer is laid. The concrete shall be kept continuously wet for a period of seven (7) days from the date of placing or until it is built over which ever is more.

86.3.0 Mode of measurements and payment :

The rate shall include the cost of all materials, tools, and labour involved in all the operation described above.

Concrete work shall be measured in length,breadth,and depth as specified on drawing or as directed correct upto nearest CM and cubical content shall be worked out up to two places of decimals.

The rate shall be for a unit of one cubic metre.

DTS No. 87:-

Providing & laying cement concrete 1:2:4 (1 cement:2 sand:4 graded stone agg. 20 mm nominal size)& curing comp. Includ.cost of form work but exclu. Cost of reinforcement for reinforced concrete work in AUGER

(A) Foundation, footing, Base of columns and Mass concrete.

[B] Columns: [i] Having cross sectional area 0.05 to 0.08 sq.mt. [ii] Having cross sectional area more than 0.08 sq.mt. and upto 0.12 sq.mt. [iii] Having cross sectional area more than 0.12 sq.mt. and upto 0.18 sq.mt.

[C] Beams : [i] Having cross sectional area 0.05 to 0.08 sq. meter. [ii] Having cross sectional area more than 0.08 sq.mt. upto 0.12 sq.meter. [iii] Having cross sectional area more than 0.12 sq.mt. and upto 0.18 sq. mt.

[D] Slabs: [i] Slabs upto 8 cms.thickness [ii] Slabs having more than 8 cms. and upto 10 cms.thickness [iii] Slabs having more than 10 cms. and upto 13 cms. thickness [iv] Slab having more than 13 cms and upto 15 cms.thickness

[E] Lintels: [F] chhajas etc.comp.

Details specification as per DTS No. 7 but read 1:2:4 instead of 1:1.5:3 and as directed by Engineer-inc-ahrge.

The concrete shall be measured for its length breadth and depth, limiting dimensions to those specified on plan or as directed. The rate shall be for a unit of one cubic meter.

DTS No. 92:-

Providing & laying cement concrete Pavement using 1:2:4 (1 cement: 2 sand: 4 graded stone agg. 20 mm nominal size) & Vacuum Dewatering technique including floating surface with a skim powder floater, curing etc. complete.

The whole work to be carried out by a specialized agency approved by Consultant/Engineer In Charge and shall be guaranteed fully effective. Notwithstanding, the responsibility of the effectiveness of the work should be fully, entirely be that of the main contractor for the contract.

Concrete Materials:

- (A) 12mm and downgraded crushed metal of black trap stone as coarse aggregate.
- (B) Fine sand as fine aggregates.
- (C) Cement Concrete Mix:
 - (A) 1:2:4 (Cement: Sand: Coarse aggregates) in volumetric proportions.
 - (B) The concrete shall have the plastic consistency of K2/K3, slump between 8 to 12cms.

Sub base: -

The sub base shall be sufficiently strong, well compacted.

Process of Work:

- 1) Before placing concrete on the sub base, waterproof paper shall be laid on the sub base act as a separation layer for protection against humidity and water.
- 2) Concrete of mix and consistency as mentioned above shall then be laid on the paper in base of not more than 20 mts x 20 mts by providing ISMC 150 channels well secured to withstand the vibrations of a vibrator. The thickness of the concrete so laid shall be 10cms.

PLANNING OF PLACING

The Contractors shall submit for review shop drawings for floor slabs detailing the location of all construction joints and the sequence of the slab placement, and manufacturer's literature describing the equipment to be used. In addition to the shop drawings, the Contractor shall indicate the quantity of each piece of dewatering equipment that will be located at the construction site and shall include the dimensions of all suction mats.

Before concreting is started the work should be planned with a view to determine areas to be placed daily, the required amount of equipment, size of vacuum mats, length of vacuum hoses, arrangement of rails, if any, or screeds etc. Crew required for the vacuum process is two men to handle the mats and the pump. Note that placing, vibration, vacuum treatment and floating follow immediately behind each other.

GENERAL :- The work shall be planned and executed so that there is no delay between the placement, screeding, dewatering and floating of the concrete. Concrete to be vacuum dewatered shall be handed and placed so as to prevent segregation. The concrete shall be internally vibrated prior to screeding.

LEVELLING:- Immediately following placement, the concrete shall be leveled with a vibrating screed running on a true surface, set at the proper elevation required to provide the specified finished elevation. The concrete surface shall be screeded high by 2% of the slab's thickness to compensate for the compaction caused by the vacuum dewatering process. (Slabs to have an aggregate hardener shall have compensation made to maintain elevation). The vibrating screed shall be moved forward as rapidly as proper consolidation allows. The proper surcharge of concrete must be maintained in front of the leading edge of the screed.

Vacuum: -Immediately after leveling, the concrete shall be covered with filter pads and suctions mats in strict accordance with the recommendation of the manufacturer to have the slab fully dewatered. The suction mat shall extend 100mm beyond the edge of the filter pad on all sides. The pads shall extend to within 100mm of the edge of concrete slab, and the mats shall cover entire slab. Before connecting the hose on the suction mat to the vacuum pump, the edges of the mat shall be smoothed to enable an airtight seal to be created. A vacuum pump, the edges of the mat shall be smoothed to enable an airtight seal to be created. A vacuum shall then be applied to the mat. After a minute the gauge on the vacuum pump should indicate a minimum vacuum of 0.700 atmospheres (500mm/Hg) and if not, the mat must be checked for leakage. For concrete that dewaterers readily the vacuum should then be maintained at 0.70-0.80 atmospheres (500/600mm/Hg) for concrete which dewaterers less efficiently the vacuum shall then be reduced to 0.50-0.60 atmospheres 300-400m/Hg). After approximately 10 minutes the vacuum can then be increased to 0.80 atmospheres.

The vacuum shall be maintained for at least 1 minute per cm fied, sufficient moisture shall be maintained to meet manufacturer's requirements). The suction mats and filter pads shall then be removed and moved to the next section in a leapfrog manner.

Stop the vacuum dewatering when light footprints only are left in the concrete when stepped upon.

FLOATING

Upon removal of the suction mats and filter pad the concrete surface shall be power-floated without delay until all imprints from the vacuum process are removed. If crusting occurs, the floating operation must be delayed till the concrete carries the machine.

The higher speed is recommended for the floating operation. Two passes with the floating disc should be made in the junction of two mats in order to avoid risk for cracking.

FINISHING

The waiting time after the floating operation depends on concrete temperature and humidity and various from 10 minutes to 2 hours.

The trowelling operation cannot take place before the concrete has hardened enough to carry the machine; i.e. the trowelling blades will not leave any marks on the concrete. Repeated trowelling, with intervals between the passes which are adapted to the setting of the concrete, greatly improves the surface characteristics. The surface will be more wear-resistant and less dusty.

At least two passes are recommended for floors which are not to be covered.

CURING

Vacuum dewatered concrete should be cured like any other quality concrete in order to achieve a good final result. Use ponding or wet burlap.

Equipment specifications

Poker/Needle Vibrators: Vibrators with more than 12500 vibrations/minute with drive length exceeding Bay width by atleast 1 mtr. Shall be used.

Surface Vibrators:

Double beam Surface Vibrator with beam spacing of 300 mm., Beam Height of 100 mm. with Weight not exceeding 15 kg. / Running Meter, Profile: Hollow to avoid loss of vibrations with vibrator unit of 2360 vibrations/min. having adjustable fly weight torque from 1.5 to 5.0 kg. /cm. and adjustable centrifugal force from 1350 to 4600 N. The Surface Vibrator will be equipped with suitable arrangement to remove sagging due to self weight and usage related stress fatigue. The surface vibrator will have a travel speed of about 1 Rmt/min.

3 Vacuum Pump: The Vacuum Pump shall have a Priming tank with Separate suction and discharge compartment, having special filter arrangements to avoid entry of dirt in the pump body, The pump should run at > 280 RPM and produce vacuum upto 600 mm/Hg (-0.70 Atmospheres) An appropriate gauge should be provided to indicate the level of vacuum achieved. A valve to adjust the vacuum will be provided on the vacuum pump to control the vacuum created. The suction and discharge hoses should be provided with leak proof couplings and should be capable to withstand the pressure. The suction hose should also be provided with a valve to prevent backflow of water. The pump shall be capable to dewater concrete surface area of 24 m² with single connection and 48-m² max. with double connection without any extra modification. The pump unit shall be mounted on a trolley for ease in shifting during the course of work and should be less than 150 kg. in weight (DRY) for easy handling and operation.

4 The suction Mat-Top Cover should be made of calendared PVC/PE Sheet Reinforced with Nylon/PP/LDPE fibers for withstanding the Pressures and provide flexibility for effective sealing to allow for proper vacuum creation. For a mat size of 24 m² the centrally Provided Suction net area shall be minimum 0.5m² to evenly distribute the vacuum. This suction net area shall have suitable openings for effective vacuum and will have a set of Nylon wire mesh to create sufficient cross sectional area for water to flow through. The suction pipe fitted on top cover should be fixed with appropriate gaskets to avoid any leakage.

5 The filter pads should be made from Calendared Plastic Sheets with non-collapsible distance cushions to allow sufficient cross sectional area for effective flow of water. The filter pads shall have markings to indicate overlap distances for ease in usage by labour/operators handling the same.

6 The finishing Equipment - Skim floaters should not exceed 100 kg/m² weight, so as to avoid disturbing the freshly laid - dewatered concrete. The machines shall have 2 speeds to regulate the level and quality of finish. The machine should be capable of doing both functions floating and trowelling for faster output and ease of operation. The floating disc will have a gentle curvature and oscillating motion to achieve better level control and effectively seal

the capillary pores of dewatered concrete. The machine should be capable of after grinding hydrated cement to result in improved wear resistance. The trowelling blades should be adjustable in tilt to increase or decrease the contact area of the trailing edge to achieve the desired finish and better abrasion resistance. The machine handles shall be at least 2 mtrs. in length with arrangements to increase or decrease the height for ease in operation and to allow to reach the concrete surfaces with minimum stepping upon concrete surface.

Quality Control & Testing:

1 Side Form: Side form shall be rigid enough to ensure that it does not Bulge/Collapse during the concreting. The top edge - level guide shall be straight to achieve final floors in the level tolerance of + 6mm per 4 meters on Transverse or linear directions.

2 Equipment: The equipment shall be as per equipment manufacturers specifications of Aquarius "Tremix" make or equivalent and shall be in proper working condition. The Authority will have a right to get the same inspected and certified through the manufacturer at any time during the course of work for its performance and genuinity, any cost towards such inspection/certification will be borne by the contractor

3 The concrete after vacuum dewatering and finishing shall give a minimum increase of 25% in compressive strength - vis a vis to reference concrete and a minimum 50% increase in abrasion resistance vis-a-vis to reference concrete. This may be either checked by cast in situ cubes or by cores taken after 7-14 & 28 days. Depending upon the total volume of work suitable quantities of samples shall be taken and checked. The testing should be a mandatory requirement as the cost paid towards equipment application is solely for the purpose of improved quality. Contractors at their expenses will do the entire arrangements for such sampling & testing.

Special Terms & Conditions;

1 The equipment will be Aquarius "Tremix" make or equivalent as per equipment specifications and performance. The Authorities will have the right to get the same inspected and certified through approved certification Agency and the costs of such inspections Certifications will be borne by the Contractor. Any defects found by the Certification Agency will be rectified immediately without which any further work execution will not be allowed. The costs of such rectifications will be borne by the contractor.

2 Test panel before start of work shall be executed by the Contractor at his own costs and only after satisfactory 7 day results the actual work will be started in case of test panel results not being satisfactory one more chance will be provided before rejection of work / agency.

3 All test samples for the test panel and actual work - either by way cast in situ cubes or cores will be tested by approved testing authorities only and the costs for such tests will be borne by the contractor.

4 The necessary arrangements for test samples such as sufficient quantities of cube moulds / core drills etc. etc. will be arranged for by the contractor at his own costs.

5 The Engineer-in-Charge of site will have the right to demand samples from any working day's concrete at any time and the same will be provided by the Contractor immediately at his own cost.

MODE OF MEASURE AND PAYMENT:

The Rate shall be for a unit of one cubic meter.

DTS No. 101:-

Providing & laying Granular sub base (GSB) confirming to Grading-II of Table 400.0 of compacted thick of 150mm with specified graded stone metal and sand mixed in place and laid with mechanical means spreading with motor grader and compacting with vibratory roller having minimum 80-100 KN static weight to acheve desired density of 98% of MDD including all material, labour, machinery with all leads and lift etc. complete.

101.1.0 SCOPE:

The work shall consist of laying and compacting well-graded material on prepared subgrade in accordance with the requirements of these Specificatins. The material shall be laid in one or more layers as sub-base or lower sub-base and upper sub-base (termed as sub-base hereinafter) as necessary according to lines, grades and cross-sections shown on the drawings or as directed by Engineer-in-charge.

101.2.0 MATERIALS:

The material to be used for the work shall be natural sand, murrum, gravel, crushed stone, or combination thereof depending upon the grading required. Materials like crushed slug, crushed concrete, brick metal and kankar may be allowed only with the specific approval of the Engineer. The material shall be free from organic or other deleterious constituents and conform to one of the three gradings given in Table 400-1.

While the grading in Table 400-1 are in respect of close-graded granular sub-base materials, one each for maximum particle size of 75 mm, 53 mm and 26.5 mm, the corresponding gradings for the coarse graded materials for each of the three maximum particle sizes are given at Table 400-2. The grading to be adopted for a project shall be as specified in the Contract.

Physical requirements: The material shall have a 10 percent fines value of 50 kN or more (for sample in soaked condition) when tested in compliance with BS:812 (Part-III). The water absorption value of the coarse aggregate shall be determined as per IS:2386 (Part-3); if this value is greater than 2 percent, the soundness test shall be carried out on the material delivered to site as per IS:383. For Grading-II and III materials, the CBR shall be determined at the density and moisture content likely to be developed in equilibrium conditions which shall be taken as being the density relating to a uniform air voids content of 5 percent.

TABLE 400-1 GRADING FOR CLOSE GRADED GRANULAR SUB-BASE MATERIALS

US. Sieve Designation Grading-I	Percent by weight passing the IS sieve		
	Grading-I	Grading-II	Grading-III
75.0 mm	100	--	--
53.0 mm	80-100	100	--
26.5 mm	55-90	70-100	100
9.50 mm	35-65	50-80	65-95
4.75 mm	25-55	40-65	50-80
2.36 mm	20-40	30-50	40-65
0.425 mm	10-25	15-25	20-35
0.075 mm	3-10	3-10	3-10
CBR Value (Minimum)	30	25	20

TABLE 400-2 GRADING FOR COARSE GRADED GRANULAR SUB-BASE MATERIALS

US. Sieve Designation Grading-I	Percent by weight passing the IS sieve		
	Grading-I	Grading-II	Grading-III
75.0 mm	100	--	--
53.0 mm	--	100	--
26.5 mm	55-75	50-80	100
9.50 mm			
4.75 mm	10-30	15-30	25-45
2.36 mm			
0.425 mm			
0.075 mm	<10	<10	<10
CBR Value (Minimum)	30	25	20

Note:- The material passing 425 micron (0.425 mm) sieve for all the three gradings when tested according to IS:2720 (Part-5) shall have liquid limit and plasticity index not more than 25 and 6 percent respectively.

101.3.0 STRENGTH OF SUB-BASE:

It shall be ensured prior to actual execution that the material to be used in the sub-base satisfies the requirements of CBR and other physical requirements when compacted and finished.

When directed by the Engineer, this shall be verified by performing CBR tests in the laboratory as required on specimens remoulded at field dry density and moisture content and any other tests for the "quality" of materials, as may be necessary.

CONSTRUCTION OPERATIONS:

Preparation of subgrade: Immediately prior to the laying of sub-base, the subgrade already finished to Clause 301 or 305 as applicable shall be prepared by removing all vegetation and other extraneous matter, lightly sprinkled with water if necessary and rolled with two passes of 80-100 kN smooth wheeled roller.

Spreading and compacting: The sub-base material of grading specified in the Contract shall be spread on the prepared subgrade with the help of a motor grader of adequate capacity, its blade having hydraulic controls suitable for initial adjustment and for maintaining the required slope and grade during the operation or other means approved by the Engineer-in-charge.

When the sub-base material consists of combination of materials mentioned in Clause 401.2.1, mixing shall be done mechanically by the mix-in-place method.

Manual mixing shall be permitted only where the width of laying is not adequate for mechanical operations, as in small sized jobs. The equipment used for mix-in-place construction shall be a rotavator or similar approved equipment capable of mixing the material to the desired degree. If so desired by the Engineer, trial runs with the equipment shall be carried out to establish its suitability for the work.

Moisture content of the loose material shall be checked in accordance with IS:2720 (Part-2) and suitably adjusted by sprinkling additional water from a truck mounted or trailer mounted water tank and suitable for applying water uniformly and at controlled quantities to variable widths of surface or other means approved by the Engineer so that at the time of compaction, it is from 1 percent above to 2 percent below the adding water, due allowance shall be made for evaporation losses. After water has been added, the material shall be processed by mechanical or other approved means like disc harrows, rotavators until the layer is uniformly wet.

Immediately thereafter, rolling shall start. If the thickness of the compacted layer does not exceed 100 mm, a smooth wheeled roller of 80 to 100 kN weight may be used. For a compacted single layer upto 225 mm the compaction shall be done with the help of a vibratory roller of minimum 80 to 100 kN static weight with plain drum or pad foot-drum or heavy pneumatic tyred roller of minimum 200 to 300 kN weight having a minimum tyre pressure of 0.7 MN/Sq.m. or equivalent capacity roller capable of achieving the required compaction. Rolling shall commence at the lower edge and proceed towards the upper edge longitudinally for portions having unidirectional crossfall and super-elevation and shall commence at the edge and progress towards the centre for portions having crossfall on the both sides.

Each pass of the roller shall uniformly overlap not less than one third of the track made in the preceding pass. During rolling, the grade and crossfall (camber) shall be checked and any high spots or depressions, which become apparent, corrected by removing or adding fresh material. The speed of the roller shall not exceed 5 km per hour.

Rolling shall be continued till the density achieved is at least 98 percent of the maximum dry density for the material determined as per IS:2720 (Part-8). The surface of any layer of material on completion of compaction shall be well closed, free from movement under compaction equipment and from compaction planes, ridges, cracks or loose material. All loose, segregated or otherwise defective means shall be made good to the full thickness of layer and re-compacted.

101.5.0 SURFACE FINISH AND QUALITY CONTROL OF WORK:

The surface finish of construction shall conform to the requirements of clause-902.

Control on the quality of materials and works shall be exercised by the Engineer in accordance with section 900.

101.6.0 ARRANGEMENTS FOR TRAFFIC:

During the period of construction arrangement of traffic shall be maintained in accordance with Clause- 112.

101.7.0 MEASUREMENTS FOR PAYMENT:

Granular sub-base shall be measured as finished work in position in cubic metres.

The protection of edges of granular sub-base extended over the full formation as shown in the drawing shall be considered incidental to the work of providing granular sub-base and as such no extra payment shall be made for the same.

101.8.0 RATE:

The contract unit rate for granular sub-base shall be payment in full for carrying out the required operations including full compensation for:

- (i) making arrangements for traffic to Clause-112 except for initial treatment to verges, shoulders and construction of diversions;
- (ii) furnishing all materials to be incorporated in the work including all royalties, fees, rents where necessary and all leads and lifts;
- (iii) all labour, tools, equipments and incidentals to complete the work to the specifications;
- (iv) carrying out the work in part widths of road where directed; and carrying out the required tests for quality control.

DTS No. 102:-

Providing and laying 200 micron plastic sheet on prepared sub base for V.D.S. concrete.

As this item is self Explanatory, it is carried out as directed as per engineer in-charge.

EXECUTIVE ENGINEER,
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION

SIGNATURE OF THE CONTRACTOR.

SPECIFICATION FOR ELECTRICAL INSTALLATION WORK

SUPPLY :

The supply mains will be brought in at places marked drawing and will be 3 Phase 50, cycles, 4 wires system 415 volts between phase and 230 volts between phase and neutral.

SAMPLES :

The Contractor shall submit to the Engineer-in-charge for approval samples of accessories and apparatus they (the contractor) propose to use for the installation.

The tenderer shall submit a list of important contracts carried out by them to the Engineer-in-charge.

DRAWINGS :

Samples to be submitted by the contractor and this specifications shall not be departed from without the instructions of the Engineer-in-charge in writing. No approval given by the Engineer-in-charge approval to any drawings or samples submitted by the contractor shall in any way exonerate the contractor from his liability out the work in accordance with the terms of this contract.

SUPERVISION :

The whole of the work, shall be carried out to the satisfaction of the Municipal Engineer and under the constant supervision of the contractor's competent qualified and experience Electrical Engineer. The contractor shall if require, furnish the full details of the Engineer's qualification.

EXECUTIVE ENGINEER,
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION,

SIGNATURE OF THE CONTRACTOR.

PART-A STANDARD SPECIFICATION FOR INTERNAL WIRING

1. Scope:

This section covers, definition of point wiring, system of wiring and supply, installation, connection, testing and commissioning of point wiring for light points, ceiling fan points, exhaust fan points, convenience socket outlet points, power socket outlet points, bell outlet points etc. Including fixing of light fixtures, ceiling fan, exhaust fan, wall fan, bell etc

2. Material specification & workmanship

2.1. Standards

Code of practice for electrical wiring installation system voltage not exceeding 650: IS: 732

Code of practice for fire safety of buildings general) electrical installation: IS: 1646

Rigid steel conduits for electrical wiring : IS: 1653

Fittings for rigid steel conduits for electrical : IS: 2667

Flexible steel conduit for electrical wiring : IS: 3480

Accessories for rigid steel conduits for : IS: 3837

PVC insulated cables (wires) : IS: 694

Rigid non-metallic conduits for electrical wiring : IS: 2509

Flexible (playable) non-metallic conduits for : IS: 6946

Three pin plugs and sockets : IS: 1293

Conductors for insulated electrical cables and : IS: 8180

Specification for conduit for electrical installation : IS: 9537--1980

Accessories for non-metallic conduits for electrical wiring : IS: 3419

Switches : IS: 3854

Plugs : IS: 6538

Shunt capacitors for power systems : IS: 2834-1954

HRC cartridge fuses and links up to 660 volts : IS: 2208

General and safety requirement for lighting fittings : IS: 1913-1969

Code of practice for lighting public thorough fares : IS: 2944-1981

3 pin plug sockets : IS -1293

Specification of conduits for electrical installation : IS -8130

Guide for electrical layout in residential building Indian electricity act and rules: IS-4648

3. Rigid and flexible conduits:

3.1. All conduits shall be rigid PVC pipe having minimum wall thickness of medium gauge 1.5 to 1.8 approved by fia. &is and shall confirm to is 9537.

3.1.1. Up to 38 mm. Diameter - minimum 1.8 mm. Wall thickness.

3.1.2. Above 40 mm. Diameter - minimum 2.2 mm. Wall thickness.

3.1.3. 20, 25, and 32 mm diameter- minium1.5 mm wall thickness

3.1.4. Flexible conduits shall be formed from a continuous length of spirally wound interlocked steel strip with a fused zinc coating on both sides. The conduit shall be terminated in brass adapters.

3.1.5. Accessories:

3.1.6. PVC conduit fittings such as bends, elbows, reducers, chase nipples, split couplings, plugs etc. Shall be specifically designed and manufactured for their particular application. All conduit fittings shall conform to is: 2667-1964 and is: 3857-1966.

4. Casing and capping

4.1. Casing and capping shall be of good quality PVC, free from defects like deformations, unevenness, blisters, cavities, etc.

4.2. The casing shall be of square or rectangular body with top of the side walls suitable for tightly fitting slide-in type capping with double grooving. All surfaces shall have smooth finish inside and outside.

5. Wires:

5.1. All wires shall be single core multi-strand/ flexible copper FRLS type PVC insulated as per is: 694 and shall be 660 v\1100 v grade.

5.2. All wires shall be colour coded as follows :

Phase	colour of wire
R	red
Y	yellow
B	blue
N	black
Earth	green (insulated)
Control (if any)	grey

5.3. All off wires shall be same as phase wire

6. Switches & sockets:

6.1. Switches shall be moulded plate type flush Modular type with silver-coated contacts.

6.2. Sockets shall be 3 pin with switch and plate type cover.

6.3. Combination of multiple switch units and sockets should be used to minimize the switch boxes.

6.4. All screws shall be brass – chromium plated and shall be counter sunk type with half round head or flat headed.

6.5. For heavy duty, metal clad sockets MCB/Isolator mounted in a galvanized steel box shall be provided.

7. Workmanship

7.1. Point wiring

7.1.1. The size of conduit shall be selected in accordance with the number of wires permitted under table given below. The minimum size of the conduit shall be 25 mm. Diameters unless otherwise indicated or approved. Size of wires shall not be less than 1.5 sqmm copper or 2.5 sqmm aluminium

Nominal dia of wires	Nominal cross sec. Area	20 mm		25 mm		32 mm		38 mm	
(mm)	(mm2)	S	B	S	B	S	B	S	B
1/1.12	1.0	7		13	--	20	--	--	--
1/2.40	1.5	4		8	6	15	9	--	--
1/1.80	2.5	4		6	4	10	8	--	--
1/2.24	4	2		4	3	8	6	--	--
1/2.80	6	1		4	3	6	6	--	--
1/3.55	10	1	--	3	2	5	4	6	5

Note: S: runs of conduits which have distance not exceeding 4.25 m. between draw boxes & which do not deflect from the straight by an angle more than 15 degree.

B: runs of conduits which deflect from the straight by more than 15°

7.2. Conduits shall be kept at a minimum distance of 100 mm. From the pipes of other non-electrical services. And maintain minimum 300 mm distance between telephone, TV& computer piping (if possible)

largest associated copper circuit Conductor in sq. Mm	earth continuity conductor in sq. Mm
6.0	2.5
10.0	6.0
16.0	6.0
25.0	16.0
35.0	16.0
50.0	16.0

8. Lighting & power wiring:

- 8.1. All final branch circuits for lighting and appliances shall be flexible copper wire of appropriate size run inside conduits. The conduit shall be properly connected or jointed into sockets, bends, and junction boxes.
- 8.2. Branch circuit conductor sizes shall be as shown in the schedule of quantities and or drawings.
- 8.3. All circuits shall preferably be kept in a separate conduit up to the distribution board. No other wiring shall be bunched in the same conduit except those belonging to the same phase. Each lighting branch circuit shall not have more than ten outlets or 800 watts whichever is lower. Each conduit shall not hold more than three branch circuits, of the same phase.
- 8.4. Flexible cords for connection to appliances, fans and pendants shall be 650/1100 v grade (three or four cores i.e. With insulated neutral wire of same size) with tinned stranded copper wires, insulated, twisted and sheathed with strengthening cord. Colour of sheath shall be subject to the engineer's approval.
- 8.5. Looping system of wiring shall be used. Wires shall not be jointed. Where joints are unavoidable, they shall be made through approved mechanical connectors. No such joints shall be made unless the length of the sub-circuit, sub-main or main is more than the length of the standard coil.
- 8.6. Control switches shall be connected in the phase conductors only and shall be 'on' when knob is down. Switches shall be fixed in 3 mm. Thick painted or galvanized steel boxes with cover plates as specified. Cadmium plated brass screws shall be used.
- 8.7. Power wiring shall be distinctly separate from lighting wiring. Conduits not less than 25 mm. And wires not less than 2.5 sq.mm. Copper shall be used.
- 8.8. Every conductor shall be provided with identification ferrules at both ends matching the drawings.

9. Testing

- 9.1. The entire installation shall be tested for:
- 9.2. Insulation resistance.
- 9.3. Earth continuity.
- 9.4. Polarity of single pole switches

PART-B STANDARD SPECIFICATION FOR LT SWITCH GEAR PANELS

1. Intent:

- 1.1. This specification is intended to cover the design, manufacture, assembly, testing at manufacturer's works, packing, transportation, receipt at site, installation, testing and commissioning of all Low voltage switchgear Panel, Main PCC Panel, UPS Panels, Lift Panels, Outdoor Lighting Feeder Panels, etc. and complete with all materials and accessories for efficient and trouble-free operation
- 1.2. The LT Panel shall be manufactured as per the relevant Indian and International Standards & from CPRI Approved Panel Manufacturer Only.
- 1.3. All the components in the panel shall be of the panels shall be as per approved make. The panels shall be manufactured with sheet steel prepared using CNC Machines for accurate cutting, bending and drilling etc. The sheet metal shall be pre-treated before painting. The assembly of the panels shall be with new techniques for easy removal and refitting of the components. The panel shall have a high degree of reliability and safety of the operating personnel. The components of identical feeders should be fully compatible to each other. The panel manufactured shall be fully conforming to the following standards.

IS 1248 & 3107	: Direct acting Electrical indicating instruments
IS 2959	: AC contactors up to 1000V
IS 13947	: AC Circuit Breakers
IS 2705	: Current Transformers
IS 3156 & 4146	: Potential Transformers
IS 4047	: Specification for air break switches and combination fuse Switch units for voltage not exceeding 1000V
IS 6875	: Control switches for voltages up to and including 1000V AC and 1200V DC.
IS 1822	: Motor duty Switches
IS 12021	: Specification for control transformer
IS 8623	: Factory built assembly of switchgear & control gear for voltage not exceeding 1000V
IS 13947 (Part I)	: Degree of protection for enclosure
IS 3842	: Specification for electrical relays for AC system
IS 2208 & 9224	: Specification for HRC fuses
IS 5082	: Wrought Al. and aluminium alloys, bars, rods, tube and sections for electrical purposes.
IS 4237	: General requirement for switchgear & control gear for voltage not exceeding 1000V
IS 3231	: Electrical relays for power system protection 151
IS 375	: Marking and arrangement for switchgear bus bars, main connection and control aux. wiring
IS 5578	: Guide for marking of insulated conductors.
IS 3618	: Pre-treatment of MS sheets for phosphatizing

2. Air Circuit Breaker (A.C.B)

2.1. General

- 2.1.1. ACB shall be equipped with a trip unit that offers the appropriate level of protection performance to fit to the application. All trip units could be proposed with versions that provide measurement, and communication functions
- 2.1.2. ACB shall be available in fixed or withdraw able versions as well as in 3-pole and 4-pole versions. For withdraw able versions, a safety trip shall provide advanced opening to prevent connection and disconnection of a closed circuit breaker
- 2.1.3. It shall be possible to supply power either from the top or bottom side without reduction in performance.
- 2.1.4. For an ACB rating frame given, dimensions shall be the same whatever the ultimate breaking capacity.
- 2.1.5. ACB shall have a rated operational voltage (U_e) of 690 V, a rated insulation voltage (U_i) of 1000 V (AC 50/60 Hz) and a rated impulse voltage (U_{imp}) of 12kV,
- 2.1.6. ACB shall suitable for isolation according to IEC 60 947-1 and –2 for the rated insulation voltage of 1000 V and for the overvoltage category IV.
- 2.1.7. No safety clearance shall be required around draw out circuit breakers. For fixed circuit breakers, 150 mm of free space shall be provided above the arc chutes to allow removal of the latter.

2.1.8. The operating mechanism shall be of the Open/Closed/Open stored-energy spring type. The closing time shall be less than or equal to 70 milliseconds for rating <4000A.

2.2. Applicable Standards

Reference	Title	Scope
EN /IEC 60947-1 & 2	Low-voltage Switchgear and control gear Part 2 : Circuit Breaker	Characteristics of circuit-breakers; operation and behavior in normal service; operation and behavior in case of overload and operation and behavior in case of short-circuit, including co-ordination in service (discrimination and back-up protection); - dielectric properties;
IEC 60947-2, annex B	Circuit Breaker incorporating residual current protection	
IEC 60947-2, annex F	Additional tests for circuit-breakers with electronic over-current protection	Electronic trip unit (rms current measurement, EMC)
IEC 60664-1	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	Category IV for a rated insulation voltage up to 690 V, class II insulation between the front and internal power circuits
IEC 61000-4-1	Electromagnetic compatibility (EMC) Testing and measurement techniques	EMC Immunity
IEC 61557-12	Combined performance measuring and monitoring devices for electrical parameters	Accuracy class
IEC 60068-2	Environmental testing	Climatic withstand

2.3. Circuit Breaker Design

2.3.1. Safety

2.3.1.1. For maximum safety,

2.3.1.2. Air circuit breakers main contact shall be encased in a reinforced polyester casing and offer double insulation from the operators on the breaker front face.

2.3.1.3. Air circuit breakers shall be equipped with metal filters to reduce effects perceptible from the outside during current interruption

2.3.1.4. The circuit breaker shall be equipped with a safety interlock which keeps the circuit breaker open if the trip unit is not installed.

2.3.1.5. Mechanical indicators on the front panel of Air circuit breakers shall indicate the following status conditions:

"ON" (main contacts closed)	Spring charged
"ON" (main contacts closed)	Spring discharged
"OFF" (main contacts open)	Spring charged – circuit breaker ready to close
"OFF" (main contacts open)	Spring charged – circuit breaker not ready to close
"OFF" (main contacts open)	Spring discharged

2.3.1.6. ACB shall be equipped with anti pumping function: If opening and closing orders occur simultaneously, the circuit breaker shall remain in the open position. After fault tripping or intentional opening using the manual or electrical controls, the closing order must first be discontinued, then reactivated to close the circuit breaker.

- 2.3.1.7. The draw out operation shall be possible through a closed door.
- 2.3.1.8. Three positions of the moving part shall be possible :
- 2.3.1.9. connected position - all auxiliary and main circuits engaged
- 2.3.1.10. test position - all auxiliary circuits engaged all main circuits disconnected
- 2.3.1.11. isolated position - all circuits disconnected
- 2.3.1.12. The positions shall be clearly indicated and no intermediate position shall be possible
- 2.3.1.13. Each position shall be acknowledged before moving to a new position
- 2.3.1.14. The racking handle shall be stowed on the air circuit breaker in such a manner as to be accessible without defeating the door interlocking.
- 2.3.1.15. The draw out mechanism shall be part of the fixed frame to reduce the weight of withdrawable part.
- 2.3.1.16. A door interlock shall be provided so that it shall not be possible to open the door until the air circuit breaker moving part is in the disconnected position.
- 2.3.1.17. Insulated safety shutters shall be provided over the incoming and outgoing main circuits and over the auxiliary circuits. An interlocking shall be provided to prevent insertion of a circuit breaker having a rating higher than the current rating of the fixed part, into that fixed part.
- 2.3.1.18. In electronic trip units, protection functions shall be electronically managed independently of measurement and communication function by a dedicated ASIC.

2.4. Breaking capacity, durability, discrimination,

- 2.4.1. The ACB breaking capacity performance certificates shall be available for category B according to IEC 60947-2 standards. The test shall be carried out with a breaking performance during operation (Ics) and admissible short time withstand (Icw) equal to the ultimate breaking capacity (Icu.) up to 85kA
- 2.4.2. The rated ultimate breaking capacity (Icu) of each ACB shall be equal to at least the value of the short-circuit current (Isc) at the point of installation on the electric circuit.
- 2.4.3. The ACB range will offer several level of Icu capacity up to 150kA @440V to fit to the application.
- 2.4.4. ACB's manufacturer shall provide selectivity and coordination tables with other devices such as other ACB, ACBs, switches etc.
- 2.4.5. Mechanical durability shall be at least 12500/ 10000 / 5000 operation for ratings <1600 / <3200 / >4000

2.5. Auxiliaries and accessories

2.5.1. Generals

- 2.5.1.1. All electrical auxiliaries including the motor spring charging mechanism shall be field adaptable without adjustment or the necessity for any tool (except a screwdriver). They shall be fitted into a compartment which under normally loaded conditions has no metalwork energized from the main poles exposed with it.
- 2.5.1.2. Any adaptation carried out shall not increase the breaker overall dimensions.
- 2.5.1.3. It shall be possible to connect all auxiliary wiring from the front face of the air circuit breaker, this wiring shall be taken through a set of disconnecting contacts, so that all auxiliary wiring is automatically disconnected in the isolated position.
- 2.5.1.4. Screws that held removable parts shall be self-contained

2.6. Remote operation

2.6.1. Coils:

- 2.6.1.1. The breaker could be equipped with one closing release, one shunt opening release, one additional shunt or under voltage opening release
- 2.6.1.2. Coils shall be designed for continuous-duty.
- 2.6.1.3. Voltage release auxiliary power supply
- 2.6.1.4. AC: 24 48 100/130 200/250 277 380/480 VAC
- 2.6.1.5. DC 12 24/30 48/60 100/130 200/250 VDC
- 2.6.1.6. Opening time with shunt opening release 50ms +/- 10ms
- 2.6.1.7. Closing time closing release 70ms +/- 10ms In ≤ 4000A
- 2.6.1.8. Closing time closing release 80ms +/- 10ms In > 4000A

2.6.2. Electric motor for spring charge

- 2.6.2.1. Motor auxiliary power supply:

- 2.6.2.2. AC: 24 48 100/130 200/250 277 380/415 400/440VAC
- 2.6.2.3. DC 12 24/30 48/60 100/130 200/250 VDC
- 2.6.2.4. Charging time: <=4sec
- 2.6.2.5. Operating frequency <=3 cycle / min.

2.7. Protections requirements

2.7.1. General

- 2.7.1.1. The ACB shall be available in 4-pole (neutral protection) versions. On 4-pole circuit breakers, a 3-position switch shall be provided to set neutral protection to any of the following levels: unprotected neutral (4P3D), half-protected neutral (4P3D+N/2) or fully protected neutral (4P4D).
- 2.7.1.2. The trip units shall not increase overall circuit breaker dimensions.
- 2.7.1.3. All electronic components shall withstand temperatures up to 105 °C.
- 2.7.1.4. Trip units shall be adjustable and it shall be possible to fit lead seals to prevent unauthorised access to the settings
- 2.7.1.5. Protection settings shall apply to all circuit breaker poles
- 2.7.1.6. It shall be possible to adjust protections with a knob without any power supply or when the main is off
- 2.7.1.7. Electronic trip unit shall be fitted with thermal memory
- 2.7.1.8. It shall be possible to equip ACBs with an auxiliary contact signaling an electrical fault operated by the trip unit
- 2.7.1.9. The following monitoring functions shall be integral parts of electronic trip units:
- 2.7.1.10. 1 LED for load indication lighted above 105 % of I_r
- 2.7.1.11. a test connector shall be installed for checks on electronic and tripping mechanism operation using an external device
- 2.7.1.12. Trip unit protection functions
- 2.7.1.12.1. ACB shall be equipped with a trip unit that offers the appropriate level of performance to fit to the application:
- 2.7.1.13. Basic protection (LI) with or without energy measurement
 - 2.7.1.13.1. These trip units shall offer
 - 2.7.1.13.2. Long time protection
 - 2.7.1.13.3. Adjustable I_r threshold settings from 40% to 100 % of the trip unit rating
 - 2.7.1.13.4. Adjustable t_r time delay
 - 2.7.1.13.5. Instantaneous protection
 - 2.7.1.13.6. Adjustable I_{sd} threshold settings from $1.5 \times I_r$ to $10 \times I_r$
 - 2.7.1.13.7. Main panel ACB shall have external relays as per comments in SLDs
 - 2.7.1.13.8. Selective protection (LSI) with or without energy measurement
 - 2.7.1.13.9. These trip units shall offer
 - Long time protection
 - Adjustable I_r threshold settings from 40% to 100 % of the trip unit rating
 - Adjustable t_r time delay
 - Short time protection
 - Adjustable I_{sd} threshold settings from $1.5 \times I_r$ to $10 \times I_r$
 - Adjustable t_{sd} time delay
 - Instantaneous protection
 - Adjustable I_i threshold settings from $2 \times I_n$ to $15 \times I_n$ with an OFF position
 - Selective protection & Ground fault or Earth leakage protection (LSIG) with or without energy measurement

2.7.2. Trip unit measurement function

- 2.7.2.1. If required by the application, the trip unit shall offer measurement (including energy) without additional module whatever the protection type (LI, LSI, LSIG).
- 2.7.2.2. Minimum measurements shall be:
- 2.7.2.3. Currents & Energy
- 2.7.2.4. Demand Current, Maxim Demand Current
- 2.7.2.5. Voltage, active power, reactive power, power factor,
- 2.7.2.6. Demand Power, Maxim Demand Power

- 2.7.2.7. Accuracies of the entire measurement system, including the sensors: shall be
 - 2.7.2.8. Current: 1,5%
 - 2.7.2.9. Voltage: 0.5 %
 - 2.7.2.10. Power and energy: 2%
 - 2.7.2.11. Rogowski current transformers shall be used to ensure accurate measurements from low current up to high currents
 - 2.7.2.12. For safety reason, protection functions shall be electronically managed independently of measurement function by a dedicated ASIC.
 - 2.7.2.13. The measurements shall be displayed on the breaker itself and on a remote system via Modbus communication. In addition to these solutions it shall be possible to connect a remote display
- 2.7.3. Advanced protection trip unit: In addition to the previous protection functions trip units with Under/Over Voltage, Under/Over Frequency and Reverse Power protection could be proposed.
- 2.7.4. Operating & Maintenance
- 2.7.4.1. Maintenance
 - 2.7.4.1.1. The arc chutes shall be removable on site.
 - 2.7.4.1.2. The main contacts shall be equipped with a visual wear indicator that may be accessed by removing the arc chutes, for immediate assessment of contact wear without requiring measurements or specific tools
- 2.7.5. Operating assistance function
- 2.7.5.1. Electronic trip units with measurement and communication capability shall offer operating assistance function:
 - 2.7.5.2. trips history (Fault type, date and time)
 - 2.7.5.3. Pre-alarm
 - 2.7.5.4. Trip and pre-alarm could activate relay output(s)
 - 2.7.5.5. These functions and indicators shall be available on the display, by communication or setting PC tool.
- 2.7.6. Maintenance indicators
- 2.7.6.1. Electronic trip units with measurement and communication capability shall offer maintenance indicators:
 - 2.7.6.2. Operation and trip counters,
 - 2.7.6.3. Operating hours counter,
 - 2.7.6.4. Load profile
 - 2.7.6.5. These functions and indicators shall be available by communication or PC tool.
 - 2.7.6.6. Commissioning and operating tool.
 - 2.7.6.7. A test connector shall be installed for checks on electronic and tripping mechanism operation using an external dedicated tool.
 - 2.7.6.8. A software tool available for all electronic trip unit shall be provided:
 - 2.7.6.9. To visualize and configure trip unit parameters
 - 2.7.6.10. To create and save setting files
 - 2.7.6.11. To display tripping curve
 - 2.7.6.12. To set time and date
 - 2.7.6.13. To display tripping and alarms histories
- 2.7.7. Alarms (Advanced protection trip units)
- 2.7.7.1. User shall be able to activate alarms based on measurement (I, U, F, Q, Idemand, Pdemand,)
 - 2.7.7.2. Alarms shall be time stamped
 - 2.7.7.3. Alarms could activate up to 6 relay output(s)
 - 2.7.7.4. These functions and indicators shall be available by display and/or communication and/or setting PC tool.
- 2.7.8. Communication
- 2.7.8.1. ACB shall be equipped easily with MODBUS communication.
 - 2.7.8.2. Whatever the trip unit is:
 - 2.7.8.3. The following information shall be accessible:

- 2.7.8.4. Open / Close position / fault-trip indication (SDE) / Ready to close/ Position in the Chassis (Withdrawable version).
 - 2.7.8.5. The following commands shall be possible
 - 2.7.8.6. Open / close.
 - 2.7.8.7. When trip units with measurement functions are used the following information shall be accessible:
 - 2.7.8.8. Instantaneous and demand values, maxi meters/minimeters, Energy, Current demand and power demand.
 - 2.7.8.9. Timestamp trip and alarm histories and event table.
 - 2.7.8.10. Maintenance indicators.
- 2.7.9. Environment
- 2.7.9.1. Production site organization shall be non polluting and certified to comply with ISO 9002 and ISO 14001 standards.
 - 2.7.9.2. Air circuit breakers shall be supplied in recyclable packing complying with environmental directives RoHS and WEEE..
 - 2.7.9.3. The manufacturer shall implement nonpolluting production processes that do not make use of chlorofluorocarbons, chlorinated hydrocarbons, ink for cardboard markings, etc...
 - 2.7.9.4. The manufacturer shall provide product environmental profile of the ACB
 - 2.7.9.5. The manufacturer shall provide instructions on the removal, dismantling and processing of circuit-breaker materials at the end of service life.
3. MINIATURE CIRCUIT BREAKER
- 3.1.1. Miniature circuit breakers shall be quick make and break and break type non-welding self-wiping silver alloy contacts for 10 KA short circuit both on the manual and automatic operation, confirm with British standard BS : 3871 (Part-I) 1965 and IS :8825 (1996) with facility for locking in OFF position.
 - 3.1.2. The housing of MCBs shall be heat resistant and having high impact strength. The fault current of MCBs shall not be less than 10KA, at 230 volts. The MCBs shall be flush mounted and shall be provided with trip free manual operating mechanism with mechanical "ON" and "OFF" indications. 'C' characteristic current limiting type, 10 KA and having quick break with trip free operating mechanism. Each pole of the breaker shall be provided with inverse time thermal over load and instantaneous over current tripping elements, with trip-free mechanism. In case of multi-pole breakers, the tripping must be on all the poles and operating handle shall be common. Pressure clamp terminals for stranded/solid conductor insertion are acceptable up to 4 sqmm Aluminum or 2.5 sqmm copper and for higher ratings; the terminals shall be suitably shrouded. Wherever MCB isolators are specified they are without the tripping elements.
 - 3.1.3. The MCB contact shall be silver nickel and silver graphite alloy and tip coated with silver. Proper arc chutes shall be provided to quench the arc immediately. MCB's shall be provided with magnetic fluid plunger relay for over current and short circuit protection
4. SWITCH FUSE UNIT
- 4.1.1. This unit shall be approved make triple pole metal clad switch fuse unit 415 volt, required ratings, with link type H.R.C. fuses and natural link confirming to I.S.S. erected on angle iron frame, double break type suitable for load break duty (AC 23), quick make and break action. Separate neutral link shall be provided. The door of panel shall be duly interlocked with operating mechanism so as to prevent closing of the switch when the door is not properly secured. It shall be provided with at least 2 auxiliary contacts. All contacts shall be silver plated and all live parts shall be shrouded. The incoming and outgoing terminals of switches shall be adequately sized to receive Required size of XLPE Aluminum/Copper cables. High rupturing capacity of not less than 35MVA at 415 volts HRC fuse links shall be provided with visible indicators to show that they have operated. The switch fuse unit shall be manufactured in accordance with IS: 4047-1967 as amended to date.
- 4.2. FUSE
- 4.2.1. Fuses shall be of high rupturing capacity (HRC) fuse links and shall be in accordance with IS: 2000-1962 and having rupturing capacity of not less than 35 MVA at 415 Volts. The backup fuse rating as per site requirements / equipment. HRC fuses shall be of L & T /Siemens /G.E. make or approved equal.
- 4.3. MOULDED CASE CIRCUIT BREAKER

- 4.3.1. The MCCB shall be air break type and having quick break with trip free operating mechanism confirmed to IS : 8825 and IEC-60947-1/2 standard.
- 4.3.2. It should have thermal magnetic trip unit, adjustable thermal protection from 0.8 -1 In for 400 amp. and short circuit protection from 5 -10 In for rating more than 4000amp. It should be of rated operational voltage of 690 V AC (50 Hz) and insulation voltage of 750V AC. It should have electrical life of 4000 (2500) operations and mechanical life of 10000 (8000) operations for rating 400 amp. (>400 amp.) All the MCCB above 400 shall be have breaking capacity of 50KA. And 25 KA for MCCB < 400 amp rating
- 4.3.3. Housing of the MCCB shall be of heat resistant and flame retardant insulating material. Operating handle of the MCCB shall be in front and clearly indicate ON / OFF / TRIP positions. The electrical contact of the circuit breaker shall be of high conducting non deteriorating silver alloy contacts. The MCCB shall be provided with thermal / magnetic type bi-metal over load release and electro-magnetic short circuit protection device. All the releases shall operate on common trip bus bar so that in case of operation of any one of the releases in any of the three phases, it will cut off all the three phases and thereby single phasing of the system is avoided. The MCCB whenever called for in the appendix drawings shall provide an earth fault relay. The MCCB shall provide two sets of extra auxiliary contacts with connections for additional controls at future date. The electrical parameters of the MCCB shall be as per the descriptions given in the attached drawings.

4.4. CONTACTOR:

- 4.4.1. Contactor shall be air break type, having 3 power contact and 4 nos. of auxiliary contact conforming to IS: 2959, Contactor provided shall be AC4 Duty type for capacitor and AC3 duty type for motor loads. It shall be suitable for minimum class II intermittent duty. It shall be capable of making and breaking starting current of motors and require capacity of capacitor load of corresponding rating. Auxiliary contacts shall be rated for at least 6A and shall be capable of carrying the maximum estimated current, also shall be break before make type. No volt coil working voltage shall be 360 V to 440V. It should be complete with over current relay with single phasing protection.

5. MAIN BUS BAR:

- 5.1. All bus bar size shall be Aluminum & with current density 0.6 A/mm²
- 5.2. Only bus bar of ACB first joint shall be of Copper with 1.2 A/mm²
- 5.3. 3 Phase and Neutral bus bar shall be designed for minimum specified rated current. Bus bar shall be high quality, air insulated, high conductivity, high strength, tinned copper with non hygroscopic colored sleeve. Bus bar copper shall be electrolytic grade. Minimum bus bar size used must be derived by considering current density of Bus bar and shall be mounted with standard bus bar SMC (Seat Molded Compound)/DMC support at sufficient interval to avoid sag and effectively **withstand** electromagnetic stress in the event of short circuit capacity of 50 KA RMS symmetrical for 1 sec. and pick short circuit current of 105 KA. The bus bar shall be housed in separate compartment and shall be isolated with at least 3mm thick Bakelite sheet or higher grade material. Bus bar and panel board design shall be as per Indian Electricity Rule and CPRI norms and standards. Bus bar shall be extendible type for future expansion. Necessary cut out arrangement shall be provided for the same. The size of neutral bus bar shall be same as that of phase bus bar for main panel and lighting panel. The bus bar shall be arranged such that minimum distance between them does not remain lower than below.

Between phase	: 25 mm
Between phase and Neutral	: 25 mm
Between phase and Earth	: 25 mm
Between neutral and earth	: 20 mm.

- 5.3.1. The bus bar and interconnections shall be insulated with heat shrinkable PVC sleeve with standard color identification codes. The bus bar shall be connected by chromium plated or tinned plated brass bolts and nuts and washers shall be used for tightening. All connection between bus bar and circuit breaker/ switch and terminals shall be thoroughly insulated aluminum strips of proper size to carry rated current.

6. TIME SWITCH

- 6.1. Approved make TIME SWITCH with single pole air break contacts suitable for 230 V / 16A, complete with self-starting motor driven clock ON & OFF automatic arrangement at any predetermined time during each 24 hours, with nickel cadmium rechargeable battery backup erected as directed

6.2. Technical specification

Operating Voltage	240 V AC
Supply Frequency	50-60 Hz
Power Consumption	Less Than 4 W
Ambient Temperature	-10 0C to 55 0C
Clock Accuracy	+/- 1 Sec./day at 20 0C
Switching contact	2 C/O contact
Manual Over ride	Provided
Mounting	DIN rail

7. CONTACTORS:

- 7.1. Contactor shall be of the electromagnetic type for uninterrupted duty suitable for AC-3 utilization category.
- 7.2. Main contacts of contactor shall be of silver plated copper.
- 7.3. Each contactor shall be provided with minimum two NO and two NC auxiliary contacts.
- 7.4. Unless specified otherwise, the coil of the contactor shall be suitable for operation on 220 V, 1-phase, AC supply and shall work satisfactorily between +/- 10 % of rated voltage.
- 7.5. Contactors shall comply with all other requirements of applicable standards.
- 7.6. All power contactors shall be one size higher than type 2 co-ordination chart

8. PANEL FEEDER METER:

- 8.1. It shall be provided for generator feeder. It shall be dial flush mounted digital power meter. It shall have metering capacity of all three phase Voltage, Current, KW, KVA, KVAR, PF, Frequency Phase angle. It should show three phase parameter at a same time on display. Instrument shall have measuring capacity of accuracy Class-1.

9. INDICATION LAMP

- 9.1. Indication lamp shall be LED type panel mounted, low power consumption, long life, O/L and S/C protected with its holders etc. Suitable for specified voltage shall be used.

On Indication	: RED
OFF Indication	: GREEN
TRIP Indication	: AMBER

10. CURRENT TRANSFORMERS

- 10.1. The current transformers shall have synthetic cast resin insulation and be of the single phase type, with number of cores as per the specific requirements.
- 10.2. The primary & secondary connections shall be clearly labeled.
- 10.3. All current transformers shall have insulation level and short time rating as per main switchgear. All current transformers shall be dimensioned to carry continuously a current of 120% of the rated current. The ratios shall be as per the specific requirements.

11. VOLTAGE/POTENTIAL TRANSFORMER (PT):

- 11.1. The voltage transformers shall be insulated for full voltage rating.
- 11.2. The PT shall have synthetic resin insulation and be of single phase type. Rated secondary voltage shall be 110 V/V3 unless otherwise specified.
- 11.3. PT shall be capable of withstanding thermal and mechanical stresses resulting from short circuit and momentary current rating of breaker/switches.

12. CONTROL SWITCHES/SELECTOR SWITCHES:

- 12.1. Control and meter selection switches shall have integral name plate and for all other devices, the same shall be located below the respective devices. Instrument and devices mounted on the face of the panels shall also be identified on the rear with the same number.
- 12.2. All control switches shall be rotary, back connected type having cam operation contact mechanism. Phosphor bronze contacts shall be used on switches
- 12.3. The handle of control switches used for circuit breaker operation shall turn clockwise for closing and anti-clockwise for tripping and shall be spring return to neutral from close/trip with lost motion device.
- 12.4. Control switch for DG and Incomer panels shall have one set of lost motion spare contacts.

- 12.5. Ammeter selector switches shall be with off position and with make before break feature and shall have 3 positions to read the three phase currents. Voltmeter selector switches shall also be of 3 positions and off position, suitable to read phase to phase voltages.
 - 12.6. The control switches, operating handles, meters, relays etc shall be mounted at the front of the switchgear panels. The instruments shall not be mounted less than one meter or more than two meters from the floor level. Ammeters and Voltmeters are to be provided with selector switches. Operating handles shall not be mounted at a height more than 1.75 meters. Breaker Control switches wherever provided shall be so designed that when released by the operator it shall automatically return to a neutral position. They shall be fitted in sequence with lock to avoid inadvertent operation and shall be arranged such that after passing the "closed" position the control switch cannot be moved into the "Closed" position again without passing the "open" position. Each panel shall have indicating lamps for "ON", "OFF", "TRIP" "TRIP CIRCUIT HEALTHY" and "SPRING CHARGED".
13. AUXILIARY SUPPLY
- 13.1. Auxiliary DC and AC supply shall be derived from the incoming source of the panel with suitable control arrangements for indication circuits, closing circuits, space heaters etc.
 - 13.2. Separate DC Insulated wire buses shall be provided. DC supply required for protection/ indication/ tripping shall be taken from the above wire bus bars through protective fuses.
 - 13.3. Suitable fuses and links shall be provided for individual circuits for protection and also for isolation from bus wire without disturbing the other circuits. Bus wires from panel to panel shall be wired through necessary control terminals.
 - 13.4. Panel heaters and thermostats shall be provided in all the panels.
 - 13.5. Auxiliary supply to relay system shall be from UPS
14. WIRING AND CONTROLS:
- 14.1. Control supply of the each individual feeder shall be taken from the Auxiliary contact of the MCB, so by switching the MCB, control supply of the concern feeder will be controlled. The main object of doing this is to cut-off Power as well as control supply from the feeder at the time of Maintenance / repairing. The wiring inside the modules for power and control protection and instrumentation shall be done using 1.1 KV grade, PVC insulated FRPS copper conductor cables conforming to IS 694 and IS 8130. Power wiring inside the starter module shall be rated for full current rating of contactor but not less than 4.0 sqmm size. For C.T. 2.5 sq.mm. Cu. Wire shall be used whereas other control wiring shall be done using 1.5 sq. mm wire. Control wiring and indicating lamps shall have protective fuses (HRC type) .The necessary ferrules shall be fitted to all wire terminals for ease of identification. Only one conductor shall be permitted to one termination.
15. CABLE COMPARTMENT:
- 15.1. Cable compartment should have adequate space to accommodate required number XLPE insulated copper or aluminum conductor both in incoming & outgoing. There should be ample space for the termination of this cable.
 - 15.2. Bus bar alley & cable alley shall be separate
16. CONSTRUCTION:
- 16.1. The panel shall comprise fully compartmentalized bottom entry, extensible type cubicle pattern, and front operated, suitable for floor / stand mounting as per site requirement. The panel board shall be divided into distinct vertical sections comprising of completely metal enclosed bus compartment running horizontally
 - 16.2. The schematic diagrams are intended as a guide and manufacturer shall develop his own general arrangement and schematic drawing adding necessary auxiliary devices , accessories , components peculiar to supplied equipments , ferrules number , terminal number etc. which are required for safe , convenient , efficient an proper operation of the 415 volts switchboard / M.C.C.
17. FOLLOWING SHALL BE TAKEN CARE.
- 17.1. Main bus bar should be electrolytic Aluminium type with heat shrinkable PVC sleeves with colour code.
 - 17.2. All internal wiring and all connection shall be with copper wires and strips as required. Copper flexible wire shall be used below 100 Amps.
 - 17.3. All component, frame etc shall be earthed. A common internal earth bar with two separate earthing leads shall be provided.

- 17.4. Powder coating to be done on all sheet metal works as required.
- 17.5. Panel should have MS base frame for floor mounting unless otherwise specified.
- 17.6. The board should be front operated and extendible type.
- 17.7. Compression type brass glands and crimping lugs for incomer and outgoing ends.
- 17.8. All ammeters to be provided with C.T's and selector switch and control fuses.
- 17.9. Panel components shall be specified.
- 17.10. The design and location of damp panel to be approved by the Engineer in charge before fabrication and instalment.
- 17.12. All panels should be dust and vermin proof.
- 17.13. All panels should be fabricated out of 14 gauges CRCA sheet. The door should be made from 14 gauge CRCA sheet.
- 17.14. All meters should be digital type only unless and otherwise specified.
- 17.15. Panel builder shall be CPRI approved.
- 17.16. The board should meet with requirement of IS2147/1962.
- 17.17. All the switches used should be capable of withstanding the AC23 duty for motor operation. The switches should have quick break. The contacts should be silver plated double break type. The switch should confirm to IEC 947-III.
- 17.18. If it is possible panel component as well as accessories should be one make.
- 17.19. The board should with stand the system prospective fault current.
- 17.20. The switches shall confirm to IS: 4047 the fuses shall conform to IS: 220 the fuses shall be of HRC type.
- 17.21. Engraved plastic labels shall be provided indicating the feeder details, capacity, cable size, and load in KW and danger signs.
- 17.22. The entire panel board should be with adequate height width & Depth as per relevant prevailing standard
- 17.23. Include foundation bolts of suitable size as per requirement.
- 17.24. All compartment doors should be concealed hinged type & handles of feeders to be interlocked mechanically with the doors such that door cannot be opened when the switch is in "ON" position & switch cannot be "ON" when the doors is on open position.
- 17.25. Detailed drawing shall be got approved prior to manufacture.
- 17.26. If required only front opened and operated panel for LDB and AHU panels will be accepted.
- 17.27. If capacitors of APFCR panels are not mounted in the panel itself than separate closed/covered rack with sufficient ventilation shall be included.
- 17.28. Engraved PVC labels shall be provided on incoming and outgoing feeders.
- 17.29. SLD showing circuit inside the D. B. shall be posted inside of door and covered with transparent laminated plastic sheet.
- 17.30. The name plate with panel designation shall be fixed at the top of central panel. And name plate showing feeder details shall be provided on each feeder module as well as termination door.

18. GENERAL REQUIREMENT OF THE PANEL

- 18.1. The tenderer must have CPRI approval for manufacturing panel for the tenderer, who has not CPRI approval has to make panel from CPRI approved panel manufacturer only.
- 18.2. Each switch fuse unit must be complete with the operating handle interlock, suitable H.R.C. fuses etc as per site requirement.
- 18.3. The entire L.T. switch gear unit should confirm to IS-13947.
- 18.4. All the CT's shall have cast resin type only with class I accuracy and each CT should have short link.
- 18.5. Indication lamp shall be LED type panel mounted, low power consumption, Min.100000 hours of Life, O/L and S/C protected with its holders etc. suitable for specified voltage shall be used.
- 18.6. All the measuring instruments should be of Accuracy Class 1.0.
- 18.7. Each door of the panel should be earthed separately by Flexible link.
- 18.8. The above cubicle pattern L.T. switch board comprising of Incoming and Outgoing described above must be complete with necessary floor stands, foundations bolts, copper inter connections between bus bars and incoming / outgoing / ATS / Variable Frequency Drive, inter wiring with PVC copper cables, labels marked for incoming /outgoing / ATS / Variable Frequency Drive, earthing terminal etc. and other required major / minor items.
- 18.9. All internal wiring work should be permanently marked / labelled at terminations with numbers or letters corresponding to diagram.
- 18.10. A copper earth with bus must also run throughout the panel.
- 18.11. Ample space in each compartment shall be provided for easy maintenance and repairing.

- 18.12. Extra fans should be provided for cooling the panel if required and as per directed by Engineer-In-Charge
- 18.13. The complete board should be scraped, cleaned and painted with powder coated paint after application of 7 tank process and primer using SIEMENS grey shade coat at manufacturer's works as per relevant IS.. An easy access to bus bar should be kept for testing, maintenance and checking. The board should be prepared and erected in accordance with the prevailing Indian Electricity Rules and Regulations. The appearance of the panel board should be neat, clean and pleasant. The panel should be fabricated from suitable size angles and 14 SWG CRCA sheet steel and angle / channel iron sections. Sufficient space should be available for cable jointing. All live parts must be covered with non- hygroscopic insulated sheet. The lifting Lugs / Hooks should also be provided for handling the board. The necessary sufficient louvers should be provided for heat dissipation and air cooling.
- 18.14. The space requirement for board must be specified. The board is to be installed on the R.C.C. Platform having cable trench 1.0 Metre. Size. Cable entry to panel board should be at bottom long. A floor stand and operating platform having minimum width of 1 Metre. should also be incorporated.
19. SAFETY SHUTTER DEVICES:
 - 19.1. Shutters shall be provided at bus bar chamber cut out for closing the same when the draw able chassis of the modules are drawn out.
 - 19.2. The bus bar shutters shall be automatically operated by the movement of the carriage.
20. INSULATORS:
 - 20.1. Insulators of moulded or resin bonded material shall have a durable, non-hygroscopic surface finish having a high anti-tracking index. Insulators, barriers made out of hylam, synthetic resin bonded paper, treated wood will not to be accepted.
 - 20.2. Insulators shall be mounted on the switchgear structure such that there is no likelihood of their being mechanically over-stressed, during normal tightening of the mounting and bus bars, connections etc.
21. EARTHING:
 - 21.1. Aluminium earth bar of minimum 50mm x 6mm (or specified size) size shall be run through whole length of panel. The frame work of panels shall be connected to this earth bar and it shall be provided to facilitate connection with main earth coming from earth pit on both sides of panels. The earth continuity conductor of each in/out feeder shall be connected to this earth bar. The armor shall be properly connected to earthing clamp, and clamp shall be ultimately bonded with earth bar.
22. DANGER BOARD:
 - 22.1. 440 Volt danger board as per IS: 2551-1982 in English and Gujarati shall be fixed on all sides of panel.
 - 22.2. The board shall be glass enameled with red background and white letterings.
 - 22.3. The Danger Notice Plate shall be made out of 1.6mm thick mild steel sheet. Approximate size should be 200mm x 150 mm.
 - 22.4. The letters, figures, the conventional skull and bones etc shall be positioned on the plate as per IS 2551-1982. The said figures & pictures shall be painted in single red color as per IS5-1978
23. PAINTING:
 - 23.1. The panel shall undergo chemical de-rusting and blasting and shall be effectively prophesied as per IS-6005. The panel shall be thoroughly rinsed with clean water after phosphate followed by final rinse with dilute dichromate solution and even drying. The phosphate coating shall be scaled by the application of two coats of ready mixed staving type zinc chromate primer.
 - 23.2. Two coats of finishing Polyurethane based paint shall be applied. The final finished thickness of paint film on steel shall not be less than 100 microns and shall not be more than 150 microns. The color for the finishing paint shall be approved by the Engineer. The finished appearance of panels shall present an aesthetically pleasing appearance free from dust and uneven surfaces.
24. BRIEF DESCRIPTION OF THE ATOMIZATION:
 - 24.1. The atomization is meant to control the ACBs, MCCBs, Contactors and other switchgears fully automatically as directed in drawing or elsewhere. The main features to be take care are.

- 24.2. The Bus coupler ACB must be off when any Generator is ON LOAD or Outgoing from DG or Incoming from DG to LT main Panel ACB is ON
- 24.3. The APFCR and fixed capacitors feeders must be electromechanically interlocked in such a way that, any of the capacitor does not come in line when any DG is on load.
- 24.4. The transformer outgoing ACB (Incomer-1 of Main LT panel) and Outgoing ACB of DG as well as incomer of Main LT panel can never be "ON" together.
- 24.5. All the switchgears should be mechanically interlocked in such a way that, all above conditions must be fulfilled even on manual mode of operation of DG / ACBs.
- 24.6. If client needs to provide additional back-up protection of REVERSE CURRENT/ REVERSE POWER RELAY it must be included.
25. TESTS AND INSPECTION:
- 25.1. All site tests as per Indian standards and high voltage test of bus bars in presence of Engineer-In-Charge.
26. DRAWINGS:
- 26.1. Manufacturers shall submit for approval the single line, general arrangement drawing including material list, accessories, components peculiar to supplied equipments, ferrules numbers, terminal numbers, foundation drawings and control wiring drawings. Approval of schematic drawings, single line and control wiring drawings shall be obtained before starting the manufacturing of panel board. Manufacturer shall submit the 04 Copies of final prints with Laminations and 01 reproducible tracing of each and every drawing. Out of these 04 copies, 01 Copy should be affixed in the Panel as directed by Engineer-In-Charge.
27. TEST CERTIFICATES
- 27.1. Type test certificates of all standard component parts, e.g. contactors, breakers, switches, fuses, relays, CT's, VT's, and for the standard factory built assembly shall be submitted by the supplier.
28. INSTRUCTION MANUALS
- 28.1. The supplier shall furnish specified number of copies of the instruction manual which would contain detailed instructions for all operational & maintenance requirement. The manual shall be furnished at the time of dispatch of the equipment and shall include the following aspects:
- 28.2. Outline dimension drawings showing relevant cross-sectional views, earthing details and constructional features.
- 28.3. Rated voltages, current, duty-cycle and all other technical information, which may be necessary for correct operation of the switchgear.
- 28.4. Catalogue numbers of all components liable to be replaced during the life of the switchgear.
- 28.5. Storage for prolonged duration.
- 28.6. Unpacking.
- 28.7. Handling at site.
- 28.8. Erection.
- 28.9. Pre commissioning tests.
- 28.10. Operating procedures
- 28.11. Maintenance procedures.
- 28.12. Precautions to be taken during operation and maintenance work.

DATA SHEET FOR LT SWITCH GEAR / LT PANEL/MCC PANEL/ PANEL

	Operative condition	
	Voltage	415 v \pm 10%
	No. Of phase	3
	System	3 phase, 4 wire
	Frequency	50 hz
	Fault current	50 ka
	Neutral grounding	Not required

	Control system	
	Voltage For indication For metering For protection	240 v a.c 240 v a.c 240 v a.c
	Control wiring	2.5 mm2 copper wire
	Bus bar	
	Phase bus bar Material Support No. Of flats per phase Current density Minimum clearance Insulating barriers	Aluminium/Copper Smss/dmc One Copper: 1.6 amp/ sq.mm Aluminum: 1.0 amp/ sq.mm 25 mm minimum Bakelite sheet of 3.0 mm thick
	Neutral bus bar	Aluminium/Copper
	Earth bus bar	Aluminium/ Copper
	Fabrication Main structure Mounting plate Door	14 swg 16 swg 14 swg
	Dead back/ back access	Back access
	Single front/double front	Single front
	Cable entry/exit	Bottom
	ACB	Draw out type
	Rating	As mentioned
	Control supply	230 v ac
	Site condition	---
	Type	Indoor/Outdoor
	Mounting	Floor
	Ambient temperature	50 deg.cel.
	Atmosphere	Humid (99%)
	Ventilation	Naturally cooled No louvers & fan required in the panel
	Painting	---
	Sheet should be 7 tanks processed, oven baked at 310 deg. C. With powder coating	Yes
	Type of primer	As per is-shade no. 692
	Type of paint	As per is- shade no. 692
	Hardware (zinc plated)	Yes
	Space heater	230 v ac
	Cable alley illumination	Yes
	Pocket for drawings at door	Yes

Note: This is General Data sheet for the Panels, however Data sheet for each switchgear, along with company's technical catalogue shall be submitted at the time of commissioning

29. MINIATURE CIRCUIT BREAKER

- 29.1. Miniature circuit breakers shall be quick make and break and break type non-welding self-wiping silver alloy contacts for 10 ka short circuit both on the manual and automatic operation, confirms with British standard BS : 3871 (part-i) 1965 and is :8825 (1996) with facility for locking in off position.
- 29.2. The housing of MCBs shall be heat resistant and having high impact strength. The fault current of MCBs shall not be less than 10ka, at 230 volts. The MCBs shall be flush mounted and shall be provided with trip free manual operating mechanism with mechanical "on" and "off" indications. 'c' characteristic current limiting type, 10 ka and having quick break with trip free operating mechanism. Each pole of the breaker shall be provided with inverse time thermal over load and instantaneous over current tripping elements, with trip-free mechanism. In case of multi-pole breakers, the tripping must be on all the poles and operating handle shall be common. Pressure clamp terminals for stranded/solid conductor insertion are acceptable up to 4 sqmm aluminium or 2.5 sq.mm copper and for higher ratings, the terminals shall be suitably shrouded. Wherever MCB isolators are specified they are without the tripping elements.
- 29.3. The MCB contact shall be silver nickel and silver graphite alloy and tip coated with silver. Proper arc chutes shall be provided to quench the arc immediately. MCB's shall be provided with magnetic fluid plunger relay for over current and short circuit protection

30. EARTH LEAKAGE CIRCUIT BREAKER/RESIDUAL CURRENT CIRCUIT BREAKER

- 30.1. The RCCB should suffice all the requirements of is as per code is - 12640 - 1988. The arc should be current operated and not on line voltage.
- 30.2. The RCCB should ensure mainly the following functions:
- 30.3. Measurement of the fault current value.
- 30.4. Comparison of the fault current with a reference value.
- 30.5. The RCCB should have a torrid transformer which has the main conductors of primary (p - n) which check the sum of the current close to zero
- 30.6. All metal parts should be inherently resistant to corrosion and treated to make them corrosion resistant
- 30.7. It should be truly current operated
- 30.8. It should operate on core balance torrid transformer
- 30.9. Its accuracy should be $\pm 5\%$.
- 30.10. It should operate even in case of neutral failure.
- 30.11. It should trip at a present leakage current within 30ma or as specified.
- 30.12. Its enclosure should be as per ip 30.
- 30.13. Its mechanical operation life should be more than 20,000 operations.
- 30.14. It should provide full protection as envisaged by ie rules - 61-a, 71-ee, 73-ee, 1985 and also rule 50 of ie rule1956.
- 30.15. It should conform to all national and international standards like is: 8828-1993, is: 12640-1988, bs 4293 - 1983, cee 27 (international commission rules for the approved of electrical equipment).

31. MOULDED CASE CIRCUIT BREAKER

- 31.1. The MCCB shall be air break type and having quick break with trip free operating mechanism confirmed to IS : 8825 and IEC-60947-1/2 standard.
- 31.2. It should have thermal magnetic trip unit, adjustable thermal protection from 0.8 -1 In for 400 amp. and short circuit protection from 5 -10 In for rating more than 4000amp. It should be of rated operational voltage of 690 V AC (50 Hz) and insulation voltage of 750V AC. It should have electrical life of 4000 (2500) operations and mechanical life of 10000 (8000) operations for rating 400 amp. (>400 amp.) All the MCCB above 400 shall be have breaking capacity of 50KA. And 25 KA for MCCB < 400 amp rating

31.3. Housing of the MCCB shall be of heat resistant and flame retardant insulating material. Operating handle of the MCCB shall be in front and clearly indicate ON / OFF / TRIP positions. The electrical contact of the circuit breaker shall be of high conducting non deteriorating silver alloy contacts. The MCCB shall be provided with thermal / magnetic type bi-metal over load release and electro-magnetic short circuit protection device. All the releases shall operate on common trip bus bar so that in case of operation of any one of the releases in any of the three phases, it will cut off all the three phases and thereby single phasing of the system is avoided. The MCCB whenever called for in the appendix drawings shall provide an earth fault relay. The MCCB shall provide two sets of extra auxiliary contacts with connections for additional controls at future date. The electrical parameters of the MCCB shall be as per the descriptions given in the attached drawings.

32. DISTRIBUTION BOARDS

32.1. Distribution board using TPN/ DP/ SP MCB/MCCB isolator, earthing terminal, connector strip for phase neutral and earth for each circuit, CRCA sheet steel housing and complete.

32.2. Common banking of neutral & earth conductor is not allowed. It shall be suitable to operate on 415/220 volt, 50hz. A. C. Supply and withstand short circuit current of 10ka.

32.3. Construction

32.3.1. Distribution boards shall be fabricated from 2mm. Gauge CRCA sheet or shall be factory readymade as specified in the material list. It shall be of double door type with hinged (lockable if required) door suitable for recessed mounting in wall and dead front operated. Distribution boards shall be powder coated with 7-tank process application. The distribution boards shall be provided with phase barriers, wiring channels to accommodate wires and individual per phase neutral links.

32.3.2. There shall be separate or individual earth link as per requirement. Proper arrangement shall be made for mounting of MCB's and other accessories. Distribution boards shall meet with the requirements of IS 2675 and marking arrangement of bus bars shall be in accordance with I.S. standards.

32.3.3. It should be totally enclosed and made dust, vermin and weather-proof such that, it meets to the IP-51 and IP-54 protection for indoor and outdoor application respectively.

32.3.4. A detachable cover plate of 2mm. CRCA sheet shall be on front of board such that, all live parts of the electrical accessories mounted on board shall be accessible only on removal of said cover plate. The cover plate shall be fixed to the board with adequate size zinc passivity metal screws. Above the detachable cover plate, one additional hinged door of 2 mm thick CRCA sheet should be provided with necessary locking arrangement and suitable gasket capable of withstanding corrosive and humid atmosphere.

32.3.5. Inter connection of wiring shall be done with 660/1100 V. Grade, PVC insulated, flexible copper conductor of one size higher current carrying capacity than that of switch rating.

32.3.6. Bus bars shall be suitable for the incoming switch rating and sized for a temperature rise of 35° C over the ambient. Each board shall have two separate earthing terminals.

32.3.7. Circuit diagram indicating the load distribution shall be pasted on the inside of the DB as instructed. One earthing terminal for single phase and two terminals for 3 phases DB's shall be provided with an earth strip connecting the studs and the outgoing ECU earth bar.

32.3.8. The top and the bottom faces of the D.B. shall be provided for conduit entry of minimum 1.5" dia if required and shown in drawing, copper cable entry provision shall be made. The circuit connection from MCB's shall be brought to elemex type connector provided on top/bottom of the DB. The connector shall be suitable to receive phase, neutral and earth wire/cable coming from each individual circuit. The connectors shall have identification tag. The faces if asked shall be kept detachable. All outgoing feeders shall terminate on a terminal strip which in turn is interconnected to the mcb/fuse base by means of insulated single conductor copper wires as follows

Up to 15 amp 2.5 sqmm

25 amp 4.0 sqmm

32 amp 6.0 sqmm.

40 amp 10 sqmm

63 amp 16 sqmm.

- 32.3.9. Each DB shall have indicating lamp, preferably neon type denoting power availability in the board.
Indicating lamps shall be complete with fuse.

33. IP66 Cable Junction box

33.1. Specification

- 33.1.1. Degree of Protection: IP 66 & IK08 (5 Joule)
- 33.1.2. Material: halogen free thermoplastic
- 33.1.3. Cable entry: cable/conduit entry via metric knockouts
- 33.1.4. Designed in accordance with IEC 60,670-22
- 33.1.5. Halogen-free silicone-free "halogen-free" in accordance with the examination of the cables and insulated wires - corrosiveness of fumes - as per IEC 754-2.
- 33.1.6. Flame resistant self-extinguishing
- 33.1.7. ambient temperature
 - 33.1.7.1. Average value over 24 hours + 55° C
 - 33.1.7.2. Maximum value + 70° C
 - 33.1.7.3. Minimum value - 25° C

PART-C STANDARD SPECIFICATION FOR CABLES, CABLE TERMINATION& CABLE LAYING

1.1 KV GRADE L.T. CABLES:

9.5. General:

- 9.5.1. The medium voltage cables shall be supplied, laid, connected, tested and commissioned in accordance with the drawings, specifications, relevant Indian standards specifications, manufacturer's instruction, all cables run in parallel between L.T. side of the existing transformer, L.T. incomer A.C.B.'S of L.T. switch board panel / outgoing of panel to motor terminal etc as required and as directed by the engineer-in-charge. Excavation and refilling using bricks, road crossing using RCC pipe, sand etc. Will be in the scope of contractor and shall be done as per relevant is standard.
- 9.5.2. The cable shall confirm to relevant is which should be specified and shall bear ISI mark. The quantities mentioned above are approximate only. The cables should be supplied after taking actual measurement jointly. No straight joint in any cables shall be permitted. Any piece or cut length shall have to be taken back by contractor. The contractor should plan and purchase the cable to avoid wastage / cut length / excess length as the client will not accept the same under any circumstances. The cable shall be genuine and of approved make only.
- 9.5.3. Root marker shall be provided for every 10 meter length of underground cable and cable identifier for every 20 meter length of cable not covered in underground.
- 9.5.4. RCC half round muff of standard make shall be provided for protection of underground cable.
- 9.5.5. All above item should be got approved from engineer-in-charge before execution.
- 9.5.6. The cables shall be delivered at site in the original drums with manufacturer's name, size and type clearly written on the drums.
- 9.5.7. All cables shall be adequately protected against any risk of mechanical damage to which they may be liable in normal conditions of handling during transportation, loading, unloading etc.
- 9.5.8. The cable shall be supplied in single length i.e. Without any intermediate joint or cut unless specifically approved by the client. The cable ends shall be suitably sealed against entry of moisture, dust, water etc. With cable compound as per standard practice.
- 9.5.9. All Cable shall be FRLS Type only.

9.6. Conductor:

- 9.6.1. Uncoated, annealed copper / aluminium, of high conductivity, up to 4 mm² size the conductor shall be solid and above 4 sq. Mm, the conductor shall be concentrically stranded as per IEC: 228.

9.6.2. Insulation:

- 9.6.2.1. Cross link polyethylene (XLPE) extruded insulation rated at 70oc.

9.6.3. Core identification:

- Two cores : red and black
- Three cores : red, yellow and blue
- Four core : red, yellow, blue and black
- Single core : green, yellow for earthing.
- Black shall always be used for neutral.

9.6.4. Assembly:

- 9.6.4.1. Two, three or four insulated conductors shall be laid up, filled with non-hygroscopic material and covered with an additional layer of thermoplastic material.

9.6.5. Armour:

- 9.6.5.1. Galvanized steel flat strip / round strips applied helically in single layers complete with covering the assembly of cores
- 9.6.5.2. For cable size up to 10 sq mm : armor of 1.4 mm dia g.i. round wire
- 9.6.5.3. For cable size above 10 sq mm : armor of 4 mm wide 0.8 mm thick gi strip

9.6.6. Sheath:

- 9.6.6.1. St -2 PVC along with polypropylene fillers to be provided. Inner sheath shall be extruded type and shall be compatible with the insulation provided for the cables. Outer sheath shall be of an extruded type layer of suitable pvc material compatible with the specified ambient temp. Of 50oc and operating temperature of cables. The sheath shall be resistant to water, ultra violet radiation, fungus, termite and rodent attacks. The colour of outer sheath shall be black. Sequential length marking along with size and other standard parameters shall be required at every 1.0 meter on the outer sheath.

9.6.7. Testing:

- 9.6.7.1. The finished cables shall be tested at manufacturer's works for all the routine tests for all the length and size of cables to be delivered at site and the certificate for the same shall be furnished to client. If required, the cables shall be tested in presence of the client's representative.
- 9.6.7.2. Voltage test: each core of cable shall be tested at room temperature at 3 kv A.C. R.M.S. for duration of 5 minutes.
- 9.6.7.3. FRLS Test

9.6.8. Conductor resistance test:

- 9.6.8.1. The D.C. resistance of each conductor shall be measured at room temperature and the results shall be corrected to 20 degree centigrade to check the compliance with the values specified in the is 8130 – 1976.
- 9.6.8.2. Cable tests before and after laying cables at site:
 - 9.6.8.2.1. Insulation resistance test between phases, phase to neutral and phase to earth.
 - 9.6.8.2.2. Continuity test of all the phases, neutral and earth continuity conductor.
 - 9.6.8.2.3. Earth resistance test of all the phases and neutral.
 - 9.6.8.2.4. All the tests shall be carried out in accordance with the relevant is code of practice and INDIAN electricity rules. The vendor/contractor shall provide necessary instruments, equipment's and labour for conducting the above tests and shall bear all the expenses in connection with such tests. All tests shall be carried out in the presence of client and the results shall be prescribed in forms and submitted.

9.7. Cable marking:

- 9.7.1. The outer sheath shall be legibly embossed at every meter with following legend: electric cable: 1100 v, size: ____c x ____ mm² with manufacturer's name, year of manufacturing and ISI symbol.

9.8. Sealing drumming and packing:

- 9.8.1. After tests at manufacturer's works, both ends of the cables shall be sealed to prevent the ingress of moisture during transportation and storage. Cable shall be supplied in length of 500 metres or as required in non-returnable drums of sufficiently sturdy construction. Cables of more than 250 meters shall also be supplied in non-returnable drums. The spindle hole shall be minimum 110 mm in diameter.
- 9.8.2. Each drum shall bear on the outside flange, legibly and indelibly in the english literature, a distinguishing number, the manufacturer's name and particulars of the cable i.e. Voltage grade, length, conductor size, cable type, insulation type, and gross weight. The direction for rolling shall be indicated

by an arrow. The drum flange shall also be marked with manufacturer's name and year of manufacturing etc.

10. L.T. Cable terminations:

10.1. Cable termination:

- 10.1.1. Cable terminations shall be made with solder-less aluminium crimped type solder less lugs for all aluminium cables and stud type terminals. For copper cables copper crimped solder less lugs shall be used. Crimping shall be done with the help of hydraulically operated crimping tool. For joints where cable is with aluminium conductor and bus bars are aluminium, bimetallic lugs shall be used with compound. Cupal type of washers, crimping tool shall be used for crimping any size of cable.

10.2. Cable glands:

- 10.2.1. Cable glands shall be of brass single compression type. Generally single compression type cable glands shall be used for indoor protected locations and double compression type shall be used for outdoor locations. Glands should be of nickel-plated brass, with pvc shrouds over it. Before applying PVC shrouds, all bare metal shall be wrapped with pressure sensitive adhesive tape.
- 10.2.2. For cable above 10mm², glands shall be Double compression type only

10.3. Ferrules:

- 10.3.1. Ferrules shall be of self-sticking type and shall be employed to designate the various cores of the control cable by the terminal numbers to which the cores are connected, for ease in identification and maintenance.

10.4. Cable joints:

- 10.4.1. Kit type joint shall be done and filled with insulating compound. The joint should be for this 1.1 kv grade insulation, cable termination for conductors up to 4 sqmm may be insertion type and all higher sizes shall have compression type lugs. Cable termination shall have necessary brass glands. The end termination shall be insulated with a minimum of six half-lapped layers of pvc tape. Cable armouring shall be earthed at both ends. Cable joints shall be done as per regular practice and check shall be carried out for loose connections and leakages. Insulation cutting shall be done properly taking care that no area of the conductor remains exposed. Crimping shall be done with the help of hydraulic tool. Proper insulation tape shall be applied at the cable and lug joint.

10.5. Saddles and clips:

- 10.5.1. Saddles and clips shall be pvc covered or of g.i. fixing screws shall be round head brass, where screws are used. Nuts shall be or brass, square pressed type.

10.6. Jointing sleeves:

- 10.6.1. Jointing sleeves shall be of brass with standard termination. Solder type cable connectors / cable sleeves shall be used to join the cable / conductors. The solder used shall comply with B.S. 219 type no corrosive flux only shall be used.

11. RCC Hume Pipe

- 11.1. The Concrete Pipes shall be conforming to IS: 458/2003 (Fourth Revision) with up-to-date amendment with regards to Design /Dimensions / Tolerances / Workmanship & Finish / Materials used for making the Pipes. The Pipes shall be manufactured by spinning process. The ends of the concrete pipes shall be suitable for flush joints or collar joints or suitable for Socket & Spigot, roll on joints or confined gasket joints as per the requirements of the purchaser.

12. DWC Pipe

- 12.1. Double walled corrugated pipes (DWC) of polyethylene (conforming to IS 14930 ii) with necessary connecting accessory of same material at required date for laying of cable below ground / road surface for enclosing the cable and back filling the same to make ground as per original.
- 12.2. Diameter mentioned in the abstract sheet shall be considered Inner Diameter.
- 12.3. Excavation and covering the cable:
- 12.4. The DWC duct shall be prominently marked with indelible ink, with the following information at interval of every meter to enable identification of the pipe. The size of the ink markings shall be distinct, clear and easily visible.
- 12.5. Ink marking would have following written:
 - 12.5.1. Manufacturer's name (can be in abbreviated form)
 - 12.5.2. Name of the duct with size
 - 12.5.3. Lot no. Of the product
 - 12.5.4. Date of manufacture
 - 12.5.5. Product length

13. CABLE TRAY

13.1. General

- 13.1.1. The cable tray shall be fabricated out of 3 mm thick slotted/ perforated MS sheets as channel sections, single or double bended. The channel sections shall be supplied in convenient lengths and assembled at site to the desired lengths. These may be galvanized or painted as specified.
- 13.1.2. The jointing between the sections shall be made with coupler plates of the same material and thickness as the channel section. Two coupler plates, each of minimum 200mm length, shall be bolted on each of the two sides of the channel section with 8mm dia round headed bolts, nuts and washers. In order to maintain proper earth continuity bond, the paint on the contact surfaces between the coupler and cable tray shall be scraped and removed before the installation.
- 13.1.3. The permissible uniformly distributed load for various type of cables trays and for different supported span shall be as per IS.
- 13.1.4. The width of the cables tray shall be chosen so as to accommodate all the cables in one tier, plus 30 to 50% additional width for future expansion. This additional width shall be minimum 100mm. The overall width of one cable tray shall be limited to 1000mm.
- 13.1.5. Factory fabricated bends, reducers, tee / cross junction. Etc shall be provided as per good engineering practice. The radius of bends, junctions etc. shall be less than the minimum permissible radius of bending of the largest size of cable to be carried by the cable tray.
- 13.1.6. The cable tray shall be suspended from the ceiling slab with the help of 10 mm dia MS round or 25 mm x 5 mm flats at specified spacing. Flat type suspenders may be used for channels up to 450 mm width bolted to cable trays. Round suspenders shall be threaded and bolted to the cable trays or to independent support angle 50 mm x 50 mm x 5mm at the bottom and as specified These shall be grouted to the ceiling slab at the other end through an effective means, as approved by the Engineer – in – charge, to take the weight of the cable tray with the cables.
- 13.1.7. The entire tray (except in the case of galvanized type) and the suspenders shall be painted with two coats of red oxide primer paint after removing the dirt and rust, and finished with two coats of spray paint of approved make synthetic enamel paint.
- 13.1.8. The cable tray shall be bonded to the earth Terminal of the switch bonds at ends.
- 13.1.9. The cable tray shall be measured on unit length basis, along the centre line of the cable tray, including bends, reducers, tees, cross joints, etc.
- 13.1.10. The ladder type of cable tray shall be fabricated of double bended channel section longitudinal members with single bended channel section rungs of cross members welded to the base of the longitudinal members at a centre to centre spacing of 250 cm as per IS.

14. Cable Laying

14.1. Route

- 14.1.1. Before the cable laying work is undertaken, the route layout of the cable shall be submitted to the Engineer -in-Charge and the work shall be undertaken only after approval of the route layout.
- 14.1.2. Whenever cables of different voltages are laid following points shall be noted while laying along well demarcated or established roads, the LV / MV cables shall be laid further from the kerbed line than HV cables.
- 14.1.3. Cables of different voltages and also power and control cables shall be kept in different trenches with adequate separation. Where available space is restricted such that this requirement cannot be met, LV / MV cables shall be laid above HV cables.
- 14.1.4. Where cables cross one another, the cable of higher voltage shall be laid at a lower level than the cable of lower voltage.
- 14.1.5. Proximity to communication cables.
- 14.1.6. Power and communication cables shall be as far as possible cross each other at right angles. The horizontal and vertical clearance between them shall not be less than 60 cm.

14.2. Methods of Laying

- 14.2.1. The cables shall be laid direct in ground, pipe, closed or open ducts, cable trays or on surface of wall etc. The method(s) of laying required shall be specified in the tender / schedule of work.

14.3. Laying direct in ground

- 14.3.1. This method shall be adopted where specified in the schedule of works. Normally this method shall be adopted when the cable route is through open ground, along roads, lanes, etc. and where no frequent excavations are likely to be encountered and where re-excavation is easily possible without affecting other services.

14.3.2. Trenching

- 14.3.2.1. Width and depth of the trench shall be as shown in the drawing. When more than one tier of cables is unavoidable and vertical formation of laying is adopted, the depth of the trench shall be increased by 30 cm for each additional tier to be formed
- 14.3.2.2. The trenches shall be excavated in reasonably straight lines. Wherever there is a change in the direction, a suitable curvature shall be adopted complying with the minimum bending radius specified in Table – 11. Where gradients and changes in depth are unavoidable, these shall be gradual. The bottom of the trench shall be level and free from stones, brick bats etc.

14.3.2.3. TABLE – 2

System voltage	Minimum bending radius		
	Single Core	Multi-Core	
		Armored	Unarmored
11KV	20D	12D	15D
22KV	25D	15D	20D
33KV	30D	20D	25D

- 14.3.2.4. Note: Where “D” is the overall diameter of the cable
- 14.3.2.5. Excavation should be done by suitable means – manual or mechanical. The excavated soil shall be stacked firmly by the side of the trench such that it may not fall back into the trench.
- 14.3.2.6. Adequate precautions should be taken not to damage any existing cable(s), pipes or any other such installations in the route during excavation. Wherever bricks, tiles or protective covers or bare cables are encountered, further excavation shall not be carried out without the approval of the Engineer-in- Charge.

- 14.3.2.7. Existing property, if any, exposed during trenching shall be temporarily supported adequately as directed by the Engineer -in-Charge. The trenching in such cases shall be done in short lengths, necessary pipes laid for passing cables there in , if required. If there is any danger of a trench collapsing or endangering adjacent structures, the sides should be well shored up with sheeting as the excavation proceeds. Where necessary, these may even be left in place when backfilling the trench.
 - 14.3.2.8. Excavation through lawns shall be done in consultation with the department concerned.
- 14.3.3. Laying of Cable in Trench
- 14.3.3.1. Sand cushioning: The excavated trench shall be provided with a layer of clean, dry sand cushion of not less than 8 cm in depth, before laying the cables therein. However, sand cushioning may not be provided for MV cables, where there is no possibility of any mechanical damage to the cables due to heavy or shock loading on the soil above if so specified in the tender document and as per approval of the Engineer-in-Charge. Sand cushioning shall however be invariably provided in the case of HV cables.
 - 14.3.3.2. The cable drum shall be properly mounted on jacks, or on a cable wheel at a suitable location, making sure that the spindle, jack etc. are strong enough to carry the weight of the drum without failure and that the spindle is horizontal in the bearings so as to prevent the drum creeping to one side while rotating.
 - 14.3.3.3. The cable shall be pulled over in rollers in the trench steadily and uniformly without jerks and strain. The entire cable length shall be far as possible laid off in one stretch. PVC / XLPE cables less than 120 sq.mm size may be removed by "Flaking" i.e. by making one long loop in the reverse direction. For short runs and sizes up to 50 sq.mm of MV cables, any other suitable method of direct handling and lying can be adopted without strain or excess bending of the cables.
 - 14.3.3.4. After the cable has been so uncoiled, it shall be lifted slightly over the rollers beginning from one end by helpers standing about 10 m apart and drawn straight. The cable shall then be lifted off the rollers and laid in a reasonably straight line.
 - 14.3.3.5. Testing before covering. The cables shall be tested in presence of the Engineer -in-Charge for continuity of cores and insulation resistance and the cable length shall be measured, before closing the trench.
 - 14.3.3.6. Sand covering: Cables laid in trenches in a single tier formation shall have a covering of dry sand of not less than 17 cm above the base cushion of sand before the protective covers laid. In the case of vertical multi -tier formation, after the first cable has been laid, a sand cushion of 30 cm shall be provided over the base cushion before the second tier is laid. If additional tiers are formed, each of the subsequent tiers also shall have a sand cushion of 30 cm as stated above. Cables in the top most tier shall have a final sand covering not less than 17 cm before the protective cover is laid. Sand covering as stated above need not be provided for MV cables where a decision is taken by the Engineer -in-Charge as per sub clause (iii-a) above, but theater tier spacing should be maintained with soft soil instead of sand between tiers and for covering. Sand cushioning shall however be invariably provided in the case of HV cables.
- 14.3.4. Extra loop cable
- 14.3.4.1. At the time of original installation, approximately 3 m of surplus cable shall be left on each terminal end of the cable and on each side of the underground joints. The surplus cable shall be left in the form of a loop. Where there are long runs of cables such loose cable may be left at suitable intervals as specified by the Engineer-in-Charge
 - 14.3.4.2. Where it may not be practically possible to provide separation between cables when forming loops of a number of cables as in the case of cable emanating from a substation,

measurement shall be made only to the extent of actual volume of excavation, sand filling etc and paid for accordingly.

- 14.3.4.3. Mechanical protection over the covering: Mechanical protection to cables shall be laid over the covering to provide warning to future excavators of the present of the cable and also to protect the cable against accidental mechanical damage by pick-axe blows etc. as follows:
- 14.3.4.4. Unless otherwise specified, the cables shall be protected by second class brick of nominal size 22 cm x 11.4 cm x 7 cm or locally available size, placed on top of the sand (or, soil as the case may be). The bricks shall be placed breadth wise for the full length of the cable. Where more than one cable is to be laid in the same trench, this protective covering shall cover all the cables and projects at least 5 cm over the sides of the end cables.
- 14.3.4.5. Where bricks are not easily available, or are comparatively costly, there is no objection to use locally available material such as tiles or slates or stone / cement concrete slabs. Where such an alternative is acceptable, the same shall be clearly specified in the tender specifications.

14.3.5. Backfilling

- 14.3.5.1. The trenches shall be then backfilled with excavated earth, free from stones or other shall edged debris and shall be rammed and watered, if necessary in successive layers not exceeding 30 cm depth.
- 14.3.5.2. Unless otherwise specified, a crown of earth not less than 50 mm and not exceeding 100 mm in the centre and tapering towards the sides of the trench shall be left to allow for subsidence. The crown of the earth, however, should not exceed 10 cms so as not to be a hazard to vehicular traffic.
- 14.3.5.3. The temporary restatements of roadways should be inspected at regular intervals, particularly during wet weather and settlements should be made good by further filling as may be required.
 - 14.3.5.3.1. After the subsidence has ceased, trenches cut through roadways or other paved areas shall be restored to the same density and materials as the surrounding area and repaved in accordance with the relevant building Specifications to the satisfaction of the Engineer -in-Charge.
 - 14.3.5.3.2. Where road berms of lawns have been cut out of necessity, or kerb stones displaced, the same shall be repaired and made good, except for turfing /asphalting, to the satisfaction of the Engineer -in-Charge and all the surplus earth or rock shall be removed to places as specified.

14.3.5.4. Laying of single core cables

- 14.3.5.4.1. Three single core cables forming one three phase circuit shall normally be held in close trefoil formation and shall be bound together at intervals of approximately 1m. The relative position of the three cables shall be changed at each joint at the time of original installation, complete transposition being effected in every three consecutive cable lengths.
- 14.3.5.4.2. Route markers
- 14.3.5.4.3. Location: Route markers shall be provided along with the runs of cable allocations approved by the Engineer -in-Charge and generally at intervals not exceeding 100m. Markers shall also be provided to identify change in the direction of the cable route and locations of underground joints.
- 14.3.5.4.4. Plate type marker: Route markers shall be made out of 100 mm x 5 mm G.I. /aluminium plate welded / bolted on 35 mm x 35 mm x 6 mm angle iron, 60 cms long. Such plate markers shall be mounted parallel to and at about 0.5 m away from the edge of the trench.

- 14.3.5.4.5. CC marker: Alternatively, cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate of 20 mm in size) shall be laid flat and centered over the cable. The concrete markers, unless otherwise instructed by the Engineer -in-Charge, shall project over the surrounding surface so as to make the cable route easily identifiable.
- 14.3.5.4.6. Inscription: The words IITG-MV / HV CABLE as the case may be shall be inscribed on the marker.

1.1. Laying in Pipes / Closed Ducts

- 1.1.1. In locations such as road crossing, entry in to buildings, paved areas etc., and cable shall be laid in pipes or closed ducts. Stone ware pipes, GI, CI or spun reinforced concrete pipes shall be used for cables as specified in the schedule of works.
- 1.1.2. Where cables pass through foundation walls or other underground structures, the necessary ducts or openings will be provided in advance for the same. However, should it become necessary to cut holes in existing foundations or structures, the electrical contractor shall determine their location and obtain approval of the Engineer in Charge before cutting is done.
- 1.1.3. At road crossing and other places where cables enter pipe sleeves adequate bed of sand shall be given so that the cables do not slack and get damaged by pipe ends.
- 1.1.4. At road crossings, the top surface of pipes shall be at a minimum depth of 1 m from the pavement level. When pipes are laid cutting existing road, care shall be taken so that the soil filled up after laying the pipes is rammed well in layers with watering as required to ensure proper compaction. A crown of earth not exceeding 10 cm should be left at the top. After the subsidence has ceased, the top of the filled up trenches in road ways or other paved areas shall be restored to the same density and material as the surrounding area in accordance with the direction of the Engineer -in-Charge (Civil) up to his satisfaction.
- 1.1.5. All G.I. pipes shall be laid as per layout drawings and site requirements. Before fabrication of various profiles of pipe by hydraulically operated bending machine (which is to be arranged by the Contractor), all the burrs from the pipes shall be removed. G.I. pipes with bends shall be buried in soil / concrete in such a way that the bends shall be totally concealed. For G.I. pipes buried in soil, bitumen coating shall be applied on the buried lengths. Installation of G.I. pipes shall be undertaken well before paving is completed and necessary coordination with paving agency shall be the responsibility of Electrical Contractor. The open ends of pipes shall be suitably plugged with G.I. plugs after they are laid in final position. G.I. plugs shall be supplied by the Contractor at no extra cost.

1.2. Laying in Open Ducts.

- 1.2.1. Open ducts with suitable removable covers (RCC slabs or chequered plates) are generally provided in substations, switch rooms, plant rooms, and workshops etc. for taking the cables. The cable ducts should be of suitable dimensions for the number of cables involved.
- 1.2.2. For laying of cables with different voltage ratings in the same duct shall be avoided. Where it is inescapable to take HV & MV cables same trench, they shall be laid with a barrier between them or alternatively, one of the two (HV / MV) cables may be taken through pipe(s). Splices or joints of any type shall not be permitted inside the ducts.
- 1.2.3. The cables shall be laid directly in the duct such that unnecessary crossing of cables is avoided.
- 1.2.4. Where specified, cables may be fixed with clamps on the walls of the duct or taken in hooks / brackets / cable trays through in ducts.
- 1.2.5. Where specified, ducts may be filled with dry sand after the cables
- 1.2.6. are laid and covered as above, or finished with cement plaster, especially in high voltage applications.

1.3. Laying on Surface

- 1.3.1. The method may be adopted in places like switch rooms, workshops, tunnels, rising (distribution) mains in buildings etc. This may be necessitated in the works of additions and / or alternations to the existing installation, where other methods of laying may not be feasible. Cables may be laid in surface by any of the following methods as specified:
 - 1.3.1.1. Directly clamped by saddles or clamps
 - 1.3.1.2. Supported on cradle
 - 1.3.1.3. Laid on troughs / trays duly clamped.

1.4. Laying on Cable Tray

- 1.4.1. This method may be adopted in places like indoor substations, air - conditioning plant rooms; generator rooms etc. or where long horizontal runs of cables are required within the building and where it is not convenient to carry the cable in open ducts. This method is preferred where heavy sized cables or a number of cables are required to be laid. The cable trays may be either of perforated sheets Type or ladder type as specified.
- 1.4.2. Cable dressing with heavy duty PVC UV protected cable ties & Final clamping with Aluminum 2mm thickness strips at the interval of 400mm

PART-D STANDARD SPECIFICATION FOR EARTHING

1. Funnel Type Pipe Earthing

- 1.1. The earth station shall be as shown on the drawing and shall be used for equipment earth grid
- 1.2. The earth electrode shall be 1.5 M long 40 mm dia
- 1.3. The earth electrode shall be class "B" galvanized steel pipe.
- 1.4. The earth lead shall be fixed to the pipe with a nut and safety end screws. The clamp shall be permanently accessible.
- 1.5. G.I. pipe shall be provided with funnel of approved quality for watering the earth electrode \ station.
- 1.6. The brick masonry chamber with cast iron hinged cover shall be provided for housing the above referred funnel and pipe as per detailed drawing.
- 1.7. The hardware and other consumables for earthing installation shall be hot dip galvanized iron material

2. Safe Earthing Electrode consisting Pipe-in-Pipe Technology Size: 3 meter

2.1. Scope of work:

- 2.1.1. Supplying & erecting Safe Earthing Electrode complete with earthing pit as per detailed drawing.

2.2. Technical Specification:

- 2.2.1. Making earth pit of required size as shown in detailed drawing.
- 2.2.2. Safe Earthing Electrode consisting Pipe-in-Pipe Technology as per IS 3043-1987
- 2.2.3. Made of corrosion free G.I. Pipes having Outer pipe dia of 80 mm having 80-200 Micron galvanizing, Inner pipe dia of 40 mm having 200-250 Micron galvanizing,
- 2.2.4. With Connection terminal dia of 14 mm
- 2.2.5. With constant ohmic value surrounded by highly conductive compound with high charge dissipation
- 2.2.6. Length of Pipe - 3 Mtr
- 2.2.7. Recommended short circuit current rating: 50kA for 1 Second
- 2.2.8. Back filling compound - 2 Nos. of Bag of 15 Kgs.
- 2.2.9. Necessary back filling compound shall be mixed with excavated soil.
- 2.2.10. As per Specification mentioned in item no 3 of General Specification for electrical work
- 2.2.11. With RCC Pre-casted 450mm x 450 mm earth-pit Block with necessary civil work

3. Standard Lightning Protection System

- 3.1. Supply, installation, testing and commissioning of Air Terminal Franklin Tyep, 1 meter long, made out of Solid GI with copper coating, with spikes, mounting base, etc.
- 3.1.1. It shall be mounted on required size of GI Pipe of 4 Meter Long.

4. Plate Earthing

- 4.1. Supply and erecting of funnel type earthing having earth plate of following size buried in specifically prepared earth pit 3.00 meter below ground with required kg charcoal and salt with alternate layer of charcoal and salt, 50 mm dia GI pipe with funnel.
- 4.2. Size of the copper plate - 600x600x6mm
- 4.3. Copper plate is to be properly fastened with nuts and bolts to the copper wire/Strip of required size. This copper strip/copper wire is laid up to the earthed equipment.
- 4.4. 50 mm GI pipe to be laid for watering purposes. This will have a funnel at the top of the earth pit chamber.
- 4.5. 50 Kg. of salt and approx. 100 Kg. of coal are to be filled in the pit, in layers, after the plate and the pipes are laid in the pit.
- 4.6. 2 numbers of 50x 6 mm copper strips shall be welded/bolted to Copper Plate upto the terminal plate.

5. Material Specification & Workmanship

- 5.1.1. The earthing system complete in all respect with all equipment, fittings and accessories for efficient and trouble-free operation. The material to be supplied by the contractor and work to be carried out by the contractor shall be in general, but not limited to, conforming to the specification laid down for each item.

6. Codes & standards

6.1. The design, material, assembling, inspection and testing shall comply with all currently applicable statutes, regulations and safety codes in the locality where the system will be installed. The equipment shall also confirm to the latest applicable standards and codes of practice as mentioned below

Sr.	Item	Relevant is
1	Code of practice for earthing	IS 2309 BS7430
2	Insulation co-ordination application guide	IS 3716
3	Code of practice for protection of buildings and allied structures against lightning	IS 3043 BS 6651
	IEEE guide for safety in AC sub-station grounding	IEEE 80
	Standard for qualifying permanent connections used in Substation grounding.	IEEE 837
4	Indian electricity rules, 1956 with latest amendments	
5	Indian electricity act, 1910	
6	National electrical code	

Wherever, reference to any specification appears in this document, it shall be Taken as a reference to the latest version of that specification unless the year of issue of the specification is specifically stated.

7. Materials required

7.1. All required hardware such as bolts, nuts, washers (round and spring type), anchor fasteners, screws, etc. of sizes and type as required shall be conforming to relevant is. All hardware shall be hot-dip galvanized or zinc passivized /cadmium plated as per requirement of work either mechanical fabrication or electrical jointing

7.2. All other items required for installation shall be as approved by engineer in-charge.

8. Workmanship

- 8.1. Following activities shall be carried out for the earthing station
- 8.2. Excavation in hard murrum.
- 8.3. Laying Watering pipe.
- 8.4. Brick masonry with cast iron frame and hinged covers.
- 8.5. Charcoal and Salt fill.
- 8.6. Earth station should be 1 meter away from building.
- 8.7. Keep minimum 3 meter distance between two earth pits.
- 8.8. The pit should be minimum 4 meter deep.
- 8.9. The earth resistance should not exceed 1 ohm.
- 8.10. All earth pits of same category shall be interlinked with strip.
- 8.11. Separate earthing for the Audio-Video device to be provided as required

9. INSTALLATION OF SYSTEM

- 9.1. The plate/pipe electrode, as far as practicable, shall be buried below permanent moisture level but in no case less than 3 M below finished ground level
- 9.2. The plate/pipe electrode shall be kept clear of the building foundation and in no case, it shall be nearer by less than 2 M from outer face of the respective building wall / column
- 9.3. The plate electrode shall be installed vertically and shall be surrounded with 150 mm. thick layers of Charcoal dust and Salt mixture
- 9.4. 50 mm. dia. G.I. pipe for watering, shall run from top edge of the plate electrode to the mid-level of block masonry chamber
- 9.5. Top of the pipe shall be provided with G.I. funnel and screen for watering the earth / ground through the pipe
- 9.6. The funnel with screen over the G.I. pipe for watering to the earth shall be housed in a block masonry chamber as shown in the drawing

- 9.7. The masonry chamber shall be provided with a Cast Iron hinged cover resting over the Cast Iron frame which shall be embedded in the block masonry
- 9.8. Construction of the earthing station shall in general be as shown in the drawing and shall conform to the requirement on earth electrodes mentioned in the latest edition of Indian Standard IS: 3043, Code of Practice for Earthing Installation
- 9.9. The earth conductors (Strips / Wires, Hot dip G.I. / copper) inside the building shall properly be clamped / supported on the wall with Galvanized Iron clamps and Hot Dip GI screws / bolts. The conductors outside the building shall be laid at least 600 mm. below the finished ground level
- 9.10. The earth conductors shall either terminate on earthing socket provided on the equipment or shall be fastened to the foundation bolt and / or on frames of the equipment. The earthing connection to equipment body shall be done after removing paint and other oily substances from the body and then properly be finished
- 9.11. Over lapping of earth conductors during straight through in joints, where required, shall be of minimum 75mm. long and bitumen coated
- 9.12. The earth conductors shall be in one length between the earthing grid and the equipment to be earthed
- 9.13. Minimum distance of 3 meter shall be maintained between other electric conductor, earthing conductor and the conductor laid for the lightning protection system. Earthing and lightning protection system conductors shall be bonded to each other to prevent side flashover in case of non-availability of adequate clearance
- 9.14. The earthing met conductors, risers, earthing cables, etc. passing through walls shall be covered with galvanized iron sleeves for the passage through wall. Water stop sleeves shall also be provided wherever the earthing conductor enters the building from outside

10. INSPECTION AND TESTING

- 10.1. The following earth resistance values shall be measured with an approved earth megger and recorded.
- 10.2. Each earthing station
- 10.3. Earthing system as a whole
- 10.4. Earth continuity conductors
- 10.5. Earth conductor resistance for each earthed equipment shall be measured which shall not exceed 1 ohm in each case. In case of more earth resistance, the Contractor shall have to carry out necessary modification in the system without any cost implication to the Client
- 10.6. Measurements of earth resistance shall be carried out before earth connections are made between the earth and the object to be earthed
- 10.7. All tests shall be carried out in presence of the consultant / client and report should be submitted in two sets

11. Size of GI Earth-strip for earthing shall be generally under:

12. Mode of Measurement

- 12.1. Provision of earthing station complete with excavation, plate, earth lead up to chamber, earth link in the chamber, electrode, GI watering pipe, Salt, Charcoal, soil treatment to achieve the earth resistance less than 4 ohm, masonry chamber with cast iron cover etc. shall be treated as one unit of measurement.
- 12.2. The following items of work shall be measured and paid per unit length covering the cost of the earth wires/strips, clamps, labor etc. main equipment earthing grid and connection to the earthing stations, connection to the power panels, DB etc.
- 12.3. The cost of earthing the following items shall become part of the cost of the item itself and no separate payment for earthing shall be made.
- 12.4. Light fittings - form part of installation of the light fitting, conduit wiring, cabling - should form part of the wiring or cabling. Street lighting - should form part of the street light poles.

PART-E STANDARD SPECIFICATION FOR INDOOR LIGHT FIXTURES & FANS

1. General

- 1.1. This section relates to technical specification for indoor & outdoor lighting equipments of the project.
- 1.2. All fixtures shall be complete with accessories necessary for installation whether so detailed under fixture description or not.
- 1.3. Fixture housing, frame or canopy shall provide a suitable cover for the fixture outlet box or fixture opening.
- 1.4. Fixtures shall be installed at mounting heights as detailed on the drawings or instructed on site by the engineer in charge.
- 1.5. Fixtures and/or fixture outlet boxes shall be provided with hangers to adequately support the complete weight of the fixture. Design of hangers and method of fastening other than shown on the drawings or herein specified shall be submitted to the engineer in charge for approval.
- 1.6. Pendant fixtures within the same room or area shall be installed plumb and at a uniform height from the finished floor. Adjustment of height shall be made during installation as per engineer in charge instructions.
- 1.7. Flush mounted and recessed fixtures shall be installed so as to completely eliminate light leakage within the fixture and between the fixture and adjacent finished surface.
- 1.8. Fixture mounted on outlet boxes shall be tightly secured to a fixture stud in the outlet box. Extension pieces shall be installed where required to facilitate proper installation.
- 1.9. Fixture shall be completely wired and constructed to comply with the regulations and standards for electric lighting fixtures, unless otherwise specified. Fixtures shall bear manufacturer's name and the factory inspection label unless otherwise approved.
- 1.10. Wiring within the fixture and for connection to the branch circuit wiring shall not be less than 2.5 sqmm copper for 250 volt applications. Wire insulation shall suit the temperature conditions inside the fixture and wires bypassing the choke/ballast shall be heat protected with a heat resistant sleeve.
- 1.11. Metal used in lighting fixtures shall be not less than 22 swg or heavier if so required to comply with the specification or standards. Sheet steel reflectors shall have a thickness of not less than 20 swg. The metal parts of the fixtures shall be completely free from burrs and tool marks. Solder shall not be used as mechanical fastening device on any part of the fixture.
- 1.12. Ferrous metal shall be bowdlerized and given a corrosion resistant phosphate treatment or other approved rust inhibiting prime coat to provide a rust-proof base before application of finish.
- 1.13. Non-reflecting surfaces such as fixture frames and trim shall be finished in baked enamel paint.
- 1.14. Light reflecting surface shall be finished in baked white enamel having a reflection factor of not less than 80%. All parts of reflector shall be completely covered by finish and free from irregularities. After finish has been applied and cured, it shall be capable of withstanding a 6 mm radius bend without showing sign of cracking, peeling or loosening from the base metal. Finish shall be capable of withstanding 72 hours exposure to an ultraviolet sun lamp placed 10 cm from the surface without discoloration, hardening or warping and retain the same reflection factor after exposure. Test results shall be furnished for each lot of fixtures.
- 1.15. Fixture with visible frames shall have concealed hinged and catches. Pendant fixtures and lamp holders shall be provided with ball type algiars or similar approved means. Recessed fixtures shall be constructed so as to fit into an acoustic tile ceiling or plaster ceiling without distorting either the fixture or the ceiling plaster rings/flanges shall be provided for plaster ceiling. Fixtures with hinged diffuser doors shall be provided with spring clips or other retaining device prevent the diffuser from moving.
- 1.16. Detailed catalogue cuts for all fixtures, or, if so required by the engineer in charge sample fixtures shall be submitted for approval to the architect/consultant before orders for the fixtures are placed. Shop drawings for non-standard fixture types shall be submitted for approval to the architect/consultant.
- 1.17. Recessed fixtures shall be constructed so that all components are replaceable without removing housing from the ceiling.

2. LED Fixtures
 - 2.1. Indoor fittings with LEDs of wattage required Watt assembled on single MCPCB,
 - 2.2. With housing used as a heat sink shall be made of thick sheet Steel conforming to IS: 513/CRCA polyester powder coated and high U.V. & corrosion resistance with diffuser and/or Polycarbonate optics with company mark/name
 - 2.3. 120 to 300 V,
 - 2.4. Power Factor more than 0.9,
 - 2.5. THD < 10 %,
 - 2.6. CCT 4000 K to 6500K,
 - 2.7. Luminaire efficacy > 85 lumens/watt ,
 - 2.8. LED driver efficiency > 85 %
 - 2.9. Each fitting required LM-79 & LM-80 Certificates.

3. Lamps:
 - 3.1. Lamps shall be supplied and installed in all lighting fixtures furnished under this contract. All lamps shall be rated for 250 volts.
 - 3.2. Lamps used for temporary lighting service shall not be used in the final lighting of fixtures units.
 - 3.3. Lamps shall be of wattage and type as shown on the drawings and schedule. Where not shown, the details shall be ascertained from the architect / engineer in charge before procurement.
 - 3.4. Lamps for permanent installation shall not be placed in the fixtures until so directed by the architect / engineer in charge, and this shall be accomplished directly before the building portions are ready for occupation.
 - 3.5. Lamp should be of the same make as of control gear/ballast.

4. Fluorescent fittings with hi - frequency ballast:
 - 4.1. Only single and/or two lamp ballast shall be used in any one fixture. Ballast shall be completely enclosed inside sheet steel casing and shall have corrosion - resistant finish. Ballast shall contain a thermosetting type compound not subject to softening or liquefying under any operating conditions or upon ballast failure. Compound shall not support combustion. All ballast shall be of high power factor compensated to above 0.9pf. Ballast temperature and sound rating shall be specified by the manufacturer and guaranteed. Ballast shall be for operation at the voltages and frequencies indicated and under temperature conditions prevailing in the various locations of the premises. Tapped ballast is preferred.
 - 4.2. Ballast general/technical specification must be within the specified limit as mentioned in is 13021 part-i&ii with latest amendments. The e.m.i&r.f.i values must be as per is 6842 with latest amendments, if any. The ballast should have over voltage protection circuit and transient/spike suppression circuit. Total harmonic distortion should be less than or equal to 33%, current crest factor (peak/rms current value) should be ≤ 2 .
 - 4.3. All fluorescent fixtures shall be provided with separate wiring channel with cover plate and an earth terminal. All screws shall be chromium brass screws. Lamp and starter holders shall be out of tough molded plastic with spring loaded rotor type contactors rendered shock and vibration proof. Condensers shall be low loss paper impregnated hermetically sealed complying with is 1969-196. Internal wiring shall be neatly clipped and where by passing the ballast, a suitable heat resistant barrier or sleeve shall be provided.
 - 4.4. Minimum working (burning) life of fluorescent lamp should be more than or equal to 15000 hours. (necessary confirmation must be sought from the manufacturer). Lamp lumen output should be ≥ 91 lumen/watt. Depreciation of lumen output over life span of lamp should not exceed 10%.
 - 4.5. The combined power factor should be more than or equal to 0.92 at 230 volt.
 - 4.6. Surface mounted fixtures longer than two feet shall have one additional point of support besides the outlet box fixture stud when installed individually. Pendant individually mounted fixtures four feet long and smaller shall be provided with twin stem/conduit hangers. Stems shall have ball aligners or similar

devices and provided for a minimum of 25 mm vertical adjustment. Stem shall be of appropriate length to suspend fixtures at required mounting height.

4.7. Lamps shall have bi-pin bases and a minimum approximate rating.

5. Emergency signage

5.1. Scope:

5.2. Customized Hospital Signage/ Emergency Signage/ Evacuation Signage/ Any other type of signage - Single/ Double Sided, of Slim Display Light, Emergency/ Non-Emergency, housing made of aluminum, Hanging or Wall mounting type, complete with SMPS/Driver, hanging chain or wall mounting clamps etc. ready to install. The Model equivalent to PROLITE of size mentioned in the price schedule.

5.3. Code & standards:

5.3.1. National building code of india	: sp: 7 2005
Specification for emergency lighting unit	is: 9583-1981
Code of practice for safety colors and safety signs	is: 9457-1980
Fire protection safety sign	is: 12349-1988
Fire safety in hotels-code of practice	is: 13716

5.3.2. Code of practice for fire safety of building(general)

Exit requirement and personal hazards	is: 1644-1988
Code of practice for fire safety of building (electrical Installation)	is: 1646
Graphic symbols for fire protection plans	is: 12407-1988

5.4. Technical specifications:

5.4.1. Ac supply for charging of battery: 240vac, 50/60hz.

5.4.2. Recharging period should be 10-12 hours and regulated battery charging with constant voltage tapering current characteristics and goes into trickle charge when the battery attains full charge

5.4.3. Emergency light switches on instantly on ac mains failure. Switches off automatically and reverts back to battery charging mode after supply resumption.

5.4.4. Automatic low battery cut-off.

5.4.5. Over voltage protection

5.4.6. Manual switch for switching of emergency light when not required.

5.4.7. Rugged metal body with powder coated finish.

5.4.8. Provision of wall mounting of the light fixture should be provided.

5.4.9. It should be with ni-mh/ni-cd rechargeable battery of constant current charge type.

5.4.10. All emergency lighting should be tested in accordance with en60598-2-22.

5.4.11. Inbuilt push test switch should be provided.

Battery backup: 3 hour for emergency signages& 1 hour for the emergency light

6. Fans, regulators and clamps :

6.1. Ceiling fan should follow the below mentioned standards

- ✓ Is 374(part 0/sec 0):1979 : electric ceiling type fans and regulators (third Revision)
- ✓ Is 2997(part 0/sec 0):1964 : air circulator type electric fans and regulators
- ✓ Is 302 (part 2/sec 80):2003 : safety of household and similar electrical Appliances
- ✓ Part 2 particular requirements, sec 80 fans (superseding is 12155:1987)

6.2. Ceiling fans including their suspension shall conform to relevant iss with secondary safety device incorporated against free fall of fans from their hooks.

- 6.3. Fan hooks made of MS rods of 15mm diameter shaped in 'u' form with their legs projecting horizontally on the top at least 19 cm on either side and tied over the top reinforcement of the roof shall be laid in the concrete slabs.
- 6.4. The body of the ceiling fan, exhaust fan and fan regulator shall be connected to the earthing system by proper earth leads.
- 7. Exhaust fans
 - 7.1. Exhaust fans shall conform to IS 302(part 2/sec 80):2003: safety of household and similar electrical appliances: part 2 particular requirements, Sec. 80 - fans (superseding is 12155:1987) and other relevant ISS.

PART-F STANDARD SPECIFICATION FOR OUTDOOR LIGHT FIXTURES

1.

GENERAL NOTE: LM-79 & LM-80 reports shall be from company's own NABL approved laboratory or NABL approved third party laboratory. Reports submitted by the contractor must be certified by appropriate authority of respective manufacturing company. If desired, SMC may send one or more fittings to a third party NABL laboratory for testing of light fittings and if fitting does not match with Test Certificates submitted by the contractor, SMC will not only reject said/all products of that company but will also in liberty to take disciplinary actions for submitting misleading information. All drivers shall be constant current type only. All drivers shall IP20 for Indoor application and IP65 for outdoor application.

1. Decorative 8 meter Conical Pole

1.1. Scope:

- 1.1.1. Supplying & Installing/Erecting 8 meter height Conical Pole.
- 1.1.2. The Pole shall be supplied with hot deep galvanized foundation bolts.
- 1.1.3. Conical Poles (Medium Duty) Made from sheet steel.
- 1.1.4. The pole should be made as per IS. and shall be coated with hot dip galvanizing as per IS 2629/4759.
- 1.1.5. With required base plate as erected on existing foundation.
- 1.1.6. With Base Plate 15mm
- 1.1.7. The Pole shall be Primered and The Pole shall be painted two coats of polyurethane based paint company made paint in paint booth with spray machine to have better finish. The paint shall be stabilized against UV rays
- 1.1.8. Size: 8 Mtr. Long 70 mm Top X 190 mm bottom dia, 3 mm thickness.
- 1.1.9. The column shall also be provided with flush door at the bottom, riveted hinged door, with proper strengthening to the cut-out of the door opening.
- 1.1.10. A junction / looping box with heavy duty 3 phase connector shall be built into the pole.
- 1.1.11. It should be supplied with GI foundation bolts & nuts as required
- 1.1.12. The Pole shall be painted two coats of polyurethane based paint company made paint in paint booth with spray machine to have better finish. The paint shall be stabilized against UV rays
- 1.1.13. The 6 Amp SP MCB of "B" Curve shall be provided with pole.
- 1.1.14. The pole shall be earthed with GI earth strip along with the foundation itself.
- 1.1.15. All the arrangement to mount the fixture on the pole shall be done according to requirement of light fixture supplier.

2. Decorative 4 meter Conical Pole

2.1. Scope:

- 2.1.1. Supplying & Installing/Erecting 4 meter height Conical Pole.
- 2.1.2. The Pole shall be supplied with hot deep galvanized foundation bolts.
- 2.1.3. Conical Poles (Medium Duty) Made from sheet steel.
- 2.1.4. The pole should be made as per IS. and shall be coated with hot dip galvanizing as per IS 2629/4759.
- 2.1.5. With required base plate as erected on existing foundation.
- 2.1.6. With Base Plate 10mm
- 2.1.7. The Pole shall be Primered and The Pole shall be painted two coats of polyurethane based paint company made paint in paint booth with spray machine to have better finish. The paint shall be stabilized against UV rays
- 2.1.8. Size: 4 Mtr. Long 70 mm Top X 130 mm bottom dia, 3 mm thickness.
- 2.1.9. The column shall also be provided with flush door at the bottom, riveted hinged door, with proper strengthening to the cut-out of the door opening.
- 2.1.10. A junction / looping box with heavy duty 3 phase connector shall be built into the pole.
- 2.1.11. It should be supplied with GI foundation bolts & nuts as required
- 2.1.12. The Pole shall be primared&painted two coats of polyurethane based paint company made paint in paint booth with spray machine to have better finish. The paint shall be stabilized against UV rays
- 2.1.13. The 6 Amp SP MCB of "B" Curve shall be provided with pole.
- 2.1.14. The pole shall be earthed with GI earth strip along with the foundation itself.
- 2.1.15. All the arrangement to mount the fixture on the pole shall be done according to requirement of light

fixture supplier.

3. SETC of 120W LED Street Light Luminary, IP66
 - 3.1. Supplying and erecting LED street light / Flood light fittings
 - 3.2. With High power White LEDs, assembled on single MCPCB,
 - 3.3. Corrosion free High pressure die cast aluminium housing with smooth finish powder coated and heat sink extruded aluminium with diffuser and Polycarbonate optics/ lenses with company mark/name engraved or embossed
 - 3.4. 120 to 300 V,
 - 3.5. Power Factor more than 0.95,
 - 3.6. THD < 10 %,
 - 3.7. CCT 5000 K to 5700K,
 - 3.8. Luminaries efficacy > 100 lumens/watt .
 - 3.9. LED driver efficiency > 85 %.
 - 3.10. Each fittings required LM-79 & LM-80 certificates
4. Decorative Street Light Bracket
 - 4.1. Providing street light pole bracket consisting of Light Class MS. pipe of 4.2 cms. outside dia.
 - 4.2. Complete with suitable GI sleeve tubing of approximate 45 cms. and length suitable for 76.5 mm / 80mm. / require size pole top having sufficient fasteners for fixing the brackets
 - 4.3. Having spread of 1 mtr. length with suitable rise as per site condition & suitable welded stiffener reducer and nipple with check nut complete.
 - 4.4. The Bracket shall be Primered & painted two coats of polyurethane based Paint Company made paint in paint booth with spray machine to have better finish. The paint shall be stabilized against UV rays
 - 4.5. Single Arm bracket 1 Mtr. , Type -1 Assembly, Mounting @ 8 Meter Height
5. SETC of Decorative LED Luminaries for Urban lighting.
 - 5.1. Urban lighting, body made of painted spun aluminium, The protector is made of polycarbonate grade UV-resistant, Decorative Suspended mounting Antique/ Heritage Look Luminary, 35 to 40W LED, Ingress Protection: IP66.
 - 5.2. Lumen Package : 3600-4200 Lumens
 - 5.3. Ingress Protection: IP66
 - 5.4. Surge Protection : 10KV
 - 5.5. Each fitting required : LM-79 & LM-80 Certificates, (NABL approved company's or third party's laboratory)
 - 5.6. Heat Sink : Sheet Steel or Aluminium
 - 5.7. Voltage : 140 to 300 V,
 - 5.8. Power Factor more than : 0.9,
 - 5.9. THD : < 10 %,
 - 5.10. CCT : 4000K as per Ansi
 - 5.11. LED driver efficiency : > 85 %
 - 5.12. The Luminaries paint shall be stabilized against UV rays
 - 5.13. The Protector shall be stabilized against UV rays IK08
 - 5.14. With Suspended Mounting Luminary Type Bracket having 1.2 Meter overhang as per drawing., Type -1 Assembly, Mounting @ 5 Meter Height),
 - 5.15. The Bracket shall be Primered & painted two coats of polyurethane based Paint Company made paint in paint booth with spray machine to have better finish. The paint shall be stabilized against UV rays
6. SETC of Decorative LED Luminaries for Urban lighting.
 - 6.1. Body made of painted spun aluminium, The protector is made of polycarbonate grade UV-resistant, Decorative Suspended mounting Antique/ Heritage Look Luminary, 75 to 80W LED, Ingress Protection: IP66.
 - 6.2. Lumen Package : 7500-8000 Lumens
 - 6.3. Ingress Protection: IP66
 - 6.4. Surge Protection : 10KV
 - 6.5. Each fitting required : LM-79 & LM-80 Certificates, (NABL approved company's or third party's laboratory)
 - 6.6. Heat Sink : Sheet Steel or Aluminium
 - 6.7. Voltage : 140 to 300 V,
 - 6.8. Power Factor more than : 0.9,

- 6.9. THD :< 10 %,
 - 6.10. CCT : 4000K as per Ansi
 - 6.11. LED driver efficiency :> 85 %
 - 6.12. The Luminaries paint shall be stabilized against UV rays
 - 6.13. The Protector shall be stabilized against UV rays IK08
 - 6.14. With Suspended Mounting Luminary U Type Bracket as per drawing, Type -2.
 - 6.15. The Bracket shall be Primered& painted two coats of polyurethane based Paint Company made paint in paint booth with spray machine to have better finish. The paint shall be stabilized against UV rays
7. SETC of LED Tree Up lighter/ Ground Embedded/ Burial type Flood Light
 - 7.1. Lumen Package : 1100-1400 Lumens
 - 7.2. Minimum Surge Protection : 10KV
 - 7.3. Each fitting required : LM-79 & LM-80 Certificates, NABL approved company's or third party's laboratory)
 - 7.4. Voltage : 120 to 300 V,
 - 7.5. Power Factor more than : 0.9,
 - 7.6. THD :< 10 %,
 - 7.7. CCT :3000K to 4000K,
 - 7.8. Minimum LED driver efficiency :> 85 %
 - 7.9. LED used for luminaries : CREE/ OSRAM/ PHILIPS Lumileds/ NICHIA/ SEOUL/ Bridgelux (U.S.A.)/ Luxeon Rebel Make LED
 - 7.10. Ingress Protection : IP67
 - 7.11. Beam Angle : 12/20/24/30/36/40Degree Beam Angles.
 - 7.12. Installation Kit shall be included.
 - 7.13. Protector : Toughened thick glass protector capable of withstanding load of around 1 tons;
 - 7.14. Pre-wired with 2.5 sq mm, 3 core copper flexible cable 5 M long
 - 7.15. It should be supplied with Framed Three Color Filter (Wide Pink, Green & Blue).
 - 7.16. The fixture should be embedded in RCC casing of appropriate size. The entire RCC casing must have same size and good looking .The RCC casing should be well finished & colored with weatherproof paint.
 8. SETC of LED Bollard Luminaries
 - 8.1. SETC of LED Bollard, Antique/ Heritage Type, with base plate, as per selection,
 - 8.2. Minimum Surge Protection : 2KV
 - 8.3. Each fitting required : LM-79 & LM-80 Certificates, NABL approved company's or third party's laboratory)
 - 8.4. Voltage : 120 to 300 V,
 - 8.5. Power Factor more than : 0.9,
 - 8.6. THD :< 10 %,
 - 8.7. Minimum LED driver efficiency :> 85 %
 - 8.8. LED used for luminaire : CREE/ OSRAM/ PHILIPS Lumileds/ NICHIA/ SEOUL/ Bridgelux (U.S.A.)/ Luxeon Rebel Make LED
 - 8.9. Ingress Protection : Minimum IP65
 - 8.10. Height : 800mm to 1200 mm
 9. SETC of LED under Water Light,12V DC including Driver,IP-68 Suitable for 1 Meter Water Depth, with impact resistance clear toughened glass
 - 9.1. Lumen Package : 900-1300 Lumens
 - 9.2. Minimum Surge Protection : 4KV
 - 9.3. Each fitting required : LM-79 & LM-80 Certificates, NABL approved company's or third party's laboratory)
 - 9.4. Power Factor more than : 0.9,

- 9.5. THD :< 10 %,
- 9.6. CCT :3000K to 4000K,
- 9.7. Minimum LED driver efficiency :> 85 %
- 9.8. LED used for luminaire : CREE/ OSRAM/ PHILIPS Lumileds/ NICHIA/ SEOUL/ Bridgelux (U.S.A.)/Luxeon Rebel Make LED
- 9.9. Ingress Protection : IP68

- 10. SETC of LED Spot Light Luminaire
 - 10.1. Lumen Package : 400-750 Lumens
 - 10.2. Minimum Surge Protection : 2KV
 - 10.3. Each fitting required : LM-79 & LM-80 Certificates, NABL approved company's or third party's laboratory)
 - 10.4. Voltage : 120 to 300 V,
 - 10.5. Power Factor more than : 0.9,
 - 10.6. THD :< 10 %,
 - 10.7. CCT :3000K to 4000K,
 - 10.8. Minimum LED driver efficiency :> 85 %
 - 10.9. LED used for luminaire : CREE/ OSRAM/ PHILIPS Lumileds/ NICHIA/ SEOUL/ Bridgelux (U.S.A.)/ Luxeon Rebel Make LED
 - 10.10. Ingress Protection : IP65
 - 10.11. Impact Resistance : IK08
 - 10.12. Complete with all mounting spike/accessories as required.

- 11. Supply, Installation, Testing & Commissioning of 2 to 5 Watt Decorative LED Step Light as approved by consultant.
 - 11.1. Lumen Package : 30-50 Lumens
 - 11.2. Minimum Surge Protection : 2KV
 - 11.3. Each fitting required : LM-79 & LM-80 Certificates, NABL approved company's or third party's laboratory)
 - 11.4. Voltage : 120 to 300 V,
 - 11.5. Power Factor more than : 0.9,
 - 11.6. THD :< 10 %,
 - 11.7. CCT :3000K to 4000K,
 - 11.8. Minimum LED driver efficiency :> 85 %
 - 11.9. LED used for luminaire : CREE/ OSRAM/ PHILIPS Lumileds/ NICHIA/ SEOUL/ Bridgelux (U.S.A.)/ Luxeon Rebel Make LED
 - 11.10. Ingress Protection : IP67
 - 11.11. Integrated driver
 - 11.12. CE Marked
 - 11.13. Complete with Concealed Installation Kit/ Mounting Box.

PART-G STANDARD SPECIFICATION FOR PUBLIC ADDRESS

1. Outdoor PA Speaker
 - 1.1. Supply, Erecting, Testing & Commissioning of Outdoor IP66 Unidirectional sound projector,
 - 1.2. EN 54- 24 certified,
 - 1.3. Powerful 12 W sound projector intended for speech and music reproduction in outdoor applications,
 - 1.4. The housing shall made of sturdy aluminum enclosure.
 - 1.5. It shall have provisions for cable loop through connection.
 - 1.6. It should be suitable for use in voice alarm systems.
 - 1.7. Loudspeakers shall be designed to withstand operating at their rated power for 100 hours in accordance with IEC 268- 5 Power Handling Capacity(PHC) standards.
 - 1.8. It shall be provided with A sturdy aluminum mounting bracket to allow easy mounting and directing in virtually any position.
 - 1.9. Complete with Pole mounting bracket
2. SETC of 240W Booster Amplifier
 - 2.1. High performance dual channel amplifiers capable of fulfilling a wide variety of public address requirements
 - 2.2. The amplifiers shall be protected against overload and short circuits
3. Supplying & Laying 2c X 1.5 sq mm copper, stranded, shielded cable, oxygen free Speaker Cable. (Speaker Cable) to be laid in Heavy type Rigid PVC Pipe or DWC Pipe

PART-H STANDARD SPECIFICATION FOR PUMPS & STARTERS

1. Direct - On - Line Starter
 - 1.1. Supplying and erecting Direct - On - Line Starter
 - 1.2. With 18 A rating contactor and
 - 1.3. With 3.5 Amp. 18A range directly operated in totally insulated elegant enclosure for single phase operation up to 3 HP
 - 1.4. As per IS 13947
 - 1.5. Complete erected on P.W. Block with necessary connection. Cat III
2. Open well type horizontal mono block pump set
 - 2.1. Providing & erecting open well type horizontal mono block pump set with stainless steel body
 - 2.2. 0.5 H.P. single phase open well motor pump set
 - 2.3. Having discharge of 115 LPM @ 15 mtr. head suitable for 32 mm dia. delivery pipe
 - 2.4. With control panel
3. Automatic liquid level controller
 - 3.1. Supplying & erecting approved make Automatic liquid level controller 6A.
 - 3.2. To be erected as per instruction of Engineer in charge on site
 - 3.3. Complete with wiring connection with existing wires , with copper conductor from pump to upper and lower tank.

EXECUTIVE ENGINEER,
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION,

SIGNATURE OF THE CONTRACTOR.

Approved Vendor List

Civil Material Make list		
NO.	ITEMS	MAKE/BRANDS
1	Cement	Ultratech, Ambuja, Sanghi, Siddhi, J K Laxmi (53 / 43 Grade)
2	High Yield Strength Deformed steel bars Thermo mechanically treated (TMT) / Structural steel	(Fe-500) Tata, SAIL, RINL, JSW, Electrotherm, National, Ramasroop, Monosteel India Ltd.
3	Mild steel structure	Tata, SAIL, RINL, Jindal, Electrotherm, National
4	Vitrified tiles	Orient, Kajaria, Jhonson, Nitco, Somani, Bell, Asian or Euro
5	Telephone Black granite	With metallic ringing Sound (Approved by Architect or engineer in charge)
6	Dark original green Udaypur marble, Khatu Stone	Without any stain or color coating (Approved by Architect or engineer in charge)
7	Glazed tiles	Orient, Kajaria, Jhonson, Nitco, Somani, Bell, Asian or Euro
8	Aluminum Section (Powder coated)	Jindal, Banco, Hindalco
9	Acrylic emulsion plastic Paint	Nerolac, Asian, ICI, Berger
10	Weather shield max paint	ICI, Asian apex ultima, Dulux
11	Sanitary fittings	Cera, Hindware, Perryware, Nicer, Duravit, Jaguar
12	PVC or UPVC fittings	Astral, Supreme, Prince, Finolex
13	PTMT fittings	Prayag, Wilson
14	PVC (Triple layer coated) water tank	Sintex, Super
15	Construction chemicals	FOSROC, ROFFEE, PERMA
16	Door-window fittings & fixtures	Brass-sonal make c.p. heavy section
17	Wood	100% natural (pure) seasoned wood
18	Ply wood	Century or Anchor
19	Glass	Saint gobain , Modi, AIS,
20	Ready mixed concrete	Ultra tech / Lafarge
21	Rebars	Hilti, Fisher
22	Binding Wires	Galvanised coated wire

23	Epoxy Joints	Shipra, Laticretes, Pidilite, Mapei
24	Veneer / Laminates	Century, Greenlam
25	FRP Frame and Shutters	Sintex or equivalent approved by Consultant
26	Aluminium Section	Jindal, Hindalco, Banco
27	Lapi / Putty	JK White, Birla
28	SS Pipes	Grade 316, Jindal or its equivalent
29	Sanitary fittings	Jaguar, Cera, Hindware, Hindustan
30	Toilet fittings	Cera, Hindware, Perryware, Nicer, Duravit, Jaguar
31	Water Proofing Cool Gaurd	Panas, Cembo
32	Concrete Admixture	SIKA, FOSROC or Equivalent
33	Waterproofing to Terrace or Sunken Slab	SIKA, FOSROC or Equivalent
34	Special Repairs Job including Polymer Mortar, Protective Coating, Injection Grout, Micro Concrete, Fiber Wrapping etc.	SIKA, FOSROC or Equivalent
35	Anchor Grouts	FOSROC, SIKA, HILTI or Equivalent
36	Foundation Grouts	SIKA, FOSROC or Equivalent
37	Construction and Expansion Joint Sealant	SIKA, FOSROC or Equivalent
Electrical Specification		
Sr. No.	Item	Make
1.	Wiring Accessories	SOR Category - II
2.	Switchgear & DB	SOR Category - III
3.	Wires and Cables	Any ISI
4.	Lift	KONE, Schindler, Mitsubishi
5.	Concealed Pipes	FIA approved and ISI
6.	Ceiling Fan	BEE (5 star rating)
7.	Glands and lugs	HMI, MCI and Dowels
8.	Pump	SOR Category-III
9.	Starter	L&T, Siemens, Crompton

10.	Lighting Items	SOR Category-III
11.	Measuring Instruments	Enercon, Meco, Rushabh
12.	Air condition	BEE (5 Star rating)
13.	Panel Fabricator/Builder	CPRI Approved only
14.	Automatic liquid level controller	Electro Power

Sr. No.	Item	Approved Make	Make Offered By Contractor
1	Modular Switches &Accessoires	Legrand, Schneider, MK,Ancohor,allwyn,pointer,vinay,alex, promot	
2	Rigid PVC Pipe, Junctions, Fan Box & Other Conduit Accessories	Precesion, Nihir, Finolex, polycab, BPL	
3	Flexible Wires & Flexible Cables	R.R. Kable, Havell's, Finolex, KEI, Polycab	
4	ARMoured Cables & UNARMoured Cables	Finolex, Torrent, Havells, KEI, RR kabel, Bharat CAB,CCI,UNIVERSAL,INCAB,GLOSTER,AVO CAB	
5	Ceiling Fan, Wall Fan	Havells, Crompton, Bajaj, Khaitan,USHA	
6	Exhaust Fan	Almonard, Havells, Crompton, Bajaj, Khaitan	
7	LED Batten (Box Type Tube Light)	Philips, Osram, Havells, GE,BAJAJ,XAL	
8	LED Panel, Down Light, Decorative Suspended Light, Profile Lighting, Decorative Low Bay, Decorative Hanging/Pendent Light	Philips, Osram, XAL, GE, TAL, Thorn, Bega, Regent,HAVELLS	
9	LED Rope Light/ LED Strip	Havells, Bajaj, Osram, Philips	
10	LED Street Light	Philips, Keselec Schreder, Osram, Havells, Bajaj	
11	Decorative LED Urban Street Light	Philips, Keselec Schreder, Osram, Havells, Bajaj	
12	Tree Uplighter, Bollards, Wall Mounted Up-Down Light, Spike Light, Step Light	Philips, Keselec Schreder, Osram, Thorn, Bega, Fiberly,	

13	Underwater Light Fixture (Static & RGB)	Philips, Osram, Keselec Schreder, Fiberly,	
14	Distribution Boards, ELCB & MCBs	Legrand, Schneider, Hager, Siemens, havells, I&T, ABB, C&S, MDS, BENTES	
15	IP66 Junction Box	Hansel, Legrand, Schneder, SINTEX, NATIONAL	
16	LT Panel	CPRI Approved Following Vendors	
17	LT Switchgear, ACB, MCCB, Changeover	Legrand, Schneider, Hager, Siemens, L&T, ABB	
18	Power & Control Panel accessories	Trinity, Nippen, Standard, L&T, Elico, Legrand, Schneider, Siemens	
19	Time Switch	Siemens, Schneider, Legrand, Hager, L&T, MSD	
20	Digital Meters	Rishabh (L&T), Conserve, HPL, Enercon, Krycard, Yocogava, Abb, Siemens,	
21	Selector Switch	L&T, Keycee, Salzer, Siemens, Jyoti	
22	C.T (Cast Resin)	Ashmor, Kappa, Jyoti, ABB, Silkana, Gilbert, Precise, L&T	
23	LED Indicating Lamp	Raas Control, Teknik, Vaishno, Binay, Esbee (L&T),	
24	Push Button	Siemens, Raas Control, L&T, Binay, ABB, Schneider	
25	LT Cables (Copper & Aluminium)	R.R. Kable, Havells, Finolex, KEI	
26	Cable Gland	Jaison, 3d, Commet, HMI	
27	Lugs & Sockets	Dowells, Ismal, 3d, Jaison	
28	Maintenance Free Earthing & BFC	Ashlok, Elink	
29	Public Address & Evacuation System	Bosch, Bose, Philips, Yamaha, Sony, Atlass Sound	
30	ELV Cables (HDMI, VGA, RCA)	Kramer, QED, or as approved by consultant & Client	
31	Lift	Kone, schindler, otis, Mitsubishi, Thyssenkrupp, Trio, Techno, Omega, Johnson, Orbis	

32	D.G Set	Engin : Cummins,Greaves,kirloskar,Caterpillar Alternator : Crompton,KEC,Stamphord	
33	C.C.T.V System And DVRs (Camera System)	Bosch,Pelco,Sensormatic,Zicom,Sony,Hik Vision	
34	Pumps set	Cromton,Kirlosker,Lubi,CRI	
35	Liquid Level Controller	GELCO, OCLEG, C&S, BCH, Siemens	
36	DWC PIPES	REX,GEMINI,DURALINE,SY-ARON(VIRAHIPOLYMERS)	
37	CONICAL/OCTAGONAL POLE	BAJAJ,TRANSRAIL,VALMONT,UTKARSH,AS TER	

NOTE ON APPROVED VENDOR LIST: -

1. Equipment's/ items for which no make is specified, approval shall be obtained from both Consultant and Client prior to supply. Contractor will have to propose Minimum three vendors for such item, right to selection/rejection of particular make offer by contractor is with consultant and client.
2. Various options are given in the above vendor's list. However, choice as to the selection of particular make will rest to both Consultant and Client.
3. No deviation in the make list shall allowed.

QUALIFICATION CRITERIA

The qualification process will lay high emphasis on the ability and competency of bidders to do high quality work within the given time schedule. The following criteria along with other conditions/criteria shall be applicable to Bidder.

- Bidder must possess valid electrical contractor's license, issued by concerned department of state government of Gujarat.
- Registration in any department of the government namely JPWD/ MES/ CPWD/ SMC or any other municipal corporation.
- The Electrical and Mechanical work was be carried out through an experienced ,Registered and competent licenced electrical contractor, however prior approval shall be taken from the competent authorities of SMC for the same with supporting document for subcontracting electrical-mechanical work material in tender.

GENERAL SPECIFICATIONS

1. **WIRING RULES :**
The installation generally shall be carried in conformity with the Indian Electricity Act/Rules and the latest edition of the wiring rules of the Institution of Electrical Engineers (London) but where this specification differs from those rules the specifications shall be followed.
2. **DEFINITION :**
The definition of terms the I.E.C. wiring rules shall apply.
3. **PRESSURE AND FREQUENCY :**
The supply will be three phase 50 cycles A.C. 4 wire system 415 volts between phase, and 230 volts between phase and neutral and apparatus required shall be suitable for this supply.
4. **SYSTEM OF WIRING :**
Wiring for lights, fans wall sockets, refrigerators and bells shall be carried out as described in the items and details shall be confirmed with the specification herein.
5. All wiring must be done on the distribution system with main and branch distribution board at convenient centres and without isolated fuse. All conductors shall be run as far as possible so as to be easily accessible and capable of being inspected. Facility for maintenance shall be particularly provided for and blanking of circuits carefully arranged.
6. **CONDUCTORS :**
All conductors shall be of copper as set for in the I.E.C. wiring rules 11th edition and no insulated conductor shall have cross section less than of 1/0.044 and every such conductor of greater cross section shall be standard.
7. **FALL OF POTENTIAL :**
The cross sectional area of all conductor inside the building shall be so proportioned to their loads that the drop in pressure between the main fuses and the nearest consuming appliance shall not exceed 2% with all devices in use.
8. **CIRCUITS :**
No final lighting or fan circuits from a distribution board shall carry more than 3 amperes of 6 points and as far as possible the loading shall be arranged so as to obviate the necessity of using various sizes of fuse wires on sub-circuits.
9. **TESTS :**
The installation with fittings complete shall before current is switched on satisfactorily pass the following test.
 - (a) All the lamps and appliance having been connected to the conductors and all switches and fuses be (ON a pressure not less than twice the working pressure) (subject to a limit of 500 volts) shall be applied and the installation resistance of the whole or any part of the installation to earth must be less in megohms than 25 divided by the number of points.
10. **JOINTS :**
All joints in conductors shall be made by means of approved mechanical connector in suitable approved joints boxes but as far as possible looping back shall be adopted.

11. SWITCHES :

- (a) All main switches shall be of quick make and break combined switch and fuse, ironclad type of reliable make and subject to approval.
- (b) All branch switches controlling not more than 5 amperes shall be of quick and break, push button or tumbler pattern and shall be 'NO' when the knob is down, the attachment of covers to the base of the switch must be by means of machine screws. All fan and wall socket shall be provided with controlling switches.

12. DISTRIBUTION BOARDS :

All distribution boards shall be fitted with hard grain pattern Home Office Type porcelain fuses (one on positive side of circuit, the neutral being connected to a common bus bar of copper in such a way that the circuit can be easily isolated from the distribution boards) of substantial make and at least of 5/10 Amp. capacity porcelain 5 amp. round cut-outs will not be allowed to be used as fuse holder. All distribution boards shall be fitted with the wall enclosed in box of approved pattern (to be supplied by the contractor) when concealed system is adopted and on polished folding Type Teakwood blocks with cover in the case of open wiring in each case the pattern shall be submitted to the Engineer-in-charge for approval. Load on each floor shall be distributed on required distribution boards.

13. CEILING ROSES AND SOCKETS :

Ceiling roses and wall sockets shall be of reliable make and subject to the approval. The subsuspension of the flexible wire for light pendants shall be so executed that the weight of the pendant will not be carried by the terminals of the ceiling rose.

14. LAMP HOLDERS :

Lamp holders for use on brackets shall have not less than a half inch female nipple. All cases must be solid and substantial and of bayonet pattern. Pendant lamp holder shall have a good grip fitted on them so as to carry the weight of the pendant.

15. INTERCHANGEABILITY :

Similar parts of all the switches, lamp holders, ceiling rose, brackets, pendants and all other fittings of the same type shall be interchangeable.

16. CONDUIT TO BE CONTINUOUS :

Conduit shall be of rigid P.V.C.

17. BUNCHING OF WIRES :

The wires of a circuit must be each together in a conduit.

18. JOINTS IN CONDUIT :

The lengths of conduit shall be jointed by means of adhesive solution.

19. PRECAUTION AGAINST INSECTS AND DAMP :

All outlets of conduit system shall be properly drained and ventilated but in such a manner as to prevent the entry of insects.

20. PROTECTION OF CONDUIT :

The conduits and fittings shall be joined by means of adhesive solution.

- 21. CONDUCTOR :**
All conductors used in in conduit wiring shall be standard confirming to I.S. 694 1988 Part -II
- 22. ERECTION AND EARTHING OF CONDUIT :**
Conduit shall be electrically continuous through out and shall be permanently and efficiently connected to earth by means of solid or standard copper wire having a cross sectional area not less than that of No. 8 S.W.G. in conduit system the pipe must be continuous when passing through wall of 1 floor and earthing shall extend to the metal frame of all main and branch switches and distribution boards. Gas pipes must not be used for obtaining and earth connection.
- 23. EARTH WIRE AND PLATES :**
The earthing wire and the connection with earth shall be of 8 SWG G.I. as per specified instructed by Engineer-in-charge and shall be so constructed and laid as to avoid the formation of any electronic couple. all earthing wire shall be efficiently protected against mechanical damages.
- 24. PASSING THROUGH WALLS :**
The conductor shall be carried in an approved heavy gauge solid drawn or lapwelded conduit tube or porcelain ducts. Where a wall tube passes outside a building so as to be exposed to the weather, the other end shall be bellmouthed and turned down wards.
- 25. PLUGGING WALLS :**
Plugs for ordinary walls or ceiling shall be of well seasoned teak wood not less than two inches long by one inch square on the inner and three fourth inch square on the outer or they shall be cemented into the walls to within one fourth inch of surface used with plaster or lime putting to give the cement hold the plugs, two counterbores not less than half inch diameter, one inch deep must be provided on each of the two opposite sides. Iron screw may be used for attaching battens to the plugs. Where owing to **IRREGULAR COURING OR OTHER REASONS THE PLUGGING OF THE WALLS IRREGULAR PRESENTS DIFFICULTIES BATTENS OR CONDUIT SHALL BE ATTACHED TO THE WALLS OR CEILING IN A MANNER APPROVED BY THE ENGINEER-IN-CHARGE.**
- 25. ATTACHMENT TO WALLS AND CEILINGS :**
In the case of lead covered or Cable-Tyre Shethed system the conductors shall be fixed on varnished teak wood battens not less than half inch in thickness by means of metal clips (of approved make) spaced at intervals of not more than 4.1/2 inches. The clips shall be fixed to T.W. battens by means of brass screws or pins set level with the surface of the clips. Pawl plug may be used for fixing battens to walls and ceiling, but only taper T.W. plugs (see clause 24) shall be used for fixing T.W. base blocks for switches regulator and ceiling rose.
- 26. ATTACHMENT OF FITTINGS AND ACCESSORIES :**
All ceiling roses, wall socket switches, regulators, brackets, pendants and accessories attached to wall or ceiling shall be mounted on substantial teak wood varnished blocks having solid backs not less than quarter inch thick. All accessories shall be fixed to such base blocks by means of brass screw.
- 27. PASSING THROUGH FLOORS :**
All wires passing through floors shall be efficiently protected by means of metal or T.W. covering box extending not less than 8 fts. above floor level conduit or porcelain tubes shall be used for lading the wires through the floor.
- 28. FITTINGS :**
No wire shall be buried directly in plaster.

29. FITTINGS :

Fans, regulators, lighting, fixtures etc. whether supplied by the employer or conductor shall be erected in position by the contractor in such manner as not expose any unsightly fittings necessary for suspension from the ceiling or walls, and in conformity with the surrounding architectural design.

30. RATING :

The rating of consuming devices unless indicated on the drawings will be as follows :-

Ceiling Fans	150 Watts.
Desk fans	80 ,,
Lights	60 ,,
Wall sockets	80 ,,

31. LOCATION OF CONTROL BOARDS :

The control boards shall be fixed in consultation with the Engineer-in-charge.

32. All makings on the switches and distribution boards shall comply with Rule 510 of Indian Electricity Act.

33. All control switches shall be located as far as possible on walls.

34. In wiring work should be used approved by I.S.I.

SIGNATURE OF THE CONTRACTOR.

EXECUTIVE ENGINEER
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION

GENERAL

1. Meters for power points, light and fan points shall be separate mains shall be brought to the position indicated on the planned the line shall be taken there from to the distribution boards on various floors.
2. Electric company's charges for bringing the main cables to position indicated together with the connection for meters are payable by the S.M.C.
3. It will be the responsibility of the contractor to get power connection form supplying company. The application and all respective forms shall be signed by the contractor & service connection, applicable charges shall be paid by the corporation. The Corporation will not take over the possession of dwelling units unless permanent electric connection is received and the entire installation is energized.
4. The contractor having electric contract license of Gujarat State shall only be eligible to tender.

SIGNATURE OF THE CONTRACTOR.

EXECUTIVE ENGINEER
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION

I have tendered after studying the above specification.

Signature of the Contractor:-

Address:-

Date:-

SPECIFICATION OF MATERIAL

WIRES & CABLES	: FINOLEX/L & T /HAVELLS/R.R.CABLES
ARMOURED CABLES	: TROPODURE/INCAB/TORRENT/FINOLEX/UNISTER/GLOSTER/CCI/BHARAT CAN/ABOCAB/HAVELLS.
UNARMOURED CABLES	: TROPODURE/INCAB/TORRENT/FINOLEX/UNISTER/GLOSTER/CCI/BHARAT CAN/ABOCAB/HAVELLS/R.R.CABLES
WIRING ACCESSARIES	CRABTREE, M K INDIA(LOGIC),ANCHOR(ROMA),JAINEX,STRACCO
MCB /DISTRIBUTION BOARDS	: SEIMENS/INDO KUPP/MDS/HAVELES/HAGER/STANDARD/SCHINEIDLER/ABB

I here by agree to supply as above make materials of your choice.

Date :-

Signature of the Contractor.

SPECIAL CONDITION

- (1) Point wiring shall be from the distribution fuse board, No sub main shall be measured.
- (2) Samples of materials shall be given to Engineer-in-charge and approval should be taken in writing before its use.
- (3) Fabrication drawing should be get approved from the Engineer-in -charge prior to Manufacturer.
- (4) Pipe laying lay out shall be as per instruction given by Engineer-in-charge.
- (5) There shall be no junction in wiring out let box shall be used after bond.
- (6) Electrical contractor shall make good the civil work if chased or damaged.
- (7) Electrical Engineer-in-charge opinion shall be final and binding on contractor.
- (8) Qualified labour and supervisors shall work at site.
- (9) Electrical Contractor shall not permit unqualified labour contractor to work at site. He shall observe Govt. rules regarding control of labour. He shall submit test report and carry out tests as required and furnish detailed drawings on completion of work. The responsible authorised person by the contractor should be available at site daily when work is in progress.
- (10) The Electrical appliance-materials shall bear the ISI mark or declaration indicating manufacturer's names and appliances material used having been manufactured in accordance with the manufacturer's certificate issued by the Government of Gujarat and conforming to the standard specified by the I.S.I. shall be given by the contractor.
- (11) Entire work shall be conforming to IS where ever not specified.

The conditions laid down under House Hold Electrical appliances (Quality control Act 1981) shall be followed.

The Contractor shall provide test report and get the installation approved from Govt. Elect. Authority is required.

CONTRACTORS STAMP AND SIGNATURE.

DECLARATION FORM

- (1) I/We hereby declare that I/We have visited the site and fully acquainted myself/ourselves with the local situation regarding materials, labour and other factors pertaining to the work before submitting this tender.

- (2) I/We hereby declare that I/We have carefully studied the conditions of contract, specifications and other tender documents of this work and agree to execute the same accordingly.

SIGNATURE OF THE CONTRACTOR.

EXECUTIVE ENGINEER
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION

Address:-

Date:-

Place:-

FORMAT FOR BANK GAURANTEE

To,
The Commissioner,
Surat Municipal Corporation,
SURAT.

[1] In consideration of the Terms and Conditions of an Agreement made between Commissioner, Surat Municipal Corporation, Surat (herein after called" Surat Municipal Corporation") and (Contractor) (hereinafter called "Contractor") for the work of **Repairing and Maintanance work of School building In T.P.S. No. 19 (Parvat-Magob), T.P.S. No. 35 (Kumbhariya) and T.P.S. No. 64 (Dumbhal-Magob) in South East zone (Limbayat), Surat** for the Earnest Money deposit for the due fulfillment by the contractor of the terms and conditions contained in the said agreement, We Bank(hereinafter referred to as the Bank) at the request of (Name of Contractor) do hereby undertake to pay the Surat Municipapl Corporation an Amount not exceeding **Rs. 18,800.00** (i.e. 50% of Total E.M.D. Amount) against any loss or damage caused to or suffered by Surat Municipal Corporation by reason of any breach of any term or condition contained in the said agreement by the said Contractor.

[2] We Bank of.....,do hereby undertake to pay the amount due and payable under this Guarantee without any demur merely on a demand from the Surat Municipal Corporation stating that the0 amount claimed in due by way of loss of damage caused to or would be caused to or suffered by the Surat Municipal Corporation by the reason of breach by the said contractor of any of the terms and conditions in the said agreement of by reason of the contractor failure to perform the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee shall be restricted to an amount not exceeding **Rs. 18,800.00** (50% of Total of Amt. of EMD)

[3] We undertake to pay the Surat Municipal Corporation any money so demanded not withstanding dispute or disputes raised by the contractor. In any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by under this bond shall be a valid discharge of our liability for payment thereunder and the contractor shall have no claim against us for making such payment.

[4] We Bank of.....,further agree that the guarantee herein contained shall remain in full force and effecting during the period that would be taken for the performance of the said agreement and that under or by virtue of said agreement have been fully paid and its clime satisfied or discharged or till Commissioner, Surat Municipal Corporation, Surat clarified that the terms and conditions of the said agreement have been fully and properly carried out by the said contractor and accordingly discharge this guarantee. Unless a demand or claim under this agreement is made on us in writing on or before **Dtd** we shall be discharged from all liability under this Guarantee thereafter.

[5] We Bank of.....,further agree with the Surat Municipal Corporation that the Surat Municipal Corporation shall have the fullest liberty without our consent and without in any manner our obligations hereunder to vary and of the terms and conditions of the said agreement or to extend the time of performance by the said contractor from time to time or to postpone for any time or time to time any of the power excersizable by the Surat Municipal

Corporation against the said contractor and to Forces or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any variation or extension being granted to the said contractor or for any biarnaise, act or omission of the part of the Surat Surat Municipal Corporation or any indulgence by the Surat Municipal Corporation to the said contractor or by any such matter or thing whatsoever which under the law relating to sureties would but for his provision have of a relieving us.

- [6] This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.
- [7] We Bank of, lastly undertake not to revoke during its currency except with the previous consent of the Surat Municipal Corporation in writing.
- [8] Notwithstanding anything contained here-in-above our liability under this guarantee is restricted to **Rs. 18,800.00** (50% Amt. of EMD) shall remain in force until **Dtd.**_____ unless a claim or demand under the guarantee is made against us in writing and received on or before **Dtd.**_____ all your rights under the said guarantee shall be forfeited and we shall be relieved discharged from all liabilities there under.

Seal, stamp and signature
of Bank's authorized signatory

Date :-

COVERING LETTER

To,
Municipal Commissioner,
Surat Municipal Corporation,
SURAT.

Sir,

I / We have tendered for the work..... of
.....
.....and have paid Earnest
Money Deposit Amounting to Rs..... drawn by
.....

(Name of the Bank)

The receipt No. dated by the Corporation is attached herewith.

In case, my / our tender is not accepted, therefore kindly arrange to refund the amount of Earnest Money Deposit paid by me / us as per the details referred to above.

Advance, stamped Receipt duly signed on Revenue Stamp of Rs. 1.00 p. is also enclosed here with.
Signature of the Contractor.....

Address :-
.....
.....

Encl : As Stated.

ADVANCE STAMP RECEIPT

Received with thanks the sum of Rs. (In Words)
only from the Surat Municipal Corporation being the refund of Earnest Money Deposit placed by me/us
vide SMC's Receipt No. dated along with the tender paper for
the.....

(Name of the work)

_____D
ate :- Revenue Stamp

Signature of the Tenderer.

F.W.C. to the Accountant,

2. For remarks whether thedeposit amounting to Rs. placed on
by Shri/M/s. in connection with the work of
.....
..... stands in full in the name of the
aforesaid party (R.No. dated)

SIGNATURE OF THE CONTRACTOR.

EXECUTIVE ENGINEER
SOUTH-EAST ZONE
SURAT MUNICIPAL CORPORATION

F.W.Cs. to EXECUTIVE ENGINEER, SLUM UPGRADATION DEPARTMENT,

To deposit of Rs. placed on by Shri/M/s. stands
in full in the name of the aforesaid party.

Accountant.

Submitted,

For favour of sanction of refund Rs. being the amount of
deposit placed on.....vide Receipt No..... by
Shri/M/s..... in connection with the work of
..... as the tender of
the above party has been accepted / had not been accepted and the concerned contractor has paid
security deposit of Rs. for the above referred work on Dt. The
party has also executed an agreement for the above work. The above deposit stands in full in the name
of the said party as certified by the Accountant on..... The expenditure will be
debited on B.H.G. Tender Deposit Account.

Assistant Engineer / Jr. Engineer.

Dy. Engineer,

Sanctioned Accordingly.

ANTI-BLACKLISTING CERTIFICATE

(on Non Judicial Stamp Paper of Rs.300/-)

(To be provided by Bidder)

I M/s. _____ (Name of the Bidder along with name and address of registered office) hereby certify and confirm that we or any of our promoter/s/ director/s are not barred by Government of Gujarat (GoG)/ any other entity of GoG or blacklisted by any state government or central government/ department/ agency/local self Government/Surat Municipal Corporation in India from participating in Project/s, either individually or as member of a Consortium as on _____ (Bid Submission Date).

We further confirm that we are aware that our Bid for the captioned Project would be liable for rejection in case any material misrepresentation is made or discovered with regard to the requirements of this Tender at any stage of the Bidding Process or thereafter during the agreement period. Dated this ____ day of _____ 2024

To be signed by:

Authorised Signatory with name & designation

Name of the Bidder

UNDERTAKING

Photographs of Partners, Managing Director



1. I/We agree that the decision of the SURAT MUNICIPAL CORPORATION in pre-qualification/selection of applicants/contractor, phasing of work and in any other project related matter, will be final and binding to me/us.
2. All the information and data furnished herewith and correct to my/our best of knowledge.
3. I/We agree that we have no objection if inquiries are made about our works, its related areas and any other inquiry regarding all details, projects and works listed by us in the pre-qualification document at any state.

SIGNATURE AND SEAL OF THE CONTRACTOR:-

NAME AND ADDRESS:-

DATE:-

SURAT MUNICIPAL CORPORATION

STATEMENT-A

Statement showing the similar works completed in the last seven years, i.e. for a period starting from Dt. 01-04-14 to 31-03-2021

Sr.No.	Name of Department / Client with Address	Name of work	Estimated cost of work put to tender	Tendered Amount	Date of award of contract	Target date of completion of work as per contract and date of completion of work if completed		Actual Amount of work completed	Time limit in year and months		Percentage rate and amount of Penalty	Reasons for delay in completion of work	Remarks
						Target Date	Completion Date		Original Y M	Extended Y M			
1	2	3	4	5	6	7a	7b	8	9a	9b	10	11	12

**Date
Place**

Signature of contractor

STATEMENT-B

Statement showing the similar works on hand / in progress.

Sr.No.	Name of Department / Client with Address	Name of work	Estimated cost of work put to tender	Tendered Amount	Date of award of contract	Target date of completion of work as per contract and date of completion of work if completed		Actual Amount of work done	Time limit in year and months		Reasons for delay in completion of work	Remarks
						Target Date	% Progress till Date		Original Y M	Extended (if any) Y M		
1	2	3	4	5	6	7a	7b	8	9a	9b	10	11

Signature of the contractor

Address

ANNEXURE A
AFFIDAVIT

NAME OF WORK:- Repairing and Maintanance work of School building In T.P.S. No. 19 (Parvat-Magob),
T.P.S. No. 35 (Kumbhariya) and T.P.S. No. 64 (Dumbhal-Magob) in South East zone
(Limbayat), Surat.

- 1.0 I, the undersigned, do hereby certify that all the statements made in the required attachments are true and correct.
- 2.0 The undersigned also hereby certifies that neither our firm M/s _____ nor any of its constituent partners have abandoned any work in India nor any contract awarded to us for such works has been rescinded during last five years, prior to the date of this bid.
- 3.0 The undersigned hereby authorize(s) and request(s) any bank, person, authorities, government or public limited institutions, firm or corporation to furnish pertinent information deemed necessary and requested by the SMC to verify our statements or our competence and general reputation.
- 4.0 The undersigned understands and agrees that further qualifying information may be requested, and agrees to furnish any such information at the request of the SMC.
- 5.0 The SMC and its authorised representatives are hereby authorised to conduct any inquiries or investigations to verify the statements, documents, and information submitted in connection with this application and to seek clarification from our bankers and clients regarding any financial and technical aspects. This Affidavit will also serve as authorisation to any individual or authorised representative of any institution referred to in the supporting information, to provide such information deemed necessary and requested by yourselves to verify statements and information provided in the Tender or with regard to the resources, experience and competence of the Applicant.

Signed by the authorised signatory of the firm

Title of the office

Name of the firm

Date

Note: The affidavit format as indicated above to be furnished on non judicial stamp Paper of **Rs.300.**

ANNEXURE - B

- 1.0 E.M.D. & Tender fee shall be submitted in electronic format only through online (by scanning) while uploading the bid. This submission shall mean that E.M.D. & Tender fee are received for purpose of opening the bid. Accordingly ,offer / tenders of those tenderers whose E.M.D. & tender fee is received electronically , shall be opened. However , for the purpose of relization of EMD and Tender fee,bidder shall send the EMD as well as Tender fee required format in original through RPAD / Speed post so as to reach to Account Department (Main Office) within stipulated date as mentioned in tender notice for the submission of tender FEE & E.M.D. ~~Punitive action shall be initiated for non submission of EMD & Tender fees in original to Account Department (Main office) by bidder including abeyance of registration and cancellation of E tendering code for one year.~~ All document in supporting of bid shall be in electronic format only through online (by scanning) during the bidding period & hard copy will not be accepted Separately.
- 2.0 All Document must be coloured scanned to be seen as original. Scanning in black and white or gray shall not be acceptable.
- 3.0 All the document must be notarised with clearly displaying stamp stamp , number and name of the notary.

“Following Document shall only be submitted in Hard copy to Surat Municipal Corporation by all Bidders.” as Mentioned in IT-09.

