

**SURAT MUNICIPAL CORPORATION
WEST ZONE**

Name of work : PROVIDING & FIXING KOTA STONE/PAVER BLOCK FOOTPATH / STREETS , WATER TABLE, PCC ,GAURD STONE AND REPAIRING OF BRTS RAILING AT VARIOUS PLACES IN PAL DEPOT AREA OF WEST ZONE (RANDER) (3RD ATTEMPT).

WORK NO.01

E-TENDER NOTICE NO. (On Line) No.Addi. City Engineer/WestZone/04/2026-27

VOLUME-I : TECHNICAL BID

DOWNLOAD OF TENDER DOCUMENTS FROM website smc.nprocure.com	:	From 29/06/2026 to 14/07/2026 upto 16.00 hrs
DATE OF PRE-BID CONFERENCE	:	NA
Online queries submission	:	N.A.
LAST DATE OF SUBMISSION OF ONLINE TENDER	:	On or before 14/07/2026 up to 18.00 hrs.
LAST DATE OF SUBMISSION OF TENDER FEES AND EMD IN HARD COPY	:	On or before 21/07/2026 to up to 17.00 hrs. To The Chief Accountant, SMC, Muglisara, Surat by R.P.A.D./Speed Post
Opening of Technical Bid (On line) etc. Probable date	:	15/07/2026 at 10.00 hrs onwards if possible (tentative)
Opening of Price Bid (On line) etc. Probable date	:	22/07/2026 , 12.00 hrs. on wards if possible
ESTIMATED AMOUNT	:	Rs. 67,53,262.05
E.M.D.	:	Rs.68,000/-
DOCUMENT FEES	:	Rs. 2400/- + 432/- = 2832/-
CLASS	:	"D"

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

SURAT MUNICIPAL CORPORATION
TENDER DOCUMENT
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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 24.00 hours FROM **Dt.29/06/2026 to Dt.14/07/2026** up to 16.00 hrs. on website smc.nprocure.com. The tender received after due time and date specified will not be accepted.

1. PROVIDING & FIXING KOTA STONE/PAVER BLOCK FOOTPATH / STREETS , WATER TABLE, PCC ,GAURD STONE AND REPAIRING OF BRTS RAILING AT VARIOUS PLACES IN PAL DEPOT AREA OF WEST ZONE (RANDER) (3RD ATTEMPT).

2. ESTIMATED COST : Rs. 67,53,262.05

3. EARNEST MONEY DEPOSIT : RS. 68,000/-

4. TIME LIMIT : 15 (Fifteen) months (Including monsoon)

5. Document Fee : Rs. 2400/- + 432/- = 2832/-

5. Registration required : 'D' class

(C) OPENING OF TENDERS :

The tenders will be opened online in presence of bidders and opening authority subject to **Technical bid, Tender Fees, EMD and other Documents in hard copy. 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 Dt.29/06/2026 to Dt.14/07/2026 16.00 hrs.

Tender documents fees of **Rs.2400/- + 432/- = 2832/-** per set which is required for submission of tender towards the cost of tender documents in 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 alongwith 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.

(D) CONTRACT PERIOD :

The total contract period is hereby fixed as **15 (Fifteen) months (Including monsoon)** from the 10th Day of issuance of work order.

(E) 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 68,000/-**

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

(e) The successful Tenderer will be required to furnish a performance bond (Security Deposit) of an amount equal to (2%) Two percent of the tendered amount.

(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.**

(k) **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.**

(F) RECEIPT OF TENDER DOCUMENTS :

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 7 days 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 & cancellation of E-Tendering code for 6 months (As per IT-09). Any documents in supporting of bid shall be in electronic format only through online(By scanning) and elctronic format only through online (by scanning) will not be accepted separately.

(G) Tender Validity Period :

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

(H) Rights Reserved :

Without assigning any reason, The Surat Municipal Corporation reserves the right to reject the lowest 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 this 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,
WEST ZONE (RANDER)
Surat Municipal CORPORATION,

Signature of the Contractor.

ANNEXURE-I TO II FOR PRE-QUALIFICATION
TO BE FILLED IN BY TENDERER

ANNEXURE-I

Performa for list of works of similar nature already completed by the Tenderer during last 7 years.

Sr. No.	Name of work and Place	Cost on Completion	Time taken in months to complete the work	Client name	Date of completion
1	2	3	4	5	6

Note: Bidder shall give completion certificate from client. In absent of such completion certificate, experience shall not be considered for evaluation. If completion certificate covers "Similar work (as per IT-04) with other work" then bidders shall have to submit copied of final bill indicating similar work or certificate of amount including "Similar work" from relevant authority.

Please Fill above details attached separate sheet.

Signature of the Contractor
With seal.

Place:

Date

ANNEXURE-II

Performa for declaration regarding work on hand with the tender:

Sr. No.	Name of work with place	Estimated Cost	Date of Issue of work order	Stipulated period of completion	Amount of work done	Brief details of delay if any	Name of client
1	2	3	4	5	6	7	8

Present liability = Total of column 3 - Total of column-6

Signature of the Contractor
with seal

Place

Date:

Note: Amount of work done in Column 6, should be given up to the month previous to the month in which tender are invited.

Please Fill above details attached separate sheet.

SURAT MUNICIPAL CORPORATION

WEST ZONE (RANDER)

CONTRACTOR TO PLEASE READ THIS CAREFULLY

- (1) If the tender is taken in favour of the company, a company of attorney in favour of the person who may have signed the tender for the company, must accompany the tender.
- (2) Solvency certificate of current year Bank or a Revenue Officer of an amount upto 20% of the tender cost plus works on the hand still to be executed will have to be produced by the contractor.
- (3) Voucher for earnest money must accompany the tender. Tenderer may pay earnest money in form of a crossed demand draft of a local Bank drawn in favour of the Municipal Commissioner. Earnest Money by cheque shall not be accepted.
- (4) The contractor shall have to furnish income tax clearance certificate before his tender is accepted and intimate assessment No. and Ward under he is which assessed.
- (5) Copies of certificate as regards previous experience, if any must accompany the tender.
- (6) Declaration showing all works on hand with the contractor and the value of works that remains to be executed in each case must accompany the tender.
- (7) All pages of Schedule: 'A & B' & specification should be initialed by the contractor.
- (8) All corrections, erasures & over writing should be initialed by the contractor.
- (9) Discrepancies and adjustment of errors:-Any error in quantity or amount in Schedule-'B' showing item of words to be carried out shall be adjusted in accordance with the following rules:-
 - (a) In the event of a discrepancy between description in works and figures quoted by a tenderer in the 'rates' column, the descriptions in words shall prevail.
 - (b) In the event of an error occurring in the amount column of the Schedule- 'B' showing items of works as a result of wrong multiplication of the unit rate and quantity, the units rate shall be regarded as firm and multiplication shall be amended on the basis of the rate.
 - (c) All the errors in totaling in amount column and in carrying forwarded total shall be corrected.
 - (d) Any rounding of amounts against item' or in totals' shall be ignored.
The tendered sum so altered shall, for the purpose of the tenders, be substituted for the sum originally tendered and considered for acceptance.
- (10) (i) It may please be noted that the tender shall be considered as invalid specially, if the requirements as per instruction No.1 to 9 above are not complied with before submitting the tender. Also please read carefully the face sheet and "General Rules and Direction for the guidance of contractor" of his form.
 - (ii) Right is reserved to reject any or all tender (s) without assigning any person (s) thereof.
- (11) In addition to the above the tender will also be liable to rejected outright if :-
 - (i) The tenderer proposes any alteration in the works specified or in the time allowed for carrying out the work or any conditions or correction made in any code or made of Schedule-'B' or specifications.
 - (ii) Any of the page or pages of the tender is removed or replaced.
 - (iii) All corrections, additions or pasted slips are not initialed by the tenderer.
 - (iv) Any erasures is made by him in the tender

AND

- (v) The tenderer or in the case of a firm, each partner or person holding the power of attorney thereof does not signed or the signature/s is/are not attested by witness on page-9 of the tender in the space for the purpose.
- (12) In respect of the tenders from the co-operative society, a solvency certificate of an amount equal to 20% of the amount of the work put to tender will have to be produced along with the tender or a certificate regarding the borrowing capacity if the society issued by the legal Assistant, Directorate of Cottage Industries will have to be produced along with the tender.
- (13) (1) The several documents for mining the contract are the essential part of the contract and requirement occurring in one is as binding as through occurring in all, they are intended to be mutually explanatory and complementary and to described and provide for a complete work.
(2) In the event of any discrepancy, the several documents forming the contract or in any the document, the following order or precedence should apply:-
 - (a) Dimension & quantities :-
 - (i) Drawings.
 - (ii) Schedule-B of the tender form.
 - (iii) Specification.On drawings, figures, dimensions, unless obviously incorrect will followed in preference to sealed dimensions.
 - (b) Description :
 - (i) Schedule-B of the tender form.
 - (ii) Drawings.
 - (iii) Specifications.In case of defective description or ambiguity, the Engineer- in-charge should issue further instructions direction in what meaner the work is to be carried out it being understood that the best modern practice is to followed. The contractor should forthwith comply with such instructions.
- (3) The contractor should taken no advantage of any apparent error or omission in drawings or specification and the Engineer in charge shall make such corrections and interpretation as necessary to fulfill the intent of the Plans and specifications.
- (4) No withstanding that all proper precautions may have been taken by contractor at all the times during the progress of the work, the contract shall be held responsible for all damages whether to the work under execution or to any other property or to lives of persons during the progress of the work and the period of maintenance.
- (5) Plans are for rough guidance only when detailed plans are received from the Architect of corporation during the course of execution the same will supersede previous plans
- 14. The contractor should appoint a qualified engineer and he must remain present on site during working hours.

Signature of the Contractor

Executive Engineer,
WEST ZONE (RANDER)
Surat Municipal CORPORATION,

DECLARATION FORM

I / We hereby declare that I / We have made myself / ourselves thoroughly conversant with the local conditions including all materials and labour on which I / We have based my / our rates for this tender. The specifications and leads on this work have been carefully studied and understood before submitting this tender. I / We undertake to use only the best materials approved by the Engineer or his duly authorized representative during execution of the work and to abide by the decision.

Contractor Signature with
Address:
Date :

Executive Engineer,
WEST ZONE (RANDER)
Surat Municipal CORPORATION,

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 **PROVIDING & FIXING KOTA STONE/PAVER BLOCK FOOTPATH / STREETS , WATER TABLE, PCC ,GAURD STONE AND REPAIRING OF BRTS RAILING AT VARIOUS PLACES IN ADAJAN GAM DEPOT AREA OF WEST ZONE (RANDER) (3RD ATTEMPT)**. 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 lowest 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-03 QUALIFICATIONS OF TENDERERS:-

- (A) 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 as per tender notice) 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 & cancellation of E-Tendering code for 6 months (As per IT-09). Any documents in supporting of bid shall be in electronic format only through online (By scanning) and electronic format only through online (by scanning) will not be accepted separately.

Mainly tenderer shall fulfill following the pre-qualification.

(a) Experience of having successfully completed similar works during last 7 years.

(1a) Three similar completed works, each costing not less than amount equal to 40% of the estimated cost.

OR

(2a) Two similar completed works, each costing not less the amount equal to 50% of the estimated cost.

OR

(3a) One similar completed works, each costing not less the amount equal to 80% of the estimated cost.

(b) Turnover during last 3 years, ending 31st March of previous financial year should be atleast 30% of Estimated Cost. An attested copy of annual turnover for last 3 years should be enclosed.

(c) Solvency certificate from bankers of schedule bank/Nationalized bank for the 20% of tender amount. Tenderer has to submit higher amount of bank solvency if so desired by Commissioner.

(d) An attested copy of registration with MES, Various department of State Govt., Surat Municipal Corporation, CPWD etc.

(e) List of the works already complete last years in prescribed proforma as per Annexure-I 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 an financial figures to amount base for the value of the works completed in India.

Financial Year	Multiplying factor
One (2025-26)	1.10
Two (2024-25)	1.21
Three (2023-24)	1.33
Four (2022-23)	1.46
Five (2021-22)	1.61
Six (2020-21)	1.77
Seven (2019-20)	1.95

Bidder should indicate actual figures of cost and the amount for the work executed in Annexure-I without accounting for the above mentioned factors.

(f) Declaration regarding the work on hand with the tender should also be given in prescribed performa as per Annexure-II. Attested copies of work orders, interim certificates if any shall also be attach as supporting documents.

(g) Attested cost of partnership deed, power of attorney etc.

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.68,000/-** The tenderer shall pay Earnest Money Deposit to be deposited by pay order/demand draft issued in favour of Commissioner, Surat Municipal Corporation, Surat through Nationalised/Schedule Bank only. The Earnest Money Deposit in the form of FDR or cheque shall not be accepted. The tender received without Earnest Money Deposit shall be out rightly rejected.

The instruments for Earnest Money Deposit shall be issued by or payable/encashable at Surat Branch of the said nationalized 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 longhand.
 - 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 (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 as per IT-10 below 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.

No.	Tender Amount	Penalty Amount in Rs.
1.	Rs. 1 Crore	Rs. 10,000/-
2.	than Rs. 1 Crore and Upto Rs. 10 Crore	Rs. 20,000/-
3.	than Rs. 10 Crore and Upto Rs. 50 Crore	Rs. 30,000/-
4.	than Rs. 50 Crore and Upto Rs. 100 Crore	Rs. 70,000/-
5.	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 Required documents must be notarized with clearly-displaying stamp, number and name of the notary.

IT 10 SUBMISSION OF TENDERER DOCUMENT :-

1. Following documents shall be submitted electronic format only through online (by scanning) to Surat Municipal Corporation:
- All necessary documents mentioned in Technical bid.
 - Earnest Money Deposit as mentioned in the Tender.
 - Tender Fees.
 - Affidavit on non judicial stamp paper of Rs.300/- as per Annexure-A
 - Under taking by the tenderer for not black listed on Rs.300/- government stamp paper.
 - 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 and Price Bid in hard copy shall be submitted by Successful bidder upon intimation from Surat Municipal Corporation.

- (i) COVER-1 : Technical Bid

E.M.D and Tender Fees for the work of **PROVIDING & FIXING KOTA STONE/PAVER BLOCK FOOTPATH / STREETS , WATER TABLE, PCC ,GAURD STONE AND REPAIRING OF BRTS RAILING AT VARIOUS PLACES IN PAL DEPOT AREA OF WEST ZONE (RANDER) (3RD ATTEMPT).** along with other Documents in Elctronic format only through online (by scanning) Dt.**29/06/2026** to Dt.**14/07/2026** up to 16.00 hrs. Also mention

the name of tenderer, address, tender notice number etc. on the cover .

(ii) PRICE BID

Price bid for the work of **PROVIDING & FIXING KOTA STONE/PAVER BLOCK FOOTPATH / STREETS , WATER TABLE, PCC ,GAURD STONE AND REPAIRING OF BRTS RAILING AT VARIOUS PLACES IN PAL DEPOT AREA OF WEST ZONE (RANDER) (3RD ATTEMPT)**. shall be submitted online. The name of work to be written on cover shall be work **PROVIDING & FIXING KOTA STONE/PAVER BLOCK FOOTPATH / STREETS , WATER TABLE, PCC ,GAURD STONE AND REPAIRING OF BRTS RAILING AT VARIOUS PLACES IN PAL DEPOT AREA OF WEST ZONE (RANDER) (3RD ATTEMPT)**. 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.68,000/-** The tenderer will pay Earnest Money Deposit by Pay Order/Demand Draft issued in favour of "Commissioner, Surat Municipal Corporation, Surat" by SMC enlisted Bank. In the form of Demand Draft.
 - (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 firm) 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 elctronic format only through online (by scanning) shall be received **Dt.29/06/2026 to Dt.14/07/2026** upto 16.00 hrs.

The same will be opened on the Dt.**15/07/2026** (On line) 10.00 hrs. on wards 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. Tenderers 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.
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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 the 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 furnish satisfactory evidence of its existence before the contract is awarded.

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 CLAUSE FOR CONSTRUCTION / ERECTION / COMMISSIONING/ INSTALLATION/ REPAIRS/ MAINTANANCE/ RENOVATION/ FABRICATION/ OF STRUCTURE INCLUDING BUILDING (MEANS ALL WORKS CONTRACT/ TURN KEY PROJECT SUPPLY OF MATERIAL/ GOODS)

- GST (Goods & 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 Terms of Contract agreed upon 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 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 falling 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 regards. Further, the non-payment of GST to the Government may lead to the termination of contract and forfeiture of Security Deposit / Performance Guarantee Amount.
- All duties, taxes and other levies except GST payable by the Contractor under the contract, for any other cause shall be included in the rates, prices and total bid price submitted by the bidder (GST will be paid extra).
- Payment of GST (Prevailing rates) on the amount payable under the contract to the contractor will be made by the employer. Hence, it is the responsibility of the Contractor to pay the GST to the concerned Authority.

- The rates quoted by the Contractor must be inclusive of all taxes prevailing on due date of bid submission except GST. However, any subsequent changes in the tax structure by Government after due date of bid submission will be compensated (+/- on availability or submission of actual documentation. Contractor will have to intimate Engineer regarding changes occurred in the Tax structure after bid submission. If the Contractor fails to provide such information and if any financial obligation may arise due to change in Tax structure, same will be recovered from the Contractor. GST will be paid separately on the Bills. Hence, it is the responsibility of the Contractor to pay the GST to the concerned Authority.
- Except GST, 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 and obliged to be reimbursed and no dispute regarding same shall be entertained by SMC. Bidder / firm should have to produce attested copy of sale tax certificate with proof of residence.

The Construction labour welfare cess shall be deducted from R.A. bill of the contractor at the prevailing rate. The current rate of labour cess is 1% of the capital amount.

Note :- The Rates mentioned in BOQ/SCHEDULE-B 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.

IT-19 EVALUATION OF TENDERS: DELETED

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 10th day from the date of work order to proceed. Total completion period is calendar months from 10th 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 authorized 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) :

As a contract security the tenderer to whom the award is made shall furnish a performance guarantee (Security Deposit) for amount equal to Two percent (2%) of the contract price to guarantee the faithful performance completion and maintenance of the works of the contract in accordance with all the conditions and terms specified herein and to the satisfaction of the Engineer and ensuring the discharge of all obligations arising from the execution of contract, in one of the forms mentioned below.

- (a) By a demand draft of a Scheduled bank Acceptable to owner on the Surat Branch.
- (b) A fixed deposit receipt (S. D. Amount more than Rs.68,000/-) of a Scheduled Bank or Government securities duly, located at Surat endorsed in favour of the Municipal Commissioner, Surat Municipal Corporation, Surat.

The performance guarantee shall be delivered to the Municipal Corporation within Ten (10) days of the notice of award.

(1) For the works up to Rs. 2.00 crores

- (a)Initial Security Deposit of 2%, (Released after completion of both final bill as well as defect liability period)
- (b)2% Retention money deposit to be deducted from running bills (Released with final bills)
- (c)5% retention money deducted from running bills. (Released with final bills)

Note: 2% Initial Security deposit shall be deposited in the form of Cash/DD/Pay order only.

(2) For the works above Rs. 2.00 crores

If the initial security deposited (2%) in the form of bank guarantee	If the initial security deposit (2%) in cash/D.D/F.D.R/Pay order
(a) (2%) The initial security deposit shall be released with final bill.	(a) (2%) The initial security deposit shall be released after completion of both final bill as well as defect liability period.

(b) The security deposit (2%) deducted from running bill shall be released after completion of both final bill as well as defect liability period.	(b) The S.D. (2%) deducted from running bill shall be released with final bill.
(c) 5% Retention money deducted from running bills shall be released with final bill.	(c) 5% Retention money deducted from running bills, shall be released with final bill.

Security deposit shall be paid in time and if it is paid after ten (10) days from the date of preliminary work order then the penalty of 0.065 % per day of the amount of security deposit shall be recovered from the contractor while receiving the security deposit. On due performance and completion of the contract in all respects, the performance guarantee (security deposit) will be returned to the contractor after the defect liability period and on completion of audit related procedure. 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 Two percent (2%) of the tendered amount accepted by the competent authority shall have to be paid towards security deposit at the time of execution of agreement. This will be known as initial security deposit which will be released after the total completion of contract after payment of final bill.

7% of the total tendered amount shall be deducted as retention money from the running account bill which will be released at the time of final bill.

IT-28 STAMP DUTY :

The successful tenderer shall have to enter into an agreement on a non-judicial stamp paper as per rules and regulation of government at the time of agreement which is approved by the Surat Municipal Corporation. The Contract Agreement,Surety & Undertaking shall be executed on stamp paper worth Rs.300/-.

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 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 No mobilisation advance or advance on machinery will be given.

IT-38 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. More over, 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.

EXECUTIVE ENGINEER,
WEST ZONE (RANDER)
SURAT MUNICIPAL CORPORATION,
SURAT.

SIGNATURE OF THE CONTRACTOR.

SURAT MUNICIPAL CORPORATION
PERCENTAGE RATE TENDER & CONTRACT FOR WORKS

GENERAL RULES AND DIRECTIONS FOR THE GUIDANCE OF CONTRACTORS :-

- (1) 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 rated 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 are 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.

- (2) 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.
- (3) 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.
- (4) 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 than one work but contractors who wishes to tender for each. Tender shall have (to which they refer) written outside the envelope.
- (5) 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.
- (6) The officer competent to dispose of the tender shall have the right of rejecting all or any of the tenders.
- (7) 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.
- (8) 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.

- (9) 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.
- (10) Under no circumstances shall any contractor be entitled to claim enhanced rates for any items in this contract.
- (11) 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.
- (12) All corrections and additions or pasted slips should be initiated.
- (13) 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.
- (14) A.The Insurance Company's bond will not be accepted against the Security Deposit.
- (15) The contractor shall have to attach to his tender Income Tax Clearance Certificate to be obtained from the Income Tax Officer.
- (16) 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.
- (17) 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.
- (18) 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 calender 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).
- (19) 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 them 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.

- (20) 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.
- (21) Tenderer should submit True Copy of the Certificate of Registration along with the tender without which the tender will not be considered.
- (22) 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.
- (23) "What ever sales tax is levied by the Government on works contract and if paid by the contractor in the first instance, shall be refunded to the concerned contractor by Corporation.

Executive Engineer,
WEST ZONE (RANDER)
Surat Municipal CORPORATION,

Contractor Signature with
Address:
Date :

GENERAL CONDITION OF CONTRACT

SECTION-I

GC-01 DEFINITIONS AND INTERPRETATIONS :

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.

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

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 assignees.

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.

"Engineer - in - charge's Representative" shall mean any Engineer or Asstt. 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.

"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.

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

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

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

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

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

"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 assignees of such person, firm or company.

"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) thereunder. 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.

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.

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.

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.

The "Temporary Work" shall mean all temporary works of every kind required in or about the execution, completion and maintenance of the work.

"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.

"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.

"Notice in Writing or Written Notice" means a notice written, types or printed form delivered personally or sent by Registered post to the latest know private of business address at Registered Office of the Contractor.

The "Alteration/Variation order" means an orders given in writing by the Engineer-in-charge to effect additions to or deletion from and alterations in the work.

"Final Test Certificate" shall mean the final test Certificate issued by the owner within the provisions of the Contract.

The "Completion Certificate" shall mean a certificate to be issued by the Engineer-in-charge when the work has been completed to his satisfaction.

The "Final Certificate" shall mean the final certificate issued by the Engineer-in-charge after the work is finally accepted by the owner.

"Defect Liability Period" shall mean the specified period between the issue of completion Certificate and the final certificate as specified in the tender.

"Approved" shall mean approved in writing including subsequent modification in writing of previous verbal approval and "Approval" means approved in writing including as aforesaid.

"Letter of Acceptance" shall mean an intimated by a letter to tenderer that the tender has been accepted in accordance with provisions contained therein.

"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.

"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.

"Security Deposit" shall mean the deposit to be held by the owner as security for the due performance of contractual obligations.

"The appointing authority" for the purpose of Arbitration shall be the Municipal Commissioner, Surat Municipal Corporation, Surat.

Retention Money shall mean the money retained from R. A. Bill for due completion of "NET WORK".

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.

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 Western Railway Broad Gauge line, Government Irrigation Canal Crossing. The intending Tenderer should inspect the site and make himself familiar 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 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 net works 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 of 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 corporated 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 ar variance with any provisions of the special conditions of contract, then, unless a different intension 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 require- ments 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 worner 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 circumstances 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 accordingg 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 misunder-standing or incorrect information given in writting by the Engineer.

GC-07 ERROR IN SUBMISSION ;

The contractor shall be responsible for any errors or omissions 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)

1. A sum of 2.0% of the accepted value of the tender contract price shall be deposited by the tenderer (hereinafter called. The Contractor while tender is accepted) as Security deposit with the S.M.C. for the faithful performance, completion of the works in accordance with the contract documents and to the satisfaction of the Engineer and assuring the payment of all obligations arising from the execution of the contract.

This shall be deposited initially at 2.0% of the value of the contract within fifteen days of the receipt by him or the notification of acceptance of tender and at least three (3) days before the contract agreement is executed in the forms mentioned below :

(a) In cash or by a demand draft of a Schedule Bank acceptance to owner on the Surat Branch.

(b) A fixed deposit receipt of a Scheduled Bank or Government Securities located at Surat duly endorsed in favour of the Municipal Commissioner, Surat Municipal Corporation, Surat.

(c) If the value of the work as per actual execution exceeds the accepted value of tender because of allotment of further work further recoveries towards security deposit shall be effected at four percent (4%) of R.A .Bill to make up the total amount of security deposit equal to two point five percent (2.5%) of the revised value of contract. Alternatively the Contractor may at his option deposit the full amount of security deposit as per the revised value of the contract within fifteen days of receipt by him on the notification accepting the tender in the form as aforesaid.

2. If the Contractor, sub - contractor or their employees shall break, deface or destroy any property belonging to the owner or other agency during the execution of the contract, the same shall be made good by the contractor at his own expenses and in default thereof, the Engineer- in-charge may cause the same to be made good by other agencies and recover expenses from the Contractor (for which the certificate of the Engineer-in-charge shall be final). These expenses can be recovered from the security deposit if recover from other sources is not possible. The amount so reduced in security deposit will be made good by deduction from the next R.A.Bill of the Contractor.

3. All compensation or other sums of money payable by the contractor to the owner under terms of this contract may be deducted from or paid by the sale of sufficient part of his security deposit or from any sums which may be due or become due to the contractor by the owner on any account whatsoever and in the event this Security deposit being reduced by reasons of any such deductions or sale of security deposit or part thereof as aforesaid, the Contractor shall within fifteen days thereafter make good the in cash, bank drafts or Government Securities endorsed as aforesaid. No interest shall be payable by the owner for sum deposited as security deposit.

4. The security deposit shall be extendable upto the date as decided by Engineer in accordance with Requirement of contractual obligations under the contract.

5. The security deposit less any amounts due shall be returned to the contractor without any interest after the defects liability period is over and subject to the Engineer-in-charge certifying that no liability attaches to the contractor.

6. The performance guarantee shall be delivered to the Municipal Corporation within Ten (10) days of the notice of award. Security Deposit should be paid in time and if it is paid after fifteen days from the date of work order then the penalty of 0.065% per day of the amount of security deposit should be recovered from the Contractor while receiving the security deposit. The performance guarantee will be returned to the Contractor without any interest after the defect liability period is over. 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. Two percent (2.0%) of the tendered amount accepted by the competent authority shall have to be paid towards security deposit at the time of execution of agreement.

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 dispatched 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** from the date of issue of completion certificate. 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 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 program 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 program of time schedule for execution of the works in accordance with the specifications & the completion date. The entire program to be finalized 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 program 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 individuals contractor is submitted to the Engineer-in-charge before being entered into and in approved by him. List of Sub-Contractors is to be supplied. Not with standing any subletting with such approval as aforesaid and not with standing 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 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 as 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-20A.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 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 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 or 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 the contractor 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 preceding 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 a 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 be have any claim for compensation by reason if any alternations 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 whereunder 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 ensure 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 equipments, 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, it 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, foramen 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 r employed 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 behaviour 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 neighborhood 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 be give written notice to the contractor request his to terminate such sub-contract and the contractor upon the receipt of such notice shall terminate such sub-contract and the letter 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 ENTRY :

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 license 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 authorized 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 conform 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 leveling, 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 One year.

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 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 other-wise 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 hereunder :

(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 faithfully performance of the contract subject to his providing a satisfactory guarantee for the due and faithful performance of the contract upto 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 condemnation 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 froths 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.

It 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 questions of fact arising under the contract shall be decided by the Commissioner, subject to a written appeal by the Contractor to the Commissioner, and these decisions shall be final and binding to the contractor.

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 reasonable defrayed by payment under (a) above;

c) The Municipal Commissioner also release all bonds and guarantees at its disposal except is cause 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 like wise 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 perviously 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 CORRECTTNESS 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 un-used 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 head 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 licenses 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 license 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.

Incase 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 twenty (20%)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 2021-2022 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 notice 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 directed 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 contractor shall, no demand in writing from Engineer-in-charge or his authorized representative specifying the work, materials or articles companied 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 continue and in the case of any such failure the Engineer-in- charge may on expiry of the notice period rectify and remove and reexecute 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 made 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 be 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 obtain. 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 authorized agent. Such measurements will be got recorded in the measurement book by the Engineer or his authorized representative and signed by contractor or his authorized agent in token of acceptance. If the contract or his authorized 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 authorized 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 preformed 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 postponed 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 RECOVERDED 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 unauthorized 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 finalized 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 fulfill 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. :

The Contractor shall be liable to payment of all the Central/ State/Local Bodie's Levies, taxes or duties etc. The SMC shall neither bear it nor reimburse at any time but will ensure deduction of Central/State/Local levies and taxes at Source at the rate provided under the relevant statutes from time to time enforce. Further the work contract tax or sale tax shall be borne by the Contractor as per Rules and Regulations of Government.

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

GST

GST (GOODS & SERVICE TAX) HAS COME IN EXISTENCE FROM 1st JULY 2017, CONTRACTOR/SUCCESSFUL BIDDER IS BOUND TO PAY ANY AMOUNT OF GST PRESCRIBED BY THE.GOV'T. OF INDIA AS PER THE TERMS OF CONTRACT AGREED UPON DURING THE COURSE OF EXECUTION OF THIS CONTRACT.

DURING THE COURSE OF EXECUTION OF THIS CONTRACT, IF THERE IS ANY CHANGE IN RATE OF GST (GOODS & SERVICE TAX) BY THE GOVERNMENT, THE SAME SHALL BE REIMBURSE / 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 ALONE WITH A CERTIFICATE FROM CHARTERED ACCOUNTANT OF CONTRACTOR / SUCCESSFUL BIDDER CERTIFYING 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 SOLO 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 / SUCSESSEFUL BIDDER IN THIS REGARD. FURTHER, THE NON-PAYMENT OF GST TO THE GOVERNMENT MAY LEAD TO THE TERMINATION OF CONTRACT AND FURFEITURE OF SECURITY DEPOSITE / 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 COURSED OF THE CONTRACT. THE SAME SHALL BE BORNE BY THE CONTRACTOR / SUCSESSEFUL BIDDER ONLY, IN NO CASE SMC SHALL BE LIABLE FOR THE SAME.

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 workman's' 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 OUR 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 labors 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 labors engaged on work according the law.
4. The Contractor and sub-contractors o f 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 licenses, consents, Registration and / or other authorization as shall from time to time be or become necessary for relating 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 licenses ,consents, regulation and other authorization 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 forth herein.

1. First Aid and Industrial Injuries :

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

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.

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 :

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 :

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 sand 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).

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 :

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 or work.

5. Display or Safety Instructions :

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 :

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 :

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.

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 or by the Municipal Corporation as principal employer, the Engineer-in-charge may 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 liability. On receipt of award from the labour commission in regard to quantum of compensation, the difference in amount will be adjusted.

GC-93 It is clarified that if the contractor makes his own arrangements for water required for construction and labour camp etc. by drilling bore. No water charges will be recovered from the contractor. On the otherhand, 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 even so water charges shall be recovered as per relevant condition of the tender.

GC-94 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 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 the 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 along 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 management project

EXECUTIVE ENGINEER,
WEST ZONE (RANDER)
SURAT MUNICIPAL CORPORATION,
SURAT.

SIGNATURE OF THE BIDDER.

SCHEDULE - A**ADDITIONAL INSTRUCTION FOR CEMENT AND STEEL : (SCHEDULE-A)**

Surat Municipal Corporation shall not issued cement and reinforcement steel to be used for this work.

The cement and reinforcement steel required for the above said work shall be procured by contractor at its own cost.

The brands for cement shall be Ambuja, Ultrateck, Sanghi, Hathi, Sidhdhi, JK Laxmi company confirming to IS-12269/87 latest amendment ISO-15000 of 53 grade only.

Approved make of TMT reinforcement steel :- TATA, SAIL, Rastriya Ispat, Electrothurm, Ramswaroop, National as per confirming to IS 1786/85 latest amendment TMT Fe-415/Fe-500. TMT Steel shall be purchased by only manufacturing company/Authorized dealer/ Distributor/ Stockiest only shall be allowed to use 6 mm plain steel shall be as per IS 2062/99 with latest amendment

of any brand/make.

Any of the above mentioned brands of Cement and Reinforcement steel shall only be used by the contractor at the time of execution.

WASTAGE OF CEMENT AND REINFORCEMENT STEEL :

As the contractor is to bring the cement and steel, the question of considering the wastage on the basic of issue rate does not arise i.e. no separate payment shall be made for any kind of wastage in the materials. The payment for reinforcement bar will be made on theoretical weight basis. 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.

The steel consumption either less than 7.5% of the standard consumption shall be penalized either at the double existing corporation issue rate or the prevailing market rate, whichever is more.

Similarly, for cement also, the less consumption beyond 5% shall be penalized at the double existing corporation issue rate or the prevailing market rate, whichever is more.

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, 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,
WEST ZONE (RANDER)
Surat Municipal Corporation.

Signature of the Contractor:

MEMORANDUM

1.	General Description of work	:	PROVIDING & FIXING KOTA STONE/PAVER BLOCK FOOTPATH / STREETS , WATER TABLE, PCC ,GAURD STONE AND REPAIRING OF BRTS RAILING AT VARIOUS PLACES IN PAL DEPOT AREA OF WEST ZONE (RANDER) (3RD ATTEMPT) .
2.	Estimated Cost	:	Rs.67,53,262.05
3.	Earnest Money Deposity	:	Rs.68,000/-
4.	Additional Security Deposit (i) Cash (not less than the amount of earnest money)	:	Rs. 2% of Tender Amount.
	(ii) To be deducted for current bills	:	Rs. -----
	Total Deposit	:	Rs. 2% of Tender Amount.
5.	Time allowed for the completion of work from date fixed in written order to commence	:	15 (Fifteen) Months (Including monsoon)
6.	Compensation for delayed work under Clause 2	:	Zero Point two percent (0.2%) of the contract price per day maximum upto ten percent (10%) of the contract price.
7.	The progress of work should confirm to the following schedule		
	1/4 of the work in 1/2 of the work in 3/4 of the work in	:	1/4 of the time. 1/2 of the time. 3/4 of the time.
8.	Percentage to be retained from running Account Bills	:	5%+2%= 7% (Seven Percent)
9.	Defect Liability Period	:	12 (Twelve) Months From the Complition of work.
10.	Water Charges	:	CONDITION FOR THE WATER SUPPLY& ELECTRIC SUPPLY on next page.
12.	Construction Cess will be deducted from respective R.A. Bill and Final bill in accordance with the prevailing norms of Govt. of Gujarat.	:	1% of Taxable Amount in R.A.Bill

Signature of the Contractor:

Executive Engineer,
WEST ZONE (RANDER)
Surat Municipal Corporation,

SURAT MUNICIPAL CORPORATION
WEST ZONE (RANDER)
CONDITION FOR THE 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.

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 Licenced plumber in prescribed form.
2. Contractor has follow all procedure with his own expenses.
3. According to rule Municipal Corporation issue bill to contractor for consumption of water and contractor has to paid it within stipulated time and contractor has submit one copy of bill and payment receipt to concern department. If contractor fail to pay the bill the amount of bill/paid receipt can be recover 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 cancelled 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.

(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.

EXECUTIVE ENGINEER,
WEST ZONE (RANDER)
SURAT MUNICIPAL CORPORATION,
SURAT.

SIGNATURE OF THE CONTRACTOR.

IMPORTANT INSTRUCTION-A TO THE CONTRACTOR

- (1) This tender document containing Page No.01 to 122 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 tender 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,
WEST ZONE (RANDE)
SURAT MUNICIPAL CORPORATION,
SURAT.

SIGNATURE OF THE CONTRACTOR.

SPECIFICATIONS OF MATERIALS

WATER :

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. 456-2000.

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. 269-1989. 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.

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.

Hard and bitter water shall not be used for curing.

Portable water shall generally be found suitable for curing mortar or concrete.

LIME :

Lime shall be hydraulic lime as per I.S. 712-1984. Necessary tests shall be carried out as per I.S. 6932 (Parts I to X) 1995.

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.

Storage shall comply with I.S. 712-1984. 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.

Field testing shall be done according to I.S. 162-1989 to show the acceptability of materials.

CEMENT :

- 3.1 Cement shall be ordinary portland slag cement as per I.S. 269-1989 or Portland slag cement as per I.S. 455-1976 and revised latest I.S.

WHITE CEMENT :

- 4.1 The white cement shall conform to I.S. 8042-1989.

COLOURED CEMENT :

Coloured cement shall be with white or grey portland cement as specified in the item of the work.

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.

The pigment shall have the property such that it is neither affected by the cement nor detrimental to it.

SAND :

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, alkali, salts, organic matter, 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.

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
4.55 mm	100	600 Micron	30-100
2.36 mm	1500-100	300 Micron	5-70
1.18 mm	70-100	150 Micron	0-60

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 sieve	I.S. Sieve Designation	% by weight passing sieve
4.55 mm	100	600 Micron	40-85
2.36 mm	100	300 Micron	5-50
1.18 mm	75-100	150 Micron	0-10

STONE DUST :

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.

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.

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.

The fineness modulus of stone dust shall not be less than 1.80.

STONE GRIT :

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. 383-1990. 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.

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

I.S. Sieve Designation	% by weight passing sieve	I.S. Sieve Designation	% by weight passing sieve
12.50 mm	100%	4.75 mm	2.20%
10.00 mm	80-100%	2.36 mm	0.25%

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.

The necessary tests for grit shall be carried out as per the requirements of I.S. 2338 (Parts I to VIII) 1988, as per instruction of the Engineer-in-charge. The necessity of test will be decided by the Engineering-in-charge.

CINDER :

Cinder is well brunt furnace residue which has been fused or ssintered into lumps of varying sizes.

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.

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

LIME MORTAR :

LIME : Shall conform to specification M-2. WATER : Water shall conform to specification M-1. SAND : Sand shall conform to specification M-6.

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 shall be measured by volume.

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.

STORAGE : Mortar shall always be kept damp, protected from sun and rain till used up, covering it by trapaulin or open sheds.

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.

CEMENT MORTAR :

Water shall conform to specification M-1. Cement shall conform to specification M-3. Sand shall conform to M-5.

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.

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.

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.

STONE COARSE AGGREGATE FOR NOMINAL MIX CONCRETE :

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.

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	80-100	100	-	4.75 mm	-	0.50	0.50
20 mm	0-20	85-100	100	2.75 mm	-	-	-
10 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.

The grading test shall be taken in the beginning and at the change of source of materials. The necessary tests indicated in I.S. 383-1990 and I.S. 456-2000 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 intermixng of different aggregates. If the aggregates are covered with dust, they shall be washed with water to make, them clean.

BLACK TRAP OR EQUIVALENT HARD STONE COARSE :

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.

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.

The necessary tests indicated in I.S. 383-1990 and I.S. 456-2000 shall have to be carried out to ensure the acceptability of the material.

If aggregate is covered with dust it shall be washed with water to make it clean.

BRICK BATS AGGREGATE :

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.

The brick bats shall be measured by volume by suitable boxes as directed.

BRICKS :

The bricks shall be hand or machine moulded and made from suitable soils and kiln burnt. They shall be firee 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.

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

The size of conventional bricks shall be as under --- 225 x 110 x 75mm.

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

The crushing strength of the bricks shall not be less then 35 Kg./Sq.Cm. The average water absorpton 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)-1992.

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 used on one work. The following tolerances shall permitted in the conventional size adopted in a particular work:
Length : ñ 4 mm
Width : ñ 2 mm
Height : ñ 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.

STONE :

The stone shall be of the specified variety such as Granite/Trap stone/Quarzite 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 viens, 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. 1134-1985. The minimum crushing of the strength of the stone shall be 200 Kg./Sq.Cm. unless otherwise specified.
The samples of the stone to be used shall be got approved before the work is started.
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.

LATERITE STONE :

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.
The stone shall be dressed into rectangular blocks so that all faces are from waviness and unevenness and the edges true and square.
Those type of stone in which white clay occurs should not be used.
Special corner stones shall be provided where so directed.

MILD STEEL BARS/TMT/CRS BARS :

Mild steel bars reinforcement TMT/CRS Bars for R.C.C. work shall conform to I.S. 432 (Part-II)-1982 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.
All the reinforcement shall be clean and free form dirt, paint, grease, mill scale or loose or thick rust at the time of placing.
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)	6 mm	0.22 Kg/Rmt.
(ii)	8 mm	0.38 Kg/Rmt.
(iii)	10 mm	0.62 Kg/Rmt.
(iv)	12 mm	1.89 Kg/Rmt.
(v)	14 mm	1.21 Kg/Rmt.
(vi)	16 mm	1.58 Kg/Rmt.
(vii)	18 mm	2.00 Kg/Rmt.
(viii)	20 mm	2.47 Kg/Rmt.
(ix)	22 mm	2.98 Kg/Rmt.
(x)	25 mm	2.85 Kg/Rmt.
(xi)	28 mm	4.38 Kg/Rmt.

(xii)	32 mm	6.31 Kg/Rmt.
(xiii)	36 mm	7.31 Kg/Rmt.
(xiv)	40 mm	9.86 Kg/Rmt

HIGH YIELD STRENGTH STEEL DEFORMED BARS :

High yield strength steel deformed bars shall be either cold twisted or hot rolled and shall conform to I.S. 1739-1978 and I.S. 1139-1966 respectively.
Other provision and requirements shall conform to specification No. M-18 for Mild Steel Bars.

HIGH TENSILE STEEL WIRES :

The high tensile wires for use in prestressed concrete shall conform to I.S. 2090-1983.
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.
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.
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.

MILD STEEL BINDING WIRE :

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.
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.

STRUCTURAL STEEL :

All structural steel shall conform to I.S. 226-1975. 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. 1148-1992.
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.

GALVANISED IRON SHEETS :

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. 277-1992. 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.
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 1500 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.

ASBESTOS CEMENT SHEETS :

Asbests 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.
Ridges and Hips :
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.

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.

MANGALORE PATTERN ROOF TILES :

25.1 The Mangalore pattern tiles shall conform to I.S. 654-1992 for Class 'AA' or 'A' type as specified in item. Samples of the tiles to be provided shall got approved from the Engineer-in-charge. Necessary tests shall be carried out as directed.

SHUTTERING :

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.

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.

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.

The props shall consists of bullies 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.

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.

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.

As far as practicable, clamps shall be used to hold the forms together and use of nails and spikes avoided.

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.

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.

EXPANSION JOINTS - PREMOULDED FILLER :

The item provides 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.

Premoulded bituminous joint filler, i.e. performed stirp of expansion joint filler shall not get deformed or broken by twisting, bending or other handing when exposed to atmospheric condition. Pieces of joint filler that have been damaged shall be rejected.

Thickness of the pre moulded joint filler shall be 25 mm unless otherwise specified.

Premoulded bituminous joint filler shall conform to 1.5 1838-1961.

EXPANSION JOINTS - COPPER STRIPS AND HOLD FASTS :

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.

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.

TEAK WOOD :

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.

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.

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

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

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.

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 scantalings, 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.

WOODEN FLUSH DOOR SHUTTERS (SOLID CORE) :

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)-1991. 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. 303-1298.

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 corss bands, and face veneers. The lipping, rebating, opening of glazing, venetion etc. shall be provided if specified in the drawing.

All edges of the door shutters shall be square. The shutters shall be free form twist or warp in its plane. Both faces of the shutters shall be sand papered to smoot even texture.

The shutters shall be tested for ---

- i] End Immersion Test : The test shall be carried out as per I.S. 2202 (Part-I) 1991. There shall be no delamination at the end of the test.
- ii] Knife Test : The face panel when tested in accordance with I.S. 1659-1990 shall pass the test.
- iii] Glue Adhesion Test : The flush door shall be tested for glue adhesive test in accordance with I.S. 2202(Part-I)- 1991. 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 occured in the assembly glue lines between the plywood face and the style and rail. Delamination at the corner shall be measured continously around the corner. Delamination at the knots knot, hole and other permissible wood defects shall not be considered in assessing the sample.

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.

ALUMINIUM DOORS, WINDOWS, VENTILATORS :

Aluminium alloy used in the manufacture of extruded window sections shall conform to I.S. designation HEA-WP of I.S.:733- 1991 and also to I.S. Designation WVG - WP OF I.S.:1285-1991. The sections shall be as specified the drawing and design. The fabrication shall be done as directed.

The hinges shall be cast or excluded aluminium hinges of same type as in window but or large size.

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.

ROLLING SHUTTERS :

The rolling shutters shall conform to I.S. 6248-1991. 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.

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.

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.

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.

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.

The locking arrangement shall be provided at the bottom of shutter at both ends. The shutters shall be opened from outside.

The shutters shall be completed with door suspension, shafts, locking arrangements, pulling hooks, handles and other accessories.

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, flates 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.

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 seurely 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 ruest 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.

EXPANDED METAL SHEETS :

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 - 1992 except that blank sheets need not be with guaranteed mecanical 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.

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.

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. 280-1992.

PLYWOOD :

The Plywood for general purpose shall conform I.S. 303-1998. Plywood is made by cementing together thin boards or sheets of wood into panels. There are always an old 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.

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 slitting with change in moisture content.

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 any thing from 2 to 60 minutes depending upon thickness.

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.

According to I.S. : 303-1998 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.

TABLE	
THICKNESS OF PLYWOOD BOARDS	
Board	Thich
3 ply	3 mm
	4 mm
	5 mm
	6 mm
6 ply	5 mm
	6 mm
	8 mm
	9 mm
7 Ply	9 mm
	13 mm
	16 mm
	19 mm
9 Ply	13 mm
	16 mm
	19 mm
	22 mm
11 ply	19 mm
	25 mm

GLASS :

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 ----

Sheet Glass :

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.

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 1500 mm. x 1500 mm. glass weighing not less than 11.25 Kg./Sq.m. shall be used.

Sheet glass shall be patent flattened glass of best quality and for glasing and framing purposes shall conform to I.S. 761-1963. 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 1500 mm. plate glass of specified thickness shall be used.

Plate Glass :

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.

Obscured Glass :

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 Wired Glass :

Glass shall be with wire netting embedded in a sheet of plane glass. Electrically welded 13 mm. Geogain square mesh shall be used. Thickness of glass shall not be less than 6 mm. wired glass shall be of type and thickness as specified.

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.

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. 3087-1990.

"Specification for wood particle board for general purpose." The size and the thickness of the particle board shall be as specified.

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.

RESIN BONDED FIBRE GLASS :

The resin bonded fibre glass tiles or rools shall be of approved make and shall be sizes, thickness and finish as indicated.

For test of Mineral wool thermal insulation Blanket I.S. 3144-1965 followed.

Insulation wool blanket shall be with the following coverings on one or both sides as indicated.

- (1) Bituminisedessian 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 for surfaces to be plastered over.

FIXTURES & FASTENINGS :

General ---

- i] The fixtures and fastenings, that is, butt, hinges, 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 1500 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 1500 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.

PAINTS :**Oil Paints :**

Oil paints shall be of the specified colour and shade, and as approved. 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.

Enamel Paints :

The enamel paint shall satisfy in general requirements as mentioned in specification of oil paints. Enamel paints shall conform to I.S. 2933-1991.

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. 348-1991.

MARBLE CHIPS FOR MARBLE MOSAIC TERRAZZO :

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.

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.

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. 2114-1990.

FLOORING TILES :

A] Plain Cement Tiles -

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.

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- 1990 requiring resistance to wear and water absorption.

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.

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.

The tolerance of length and breadth shall be plus or minus 1 mm. The tolerance on thickness shall be plus 5 mm.

The tiles shall satisfy the tests as regards transverse strength, resistance to wear and water absorption as per I.S. 1237-1980.

B] Plain Coloured Tiles :

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. 1237-1990.

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.

The colour of the tiles shall be specified in the item or as directed.

C] Marble Mosaic Tiles :

These tiles have the same specifications as per plain cement tiles except the requirements as stated below ---

The marble mosaic tiles shall conform to I.S. 1237-1990. 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.

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.

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.

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.

D] Chequered Tiles :

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.

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.

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.

Tiles shall conform to relevant I.S. 1237-1990.

E] Chequered Tiles for Staircases :

- 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.

ROUGH KOTAH STONE :

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.

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.

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.

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.

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.

POLISHED KOTAH STONES :

Polish kotah stone shall have the same specifications as per rough kotah stone except as mentioned below.

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 dedo, skirting, platforms sink, veneering, sills, steps etc. where machine polishing after the stones are fixed in situ is not possible shall be double polished.

DHOLPUR STONE SLAB :

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.

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 of 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.

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.

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. 1130-1993 or as revised from time to time.

GRANITE STONE SLAB :

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.

The thickness of the stone shall be specified in the item.

All exposed faces shall be double polished to tender truly smooth and even relecting surface. The exposed edges and corners shall be rounded off as directed. The exposed edges shall be machine cut and shall have uniform thickness.

P.V.C. FLOORING :

P.V.C. sheets for P.V.C. floor covering shall be homogenous flexible type, conformint to I.S. 3462-1991. The P.V.C. covering shall neither develop any toxic effect while put to use not shall give off any disagreeable odour.

Thickness of flexible type covering or tiles shall be as specified in the description of the item.

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. 1500 mm Square tiles.	+/- 0.60 mm
	4. Sheets and rolls.	+/- 0.10 percent.

Adhesive :

53.4.1 The adhesive for PVC flooring shall be of the type and make recomend by the manufacturers of PVC sheets tiles.

FACING TILES :

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. 2691-1995.

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. 1077-1992.

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

Size	Torrence for	
	1st Class Brick	2nd Class Brice
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 :

Facing dimensions.	Permissible tolerance.
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EUROPEAN TYPE WATER COLSET/WITH LOW LEVEL FLUSHING :

The European type water closet shall be white glazed conforming to I.S. 2556-1994 and I.S. 771-1692.

'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. 2548-1996. 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.

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) 1994 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.

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)-1994. 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.

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-1992. The brackets for sinks shall conform to I.S. 775-1990.

The pipes shall conform to I.S. 1239-Part-I-1990 and I.S. 404-1993 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.

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. 771-1992. 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.

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. 774-1990. 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. 775-1990.

CAST IRON FLUSHING CISTERN :

The cast iron flushing cistern shall be of 15 litres capacity. It shall conform to I.S. 774-1990. The flushing cistern shall be of best quality free from any defects.

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) 1993. 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. 775-1990.

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.

CAST IRON PIPES AND FITTINGS :

All soil, waste, vent and antisiphonage pipes and fittings shall conform to I.S. 1729-1991. 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.

The end of pipes and fittings shall be reasonably square to their axis.

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.

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 Thick	Wight of pipe excluding ears		
			1.5 m long	1.m long	2 m long
1.	75 mm	5.00 mm	12.83 Kg.	16.52 Kg.	18.36 Kg.
2.	100 mm	5.0 mm	18.14 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-68-A 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 in kept plain, smooth & free from burrs. The pipes and fittings shall be true to shape,smooth & cylidical. They shall be free from crackes,laps,pinholes or other imperfection and shall be nearly 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 lenght 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: 5382-1998. There are made out or natural rubber with a shore 'A' hardness of 40+5.

The mean outside diameter, outside diameter at any point and wall thickness manufactured plain or with socket shall be as shown in the following table:-

* All dimensions in millimeters.

Sr. No.	Nomian/Outside dia	Mean outside Diamter		Outside diameter at		Wall whtick	
		Min.	Max.	Min.	Max.	Min.	Max
1.	75	70.0	75.3	74.1	75.9	3.2	3.8
2.	100.	110.00	100.4	270.6	111.4	3.2	3.8

Minimum Wall thickness of sockets on pipes & Dimensions of sliding socket of pipes shall be as shown in following table.

* All dimensions in millimeters.

Sr. No.	Nominal outside diameter	Minimum wall thick of sockets on pipes.		Socet Depth min.	Mean inaide diamete of societ at mil point	
		S2, Min	S3, Min		Min	Max
1.	75	2.9	2.4	40.00	75.1	75.3
2.	110	2.9	2.4	48.0	110.1	110.4

* The outside diameter of pipe shall be obtained by the method given in IS: 12235(Part-1)-1998, wall thickness shall be measured by the method given in IS:12235(Part-2)1998.

The permissible variation between the mean outside diameter & the nominal outside diameter of a pipe shall be positive in the form + x, where is less than or equal to greater of the following two values.

- a) 0.03 mm, and
- b) 0.003 x nominal outside diameter- rounded off to the next higher 0.1 mm.

The permissible variation between the outside diameter at any point (d1) & the nominal outside diameter (de)of a pipe shall not exceed the greater of the following two values.

- a) 0.5mm, and
- b) 0.012 de rounde off to the next higher 0.1

The thickness of fittings and their socket & spigot dimensions shall conform to the thickness and dimensions specified for the corresponding sizes of straight pipes.

NAHNI TRAP :

Nahni trap shall be of cast iron and shall be sound and free from porosity or other defects which affect servicability. The thickness of the base metal shall not be less than 6.5 mm. The surface shall be smooth and free form 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 accommdated. The cover shall be cast iron. Perforated cover shall be provided on the trap of appropriate size.

GULLY TRAP :

Gully trap shall conform to I.S. 651-1992. 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 C.I. grating of square size corresponding to the dimensions, of inlet of gully trap. It will also have a water tight C.I. cover with frame inside dimensions 300mm. x 300mm. the cover weighing not less than 4,53 Kg. and the frame not less than 2.72 Kg. The grating cover and frame shall be of sound and good casting and shall have truly square machined seating faces.

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 throught 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. lead 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. 651-1992.

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.

G.I. WATER SPOUT :

The G.I. pipes of 40 mm dia shall be of medium quality and specials shall be of 'R' brand or equivalent brand of best quality.

The pipe shall have length as required for the thickness of wall 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.

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.

CRYDON BALL VALVE :

Ball valve of screwed type including polythene float and necessary lever etc. shall be of the size as mentioned in the description of item and shall conform to I.S. 1703-1989.

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. 1322-1998.

SELECTED EARTH :

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.

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.

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.

EXECUTIVE ENGINEER,
WEST ZONE (RANDER)
SURAT MUNICIPAL CORPORATION,
SURAT.

SIGNATURE OF THE CONTRACTOR.

GENERAL TECHNICAL SPECIFICATION FOR BUILDING WORKSGENERAL :

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 partical 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 perfix '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-londing 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 swatisfactory 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.

EXECUTIVE ENGINEER,
WEST ZONE (RANER)
SURAT MUNICIPAL CORPORATION,
SURAT.

SIGNATURE OF THE CONTRACTOR.

ITEMWISE DETAILED TECHNICAL SPECIFICATIONSITEM NO.1:

Excavating the road surface upto required depth including removing the excavated materials and depositing on the road side upto 50 mt lead etc. complete and as directed by Engineer-in-charge.

DESCRIPTION :-

The land width required for the roadway, gutters side slopes and catch water gutters shall be cleared of all trees having a girth of 30 cm. and less, loose stones, vegetation bushes, stumps and all other objectionable materials. The roots of trees and stumps shall be removed to a depth of 30 cms. below the grade formation and slopes and excavation filled up with excavated materials and loose. Useful materials shall be arranged in convenient stacks along the roads boundary or as directed at places within 50 metres lead, and handed over to the department in convenient sections. Unsuitable materials shall be burnt or otherwise disposed off by the contractor at his own cost without causing any nuisance, inconvenience or damage to the works, property or people in the neighborhood. If the materials disposed off out side the road land, necessary permission from the private land owners shall be taken by the contractor and royalty etc. if any paid by him without claiming any compensation. All materials shall be disposed off in a neat manner.

After cleaning the site, the alignment of the road shall be properly set out true to line, curves, slopes, grade and sections as shown on the plans or directed by the Engineer-in-charge. The Contractor shall provide all labour and materials such as lime, strings, pegs, nails, bamboos, stones, mortar, concrete etc. required for setting out establishing bench marks and giving profiles. The Contractor shall be responsible for maintaining the B.Ms. profiles, alignments and other marks as long as they are required for the work in the opinion of the Engineer-in-charge. If the Contractor defaults in the respect even after the direction by the Engineer-in-charge within the specified time, they may be restored by the Engineer-in-charge at the cost of Contractor. Levels and section of the ground shall be taken and recorded in the presence of the Contractor or his authorised representative before the excavation is started so as to serve as the basis of measurement. The Contractor or his representative shall sign the book in token of his acceptance of the level etc. If there is any disagreement the Contractor shall inform of it in writing to the Engineer-in-charge with the specified reference to the sections before starting further work. Once the work is started no cognizance of any complaint shall be taken merely not signing of the book shall not be deemed as disagreement.

Profiles of the section including the road side gutters to be excavated shall be laid at suitable intervals of 10 m to 50 m or other intervals as directed by the Engineer-in-charge to conform to the curved or straight alignment, section, grade and side slopes. The lineouts shall be clearly marked and profiles of embankments where excavated materials are to be used shall be set up with the toe line marked on each side. The road way section shall first be excavated with vertical side for each lift and the sides slopes for that lift shall be excavated in steps. These steps shall be smoothened to the required slope when the excavation reaches the road formation. The contractor shall on no account excavate beyond the slopes or below the specific grade unless so directed by the Engineer in writing. If excavation is done below the specified level or outside the section, it shall not be paid for and the contractor shall be required to fill up at his own cost such extra excavation in the road portion, with approved materials of the embankment grade in layer watered and fully loose to attain maximum density laid down for the embankment in its relevant item. The Engineer may required measurement ridges and deadmen to be left at specified intervals or places and kept in tact till ordered to be removed, for the

purposes of check measurements. The excavation shall be finished neatly, smoothly and evenly to the correct lines, curves, grades, section and side slopes as shown on the plans or directed by the Engineer-in-charge. The sub-grade if loose, shall be scarified, watered and loose to the same density as the embankment. The section, side slopes and catch water gutter shall be maintained by the contractor at his own cost in such a way that the formation and gutters will be well drained by providing necessary diversion etc. and not damaged due to obstruction of any drainage, necessary passages shall be provided for leading away seepage, springs, surface flow or rainwater safely without damaging the work. If any damage occurs due to default of the contractor in this respect, he shall make good the damage at his cost. If it is necessary in the execution of the work to interrupt existing surface drainage, irrigation channels, sewers or under drainage, temporary arrangements shall be provided till such time as is necessary. The Contractor at his own cost shall make good the interrupted drainage and sewer etc. unless separately provided in the tender. Any damage to the existing works or work in hand caused as a result of his operations or negligence shall be made good by the Contractor at his own cost. Road side gutters shall be excavated to the specified section and shall be measured along with the main cutting in cubic metres.

If slides occur in the cutting they shall be removed as ordered by the Engineer-in-charge. If finished slopes slide in to the road way before the final acceptance of the work, such slides shall be removed by the Contractor and shall be paid for at the contract rate for the class of excavation involved provided the slides are not due to any negligence of the Contractor. The classification of the material in slides shall conform to its condition at the time of removal and payment made accordingly regardless of its time of prior conditions. Care shall be taken to see that excavation is arranged in a safe way so that there will be no risk to the work or workman by slides, falling materials, boulders and collapsing slides.

If there is traffic nearby or if there are towns village in the neighborhood barricades and/or traffic signal shall be provided day and night for the duration of the work in such a way as to prevent accidents. Warning signals shall be displayed at 7 mt. from the danger point on both sides to give sufficient warning. If necessary, signalers shall be stationed at each end to regulate traffic where it is heavy. Measures shall be taken to see that the excavation does not affect or damage adjoining structures or property. If there is damage to property, injury to workers, the members of the public, animals etc. due to the negligence of the Contractor, he will be responsible and liable to all the consequence including compensation.

When the useful excavated materials is to be used in embankment within a lead 50 metre and all lift, it shall be directly deposited at the required location in specified layers. No handling or conveyance charges shall be paid if the materials is temporarily deposited elsewhere and subsequently conveyed to site of deposition. The sequence of operations should be arranged properly, Materials required for items other than bank shall be arranged in neat stacks at convenient places, without interfering with drainage in any way. The excavated materials shall not be deposited within 3 m from the top edge of slope or top of the bank. The lead shall be measured from the junction point of cutting and embankment up to 50 mt. on either side. The contract rate shall be for a unit of one cubic metre for the stratus mentioned in the wording of the item of excavation acceptably completed, as directed by the Engineer-in-charge.

DISPOSAL OF EXCAVATED MATERIALS :-

All the surplus excavated materials shall be the property of the contractor. Suitable material obtained from the excavation of the roadway shoulders, verge, drains, cross drainage works etc. shall be used for

- i) Filling for roadway embankments
- ii) Filling existing pits in the right of way as directed by the Engineer including levelling and spreading with all leads and lifts.
- iii) For landscaping of the road as directed by the Engineer, including levelling and spreading, with all leads and lifts.
- iv) Surplus material such as rubble, stones etc. not intended for use as above shall be used as a raw material for crusher with prior permission of Engineer-in-charge.

Unsuitable and surplus material which in the opinion of the Engineer cannot be used in the works shall be removed from site by the Contractor and disposed off including all lead & lifts. No place will be made available by the employer for disposing off the material and no claim will be entertained on that account.

1.1 MEASUREMENTS FOR PAYMENT

Excavation for roadway shall be measured by taking cross sections at suitable intervals in the original position before the work starts and after its completion and computing the volumes in cu. m. by the method of average end areas for each class of material encountered. At the option of the Engineer, the Contractor shall leave depth indicators during excavations of such shape and size and in such positions as directed so as to indicate the original ground level as accurately as possible. The contractor shall see that these remain intact till the final measurements are taken.

1.2. RATES :-

The contract unit rates for the items of roadway and drain excavation shall be payment in full for carrying out the operations required for the individual items including full compensation for :

- (i) Setting out
- (ii) Transporting the excavated materials and depositing the same on sites of embankments, spoil banks or stacking as directed within lifts and lead up to 50 m.
- (iii) Trimming bottoms and slopes of excavation.
- (iv) Dewatering
- (v) Disposal of surplus excavated stuff and clearing of site after completion of work.
- (vii) Watering where necessary and compacting to requirements.
- (viii) Erecting all safety provisions and making necessary diversions as directed by Executive Engineer/Engineer-in-charge.

ITEM NO. 2:

Dismantling of structures on roadways, including disposal of Unserviceable material free of cost in permanent work as directed by the engineer with all leads and lifts etc. complete.

- (A) Plain Concrete**
- (B) Bituminous Pavement**
- (C) Non Bituminous Pavement**
- (D) Removing existing kotah stone**

2.1.0 WORKMANSHIP :-

2.1.1 The term Demolition shall consist of one or more parts of the building as specified or shown in the drawing. Demolition implies taking up or down or breaking up. This shall consist of demolishing whole or part of

work including all relevant items as specified or shown in the drawings.

2.2.1.2 The demolition shall always be planned before hand and shall be done in reverse order of the one in which the structure was constructed. This scheme shall be got approved from the Engineer-in-charge before stating the work. This however will not absolve the contractor from the responsibility of proper and safe demolition.

2.1.3 Necessary propping, the shoring and or under pinning shall be provided for the safety of the adjoining work or property, which is to be left intact, before dismantling and demolishing is taken up and the work shall be carried out such that no damage is caused to the adjoining property.

2.1.4 Wherever required, temporary enclosures or partitions shall also be provided. Necessary precautions shall be taken to keep dust nuisance down as and where necessary..

2.1.5 Dismantling shall be done in a systematic manner. All materials which are likely to be damaged by dropping from a height. The or demolishing roofs, masonry etc. shall be carefully removed first. The dismantled articles shall be passed by hand where necessary, lowered to the ground (as not thrown) and then properly stacked as directed.

2.1.6 All materials obtained from demolition shall be the property of Corporation unless otherwise specified and shall be kept in safe custody until handed over to any store to Surat Municipal Corporation as specified by the Engineer-in-charge.

2.1.7 Any serviceable materials, obtained during dismantling demolition, shall be separated out and stacked properly on site or any store of S.M.C. as directed, with all lead and lift. All unserviceable materials, rubbish etc. shall be stacked as directed by Engineer-in-charge.

2.1.8 On completion of work the site shall be cleared of all debris rubbish and cleaned as directed.

2.2.0 Rates :

]

2.2.1 Measurements of all work except hidden work shall be taken before demolition or dismantling and no allowance for increase in bulk shall be allowed. The demolition of lime concrete shall be measured under this item. Specification for deduction for voids, openings etc. shall be on same basis as the employed for construction of work.

2.2.2 All work shall be measured in decimal system as fixed in its place subject to the following limit, unless otherwise stated hereinafter : (a) Dimensions shall be measured to the nearest 0.01 mt. (b) Areas shall be worked out to the nearest 0.01 cum.

2.2.3 The rate shall include cost of all labour involved and tools used in demolishing and dismantling including scaffolding. The rate shall also include the charges for separating out and stacking the serviceable materials properly and disposing the unserviceable materials with all lead and lift. The rate also includes for temporary shoring for the safety of the portion not required to be pulled down or of adjoining property and providing temporary enclosures or partitions where considered necessary.

2.2.4 The rate shall be for a unit of as per Schedule-B.

ITEM NO.2 (A):

Dismantling tiled or stone or Paver block pavement laid in mortar including stacking of serviceable material and disposal of unserviceable material with all lead and lift.

2.1.0 WORKMANSHIP :-

2.1.1 The term Demolition shall consist of one or more parts of the building as specified or shown in the drawing. Demolition implies taking up or down or breaking up. This shall consist of demolishing whole or part of work including all relevant items as specified or shown in the drawings. The demolition shall always be planned before hand and shall be done in reverse order of the one in which the structure was constructed. This scheme shall be got approved from the Engineer-in-charge before stating the work. This however will not absolve the contractor from the responsibility of proper and safe demolition.

Necessary propping, the shoring and or under pinning shall be provided for the safety of the adjoining work or property, which is to be left intact, before dismantling and demolishing is taken up and the work shall be carried out such that no damage is caused to the adjoining property.

Wherever required, temporary enclosures or partitions shall also be provided. Necessary precautions shall be taken to keep dust nuisance down as and where necessary.

Dismantling shall be done in a systematic manner. All materials which are likely to be damaged by dropping from a height. The or demolishing roofs, masonry etc. shall be carefully removed first. The dismantled articles shall be passed by hand where necessary, lowered to the ground (as not thrown) and then properly stacked as directed.

All materials obtained from demolition shall be the property of Corporation unless otherwise specified and shall be kept in safe custody until handed over to any store to Surat Municipal Corporation as specified by the Engineer-in-charge.

Any serviceable materials, obtained during dismantling demolition, shall be separated out and stacked properly on site or any store of S.M.C. as directed, with all lead and lift. All unserviceable materials, rubbish etc. shall be stacked as directed by Engineer-in-charge. On completion of work the site shall be cleared of all debris rubbish and cleaned as directed.

2.3.0 Rates :

Measurements of all work except hidden work shall be taken before demolition or dismantling and no allowance for increase in bulk shall be allowed. The demolition of lime concrete shall be measured under this item. Specification for deduction for voids, openings etc. shall be on same basis as the employed for construction of work.

All work shall be measured in decimal system as fixed in its place subject to the following limit, unless otherwise stated hereinafter : (a) Dimensions shall be measured to the nearest 0.01 mt. (b) Areas shall be worked out to the nearest 0.01 cum.

The rate shall include cost of all labour involved and tools used in demolishing and dismantling including scaffolding. The rate shall also include the charges for separating out and stacking the serviceable materials properly and disposing the unserviceable materials with all lead and lift. The rate also includes for temporary shoring for the safety of the portion not required to be pulled down or of adjoining property and providing temporary enclosures or partitions where considered necessary.

The rate shall be for a unit of one Sq. meter.

ITEM NO.3: Preparation of sub grade with compacting, leveling and consolidation of subgrade with mini roller/plate vibrator machine including watering and filling in depression which occur during the process. including labour, machinery, equipments required to execute this item etc. complete as detailed in tender specification & as directed by engineer in charge.

Immediately following the spreading of the subgrade material rolling shall be started with mini roller/plate vibrator machine.

Except on superlevated portion where the rolling shall proceed from inner edge to outer, rolling, shall be from the edges gradually progressing towards the centre. First the edge/edges shall be compacted with roller running forward and backward. The roller shall then move inwards parallel to the centre line of the road, in successive passes uniformly lapping preceding tracks by at least one half way width.

Rolling shall continue until the subgrade material is thoroughly keyed and the creeping of the sub-grade ahead of the roller is no longer visible. During the process rolling shall not be done when the sub grade is soft or yielding or when it causes a wave like motion in the sub-grade course.

The rolled surface shall be checked transversely and longitudinally with templates and any irregularities corrected by loosening the surface, adding or removing necessary amounts of subgrade material and rerolling until, the entire surface conforms to desired camber and grade. In no case shall use of screening be permitted to make up depressions.

The bandage materials where it is required to be used shall be applied, successively in two or more thin layers at a slow and uniform rate. After each applications, the surface shall be continuously sprinkled with water, the resulting slurry swept in with hand brooms or mechanical brooms to fill the voids properly, and rolled during which water shall be applied to the wheels of the rollers if necessary to wash down the binding materials sticking to them. These operations shall continue until the resulting slurry after filling of voids, forms a wave ahead of the wheels of the moving roller. After the final compaction of subgrade course the road shall be allowed to dry overnight. Next morning hungry spot shall be filled with screening of binding materials as directed, lightly sprinkled with water, if necessary and rolled. No traffic shall be allowed on the road until the base has set. The Engineer-in-charge shall have the discretion to stop hauling traffic from using the completed subgrade course if in his opinion it would cause excessive damage to the surface.

MODE OF PAYMENT :-

Payment will be made on Sq.mt. basis consolidation of finished work and shall also includes cost of watering, rent of machinery, cost of fuel, wages of drivers and cleaners, earthen and murrum bund etc. and watchman etc.

ITEM NO.4:

Supplying and filling fine sand (Pana) in 150 mm (Avg.) compacted thickness over the base including necessary compaction, watering etc. complete. Item includes levelling by using vibratory plates compacted machine and as directed by Engineer-in-charge.

MATERIALS :

Fine sand (Pana) shall conform to specification of material M-3.

WORKMANSHIP :

Fine sand (Pana) shall be supplied to worksite and staked at suitable place. It shall be got approved by Engineer-in-charge. Fine sand (Pana) shall be filled in compacted thickness of 75 mm. It shall be compacted and watered thoroughly.

ITEM NO.5:

Providing and laying cement concrete 1:2:4 (1 Cement : 2 coarse sand, 4 graded stone aggregate of 20 mm nominal size) including providing and fixing reinforcement as specified in drawing with necessary bending, binding and placing in position and also including form work of sheating of steel sheet so as to form necessary centering shuttering proping etc. complete and as directed by Engineer-in-charge.

' (A) R.C.C. kerb 450 mm depth and 100 mm width. ' (B) R.C.C. kerb 300 mm depth and

100 mm width.
MATERIALS :

Water shall conform to specification of material M-1.
Cement shall conform to specification of material M-2
Sand shall conform to specification of material M-3
Cement mortar shall conform to specification of material M-4
Stone coarse aggregates for nominal mix concrete shall conform to specification of material M-5
Mild steel bars shall conform to specification of material M-7
High yield strength steel deformed bars shall conform to specification of material M-8
Mild steel binding wire shall conform to specification of material M-9
Shuttering shall conform to specification of material M-10

WORKMANSHIP :
The proportion of the concrete mix shall be 1:2:4 (1 Cement 2 coarse sand, 4 graded stone aggregate 20 mm nominal size) The concrete work shall have exposed finish and even surface.

Grade	Toral 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 maxinum
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

The water cement ratios shall not be more then those specified in the table. Workability of the concrete shall be controlled by maintaining a water-cement ratio.

For reinforced concrete work, coarse aggregates having a size a 20 mm gernally considered satisfactory.

REINFORCEMENT STEEL :
The reinforcing 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.

PROPORTIONING OF INGREDIENTS :

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 if its dry volume and in case if damp sand, allowances for bulkage shall be made.

MIXING :
For all work, concrete shall be mixed in a mechanical mixer which alongwith 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.

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.

INSPECTION :

Contractor shall give the Engineer-in-charge due notice before placing concrete in the forms, to permit him to inspect and accepted. Centering, design and its erection shall be got approved from the Engineer-in-charge.

CURING :

Curing shall be done for atleast 14 days continuously from date of placement of concrete.

SAMPLING AND TESTING OF CONCRETE :

Samples from fresh concrete shall be taken as per I.S. 1199- 1959 and cubes shall be made, cured and tested at 7 days and 28 days as per requirement in accordance with I.S. 516-1959. The average strength of the group of cubes cast for each day shall not be less than the specified cube strength of 150 Kg/Sq.cm. at 28 days.

STRIPPING :

All formwork shall be removed without causing any shock or vibrations as would damage the concrete.

Providing and laying H.Y.S.D./M.S. bars shall consists of furnishing and placing reinforcement to the shape and dimensions shown as on the drawings or as directed by Engineer-in-charge.

Steel shall be clean and free from rust and loose mild scale at the time of fixing in positions and subsequent concreting.

Reinforcing steel shall conform accurately to the dimensions given in the bar bending schedule as directed. Unless otherwise specified a 'U' type hook at the end of each bar shall invariably provided to maintain reinforcement.

All the reinforcement bars shall be accurately placed in exact position 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.

PROVIDING FORMWORK OF SHEATING OF STEEL SHEETS :

The formwork shall conform to the shape, lines and dimensions of directed and be so constructed as to remain sufficiently rigid during the placing and compacting the concrete. Adequate arrangements shall be made by the contractor to safe guard against any settlement of the formwork during the course of shuttering, centering, scaffolding, bracing etc. shall be as directed.

The sheatings of steel sheets and plates of steel shall be used to obtain the desired smooth exposed finish of surface.

STRIPPING TIME :

In normal circumstances and where ordinary cement is used forms may be struck after expiry of following periods :-

	Period

(A) Sides of walls, columns and vertical faces of beams.	24 to 48 hours.

CENTERING :

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 and after pouring concrete.

INSPECTION :

The centering and formwork shall be inspected and approved by the Engineer-in-charge before concreting. But this will not be relieve the contractor of his responsibility for strength, adequacy and safety of formwork and centering. If there is a failure of formwork or centering, Contractor shall be responsible for the damages to the work, injury to life and damage to property and personal.

4.3.1 MODE OF MEASUREMENT AND PAYMENT :

The rate includes cost of all materials, labour, tools required for executing the complete item including all the kinds of incidental and/or miscellaneous expenses.

The rate shall include carting of cement and steel from Municipal Store to worksite.

The rate shall be for a unit of one running metre.

ITEM NO.6:

Providing and setting 35 to 50 mm thick rough kotah stone paving for footpath in line, level and in proper gradient including 25 mm thick beddcng in C.M. 1:6 (1 Part of cement : 6 Part of coarse sand) with sufficient ramming consolidation. Providing joints in C.M. 1:3 (1 Part of cement : 3 Part coarse sand) and smooth pointing in C.M. 1:1 (1 Part of Cement, 1 Part of coarse sand) including watering etc. complete and as directed by Engineer-in- charge.

MATERIALS :

Water shall conform to specification of material M-1.

Cement shall conform to specification of material M-2

Sand shall conform to specification of material M-3

Cement mortar shall conform to specification of material M-4

Rough kotah stone shall conform to specification of material M-11

WORKMANSHIP :

The rough kotah stones of required size shall be supplied by Surat Municipal Corporation from any of the Municipal Store at the rate show in attached Schedule-A. The carting of rough kotah stones from Municipal Store to the worksite shall be done by the contractor at his own cost. The loading and unloading of rough kotah stones shall be carried out with enough care. The stones shall be stacked at site suitably and properly.

Before laying the stone the bottom surface shall be levelled to the required gradient. Bedding of C.M. 1:6 (1 Part of Cement and 6 part of

coarse sand) shall be laid in 25 mm thickness.

Each stone shall be thoroughly wetted before laying and shall be laid evenly and firmly on bedding of cement mortar. There shall be no cavities left. The joints shall be of uniform thickness and in straight line as per pattern. The joints shall be filled with cement mortar in prop. 1:3 (1 part of cement and 3 part of coarse sand).

After daywork the joints shall be opened to a depth of about 5 mm and then grouted with cement pointing 1:1 (1 part of cement : 1 part of coarse sand).

CURING :

The paving area of footpath shall be kept wet with damp sand or watered atleast for seven days.

MODE OF MEASUREMENT AND PAYMENT :

No deduction shall be made nor extra shall be paid for any opening in the floor area upto 0.1 Smt.

The rate shall include carting of rough kotah stones from Municipal Store to worksite.

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

The rate shall be for a unit of one Sq.mt.

ITEM NO.7:

**Providing and setting 50 to 60 mm thick rough kotah stone water table in line, level and in required gradient including 25 mm thick beddcing in C.M. 1:6 (1 Part of cement : 6 Part of coarse sand) with sufficient ramming consolidation. Providing joints in C.M. 1:3 (1 Part of cement : 3 Part coarse sand) and smooth pointing in C.M. 1:1 (1 Part of Cement, 1 Part of coarse sand) including watering etc. complete and as directed by Engineer-in- charge.
Size : 2'0" x 1'0" Size : 1' x 1' (40 to 50 mm thick)**

MATERIALS :

Water shall conform to specification of material M-1.

Cement shall conform to specification of material M-2

Sand shall conform to specification of material M-3

Cement mortar shall conform to specification of material M-4

Rough kotah stone shall conform to specification of material M-11

WORKMANSHIP :

The rough kotah stones of required size shall be supplied by Surat Municipal Corporation from any of the Municipal Store at the rate show in attached Schedule-A. The carting of rough kotah stones from Municipal Store to the worksite shall be done by the contractor at his own cost. The loading and unloading of rough kotah stones shall be carried out with enough care. The stones shall be stacked at site suitably and properly.

Before laying the stone the bottom surface shall be levelled to the required gradient. Bedding of C.M. 1:6 (1 Part of Cement and 6 part of coarse sand) shall be laid in 25 mm thickness.

Each stone shall be thoroughly wetted before laying and shall be laid evenly and firmly on bedding of cement mortar. There shall be no cavities left. The joints shall be of uniform thickness and in straight line as per pattern. The joints shall be filled with cement mortar in prop. 1:3 (1 part of cement and 3 part of coarse sand).

After daywork the joints shall be opened to a depth of about 5 mm and then grouted with cement pointing 1:1 (1 part of cement : 1 part of coarse sand).

CURING :

The paving area of footpath shall be kept wet with damp sand or watered

atleast for seven days.

The water table shall be laid in required gradient so that water can drain out easily.

MODE OF MEASUREMENT AND PAYMENT :

No deduction shall be made nor extra shall be paid for any opening in watertable area upto 0.1 R.mt.

The rate shall include carting of rough kotah stones from Municipal Store to worksite.

The rate shall include the cost of all materials, labour and tools involved in all the operation as described above.

The rate shall be for a unit of one R.mt.

ITEM NO.8:

Providing and setting 60 to 75 mm thick rough kotah kerb stone (610 x 305 mm) in line level and in truly vertical position including joints in C.M. 1:3 smooth pointing in C.M. 1:1 including watering etc. complete as directed by Engineer-in-charge.

MATERIALS :

Water shall conform to specification of material M-1.

Cement shall conform to specification of material M-2

Sand shall conform to specification of material M-3

Cement mortar shall conform to specification of material M-4

Rough kotah stone shall conform to specification of material M-11

WORKMANSHIP :

The rough kotah stone of required size shall be supplied by Surat Municipal Corporation, from any of the Municipal Store at the rate shown in attached Schedule-A. The carting of rough kotah stone from Municipal Stores to the worksite shall be done by the Contractor at his own cost. The loading and unloading of rough kotah stone shall be carried out with enough care. The stones shall be stacked at site suitably and properly.

Before laying the kerb stones excavation shall be carried out as required and directed by Engineer-in-charge. The kerbstones shall be laid in truly vertical position and in streight line.

The joints shall be of uniform thickness and in streight edge. The joints shall be filled with cement mortar in 1:3 (1 part of cement 3 parts of coarse sand).

After the stones have been laid to surplus cement slurry and the joints shall be cleaned before cement hardens.

After the day work the joints shall be opened to a depth of about 5 mm and then grouted with cement pointing 1:1 (1 part of cement : 1 part of coarse sand).

CURING :

The curing shall be done atleast for 7 days.

MODE OF MEASUREMENT AND PAYMENT :

The rate shall include carting of rough kotah stones from Municipal Store to worksite.

The rate shall include the cost of all materials, labour and tools in all the operation described above.

The rate shall be for a unit of one Running metre.

ITEM NO.9:

Dismantalling carefully existing gally trap chamber upto required depth and

raising the same upto new footpath level with B.B. masonry in C.M. 1:6 (1 Part of Cement: 6 Part of coarse sand) including 12 mm thick cement plaster in C.M. 1:3 (1 Part of Cement: 3 Part of coarse sand) and fixing C.I. cover etc. complete and as directed by Engineer-in-charge.

MATERIALS :

Water shall conform to specification of material M-1.

Cement shall conform to specification of material M-2

Sand shall conform to specification of material M-3

Cement mortar shall conform to specification of material M-4

Bricks shall conform to specification of material M-6

WORKMANSHIP :

Before laying the mortar the existing chamber shall be dismantalled upto required depth and frame shall be removed with due care. All debris shall be removed. The surface shall then be thoroughly wetted. All free water removed and then coated with neat cement grout. The cover frame shall be fixed at required level so that cover could be fixed at road level surface.

Required B.B. masonry work in C.M. 1:6 (1 part of cement, 6 part of coarse sand) shall be carried out and cover frame shall be fixed properly at road level.

The inside and outside surface of chamber shall be plastered in C.M. 1:3 (1 part of cement, 3 part of coarse sand).

Curing shall be done for atleast seven days.

MODE OF MEASUREMENT AND PAYMENT :

The rate shall include the cost of dismantalling the existing chamber raising the chamber upto required level etc.

The rate shall include carting of cement and steel from Municipal Store to worksite.

The rate shall includes cost of all materials, labour, tools required for executing the complete item.

The rate shall be for a unit of one number.

ITEM NO.10:

Dismantalling carefully existing sewer trap chamber up to required depth and raising the same upto new footpath level with B.B. masonry in C.M. 1:6 (1 Part of Cement: 6 Part of coarse sand) including 12 mm thick cement plaster in C.M. 1:3 (1 Part of Cement: 3 Part of coarse sand) and fixing C.I. cover etc. complete and as directed by Engineer-in-charge.

Details specification as per Item No.8 and as directed by Engineer-in-charge.

ITEM NO.11:

Removing and resetting rough kotah stone paving for footpath in line, level and proper gradient including 25 mm thick bedding in CM 1:6 (1 Part of Cement, 6 Part of Coarse sand) with sufficient ramming, consolidation. Providing joints in C.M. 1:3 (1 Cement : 3 Coarse sand) and smooth pointing in C.M. 1:1 (1 Cement : 1 Coarse sand) including watering etc. complete and as directed by Engineer-in-charge.

MATERIALS :

Water shall conform to specification of material M-1.

Cement shall conform to specification of material M-2

Sand shall conform to specification of material M-3

Cement mortar shall conform to specification of material M-4

WORKMANSHIP :

The existing water table shall be removed carefully and in such a way that no damage is caused to the adjoining structures, cables and service lines etc. The dismantalled stone shall be properly stacked as directed by Engineer-in-charge.

Before resetting the stones the watertable the bottom surface shall be watered and rammed properly. The surface shall be levelled to the proper gradient so that water drain out easily.

Restting of rough kotah stones for watertable shall be carried out as per the detailed specification of **Item No.7** using the rough kotah stones obtained from existing footpath.

On completion of resetting work the site shall be cleared off all rubbish and cleaned as directed.

MODE OF MEASUREMENT AND PAYMENT :

The rate shall include the cost of all materials, labour, and tools involved in all the operations described above except rough kotah stones.

The rate shall be for a unit of one R.mt.

ITEM NO.12:

Removing and resetting rough kotah stone water table for footpath in line, level and proper gradient including 25 mm thick bedding in CM 1:6 (1 Part of Cement, 6 Part of Coarse sand) with sufficient ramming, consolidation. Providing joints in C.M. 1:3 (1 Cement : 3 Coarse sand) and smooth pointing in C.M. 1:1 (1 Cement : 1 Coarse sand) including watering etc. complete and as directed by Engineer-in-charge.

MATERIALS :

Water shall conform to specification of material M-1.

Cement shall conform to specification of material M-2

Sand shall conform to specification of material M-3

Cement mortar shall conform to specification of material M-4

WORKMANSHIP :

The existing water table shall be removed carefully and in such a way that no damage is caused to the adjoining structures, cables and service lines etc. The dismantled stone shall be properly stacked as directed by Engineer-in-charge.

Before resetting the stones the watertable the bottom surface shall be watered and rammed properly. The surface shall be levelled to the proper gradient so that water drain out easily.

Restting of rough kotah stones for watertable shall be carried out as per the detailed specification of Item No.5 using the rough kotah stones obtained from existing footpath.

On completion of resetting work the site shall be cleared off all rubbish and cleaned as directed.

MODE OF MEASUREMENT AND PAYMENT :

The rate shall include the cost of all materials, labour, and tools involved in all the operations described above except rough kotah stones.

The rate shall be for a unit of one R.mt.

ITEM NO.13:

Removing and resetting existing rough kotah stone kerb stone or in required size and thickness in line level and in truly vertical position including joints in CM 1:3 (1 Cement : 3 Coarse sand) smooth pointing in C.M. 1:1 (1 Cement : 1 coarse sand) including watering etc. complete and as directed by Engineer-in-charge.

MATERIALS :

Water shall conform to specification of material M-1.

Cement shall conform to specification of material M-2

Sand shall conform to specification of material M-3

Cement mortar shall conform to specification of material M-4

WORKMANSHIP :

The existing rough kotah stones of kerbstones shall be remove carefully and in such a way that no damage is caused to the adjoining structures, cables and service lines etc. The dismantalled rough kotah stones shall be properly stacked as directed by Engineer-in-charge.

Resetting of kerb stone work shall be carried out as per detailed specifications of Item No.4 using the rough kotah stones obtained from existing footpath.

On completion of resetting work the site shall be cleared off all rubbish and cleaned as directed.

MODE OF MEASUREMENT AND PAYMENT :

The rate shall include the cost of all materials, labour, and tools involved in all the operations described above except rough kotah stones.

The rate shall be for a unit of one running metre.

ITEM NO.:14

Providing and laying cement concrete 1:5:10 (1 Part of cement, 5 Part of coarse sand, 10 Part of graded stone aggregate of 40mm nominal size) in 75mm thick and curing completed including cost of form work etc. complete.

MATERIALS:

Water shall conform to specification of material M-1.

Cement shall conform to specification of material M-2

Sand shall conform to specification of material M-3

Cement mortar shall conform to specification of material M-4

Stone coarse aggregate for nominal mix concrete M- 12

WORKMANSHIP:

The proportion of the concrete mix shall be 1:5:10 (1 Cement 5 coarse sand, 10 graded stone aggregate 40 mm nominal size) The concrete work shall have exposed finish and even surface.

The water cement ratios shall not be more than those specified in the schedule. Workability of the concrete shall be controlled by maintaining a water- cement ratio.

For reinforced concrete work, coarse aggregates having a size a 20 mm gernally considered satisfactory.

MODE OF MEASUREMENT AND PAYMENT:

The rate includes cost of all materials, labour, tools required for executing the complete item including all the kinds of incidental and/or miscellaneous expenses.

The rate shall be for a unit of one C.M.

ITEM NO. : 15

Providing 100mm thick readymade/paver block C.C. Kerb of strength M-20 (size 300mm x 380mm) purchased from SMC's approved manufacturer & setting in line, level and in trully vertical position, including filling joints in C.M. 1:1 (1 Part of cement: 1 Part of Stone dust) smooth pointing in C.M. 1:1 (1 Part of cement: 1 Part of Coarse Sand) including watering etc. completed and as directed by Engineer in charge.

14(A) For rounding at the edge of footpath (for fanning portion)

Item Includes all material, labour,equipments,tools ,plants, watering,cleaning etc.complete.

RAW MATERIAL:

CEMENT:-

The cement used in the manufacture of high quality precast concrete paving block shall be conforming to IS 12269 (53 grade) ordinary Portland Cement or IS 8112 (43 grade ordinary Portland cement). The minimum cement content in concrete used for making paver blocks should be 310 kg/Cu.M. And the upper limit of cement shall not be more than 425kg/Cu.M.

AGGREGATES :-

The fine and coarse aggregates shall consist of naturally occurring crushed or uncrushed materials which, apart from the grading requirements comply with IS 383-1970. The fine aggregates used shall contain a minimum of 25% natural silicon sand. Lime stone aggregates shall not be used. Aggregates shall contain no more than 3% by weight of clay and shall be free from deleterious salts and contaminants.

WATER :-

The water shall be clean and free from any deleterious matter. It shall meet the requirements stipulated in IS:456-2000.

OTHER MATERIALS :-

Any other material/ingredients used in the concrete shall conform to latest IS specifications.

C.C.BLOCK CHARACTERISTICS:

The C.C. block should have perpendicularities after release from the mould and the same should be retained until the laying.

The concrete mix design should be followed for each batch of materials separately and automatic batching plant is to be used to achieve uniformity in strength and quality.

The C.C. block shall be manufactured in single layer only. Skilled labours should be employed for laying blocks to ensure line and level, for laying, desired shape of the surface and adequate compaction of the sand in joint.

The C.C. block must be of size 300 mm x 100 mm x 380 mm and casted in M-200 Grade with 4" (110 mm) radius rounding at the top and 2 (two) nos. 12 mm keys at the other vertical face as directed by Engineer-in-charge.

When foot path meets with a junction or approach road at the end of foot path, a turning radius equal to the width of foot path should be made as per below and as directed by Engineer-in-charge.

Sr No.	Turning Radius	No. of C.C. Block to be fix	Size of C.C. Block in rounding
1.	1.00 mt.	4 Nos.	Outer 370 mm x inner 340 mm x thickness 100 mm x Height 380 mm
2.	1.50 mt.	6 Nos.	
3.	2.00 mt.	8 Nos.	

Strength is measure of the ability of the concrete kerb unit to withstand load. It is determined under laboratory conditions using bending strength. A load is uniformly applied through a 40mm swivel parallel and rigid bearers rounded to a radius of 20mm until its failure reached. For each kerb the individual strength in MPa is determined using the second moment of area. For each of calculation, the second moment of area and distance from the centroid to the extreme tensile fibre are incorporated for the profiles specified within the standard. For other profiles please refer to individual manufacturers who will supply the relevant information. The bending strength in MPa is recovered to check compliance with BS EN, The number of the kerbs per sample will vary depending on previous production performance assessed statistically by attributes of variables.

The characteristic bending strength shall not be less than the value corresponding to the class in the table that follows. None of the individual results shall be less than the corresponding minimum bending strength in the table. Where kerbs, due to their geometry, cannot be tested according to this standard they shall be considered to be in the same class as tested kerbs provided they have at least the Bending strength classes.

Class Strength	Marking (MPa)	Characteristic Bending (MPa)	Minimum Bending Strength
1	S	3.5	2.8
2	T	5.0	4.0
3	U	6.0	4.8

WEATHERING RESISTANCE:

Is a measure of the ability of the concrete kerb to withstand weathering specific conditions exist such as frequent contact of the surface with de-icing salt under frost conditions. It can be assessed under laboratory conditions by measuring the amount of spalled material from a surface under the cycle of freezing thawing action using a de-icing salt solution, or, if de-icing salt is used, then the measurement of the porosity by measuring the water absorption of the kerb should be used.

ABRASION RESISTANCE:

Is a measure of the ability of the concrete kerb to withstand erosion caused by trafficking in service. It is assessed under laboratory conditions by abrading the surface of the kerb with a flow of a hard abrasive material while applying a

known force. The resulting loss of material from the kerb surface is measured by determining the abraded width.

SLIP/SKIP RESISTANCE:

Is a measure of the ability of the concrete kerb laid in service to withstand slipping for pedestrians and skidding for vehicles. The unpolished slip resistance value is determined using standard rubber material attached to a pendulum friction tester and tested under wet conditons. To determine the polished pvaer value (PPV) for all paving units BS 7932:1988 should be used. This test method measures the slip resistance of the kerb after it has been synthetically trafficked (or plished) under laboratory conditions to replicate the performance of kerb during their life under traffic conditons. For more details please contact interpave.

Kerb and edgings are mainly used as edge restrains to paved surfaces or where changes in surface materials or levels occur. They retain any unbound construction material, e.g. laying course material, within the paved area and help support the applied loads by preventing horizontal displacement of the pavement construction. Channels may be used in these applications as well but can also be used to intercept and transport surface water. In velucular areas kerb, edging and channel units will inevitably be overrum or suffer side impact from vehicle tyres sometime in there service life. By selecting the appropriate units and ensuring correct insallation they will give long an durable service.

TOLERANCES:

Performance deviations the value for possible deviation from manufacturer's declared values are as follows.

Length:

1% to the nearest mm, with a minimum of 4mm and not exceeding 10mm.

Other dimentions:

Other faces : 3% to the nearest mm, with a minimum 3 mm not exceeding 5 mm.

Other parts : 5% to nearest mm, with a minimum of 3 mm not exceeding 10 mm.

Flatness and straightness:

Length of gauge mm	Permissible deviation mm
300	1.5
400	2.0
500	2.5
800	4.0

The difference between any two measurements of single kerb shall be </-5mm. Installation of concrete kerbs, edging and channel units has five main stages:

- Preparatiojn of support layers.
- Construction of unit foundation.
- Laying to line and level.
- Pedding of units.
- Haunching of units.

The unit foundation itself must be supported, eithef on an extension to the underlaying pavement sub layers or, for thhin pavements (e.g. edgings on pedestrain footwaysd), directly on an adequate subgrade. The depth of the unit and that of the pavement construction will determine on which pavement layer the kerb foundation will sit.

Products should be laid using one of the following alternative methods:

1. Units set on a race of reshly mixed concrete.
2. Units bedded on a mortar bed on top of a hardened concrete race or onto a mortar beding on a carriageway.
3. Units bonded to the pavement surface.

LAYING OF C.C. BLOCK AS KERB :

C.C. block shall be placed in line, level and in purely vertical position with 12 mm gap including filling joints in C.M. 1:1 (1 Part of cement : 1 part of stone dust) and smooth pointing in C.M. 1:1 (1 cement of cement : 1 part of stone dust) including watering.

At the Residential units, it shall be kept 8" (200 mm) open above water table and at the commercial complex, it shall be kept 3" (75 mm) open above water table and as directed by Engineer-in-charge.

SAMPLING AND TESTING PROCEDURE FOR C.C. BLOCK:

Sample size:

- Internal : Average of minimum 3 samples per 3000 blocks - for paver block manufacturers.
- External : Minimum 3 blocks per 3000 blocks.

Sampling for testing :

Sampling for testing of C.C. kerb shall be done in accordance with Appendix-A in item no.6.

Compressive strength : testing for 28 days compressive strength shall be undertaken.

Abrasion Resistant: It is assessed under laboratory conditions by abrading the surface of the kerb with a flow of a hard abrasive material applying a known force. The resulting loss of material from the kerb surface is measured by determining the abraded width.

Bending strength : The characteristics bending strength shall be less than the value corresponding to the class. None of the individual results shall be less than the corresponding minimum bending strength.

The rate shall be for a unit of one R.M.

For ensuring quality control and workmanship, above test shall be taken at 01 (One) test per each 1000 (One thousand) Nos. of C.C. block.

The C.C. block shall be got tested at (R&B) field laboratory of GERI (R&B) or S.V.N.I.T., or Govt. approved laboratory.

Laying on pavement surface:

The units may be laid directly onto a suitable pavement surface which should extend to a width to fully support the units and any required haunching. The units are bonded to the surface using a suitable synthetic resin compound or with a modified strengthened mortar.

Jointing:

Concrete kerbs are generally laid with unfilled, close joints with a minimum joint width of 12 mm they must not be butt-jointed. Mortar joints should be filled by 1:1 (1 Cement : 1 stone dust) and finished with the mortar which should be freshly mixed, consisting of 1:1 (1 Cement : stone dust) where mortar joints are used, they should be completely filled and fully compacted. Joints width should be 12 mm.

Where units are laid over or adjacent to a jointed concrete pavement, suitable joints should extend through the line of the units at the joints and continue through the kerb face. When mortar joints are used, movement joints should be provided. These movement joints should be formed of 12 mm thick easily compressible material, extend through the kerb face. Mortar should be used as soon as possible and any material that has begun to set or has been mixed for more than two hours discarded.

Contractors need to plan the work to ensure risk is kept to an acceptable level. This may involve the following actions.

- Rethink the phasing of the kerb installation to maximise the number of kerbs being laid at one time.
- Lay direct from the pack rather than double handling by stringing out ahead of final laying.
- Use machinery capable of handling both packs and individual kerbs.
- Use machinery solutions for the handling of non standard kerb details such as feature kerbs, transition kerbs, drop kerbs, quadrants (cheeses) and radius kerbs.

- Ensure that workers are trained in the safe use of mechanical lifting equipment.
- Provide training in safe lifting techniques for works involved with kerb laying.
- Consider use of alternative lightweight kerb components for certain circumstances.

Kerb laying by hand involves a serious risk of injury to those who are doing the work and therefore employers need to take action to control this risk. When taking the risk, the best solutions will be those which address all three main hazards, the weight of the kerb, the repetitive nature of the operation and poor posture during work. The help find the best solution, the manual handling hierarchy of control measures is suggested. You should try to adopt the solution nearest the top of hierarchy first, as these will give the best level of risk control. In rare cases, where it is not possible to use any mechanical solutions, short stretches of kerb may be laid manually. Where this is necessary workers should be trained in good handling techniques. The use of lighter weight kerbs or devices that allow two people to share the lift will reduce the risk of injury

GENERAL GUIDANCE:

It is important that work procedures are drawn up before commencement to identify any hazards. Failure to do this can result in lack of co-ordination of materials and multiple handling of product. Correct personal protective clothing should be provided.

Planning the work:

Work should be planned and coordinated to avoid unnecessary handling.

For operations where fork lift vehicles are used, kerbs should be stacked onto timber planks. Ensure that pallets are robust as the failure of a pallet could allow kerbs to fall.

Stripping and wrapping of packs should only be removed just prior to use of the kerbs.

Care should be taken when cutting bands and/or removing wrapping to avoid kerbs falling.

Accurate placement of the concrete bed will minimise shovelling operations.

Accurate preparation of the concrete bed and any excavated trench will reduce the amount of adjustment to kerbs once laid.

Where power tools are used for cutting these should be concrete cutters with diamond blades and water flow lubrication for cooling and dust suppression.

The rate should be for a unit of One R.M.

ITEM NO. 16:

Providing and fixing interlocking type Rubber Moulded cement concrete paver block of approved shape, design and colour having 60 mm thickness (M-35) purchased from SMC's approved paverblock manufacturer only and fixing on fine sand bedding. Item includes levelling by using vibratory plates compacted machine. Item also includes all material, Labour, equipments, tools, plants, watering, cleaning etc. complete.

Without Colour

With Colour

RAW MATERIAL

CEMENT:-

The cement used in the manufacture of high quality precast concrete paving block shall be conforming to IS 12269 (53 grade) ordinary Portland Cement or IS 8112 (43 grade ordinary Portland cement). The minimum cement content in concrete used for making paver blocks should be 310 kg/Cu.M. And the upper limit of cement shall not be more than 425kg/Cu.M.

AGGREGATES :-

The fine and coarse aggregates shall consist of naturally occurring crushed or uncrushed materials which, apart from the grading requirements comply with IS 383-1970. The fine aggregates used shall contain a minimum of 25% natural silicon sand. Lime stone aggregates shall not be used. Aggregates shall contain no more than 3% by weight of clay and shall be free from deleterious salts and contaminants.

WATER :-

The water shall be clean and free from any deleterious matter. It shall meet the requirements stipulated in IS:456-2000.

OTHER MATERIALS :-

Any other material/ingredients used in the concrete shall conform to latest IS specifications.

PAVER BLOCKS CHARACTERISTICS

The concrete pavers should have perpendicularities after release from the mould and the same should be retained until the laying.

The surface should be of anti-skid and anti glare type. The paver should have uniform chamfers to facilitate easy drainage of surface run off.

The pavers should have uniform interlocking space of 2 mm to 3 mm to ensure compacted sand filling after vibration on the paver surface.

The concrete mix design should be followed for each batch of materials separately and automatic batching plant is to be used to achieve uniformity in strength and quality.

The pavers shall be manufactured in single layer only.

Skilled labour should be employed for laying blocks to ensure line and level for laying, desired shape of the surface and adequate compaction of the sand in the joints.

The pavers are to be skirted all round with kerbing using solid concrete blocks of size 100 mm x 200 mm x 400 mm or as directed by the Engineer. The kerbing should be embedded for 100 mm depth. The concrete used for kerbing shall be cured properly for 7 days minimum.

LAYING OF PAVER BLOCKS :-

PRIMING :-

It will be responsibilities of the Contractors to ensure that the manhole/pipeline cable trenches/circular drainage system etc. raised to driveway level using the requisite materials as per instruction of Engg. The areas of potholes/deep depressions at the isolated locations also have to be filled up before laying the paver blocks. No extra payments will be made for this purpose.

It will be the responsibility of the Contractors to ensure that undulations on the paver blocks are eliminated after the traffic is allowed on it. Proper slope for drainage of water needs to be ensured by the Contractor. All necessary materials, tools, tackles are required to be arranged by the Contractor.

BEDDING SAND COURSE :-

The bedding sand shall consist of a clean well graded sand passing through 4.75 mm sieve and suitable for concrete. The bedding should be from either a single source or blended to achieve the following grading.

In Sieve Size	% Passed
9.52 mm	100
4.75 mm	95-100
2.36	80-100
1.18	60-100
600 Microns	25-60
300 Microns	10-30
150 Microns	5-15
75 Microns	0-10

Contractor shall be responsible to ensure that single-sized, gap graded sands or sands containing an excessive amount of fines or plastic fines are not used. The sand particles should preferably be sharp not rounded as sharp sand possess higher strength and resist the migration of sand from under the block to less frequently areas even though sharp sands are relatively more difficult to compact than rounded sands, the use of sharp sands is preferred for the more heavily trafficked driveways. The sand use for bedding shall be free of any deleterious soluble salts or other contaminants likely to cause efflorescence.

The sand shall be of uniform moisture content and within 4%-8% when spread and shall be protected against rain when stock piled prior to spreading. Saturated sand shall not be used. The bedding sand shall be spread loose in a uniform layer as per drawing. The compacted uniform thickness shall be of 45 mm and within +/- 5 mm. Thickness variation shall not be used to correct irregularities in the base course surface.

The spread sand shall be carefully maintained in a loose dry condition and protected against pre-compaction both prior to and following screeding. Any precompacted sand or screeded sand left overnight shall be loosened before further laying of paving blocks take place.

Sand shall be slightly screeded in a loose condition to the predetermined depth only slightly ahead of the laying of paving unit.

Any depressions in the screeded sand exceeding 5 mm shall be loosened, raked and rescreeded before laying of paving blocks.

LAYING OF INTERLOCKING PAVER BLOCKS :-

Paver blocks shall be laid in herringbone laying pattern throughout the pavement. Once the laying pattern has been established, it shall continue without interruption over the entire pavement surface. Cutting of blocks, the use of infill concrete or discontinuities in laying pattern is not be permitted in other than approved locations.

Paver blocks shall be placed on the uncompacted screeded sand bed to the nominated laying pattern, care being taken to maintain the specified bond throughout the job. The first row shall be located next to an edge restraint. Specially manufactured edge paving blocks are permitted or edge blocks may be cut using a power saw, a mechanical or hydraulic guillotine, bolster or other approved cutting machine.

Paver blocks shall be placed to achieve gaps nominally 2 to 3 mm wide between adjacent paving joints. No joint shall be less 1.5 mm not more than 4 mm. Frequent use of string lines shall be used to check alignment. In this regard the "laying face" shall be checked at least every two meters as the face proceeds. Should the face become out of alignment, it must be corrected prior to initial compaction and before further laying job is proceeded with.

In each row, all full blocked shall be laid first. Closure blocks shall be cut and fitted subsequently. Such closer blocks shall consist of not less than 25% of a full blocks.

To infill spaces between 25 mm and 50 mm wide concrete having screened sand, coarse aggregate mix shall be used. Within such mix the nominal aggregate size shall not exceed one third the smallest dimension of the infill space. For smaller spaces dry packed mortar shall be used.

Except where it is necessary to correct any minor variations occurring in the laying bond, the paver blocks shall not be hammered into position. Where adjustment of paver blocks necessary care shall be taken to avoid premature compaction of the sand bedding.

INITIAL COMPACTION :-

After laying the paver blocks, they shall be compacted to achieve consolidation of the sand bedding and brought to design levels and profiles by not less than Two (2) passes of a suitable plate compactor.

The compactor shall be a high-frequency, low amplitude mechanical flat plate vibrator having plate area sufficient to cover a minimum of twelve paving blocks. Prior to compaction all debris shall be removed from the surface.

Compaction shall proceed as closely as possible following laying and prior to any traffic. Compaction shall not, however, be attempted within one metre of the laying face. Compaction shall continue until lipping has been eliminated between adjoining blocks. Joints shall then be filled and recompactd as described in Cl. 3.5.

All work further than one metre from the laying face shall be left fully compacted at the completion of each day's laying.

Any blocks that are structurally damaged prior to or during compaction shall be immediately removed and replaced.

Sufficient plate compactors shall be maintained at the paving site for both bedding compaction and joint filling.

JOINT FILLING AND FINAL COMPACTION :-

As soon as possible after compaction and in any case prior to the termination of work on that day and prior to the acceptance of vehicular traffic, sand for joint filling shall be spread over the pavement.

Joint sand shall pass a 2.36 mm (No.8) sieve and shall be free of soluble salts or contaminants likely to cause efflorescence. The same shall comply with the following grading limits.

In Sieve Size	% Passed
9.52 mm	100
4.75 mm	95-100
2.36	80-100
1.18	60-100
600 Microns	25-60
300 Microns	10-30
150 Microns	5-15
75 Microns	0-10

The Contractor shall supply a sample of the jointing sand to be used in the contract prior to delivering any such materials to site for incorporation into the works. Certificates of test results issued by a recognized testing laboratory confirming that the samples conform to the requirements of this specifications shall accompany the sample.

The jointing sand shall be broomed to fill the joints. Excess sand shall then be removed from the pavement surface and the jointing sand shall be compacted with not less than one (1) Pass by the plate vibrator and joints refilled with sand to full depth.

This procedure shall be repeated until all joints are completed filled with sand. No traffic shall be permitted to use the pavement until all joints have been completely filled with sand and compacted.

Both the sand and paver block shall be dry when sand is spread and broomed into the joints to prevent premature setting of sand.

The difference in level (lipping) between adjacent blocks shall not exceed 3 mm with not more than 1% in any 3 m x 3 mm area exceeding 2 mm. Pavement which is deformed beyond above limits after final compaction shall be taken out and reconstructed to the satisfaction of the Engineer.

EDGE RESTRAINT :-

Edge restrains need to be sufficiently robust to withstand override by the anticipated traffic, to withstand thermal expansion and to prevent loss of the laying course material from beneath the surface course. The edge restraint should present a vertical face down to the level of the underside of the laying course.

The surface course should not be vibrated until the edge restraint, together with any bedding or concrete haunching, has gained sufficient strength. It is essential that edge restraints are adequately secured.

SAMPLING AND TESTING PROCEDURES FOR PAVER BLOCKS :-

SAMPLE SIZE:-

Internal - Average of minimum 3 samples per 5000 blocks - for paver block manufacturers.
External - Minimum 2 blocks per 10000 blocks. Average of minimum 8 blocks per site - for captioned contractors.

SAMPLING FOR TESTING :-

Sampling for testing of paver blocks shall be done in accordance with Appendix-A.

COMPRESSIVE STRENGTH :-

Testing for 28 days compressive strength shall be undertaken in accordance with Appendix-B. The average compressive strength of 60 mm thick paver blocks tested shall be 31.8 MPa.

Note:- 10% lower tolerance limit in compressive strength shall be allowed.

WATER ABSORPTION :-

Testing for water absorption shall be in accordance with IS 2185:1979:Part I (Specifications for concrete masonry blocks) Appendix C

APPENDIX -A

SAMPLING OF PAVER BLOCKS :-

Method of Sampling:

The paver blocks required for carrying out the tests, a sample of 20 block shall be taken from every consignment of 4000 blocks or part thereof the same size, shape and thickness and the same batch of manufacture from these samples the blocks shall be taken at random for conducting the tests.

MARKING AND IDENTIFICATION :-

All samples shall be clearly marked at the time of sampling in such a way that the designated section of Part thereof and the consignment represented by the sample, are clearly defined.

The sample shall be dispatched to the approved test laboratory taking precaution to avoid damage to the paving in transit. Protect the paving from damage and contamination until they have been tested. The samples shall be stored in water at 20°C + 5°C for 24 hours prior to testing.

APPENDIX - B

PROCEDURE FOR TESTING OF COMPRESSIVE STRENGTH FOR PAVER BLOCK :

Reference: BS 6717 Part I (1993) Specification for Paver Blocks B-1 Testing Machine: The testing machines shall be of suitable capacity for the test and capable of applying the load at the rate specified. It shall comply, as regards repeatability and accuracy with the requirements of relevant IS specification.

Procedure - The sample specimens shall be tested in wet condition after being stored at least 24 hours, in water maintained at a temperature of 20°C + 5°C before the specimens are submerged in water, the necessary area shall be determined.

The plates of the testing machine shall be wiped clean and any loose grit or other material removed from the contact faces of the specimen. Plywood nominally 4 mm thick, shall be used as packing between the upper and lower faces of the specimen and the machine plates, and these boards shall be larger than the specimen by a margin of at least 5 mm at all points. Fresh packing shall be used for each specimen tested. The specimen shall be placed in the machine with the wearing surface in a horizontal plane and in such a way that the axes of the specimen are aligned with those of the machine plates. The load shall be applied without shock and increased continuously at the rate of approximately 15 N/sqmm per minute until no greater load can be sustained. The maximum load applied to the specimen shall be recorded.

ALLCULATION OF CORRECTED STRENGTH:-

The compressive strength of each block specimen shall be calculated by dividing the maximum load by full cross section area and multiplying by an appropriate factors.

Thickness and Chamfer Correction
Factors For Compressive Strength

Work Size thickness in mm	Correction Factors	
	Plain Block	Chamfered
60	1.00	1.06
80	1.12	1.18
100	1.18	1.24

COMPRESSIVE STRENGTH CALCULATION:-

The average corrected compressive strength for the designed block section shall be calculated.

APPENDIX -C**METHOD FOR THE DETERMINATION OF WATER ABSORPTION:-**

The test specimens shall be completely immersed in water at room temperature for 24 hours. The specimens shall then be weighed, while suspended by a metal wire and completely submerged in water

They shall be removed from the water and allowed to drain for one minute Visible surfaces water being removed with a damp cloth and immediately weighed

Subsequent to saturation, all specimens shall be dried in a ventilated oven at 100 to 115oC for not less than 24 hours and until two successive weightings at intervals of 2 hours show an increment of loss not greater, than 0.2 percent of the last previously determined mass of the specimen.

Calculate the absorption as follows:

$$\text{Absorption, kg/m}^3 = \frac{A-B}{B-C} \times 10000$$

$$\text{Absorption percent} = \frac{A-B}{B} \times 100$$

Where

A = wet mass of unit in kg
B = dry mass of unit in kg. And
C = suspended immersed mass of unit in kg.

ITEM NO. 17:

Providng & Fixing interlocking type cement concrete paver block of approved shape & design having 60mm thickness [M-40] purchased from SMC's approved approved manufactureer only & Fixing on fine sand bedding .Item includes leveling by using vibratory plates compacted machine Item also includes all materials, Labour, equipment , tools, plants, watering, cleaning etc. comp.

For Road Junction 80mm thick M-50

Details specification as per Item No. 15 and maintain grade M-40 as directed by Engineer-in-charge.

MODE OF MEASUREMENT AND PAYMENT:

The rate shall include the cost of all materials, labour, and

tools involved in all the operations described above except rough kotah stones.

The rate shall be for a unit of one square metre.

ITEM NO.18 :

Providing and laying plain cement concrete M-200 (1:1.5:3) (1 Cement : 1.5 coarse sand : 3 stone aggregates of 20 mm nominal size) for raising/lowering the existing manhole cover (with frame) of drainage water supply, sewer trap chamber, Gas chamber, scrapper manhole frame and cover and / or chambers of any utility services upto newly carpeted/ recarpeted road surface including smooth plain cement plastering in C.M. 1:3 on both side etc. complete.

17.1.0 SCOPE:

The item shall consist of dismantling the existing manhole cover upto required depth and raising/lowering the chamber with plain cement concrete (1:1.5:3) (1 Cement : 1.5 coarse sand : 3 stone aggregates of 20 mm nominal size) upto the newly re-carpeted/carpeted road surface including fixing the manhole cover frame in concrete and plastering the chamber.

17.2.0 MATERIALS:

The ordinary concrete mix shall generally be specified by volume. For cement which normally comes in bags and is used by weight, volume shall be worked out taking 50 Kg. of cement as 0.035 Cu.mt. in volume.

Ingredients required for ordinary concrete containing one 50 kg. bag of cement for 1:1.5:3 mix shall be of 1 part of cement 1.5 part of sand and 3 part of black metal of 20 mm nominal size. For measuring sand and metal suitable box shall be prepared.

Fine aggregate shall be cleaned, hard, coarse sand. It shall be free from dust and such other substances. The sand shall be got approved by Engineer-in-charge.

The coarse aggregate shall be of hard, broken black trap metal of 20 mm nominal size. This should be of approved quality and taken from a quarry approved by the Engineer-in-charge.

The water for mixing shall be potable water to satisfaction of the Engineer-in-charge. The quantities of water shall be just sufficient to produce a dense. Concrete of required workability for the job. Mixing shall be continued till materials are uniformly distributed and on uniform colour of the entire mass is obtained and each individual particle of the coarse aggregate shown complete coating or mortar containing its proportionate amount of cement. Before laying concrete the existing chamber shall be dismantled up to required depth and frame shall be removed shall when be thoroughly wetted, all free water removed and then coated with neat cement grout. The cover frame shall be fixed at required level so that cover could be fixed at road level surface. The contractor at his own expenses shall put up necessary shoring strutting and planking or cut slopes to a surface angle or both with due regard to the safety of personnel works and to the satisfaction of Engineer-in-charge.

The contractor shall furnish the design and drawing of complete form work (i.e. the forms as well as their supports) for approval of the Engineer-in-charge before any erection is taken up. The design of form work shall ensure that the forms can be conveniently removed without disturbing the concrete. The design shall facilitate proper and safe access to all parts of form work for inspection. The form work shall be robust and strong,

the jobs shall be leak-proof. The form work shall be so made as to produce a finished concrete true to shape, line and levels. Forms shall be made sufficiently rigid by the use of ties and bracings to prevent any sagging between supports.

17.1.2 Plastering:

The inside and outside surface of chamber shall be plastered in cement mortar 1:3 (1 Cement : 3 sand). The mortar shall be laid on the wall between the screed using the plasters float and pressing the mortar so that the raked joints are properly filled. The plaster shall than

finished off with a wood.

Curing shall be started as soon as the mortar used for finishing has hardened sufficiently and not to be damaged when watered.

17.2.0 Rate:

The rate shall include the cost of dismantling the existing chamber up to required depth removing the frame, raising the chamber upto required level with cement concrete, fixing the frame, plastering the chamber wall, fixing manhole cover and all labour and materials as well as tools and plants required for the work.

The measurement for payment shall be per number of manhole.

ITEM NO. 19:

Removing & Refixing interlocking type cement paver block [Rubber Moulded] of approved shape, design & colour fixing on fine sand bedding item includes levelling by using vibratory plates compacted machine. Item also includes all materials, labour, equipments tools plants watering, cleaning etc comp.

MODE OF MEASUREMENT AND PAYMENT:

The rate shall include the cost of all materials, labour and tools in all the operation described above.

The rate shall be for a unit of square metre..

ITEM NO. 20

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 : (A) Foundation, footing, Base of columns and Mass concrete.

The rate shall include the cost of all materials, labour and tools in all the operation described above.

The rate shall be for a unit of Cubic metre..

ITEM NO.21:

Removing and resetting existing ready made C.C.Kerb of strength of required size & thickness in line,level and truly vertical position ,including filling joints in C.M.1:1(1part of cement 1 part of coarse sand) smooth pointing in C.M.1:1 (1part of cement : 1 part of stone dust)including watering etc.complete as directed by engineer-in-charge.

Removing and resetting Existing ready made C.C.Kerb of strength of required size & thickness on fine sand bedding (excluding cost of fine sand.). Item includes levelling by using vibratory plates compacted machine. Item also includes all labour, equipments, tools, plants, watering, cleaning etc. complete.

ITEM NO.22:

Painting two coats of enamel paint (Excluding priming coat) over previously painted wall with even shade & surface after removing dirt, dust foreign matter etc. comp.

Details specification same as per Item No.21 and paint specification and as directed by Engineer-in-charge.

ITEM NO.23:

Providing and fixing M.S. Grill of required pattern to as directed by engineer incharge. with M.S. flats at required spacings and frame aaround, square or round bars with round headed bolts and nuts or by screws etc. complete (A) Plain Grill

23.1.0 MATERIALS :

The structural steel shall conform to M-22.

ITEM NO.24:

Fabricating and fixing in position MS railing using structural steel TATA/JINDAL/ Asian sections of YST 310 grade using hollow box sections, plates, angles, tees, pipes, MS square polished bars as per drawing. The rates shall include all kinds of welding, nut bolting, anchor bolting and grouting the bolts using non-shrink cementitious grouts of Sika or Fosroc make or The contractor shall be responsible in erecting the railing assembly in the desired line, level and alignment. The railing shall be firmly fixed to the foundation concrete blocks and shall be in place once fixed. The rates excluding excavation and foundation concrete and including for marking of foundation pits, placing the same in alignment of the road as directed by the Engineer in charge and or as per drawing with Priming coat of Red lead paint etc. comp.

24.2.0 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 revetted 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.

24.3.0 MODE OF MEASUREMENT AND PAYMENT :-

o 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.

ITEM NO.25:

Providing and applying painting two coats including priming coat on new steel and other metal surface with enamel paint, brushing interior to give an even shade including cleaning the surface of all dirt, dust and other foreign matter etc.comp.

25.1.0 Materials :

25.1.1 The ready mixed primer, brushing red lead shall conform to IS 102:1972.

25.1.2 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.

25.1.3 The enamel paints shall conform to M-44 B.

25.2.0 Workmanship :

25.2.1 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.

25.2.2 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 primary 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.

25.2.3 General :

The materials required for painting work shall be obtained directly from approved manufacturers or 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 reasons, 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 greases 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.

25.2.4 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.

25.3.0 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 cluded in the item.	Measured flat (not girthed) including chowkhat or frame. Edges, chocks,	1.30 For each side)
2.	Flush jounery	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)
3.	Fully glazed hauzed 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)
4.	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)
5.	Full Ventilationed 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)
6.	Weather boarding	Measurement flat (not girthed) supporting frame work shall not be measured separately.	1.2 For each side)
7.	Wood Shingle roofing	Measurement flat (not girthed)	1.0 For each side)
8.	Boarding with cover fillets and match boarding.	Measurement flat (not girthed)	1.05 For each side)
9.	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)
10.	Trellies (or Jafri) work one way or two way for the open spaces	Measured flat over all no deduction shall be madesupporting members shall not be measured separately.	1.00 for painting cover

11.	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
12.	Gates and open palisade fencing including standards.	Measurement flat over all No deductions shall be made for open spaces. supporting members shall not be measured separately	1.00 for painting cover
13.	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)
14	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)
15.	Plain sheet steel door and windows)	Measured flat (not girthed) including frame	1.10 (for each side)
16.	Fully glazed or gauzed steel door & windows.	Measured flat (not girthed) including frame edges etc.	0.60 (for each side)
17.	Partly panelled and partly glazed or gauzed steel doors	Measured flat (not girthed) including frame edges etc.	0.80 (for each side)
18.	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 lowest rail if the palisades do not go below it (or from the lower end of palisades, if they project below the lowest rail) upto the top of palisades but not upto the top of standards if they are higher than the palisades.

The Rate shall be for a unit of one cubic meter.

ITEM NO.26:

Providing and laying cement concrete guardstone in proportion 1:1:5:3 (1 Cement : 1.5 Coarse Sand : 3 Graded Stone Aggregate 20 mm nominal size) size and shape as per the drawing including necessary excavation steel form work and white Washing etc. complete (Cement and Steel contractor own supply).

600 MM X 225 MM 400 MM size

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) 1:1.5:3 (Cement: Sand: Coarse aggregates) in volumetric proportions.

(B) The concrete shall have the plastic consistency of K2/K3, slump between 8 to 12 cms.

Subbase: -

The subbase 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 suction 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 (300-400mm/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 varies 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

- a. Poker/Needle Vibrators: Vibrators with more than 12500 vibrations/minute with drive length exceeding Bay width by at least 1 mtr. Shall be used.
- b. 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.

ITEM NO.27:

Providing and laying cement concrete guardstone in proportion 1:2:4 (1 Cement : 2 Coarse Sand : 4 Graded Stone Aggregate 20 mm nominal size) size and shape as per the drawing including necessary excavation steel form work and white Washing etc. complete (Cement and Steel contractor own supply).

750 MM X 350 MM 400 MM size

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 12 cms.

Subbase: -

The subbase 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 suction 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 (300-400mm/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 varies 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

- c. Poker/Needle Vibrators: Vibrators with more than 12500 vibrations/minute with drive length exceeding Bay width by at least 1 mtr. Shall be used.
- d. 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.

Item no 28:-

Providing & laying cement concrete **1:1.5:3** (1 cement : 1.5 sand : 3 graded stone agg. 20 mm nominal size) & curing comp. Includ. cost of form work but exclu. Cost of reinforcement for reinforced concrete work in **(A) Foundations, footing base of columns and mass concrete.**
(C) Slabs, landings, shelves, balconies, lintels, beams, girders and cantilever up to floor two level.
(D) Columns, pillars, pots, and struts up to floor up to floor two level (E) Staircase up to floor two level (K) Vertical and horizontal fins up to floor two level.

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.

12.1.0 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.

General :-

The concrete mix is not required to be designed by preliminary tests. The proportion of the

concrete mix shall be 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm. nominal size) by volume concrete work shall have exposed concrete surface or as specified in the item.

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, 1:1.5:3 and 1:1:2 nominal mix of ordinary concrete by volume respectively with conforming to IS:456.

The ingredients required for ordinary work, containing one bag of cement of 50 kg. by weight (0.0342 cu.m.) for different proportion of mix shall be as under

Grade	Total quantity of dry aggregate by volume per 50 Kg. of cement to be taken as the sum 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	34 Liters
M-150 (1:2:4)	220 Liters		32 Liters
M-150 (1:1.5:3)	160 Liters		30 Liters
M-250 (1:1:2)	100 Liters		27 Liters

The water cement ratio shall not be more than 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 difficulties of placement and compaction so that the water cement ratio specified in the table is not exceeded.

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.

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.

For reinforced concrete work, coarse aggregates having a nominal size of 20 mm generally considered satisfactory.

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.

Where the reinforcement is widely spaced as in solid slabs, limitation of size of the aggregate may not be so important and the nominal maximum size may sometimes be as great as or greater than the minimum cover.

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.

Workmanship:

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 size shall be used for measuring sand and aggregate. The size of the boxes (internal) shall be 35x25cms. 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 bulkage shall be made.

Mixing:-

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.

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 of 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.

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.

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.

Inspection:

Contractor shall give the Engineer-in-charge due notice before placing any concrete in the forms to permit to inspect and accept the 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.

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 platforms 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.

Transporting and laying :-

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.

All formwork 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.

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.

Unless otherwise agreed to by the Engineer-in-charge, concrete shall not be dropped into place from a height exceeding 2 meters.

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 layer 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.

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.

Concrete shall be judged to be compacted when the mortar fills the spaces between the coarse aggregate and begins to cream up to 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.

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. Masonary 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.

Sampling and Testing of concrete:-

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.

Quantity of concrete in the work No. of samples

less 1-5 Cum.	1
6-15 Cum.	2
16-30 Cum.	3
31-50 Cum.	4
51 and above	4 + one additional sample for each
additional 50 mm. or part	thereof.

NOTE:-

At least 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.

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 lowest 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.

Stripping:

The Engineer-in-charge shall be informed in advance by the contractor of his intention to strike the formwork. While fixing the time for removal of formwork, 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 periods specified in the DTS NO.21 for respective item of form work.

All form work shall be removed without causing any shock or vibration as would damage the concrete. Before the soffits are removed, the concrete surfaces 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 removable 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.

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 holder be filled by cement mortar. All fins caused by form ties, 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 avoids. Surfaces which are pointed shall be kept moist for a period of 24 hours.

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.

Mode of measurement and payment:

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 dis-similar 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.

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 reinforcement for reinforced concrete work but including cost of form work.

The rate shall be for a unit of one cubic metre.

Item no 29-

Providing IS Mark TMT Bar FE 500/500D reinforcement for R.C.C. work including bending, binding and placing in position complete as per Engineer-in-charge. Upto G.L./P.L.

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.

Materials

Mild Steel bar shall conform to M-18. Mild steel binding wire shall conform to M-21.

Workmanship

The work shall consist of furnishing and placing reinforcement to the shape and dimensions shown as on the drawings or as directed

Steel shall be clean and free from rust and loose mill scale at the time of fixing in position and subsequent concreting.

Reinforcing steel shall conform accurate to the dimensions given in the bar bending schedule 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 transport or handling shall be straightened before being used on the work. They shall not be heated to facilitate bending. Unless otherwise specified 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 twice the diameter of the round bar and the length of the straight part of the bar beyond the end of the curve shall be at least four times the diameter of the round bar. In case of bars which are not round and in case of deformed bars, the diameter shall be taken as the diameter of circle having an equivalent effective area. The hooks shall be suitably encased to prevent any splitting of the concrete.

All the reinforcement bars shall lie accurately placed in exact position 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 hangers 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 concrete, except where shown on 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 and 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 protruding from concrete and to which other bars are to be laced and which are likely to be exposed for a period exceeding 10 days shall be protected by a thick coat of neat cement grout.

Bars crossing each other where required shall be secured by binding wire (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.

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. 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.

Whenever indicated on the drawings or desired by the Engineer-in-charge, bars shall be jointed 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 couplings shall conform to I.S. 226.

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 subject to more than 75 percent of the maximum permissible stresses and welds so staggered that at any one section not more than 20 percent of the rods are welded. Only electric arc welding using a process which excludes air from the molten metal 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, slag, 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.

Mode of Measurements & Payment

For the purpose of calculating consumption, wastage shall not be permitted beyond 5 percent. Excess consumption over 5% will be charged at penal rate.

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 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 tones on the same basis of

as per M-18 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.

The rate for reinforcement includes cost of steel binding wires, its carting from Department store to worksite, cutting, bending, placing, binding 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.

The rate shall be for a unit of One Kg.

ITEM NO. 30:

Removing the scraping of old deteriorated plaster /R.C.C. surface/colour of any thickness from wall / R.C.C member including striking of serviceable material and disposal of unserviceable from site of work all lead and lift.

WORKMANSHIP :

The relevant specifications of Item No.112 shall be followed but read cheaping of plaster work from old masonry wall instead of R.C.C. work. The unserviceable materials shall be disposed of at all leads and lifts. The rate excludes scraping straightening of reinforcement but includes cutting of reinforcement.

The rate shall be for a unit of one Sq.metre.

ITEM NO.31:

Providing and applying single coat of bonding agent mixed with cement in 1:1 proportion the bonding agent should be SBR based having a minimum solid contents of 40 % and the plaster has to be applied immediately after the application of the bonding agent. Approved brands for this are CERA CHEM / NEROLAC PERMA / SIKA OR EQUIVALANT or approved by engineering charge.

.....SELF EXPLAIN.....

ITEM NO.32:

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 of neeru in required proportion etc. comp. C.M 1:3(1 cement :3 sand) (A) For wall and similar surfaces --Ground Floor.

3.1.0 MATERIALS

Water shall conform to M-1. The cement mortar of proportion 1:3 shall conform to M-11.

3.2.0 WORKMANSHIP

3.2.1 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.

3.2.2 Preparation of Background - The surface shall be cleaned of all dust, loose mortar droppings, traces of algae, afflorsence 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.

3.2.3 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 recommending 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.

3.3.0 MODE OF MEASUREMENTS & PAYMENT

- 3.3.1 The rate shall include the cost of all materials, labour and scaffolding etc. involved in the operations described under workmanship.
- 3.3.2 All plastering shall be measured in square metres unless otherwise specified. Length, breadth or height shall be measured correct to a centimetre.
- 3.3.3 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 15 mm. at any point on this surface.
- 3.3.4 This item includes plastering upto floor two level.
- 3.3.5 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.
- 3.3.6 Soffits of stairs shall be measured as plastering on ceilings. Blowing soffits shall be measured separately.
- 3.3.7 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.
- 3.3.8 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.
- 3.3.9 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.
- 3.3.10 The rate shall be for a unit of one Sq.Mts.

ITEM NO 33:

Providing & applying two coats of weather shield max paint (3 coats may be required in case of darker colours.) of ICI Dulux or Apex Ultima of Asian Paint including applying exterior acrylic primer coat as per manufacturers specification and directions in shade and colour approved by architects, on exterior surfaces of the building including scaffolding, preparing the surface, watering, curing etc. complete and as directed by the architects and manufacturers.

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

SurfacePreparation:

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

Details specification same as per item description and as

directed by Engineer-in-charge., All Floor (as per approval of architect's specification ,selection & drawing detail.or Engineer Incharge)

Measurements shall be paid on Sq.mt.basis

SIGNATURE OF THE CONTRACTOR.

EXECUTIVE ENGINEER,
WEST ZONE (RANDER)
SURAT MUNICIPAL CORPORATION

ANNEXURE -A**AFFIDAVIT**

NAME OF WORK : PROVIDING & FIXING KOTA STONE/PAVER BLOCK FOOTPATH / STREETS , WATER TABLE, PCC ,GAURD STONE AND REPAIRING OF BRTS RAILING AT VARIOUS PLACES IN PAL DEPOT AREA OF WEST ZONE (RANDER) (3RD ATTEMPT).

- I, the undersigned, do hereby certify that all the statement made in the required attachments area true and correct. I also understand that in case of wrongful / false information, corporation is entitled to take any civil & criminal punitive action against me /us.
- 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 has been rescinded during last five years, prior to the date of this bid.
- The undersigned hereby authorized(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 etc.
- 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.
- The SMC and its authorized representatives are hereby authorized to conduct any inquiries or investigations to verify the statements, documents, and information submitted in connection with this bid and to seek clarification from our bankers and clients regarding any financial and technical aspects. This Affidavit will also serve as authorization to any individual or authorized representative to any institution referred to in the supporting information, to provide such information deemed necessary and requested by representative of Surat Municipal Corporation to verify statements and information provided in the Tender or with regard to the resources, experience and competence of the Applicant.

Signed by the Authorize 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 pater of Rs.300/- and duly notarized.

ANNEXURE-B

- 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 receive 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 7 days from the last date of submission of price bid. 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 six months (As per IT-09). All documents in supporting of bid shall be in electronic format only thorough online (by scanning) during the budding period & hard copy will not be accepted separately.
- Any documents in supporting of bid shall be in electronic format only through online (by scanning) & hard copy will not be accepted separately.
- All Required 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. (i.e. D.D./Bank Guarantee)
- Tender Fees as mentioned in the tender.
- Affidavit on Non Judicial Stamp Paper of Rs.300/-
- Under taking by the tenderer for not black listed on Rs.300/- government stamp paper.
- Declaration of the Contractor (As per Tender Condition)

ANNEXURE-C**SPECIMEN SIGNATURE AND PHOTOGRAPHS OF THE TENDERER**

NAME OF WORK:- PROVIDING & FIXING KOTA STONE/PAVER BLOCK FOOTPATH / STREETS , WATER TABLE, PCC ,GAURD STONE AND REPAIRING OF BRTS RAILING AT VARIOUS PLACES IN PAL DEPOT AREA OF WEST ZONE (RANDER) (3RD ATTEMPT).

TENDER INVITATION NOTICE NO.ADDI. CITY ENGINEER/WZ/04/2026-27 [WORK NO.01]

1. PAN NO.

Photographs of each
partners if
partnership firm.

*-----

Specimen Signature of the tenderer

Specimen Signature of the "power holder" if any

Name and Address of partners if any.

1. -----

2. -----

3. -----

Residential Address:

Permanent Address:

CONFIRMATION

The above details furnished are correct and we have enclosed it ourselves.

(Name of tenderer's seal and signature)

EXECUTIVE ENGINEER
WEST ZONE (RANDER)
SURAT MUNICIPAL CORPORATION.

SIGNATURE OF THE TENDERER.

ANNEXURE- E

UNDER TAKING BY THE TENDERER FOR NOT BLACK LISTED ON RS. 300/-GOVERNMENT STAMP PAPER

I/We.....Address.....

Solemnly affirm and state that on oath that (Name of Tenderer) has not been black listed by any Government/Semi Government/Public Sector Undertaking/Public limited and not has been banned/suspended business dealings with the said firm.

The information given above is true to the best of my knowledge.

I/We agree that if any notice in future, my/our bid/tender shall be rejected/terminated.

SIGNATURE AND SEAL OF THE CONTRACTOR:

NAME AND ADDRESS:

DATE:

ANNEXURE- F

Finance Department, GR No. : FD/MSM/e-file/4/2024/2859/DMO

Date : 01/05/2025

(A) Guarantees issued by the following banks will be accepted as SD/EMD on Permanent basis :

- All Nationalized Banks

(B) Guarantees issued by the following banks will be accepted as SD/EMD on March 31, 2026. The validity cut-off date in the GR is with respect to the date of issue of Bank Guarantee irrespective of the date of termination of Bank Guarantee.

- A U Small Finance Bank
- Ahmedabad Mercantile Co-operative Bank Limited
- Axis Bank
- City Union Bank
- DBS Bank India Limited
- DCB Bank
- Equitas Small Finance Bank
- Federal Bank
- HDFC Bank
- ICICI Bank
- The Kalupur Commercial Co-operative Bank Limited
- Kotak Mahindra Bank
- Nutan Nagrik Sahakari Bank Limited
- Rajkot Nagarik Sahakari Bank Limited
- Saraswat Co-operative Bank
- Saurashtra Gramin Bank
- Standard Chartered Bank
- Tamilnadu Mercantile Bank
- The Gujarat State Co-operative Bank
- The Mehsana Urban Co-operative Bank Limited
- The Surat District Co-operative Bank
- The Surat peoples Co-Operative Bank
- Bandhan Bank
- Barclays Bank
- CSB Bank
- ESAF Small Finance Bank
- HSBC Bank
- IDBI Bank
- IDFC First Bank
- Jammu & Kashmir Bank
- Jana Small Finance Bank
- Karnataka Bank
- Karur Vysya Bank
- South Indian Bank

- Utkarsh Small Finance Bank
- Yes Bank
- SBPP Co.Operative Bank Ltd.
- SVC Co.Operative Bank Ltd.
- The Cosmos Co.Operative Bank Ltd.
- The Panchmahal District Co.Operative Bank
- The Baroda District Co.Operative Bank
- Baroda Gujarat Gramin Bank

All the eligible banks are instructed to collect the original documents/papers of guarantee from the concerned tendering authority.

EXECUTIVE ENGINEER
WEST ZONE (RANDER)
SURAT MUNICIPAL CORPORATION.