



NAME OF WORK: PROVIDING & LAYING NEW DRAINAGE LINES ON VARIOUS REMAINING T.P. ROADS AND AUGMENTATION OF OLD DRAINAGE LINES AS PER REQUIREMENTS IN EAST ZONE-A (VARACHHA) & OTHER ZONE AREA WITH IN SURAT MUNICIPAL CORPORATION (2nd Attempt)

E-Tender

Tender Notice (Online No): ADD.C.E &I/C. C.E/Drainage/02/2026-27 (Work No.04)

VOLUME-I: TECHNICAL BID

Last date of download of tender documents from website : 25/06/2026 to 13/07/2026.
smctender.nprocure.com

Pre-bid query : Bidders shall have to post their queries on e-mail address exen.drainage@suratmunicipal.org on or before Date: 02/07/2026 up to 17:00 hrs.

Last date of submission of online tender : Up to 13/07/2026, up to 18:00 hrs.

Last date of submission of tender fees, EMD and other documents in hard copy (as mentioned in Tender Document) : From 14/07/2026 to 22/07/2026 to Chief Accountant SMC, Muglasarai, Surat by R.P.A.C./Speed Post up to 17:00 hrs.

Estimated Cost : Rs.1,95,21,739.43 (Excluding GST)

Earnest Money Deposit (EMD) : Rs. 1,96,000.00
100% EMD amount shall be in form of Cash or Demand Draft/ Pay Order crossed Demand Draft of Nationalised Bank payable at Surat.

Document Fees : Rs.4,248.00 (Incl. CGST 9% and SGST 9%)

Opening of Tender (Online) : From 14/07/2026, 12.00 Hrs. onwards. If possible

Tender to be submitted to:
The Chief Accountant, Surat Municipal Corporation,
Muglisarai, Surat – 395 003.



TENDER DOCUMENT

NAME OF WORK:-	PROVIDING & LAYING NEW DRAINAGE LINES ON VARIOUS REMAINING T.P. ROADS AND AUGMENTATION OF OLD DRAINAGE LINES AS PER REQUIREMENTS IN EAST ZONE-A(VARACHHA) & OTHER ZONE AREA WITH IN SURAT MUNICIPAL CORPORATION(2nd Attempt)
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**1. NOTICE TO INTENDING TENDERERS:****(A) RECEIPT AND OPENING OF TENDER:**

Online Tenders will be received from the established and reliable contractors on or before 18.00 hours on 13/07/2026 on website smctender.nprocure.com. The tender received after due time and date specified will not be accepted.

(B) NAME OF WORK: - PROVIDING & LAYING NEW DRAINAGE LINES ON VARIOUS REMAINING T.P. ROADS AND AUGMENTATION OF OLD DRAINAGE LINES AS PER REQUIREMENTS IN EAST ZONE-A(VARACHHA) & OTHER ZONE AREA WITH IN SURAT MUNICIPAL CORPORATION (2nd Attempt)

- | | |
|--------------------------|---|
| 1. ESTIMATED COST | : Rs.1,95,21,739.43 (Excluding GST) |
| 2. EARNEST MONEY DEPOSIT | : Rs. 1,96,000.00 |
| | 100% EMD amount shall be in form of Cash or Demand Draft/ Pay Order crossed Demand Draft of Nationalized Bank payable at Surat. Nationalized Bank payable at Surat. |
| 3. TIME LIMIT | : 16 (Sixteen) months (Excluding monsoon) |
| 4. Document Fee | : Rs.4,248.00 (Incl. CGST9% and SGST 9%) |
| 5. Registration required | : "B " class <i>or above</i> . |

(C) OPENING OF TENDERS:

The tenders will be opened online subject to receiving the copy of Tender Fees, EMD, Affidavit on non-judicial stamp paper of Rs.300/- and undertaking of not blacklisted on non-judicial stamp paper of Rs.300/-with documents required for qualification. The tenders will be opened in two stages i.e., Technical Bid and price Bid.

(D) PURCHASE OF TENDER DOCUMENTS:

Tender Documents can be downloaded from smc tender.nprocure.com up to 25/07/2026.

Tender documents fees per set which is required for submission of tender towards the cost of tender documents in cash, pay order or by demand draft of any nationalized bank, in favor of "The Commissioner, Surat Municipal Corporation" payable at Surat and shall be submitted along with EMD and other documents. The cost of the Tender Documents will not be refunded in any circumstances. The Surat Municipal Corporation shall not be liable for any postal delay in any case.

Demand Draft for E.M.D. & Tender (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 Clause as to reach to Chief Accountant, SMC within 7 days from the last date of online submission of the bid as per tender notice.

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



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

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

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

(E) CONTRACT PERIOD:

The total contract period is hereby fixed as **16 (Sixteen) months excluding monsoon from the 15th Day of issuance of work order.**

No Execution work shall be permitted on site from **1st June to 30th September.** However, material procurement shall be permitted.

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

- (a) All tenders must be submitted in the prescribed Tender form.
- (b) Each Tender must be accompanied by the completion Schedule.
- (c) Each tender must be accompanied by Tender Security (Earnest Money Deposit) as specified in the tender notice.
- (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 (4%) Four 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.



(G) Tender Validity Period:

The validity period of the tender submitted for this work shall be of one hundred twenty (120) calendar days from the last days of online Submission of tender 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 it. 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.

- (I) The EMD and Tender Fee shall be of any nationalized bank, or the list of banks provided in the tender, in favor of “The Commissioner, Surat Municipal Corporation” payable at Surat.

Executive Engineer
Drainage Department,
Surat Municipal Corporation

SIGNATURE OF THE CONTRACTOR: -

ADDRESS: -

DATE: -



2. QUALIFICATION OF TENDERER:

The requirements mentioned below constitute qualification criteria for this work. All submitted documents shall be colored Scanned copies to be seen as original with **self-attested or notarized with copy clearly displaying stamp, number and name of the notary**. Submitted documents shall be valid and identical to the qualification criteria. **Please note that absence of online submission of following essential mandatory documents shall lead the bidder to straight disqualification.** No relaxation shall be provided to the bidder at a later stage.

Mainly Bidder shall fulfill following Technical & Financial pre-qualification criteria as a main contractor. The Bidder shall submit the following all points **A to O** requirements / experiences for qualification.

- (A) Average Annual Turnover for the last 3 years, ending 31st March of previous financial year, should be at least 30% of total estimated cost of the tender **i.e., Rs. 58.56 Lakhs**. An attested copy of annual turnover for last 3 years should be enclosed. Here, if last financial year's turnover certificate is not available or not audited, then years before last financial year should be considered.

- (B) Experience of having Successfully Completed similar Works during last Seven Years either of the following :

- (1) Three similar completed works, each costing not less than amount equal to 40% of the estimated cost. **(Rs. 78.08 lakhs)**

OR

- (2) Two similar completed works, each costing not less the amount equal to 50% of the Estimated Cost. **(Rs.97.60 lakhs)**

OR

- (3) One similar completed works, each costing not less the amount equal to 80% of the Estimated Cost. **(Rs.156.17 lakhs)**

Similar works means work providing & laying of underground gravity RCC drainage/storm drainage pipelines.

- (C) The works carried out for Government or Semi-Government or ULB shall only be considered for qualification. The necessary work completion certificate from not below the rank of Executive Engineer shall only be considered.

- (D) The Bidder should submit Solvency Certificate minimum value of at least 20% of the total estimated cost put to the tender **i.e., Rs.39.04 Lakhs** issued by Schedule Bank/Nationalizes Bank only and should be effective and in force on the last date of receipt of bids, it will be the responsibility of the bidder to get the extension of the effectiveness of solvency certificate from corresponding bank, up to the tender validity period, if the same is getting expired before that, the same should be produced with necessary extension within 15 days of expiry of such solvency as and when asked by Surat Municipal Corporation, failing which will be liable for rejection of bid without assigning any reason thereof. (Considering validity as 1 year from date of issue of Solvency Certificate)

- (E) An colored Scanned notarized copy of registration with MES, various departments of State Government, Surat Municipal Corporation, CPWD etc.

Registration required: "B" "class or above."

- (F) List of the works already completed in last 07 years in prescribed Performa and attested copies of certificates from head of the office concerned for completion of the works.



- (G) Following enhancement factors will be used for the cost of works executed and financial figures to arrive at common base for the value of the works completed in India. **Cut of month shall be considered from month of tender submission. If tender submission changes in any of addenda corrigendum the cut off month shall be changed accordingly.**

Year	Multiplying factor
Immediate last year of the assessment year*	1.1
Second	1.21
Third	1.33
Fourth	1.46
Fifth	1.61
Sixth	1.77
Seventh	1.95

Notes:

- Here assessment year shall be reckoned from year and month in which tender is submitted.
 - Bidder should indicate actual figures of costs and amount for the work executed in Annexure – I without accounting for the above-mentioned factors.
- (H) Declaration regarding the work on hand with the tenderer shall also be given in prescribed Performa as per Annexure-II. Attested copies of work orders, interim certificates if any shall also be attached as supporting documents.
- (I) Attested copy of partnership deed, power of attorney etc.
- (J) For records reasons, SMC shall have absolute powers to qualify the bidder for any particular work irrespective of its monetary value.
- (K) The tenderer shall furnish a written statement with details in Annexure enclosed.
- (L) Joint Venture shall not be allowed.
- (M) Experience of Joint Venture or sublet or back-to-back work shall not be allowed.
- (N) The Tenderer shall submit only one tender for the work put to this tender.
- (O) The bidder shall note that in case the bidder is Blacklisted/stated as defaulter/Barred participating in tenders by any of government agencies/semi government agencies or any other equivalent agencies during last 5 years then in that case the bidder will be disqualified and will not be allowed to participate in the bidding process, though bidder satisfies all the qualification conditions, mentioned above. In this regard, the decision of the Surat Municipal Corporation will be final and binding to bidder.

Executive Engineer
Drainage Department,
Surat Municipal Corporation

SIGNATURE OF THE CONTRACTOR: -
ADDRESS:
DATE: -

**3. INFORMATION TO TENDERER:**

1	Tender validity period: -	120 days (One hundred & Twenty days) from the last date of receipt of tender
2	Earnest Money Deposit: -	Rs. 1,96,000.00 100% EMD amount shall be in form of Cash or Demand Draft/ Pay Order crossed Demand Draft of Nationalised Bank payable at Surat.nalized Bank payable at Surat.
3	Security Deposit: -	As per Chapter No. 15 Condition of Contract, Clause – 1.
4	Time of Completion: -	16 (Sixteen) months (Excluding monsoon)
5	Defect liability period: -	Twelve Months after completion of work
6	Penalty for delay: -	Zero Point two percent (0.2%) of the contract price per day maximum up to 10 % (ten percent) of the contract price.
7	Last date of download of tender: -	Date: - 25/06/2026 to 13/07/2026 from smctender.nprocure.com
8	Last date of submission of online Tender: -	Date: - 13/07/2026 18.00 hrs.
9	Last date of submission of Tender fees, EMD and other Documents: -	Up to 14/07/2026 to 22/07/2026 up to 17.00 hrs.
10	Online query: -	Bidders shall have to submit their queries on email id exen.draiange@suratmunicipal.org on or before dt:02/07/2026 at 17:00 hrs.

Executive Engineer
Drainage Department,
Surat Municipal Corporation

SIGNATURE OF THE CONTRACTOR: -
ADDRESS: -
DATE: -

**4. SUBMISSION OF TENDER**

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 technicalbid. Accordingly, offer/tenders of those tenderers whose E.M.D. & tender fee is received electronically, shall be opened. However, for the purpose of realization of EMD and Tender Fee, bidder shall send the EMD as well as Tender fee in required format in original through RPAD/Speed Post so as to reach to Account Department (Main Office) during 14/07/2026 to 22/07/2026 till 17:00hrs. 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. All documents in supporting of bid shall be in electronic format only through online (by colour scanning) during the bidding period & hard copy will not be accepted separately."

- All supporting documents must be colored scanned to be seen as original, and each document must be self-attested or notarized with the stamp, number, and name of the notary clearly visible, as scanning in black and white or gray will not be acceptable.
- Price bid shall have to be quoted strictly online only. Technical Bid in Hard copy shall be Submitted only by Successful bidders upon intimation from SMC.
- Addenda/corrigenda to these tender documents, if issued must be signed and submitted online & in Hard copy also.

5. DOCUMENT TO BE SUBMITTED IN HARD COPY:

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

- Earnest Money Deposit as mentioned in the Tender document. (i.e., D.D/Bank guarantee)
- Tender Fees as mentioned in the tender document. (i.e., D.D)
- **Affidavit on Non-Judicial Stamp Paper of Rs.300/- (Annexure-III)**
- **Undertaking by the tenderer for not blacklisted on non-judicial stamp paper of Rs. 300/- (Annexure – IX)**
- Addenda/corrigenda to these tender documents, if issue must be signed and submitted.

Price Bid shall have to be quoted strictly online only. Technical Bid in Hard copy shall be submitted only by Successful Bidders upon intimation from SMC."

Executive Engineer
Drainage Department,
Surat Municipal Corporation

SIGNATURE OF THE CONTRACTOR: -
ADDRESS: -
DATE: -

**6. DETAILS / DOCUMENT TO BE SUBMITTED IN QUALIFICATION (online)**

List of documents to be submitted along with the tender documents online on smc.nprocure.com:

All submitted documents shall be colored Scanned copies to be seen as original with **self attested or Notarized with copy clearly displaying stamp, number and name of the notary.**

- a) The scan copies of Tender fees and EMD. **(Colored scanned)**
- b) Affidavit on non-judicial stamp paper of Rs. 300 (Annexure-III) and undertaking of not blacklisted on non-judicial stamp paper of Rs. 300 (Annexure-IX). **(Colored scanned & notarized)**
- c) Documents/certificate supporting Annexure-I, II, IV, V, VI, VII and VIII in required Performa. **(Colored scanned)**
- d) Necessary documents required for various details mentioned in Tender Clause No. (2) "Qualification of Tenderers". (Form 3(A) Experience Certificate) **(Colored scanned & notarized)**
- e) Registration Certificate.
- f) Solvency Certificate.
- g) Turn over Certificate.
- h) Scan Copy of Addenda and Corrigendum (if any).
- i) Partnership deed and Power of Attorney (if any).
- j) Contractor's GST Registration.
- k) Audit Balance Sheet for the last 3 years.
- l) Income Tax Return Certificate for the last 3 years.

Note: -

- On failing to submit all the above mandatory documents through online (by scanning), bidder will not be qualified for opening of the Price Bid.
- The Bidder shall have to strictly submit the Price Bid online only, the submission in hard copies shall be rejected and tender shall not be opened further.

**7. APPROVED LIST OF BANKS**

With reference to List of Banks declared by Government of Gujarat, Finance department **GR No-FD/MSM/e-file/4/2024/2859/D.M.O. Dtd. 01/05/2025** Annexure I bank guarantee issued by following bank shall be accepted.

(A). Guarantees issued by following banks will be accepted as SD/ EMD on permanent basis.

- **All Nationalized Banks.**

(B.) Guarantees issued by following Banks will be accepted as SD / EMD for period up to **March 31, 2027**. The validity cut-off date in GR is with respect to date of issue of Bank Guaranteed irrespective of date of termination of Bank Guarantee.

Sr.No.	Bank Name	Sr.No.	Bank Name
1	A U Small Finance Bank	22	Karur Vysya Bank
2	Ahmedabad Mercantile Co-operative Bank Limited	23	Kotak Mahindra Bank
3	Axis Bank	24	NutanNagrikSahakari Bank Limited
4	Bandhan Bank	25	Rajkot NagarikSahakari Bank Limited
5	Barclays Bank	26	Saraswat Co-operative Bank
6	Baroda Gujarat Gramin Bank	27	SBPP Co-operative Bank Ltd.
7	City Union Bank	28	SVC Co-operative Bank Ltd.
8	CSB Bank	29	Saurashtra Gramin Bank
9	DBS Bank India Limited	30	Standard Chartered Bank
10	DCB Bank	31	South India Bank
11	Equitas Small Finance Bank	32	Tamilnadu Mercantile Bank
12	ESAF Small Finance Bank	33	The Gujarat State Co-operative Bank
13	Federal Bank	34	The Cosmos Co-Op Bank Ltd.
14	HDFC Bank	35	The Mehsana Urban Co-operative Bank Limited
15	HSBC Bank	36	The Surat District Co-operative Bank
16	ICICI Bank	37	The Surat People's Co-Operative Bank Ltd.
17	IDBI Bank	38	The Kalupur Commercial Co-op. Bank
18	IDFC First Bank	39	The panchmahal District Co-operative bank
19	Jammu and Kashmir Bank	40	The Baroda District Co-operative Bank
20	Jana Small Finance Bank	41	Utkarsh Small Finance Bank
21	Karnataka Bank	42	Yes Bank

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

Executive Engineer
Drainage Department,
Surat Municipal Corporation

SIGNATURE OF THE CONTRACTOR: -
ADDRESS: -
DATE: -



8. ANNEXURES FOR PRE-QUALIFICATION TO BE FILLED IN BY TENDERER
ANNEXURE-I

Performa for list of works of similar nature already completed by the Tendered.
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: -

- It is mandatory to submit the supporting documents / certificates through online (Colored scan copy)
- Bidder shall give completion certificate from client. In absence of such completion certificate, experience shall not be considered for evaluation.

SEAL & SIGNATURE OF THE CONTRACTOR: -

ADDRESS: -

DATE: -

**ANNEXURE-II****Performa for declaration regarding works on hand with the bidder:**

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

Note:

- It is mandatory to submit the supporting documents / certificates through online (Colored scan copy)
- Amount of work done in Column 6, should be given up to the month previous to the month in which tenders are invited).

SEAL & SIGNATURE OF THE CONTRACTOR: -

ADDRESS: -

DATE: -



ANNEXURE-III
AFFIDAVIT

NAME OF WORK: - PROVIDING & LAYING NEW DRAINAGE LINES ON VARIOUS REMAINING T.P. ROADS AND AUGMENTATION OF OLD DRAIANGE LINES AS PER REQUIRMENT IN EAST ZONE-A(VARACHHA) & OTHER ZONE AREA WITH IN SURAT MUNICIPAL CORPORATION

- 1.0 I, the undersigned, do hereby certify that all the statements made in the required attachments are true and correct. I also understand that in case of wrongful/false information, Surat Municipal Corporation is entitled to take any civil & criminal punitive action against me/us.
- 2.0 The undersigned also hereby certifies that neither our firm M/s _____ nor any of its constituent partners have abandoned any work in India nor any contract awarded to us for such works has been rescinded during last five years, prior to the date of this bid.
- 3.0 The undersigned hereby authorize(s) and request(s) any bank, person, authorities, government or public limited institutions, firm, or corporation to furnish pertinent information deemed necessary and requested by the SMC to verify our statements or our competence and general reputation.
- 4.0 The undersigned understands and agrees that further qualifying information may be requested and agrees to furnish any such information at the request of the SMC.
- 5.0 The SMC and its authorized representatives are hereby authorized to conduct any inquiries or investigations to verify the statements, documents, and information submitted in connection with this application and to seek clarification from our bankers and clients regarding any financial and technical aspects. This Affidavit will also serve as authorization to any individual or Authorized representative of any institution referred to in the supporting information, to provide such information deemed necessary and requested by 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 Authorized signatory of the firm

Title of the office

Name of the firm

Date

Note: -

- The affidavit format as indicated above to be furnished on non-judicial stamp Paper of Rs.300 and duly notarized.
- It is mandatory to submit the supporting documents / certificates through online & hard copy (Colored scan copy)



ANNEXURE-IV

[illegible]



ANNEXURE-V

**List of tools, plants and equipment with bidder (Format as per
Bidder's choice)**



ANNEXURE-VI

**List of tools, plants and equipment to be deployed by the tenderer for
the work (Format as per tenderer's choice).**



ANNEXURE-VII

Contractors Schedule for execution of work in the form of Bar chart

Sr. No.	Description of Activity	Start month and date and completion month and Date



ANNEXURE-VIII

Structure and Organization of the Company

1. **Name of Applicant**
2. **Nationality of Applicant**
3. **Office Address**
Telegraphic Address
Telephone No. (O) (M)
Telex No.
Fax No.
Email address:
4. Year and location of establishment
5. The Applicant is
 - a) An individual
 - b) A proprietary firm
 - c) A firm in partnership
 - d) A limited company or Corp.
(if a firm in partnership)
6. For how many years has your organization been in business of similar work under its present name? what were your fields when your organization was established?

Signature of Applicant.

Date:



ANNEXURE-IX

UNDERTAKING BY THE TENDERER FOR NOT BLACKLISTED ON RS.300/-NON-JUDICIAL STAMP PAPER

I/We..... Address..... Solemnly affirm and state that on oath that (Name of Tenderer) has not been blacklisted 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.

SIGNATUREANDSEALOFTHECONTRACTOR:

NAMEANDADDRESS:

DATE:

NOTE: -It is mandatory to submit the above Affidavit through online (Notarized colour scan copy) and also in hard copy.



9. PERCENTAGE RATE TENDER AND 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 Posted online on the website of Surat Municipal Corporation or on a board hung up in the Municipal Office and signed by the Commissioner.

This form will state the work to be carried out, as well as the date for submitting and opening tenders, and the time allowed for carrying out the work; also the amount of earnest money to be deposited with the tender, and the amount of the security deposit to be deposited by the successful tenderer and the percentage, if any to be deducted from bills. It will also state whether a refund of quarry fees, royalty's dues ground rents & water-charges will be granted. Copies of the specifications, designs drawings and estimated rates; schedule rates and any other documents required about the work which will be signed by the Executive Engineer, for the purpose of identification shall also be opened for inspection by contractors at the office of the Executive Engineer, during office hours.

Where the works are proposed to be executed according to the specifications recommended by a contractor and approved by a competent authority on behalf of the Surat Municipal Corporation such specification 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 by each partner thereof, and in the event of the absence of any partner, it shall be signed on his behalf by a person holding a power of attorney authorizing him to do so.
- (3) Receipt for payments made on account of any work when executed by a firm, should also be signed by all the partners, except where the contractors 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 person having authority to give effectual receipt for the firm.
- (4) Any person who submits a 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 each item of the work. Tenders which propose any alteration 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 sort, will be liable to rejection. No single tender shall include more than one work, but contractors who wish to tender for two or more works shall submit a separate tender for each. Tenders shall have the name and the number of the works to which they refer written outside the envelope.
- (5) ~~The Commissioner or his duly authorized Assistant will open tenders in the presence of any intending contractors who may be present at the time, and will enter the amounts of the several tenders in a comparative statement in suitable form. In the event of a tender being accepted, the contractors shall thereupon, for the purpose of identification sign copies of the specifications and other documents mentioned in Rule.1. In the event of a tender being rejected the deposit will be refundable on application.~~
- (6) The Municipal Corporation shall have the right of rejecting all or of the tenders without assigning any reason.
- (7) No receipt for any payment alleged to have been made by a contractor regard to any matter relating to this tender or the contract shall be valid and binding on Municipal Corporation unless it signed by the Executive Engineer.
- (8) The memorandum of work to be tendered for and the schedule of materials to be supplied by the Municipal Corporation and their rates shall be filled in and completed by the office of the



SURAT MUNICIPAL CORPORATION

DRAINAGE DEPARTMENT

Executive Engineer, before the tender form is issued. If a form issued to an intending tenderer has not been so filled in and completed, he shall request the said office to have this done before he completes and delivers his tender.

- (9) All work shall be measured net by standard measure and according to the rules and custom of the Municipal Department of Surat Municipal Corporation 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, if so desired by the Commissioner, produce along with his tender a banker's certificate of his financial stability. If he fails to produce such a certificate his tender will not be considered.
- (12) All corrections and additions or pasted slips should be initialed.
- (13) The measurements of work will be taken according to the usual method in use in the SMC and no proposals to adopt alternative methods will be accepted. The Commissioner's decision as to what the usual method in use in the SMC will be final.
- (14) The tender for work shall remain open for a period of 120 days from the date of receipt of his online tender for this work and that the tenderer shall not be allowed to withdraw or modify the offer on his own during this period. If any tenderer withdraws or makes modifications of additional in the terms and conditions of his tender not acceptable to the corporation shall without prejudice to any right or remedy be at liberty to forfeit in full the said earnest money absolutely.
- (15) Rate Quoted by bidder shall be inclusive of all taxes but Excluding GST. GST shall be paid extra as per prevailing rules.
- (16) Tenderers shall also note that as per the provisions of government, 01 % (one percent) construction cess on the work done amount shall be levied and shall be deducted from each running bill & final bill. The contractor shall quote the rate accordingly.
- (17) The successful tenderer shall submit the copy of technical bid duly sealed & signed within fifteen days of issue of work order.
- (18) The tenderer shall invariably submit the Certificate of Provident Fund of Employee without which bill for payment shall not be processed.
- (19) The successful tenderer shall submit the copy of labour license within fifteen days of issue of work order.
- (20) All the RCC NP3/NP4 Class pipes shall have ISI mark on it.
- (21) For the necessary modification / alteration / addition to complete the job, if any civil breaking or repairing is to be done, shall have to be carried out by contractor at his own cost, as per standard engineering practice. It shall be sole responsibility of contractor to clear construction and demolition waste (C.D. Waste) by their own risk and cost. The contractor shall ensure that their site must be clear in all respect by disposing C.D. Waste generated during the work. If it's found that contractor is irregular and showing negligence to dispose C.D. Waste then SMC is empowered to dispose the said C.D. waste through SMC authorized C.D. waste contractor /agency. All the necessary expenditure made towards disposal of this C.D. waste shall be recovered from the contractor along with the administrative charges and penalties.
- (22) During Execution of this tender, the tenderer must strictly follow "The Prohibition of Employment as Manual Scavengers and Their Rehabilitation Act-2013", "The Prohibition of Employment as



SURAT MUNICIPAL CORPORATION

DRAINAGE DEPARTMENT

Manual Scavengers and Their Rehabilitation Rules-2013”, Supreme Court Judgment for writ petition (Civil) No. 583 of 2003, Government Guidelines for working of Manual Scavengers with their latest embedment etc. Failing which Tenderer/Contractor shall be prosecuted as per the prevailing Rules/Laws/Regulations.

NOTE: Also Referred Separate attachment for above point 22.

Executive Engineer
Drainage Department,
Surat Municipal Corporation

SIGNATURE OF THE CONTRACTOR: -
ADDRESS: -
DATE: -



SURAT MUNICIPAL CORPORATION

DRAINAGE DEPARTMENT

10. TENDER FOR WORKS

I/We hereby tender for the execution for the Surat Municipal Corporation (herein before and herein after referred to as “Municipal Corporation”) of the work specified in the memorandum within the time specified in such memorandum at the tendered rates specified in schedule B (memorandum showing items of work to be carried out) and in accordance in all respects with the specification, designs, drawings, and instructions in writing referred to in clause 13 of the annexed conditions of contract and agree that when materials for the work are provided by Municipal Corporation such materials and the rates to be paid for them shall be as provided in schedule -A hereto should this tender be accepted.

I/We hereby agree to abide by and fulfill all the terms and provisions of the conditions of contract annexed hereto so far as applicable, and in default thereof to forfeit and pay to Municipal Corporation in office the sums of money mentioned in the said conditions.

Receipt No. _____ dated _____ from Municipal Corporation in respect of the sum of Rs. _____ (Rupees _____ only) / A crossed order cheque of Rs. _____ (Rupees _____ only) No. _____ dated _____ on the _____ in favor of the Commissioner, Surat Municipal Corporation is herewith forwarded representing the earnest money the full value of which is to be absolutely forfeited to Municipal Corporation should I/We not deposit the full amount of security deposit specified in the Memorandum, in accordance with Clause 1 of the said conditions.

Contractor:

Address:

Dated the _____ day of _____ 2026.

(Witness)

(Address)

(Occupation)

The above tender is hereby accepted by me on behalf of the Surat Municipal Corporation.

Deputy Municipal Commissioner,
Surat Municipal Corporation

Dated _____ day of _____ 2026.



11. CONTRACT AGREEMENT FOR

NAME OF WORK: - Providing & Laying New Drainage Lines On Various Remaining T.P. Roads And Augmentation Of Old Draiange Lines As Per Requirment In East Zone-A(Varachha) & Other Zone Area Within Surat Muncpal Corporation (2nd Attempt)

AGREEMENT

Between

Name of Contractor

AND

SURAT MUNICIPAL CORPORATION

NAME OF WORK: - PROVIDING & LAYING NEW DRAINAGE LINES ON VARIOUS REMAINING T.P. ROADS AND AUGMENTATION OF OLD DRAIANGE LINES AS PER REQUIRMENT IN EAST ZONE-A(VARACHHA) & OTHER ZONE AREA WITH IN SURAT MUNCIPAL CORPORATION (2nd Attempt).

Tender Amount: -

Sanctioned Authority: -

Work Order No.: -

This Agreement made on _____ day of _____ month of year 2026 (Two Thousand Twenty-Six) between the First Part as (here in after called the Contractor) and the Surat Municipal Corporation, a body Corporate and body constituted under the Bombay Municipal Provincial Corporation Act, 1949 and having its office at Muglisarai, Surat-395 003 (hereinafter called "The Corporation" which expression shall, unless excluded by or repugnant to the context to be deemed to include its successors and assignees) of the Second Part presented **Commissioner** of Surat Municipal Corporation on their behalf.

WHEREAS the said Contractor has Tender for the work of **PROVIDING AND LAYING RCC NP3/NP4 CLASS SPIGOT SOCKECT TYPE JOINT PIPES FOR DRAINAGE NETWORK ON VARIOUS T.P. SCHEMES UNDER EAST DRAINAGE ZONE A AND B OF SURAT MUNICIPAL CORPORATION (2nd Attempt).** in his Tender **Date:**complete with specifications, conditions of contract and annexure attached to the same.

AND WHEREAS Corporation having considered the proposal made by the Contractor and having found the tender of the said Contractor is reasonable and adequate.

AND WHEREAS the Corporation has accepted Contractor's tender by **Standing Committee Resolution No....., Dtd.....**having tender amount **Rs.**

AND WHEREAS Work Order has been sent to the Contractor vide **DNG/OUT/W/No....., Dtd.....**and contractor has furnished Security Deposit of **Rs.....**videfor execution of this work contract.

NOW IT IS AGREED AS FOLLOWS:

- (i) That the Contractor agrees to carry out the work as per conditions of contract, specifications, terms & conditions, rates and other condition mentioned as approved by **Standing Committee Resolution No., Dtd.....**in favor of



-
- (ii) That the following shall constitute the part of the contract documents.
- (A) **E- Tender Notice No.**
- (B) Tender documents duly filled in all respect signed and sealed by the Contractor.
- I Tender Dtd.....
- (D) Sanction of **Standing Comm. Res. No.**
- I **Work Order No. DNG/OUT/W/No.**.....

IN WITNESS WHEREOF the common seal of the Surat Municipal Corporation has been hereinto affixed in the presence of Two Members of Standing Committee and the **Commissioner** of Surat Municipal Corporation has hereinto set his hands and sealed and signature ofhas been herein to affixed this day and year of first part above written.

Signed, sealed and delivered by the said Contractor: -

Contractor,

I am responsible if the Contractor does not abide by the condition of this contract.

Signed and sealed by the Surety: -

Signed in the presence.

SURETY

(Name with full Address)

**Executive Engineer
Drainage Department
Surat Municipal Corporation**

**Deputy Municipal Commissioner
Surat Municipal Corporation**

The common seal of the Municipal Corporation of Surat was affixed on the _____ day of month of _____ 2026 in presence of (1) and (2) members of the Standing Committee of the Municipal Corporation of Surat city.

1.	
2.	
	MEMBERS, STANDING COMMITTEE, SURAT MUNICIPAL CORPORATION.

**12. SURETY**

This bond is made on _____ day of the month of _____ year 2026 (Two Thousand Twenty-Six) between I/We (hereinafter called the Surety / Sureties) of the first part ofand Second Part **Deputy Municipal Commissioner** on behalf of the Surat Municipal Corporation.

WHEREAS _____ the Contractor/Contractors _____ ofhas/have entered into a contract with the Surat Municipal Corporation for the works detailed in next page:

Name of Work	Tender Amount Rs. Ps.	Resolution No. & date sanctioning contract.
PROVIDING & LAYING NEW DRAINAGE LINES ON VARIOUS REMAINING T.P. ROADS AND AUGMENTATION OF OLD DRAINAGE LINES AS PER REQUIREMENT IN EAST ZONE-A(VARACHHA) & OTHER ZONE AREA WITH IN SURAT MUNICIPAL CORPORATION (2nd Attempt).		

AND WHEREAS one of the conditions of the contract being that the Contractor/Contractors shall give Surety/Sureties to the Corporation for the due fulfillment of the contract to the full value of the total expenditure of the work.

Now THIS BOND WITNESSES and it is hereby agreed and declared as follows:

I/We Surety/Sureties hereby bind myself/ourselves responsible for the due fulfillment of the contract in all its respects by the Contractor/Contractors and I/We do hereby agree and undertake to indemnify and keep harmless The Surat Municipal Corporation jointly as well as severally if the Contractor/Contractors fails/fail to carry out the whole or any part of the contract work as per the conditions and specifications of the contract work and as agreed to between the parties to the contract to the extent of full value of the total expenditure to be incurred in that behalf by the Municipal Corporation provided always that the expression "The Surety / Sureties" herein before used shall include the heirs, executors assigns or administrators of each and every person in this context.

IN WITNESS WHEREOF the Surety/Sureties and the **Divisional Head** on behalf of the Surat Municipal Corporation have hereinto set their respective hands this day of the month of the year Two Thousand Twenty-Five.

Signed & sealed by Surety

Signed in the presence.

**Executive Engineer
Drainage Department
Surat Municipal Corporation**

**Deputy Municipal Commissioner
Surat Municipal Corporation**



The common seal of the Municipal Corporation of Surat was affixed on the _____ day of month of _____ 2026 in presence of (1) and (2) members of the Standing Committee of the Municipal Corporation of Surat city.

1. _____

2. _____

**MEMBERS,
STANDING COMMITTEE,
SURAT MUNICIPAL CORPORATION.**

**UNDERTAKING**

NAME OF WORK: - Providing & Laying New Drainage Lines On Various Remaining T.P. Roads And Augmentation Of Old Drainage Lines As Per Requirement In East Zone-A (Varachha) & Other Zone Area With In Surat Municipal Corporation (2nd Attempt).

Tender Amount

Articles of Agreement made on this _____ day of the month of _____ 2026 betweenhereinafter called the “Contractor” (which expression shall include their administrator and assignees of the First party) and **Deputy Municipal Commissioner** of Surat Municipal Corporation, Surat, Gujarat (which expression include his successors and assignees of Second party).

WHEREAS the Contractor above name had tendered for the above work and the contract agreement for which has been executed on Rs.300.00 Stamp Paper for executing the above work, It is hereby agreed by the Contractor that the value of stamp affixed on the original document is as per inquiry made by the Contractor.

It is further agreed by the Contractor that if the value of the stamp affixed on original contract fails short on the requirement on the date of signing the contract, it shall be made good by the Contractor at his cost as per Government Rules prevailing on the date of signing the agreement and any damage arising due to the original agreement made on stamp paper of Rs.300.00 shall be on account to the Contractor.

**Signed, Sealed & delivered by Contractor
in the presence of**

Sign & seal of Contractor.

Name:

Address:

Name:

Address:

**13. GST****FOR CONSTRUCTION/ ERECTION/ COMMISSIONING/ INSTALLATION/ REPAIRS MAINTENANCE / RENOVATION / FABRICATION OF STRUCTURE INCLUDING BUILDING (MEANS ALL WORKS CONTRACT / SUPPLY OF MATERIAL / GOODS)**

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

The bidder must consider the prevailing tax structure on last date of bid submission for quoting the tender. During the course of execution of Contract, if there is any change in Rate of GST (Goods and Service Tax) by the Government, the same shall be reimbursed / recovered separately by SMC, subject to the submission of Original Receipt / Proof for amount actually remitted by the successful Tenderer / Contractor to the competent Authority along with a certificate form Chartered Accountant of Contractor / Successful Bidder Certifying that the amount of GST paid to the Government and the same shall be intimated / submitted /claimed within 30 (Thirty) Days from the date of payment. Remittance of GST within stipulated period shall be the sole responsibility of the Successful Bidder / Contractor, failing which, SMC may recover the amount due, from any other payable dues with SMC and decision of Municipal Commissioner shall be final and binding of the Contractor / Successful Bidder in this regard. Further, the nonpayment 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, or 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.

Executive Engineer
Drainage Department,
Surat Municipal Corporation

SIGNATURE OF THE CONTRACTOR: -

ADDRESS: -

DATE: -



14. IMPORTANT POINTS TO BE BROUGHT TO TENDERER'S NOTICE

THE TENDER MAY BE REJECTED OUTRIGHT IF THE TENDERER

- A. Stipulates the validity period less than what is stated in the form or tender.
- B. Stipulates his own conditions.
- C. Does not quote his rates inclusive of terminal or sales tax or central taxes etc. in his rates.
- D. Does not disclose the full names and addresses of all his partners in the case of partnership concern.
- E. Does not fill in and sign the tender form as well as the bill of quantities and rates, annexure, specifications etc.
- F. Does not pay the Earnest Money Deposit by Pay Order or demand draft with the PART – A: QUALIFICATION/TECHNICAL BID of the tender.
- G. Does not submit the tender before the stipulated time on the specified date in the accounts office as directed.

Executive Engineer
Drainage Department,
Surat Municipal Corporation

SIGNATURE OF THE CONTRACTOR: -
ADDRESS: -
DATE: -



15. CONDITIONS OF CONTRACT

Clause 1.

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

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

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

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

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

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

Tender costing Less than Rs.2.00 Crore.

(a) Remittance of SD/RMD

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

(b) Release of SD/RMD

- (i) The 2% Initial security deposit shall be released after clearance of Final bill by Audit Dept.
- (ii) Whereas, the 2% security deposit recovered from the each running account bills Shall be released only after clearance of Final bill by Audit Dept. & completion of defect liability period.
- (iii) 5% Retention money deposit (RMD) to be released along with final bill.

**Tender costing Rs.2.00 Crore. & More than Rs.2.00 Crore.****(a) Remittance of SD/RMD**

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

(b) Release of SD/RMD

- (i) The 2% Initial security deposit shall be released after clearance of Final bill by Audit Dept.
- (ii) Whereas the 2% security deposit recovered from the each running account bills Shall be released only after clearance of Final bill by Audit Dept. & completion of defect liability period.
- (iii) 5% Retention money deposit (RMD) to be released along with final bill.

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

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

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

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

Initial Security Deposit (i.e., 2% of Tender Amount) in form of Bank Guarantee may be accepted as per relevant tender provision, However BG shall be valid till final date of completion of work + 1(one) year (Whether final bill is audited and paid or not). It shall be contractor's responsibility to extent the BG On Or Before expiry of time limit of BG. In case of late renewal of BG, penalty of security deposit shall be levied at the interest rate of 4.0% or as per Prevailing Rule per day of BG amount for breaking period.

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



If initial Security deposit is paid in form of Fixed Deposit, additional stamp paper amounting @ 4.90% (OR as per SMC's prevailing rules and regulations) of Security Deposit shall be used to execute the agreement.

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

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

Clause 2.

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

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

Clause 3.

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

- a To rescind the contract [of which rescission notice in writing to the Contractor under the hand of the Commissioner shall be conclusive evidence] and in that case that security deposit of the Contractor shall stand forfeited and be absolutely at the disposal of the Municipal Corporation.
- b To employ labor paid by the Drainage Department and to supply material to carry out the works, or any part of the work debiting the Contractor with correctness of which cost and price the certificate of the Executive Engineer (Drainage) shall be final and conclusive against the Contractor and crediting him with the value of the work done, in all respects in the same manner and at the same rates as if it had been carried out by the Contractor under the terms of his contract, and in that case the certificate of the Executive Engineer (Drainage) as to the value of the work done shall be final and conclusive against the Contractor.
- c To order that the work of the Contractor be in measured up and to take such part thereof as shall be executed out of his hands, and to give it to another Contractor to complete, in which case any expenses which may be incurred in excess of the sum which would have been paid to the original Contractor, if the whole work had been executed by him [as to the amount of which excess expenses the certificate in writing of the Executive Engineer (Drainage) shall be final and conclusive] be borne and paid by the original Contractor and shall be deducted from any money due to him by the Municipal Corporation under the contract or otherwise from his security deposit or the proceeds of sale thereof, or a sufficient part thereof.

In the event of any of the above courses be adopted by the Commissioner the Contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchases or procured any



materials or entered into any engagements or made any advances on account of or with a view to the execution of the work or the performance of the contract. And in case the contract shall be rescinded under provision aforesaid, the Contractor shall not be entitled to recover, or be paid any sum for any work thereto actually performed by him under this contract unless and until the Executive Engineer (Drainage) shall have certified in writing the performance of such work and the amount payable to him in respect thereof, and he shall only be entitled to be paid the amount so certified.

for any work thereto actually performed by him under this contract unless and until the Executive Engineer (Drainage) shall have certified in writing the performance of such work and the amount payable to him in respect thereof, and he shall only be entitled to be paid the amount so certified.

Clause 4:

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

Clause 5.

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

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

Clause 6.

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

Clause 7.

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



been taken by his subordinates until they have received the approval of the Engineer-in-charge, the said measurement being binding and conclusive against the Contractor.

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

Clause 8.

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

All such intermediate payments shall be regarded as payments by way or advance against the final payments only and not as payments for work actually done and completed and shall not preclude the Engineer-in-charge from requiring bad, unsound imperfect or unskillful work to be removed and taken away and reconstructed, or re-erected, nor shall any such payments be considered as an admission of the due performance of the contract or any part thereof in such respect of the accruing of and claim; nor shall it conclude, determine or affect in any way the Powers of the Engineer-in-charge as to the final settlement and adjustment of the accounts or otherwise, or in any other way vary or affect the contract. The final bill shall be submitted by the Contractor within one month of the date fixed for the completion of the work, otherwise the Engineer-in-charge's certificate to the measurement and of the total amount payable for the work shall be final and binding on all parties.

Clause 9.

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

Clause 10.

A bill may be submitted by the Contractor once in each month on or before the date fixed by the Engineer-in-charge for all works executed in the previous months, and the Engineer-in-charge shall take or cause to be taken the requisite measurement for the purpose of having the same verified, and the claim, so far as it is admissible shall be adjusted if possible within fifteen days from the presentation of the bill. If the Contractor does not submit the bill within the time fixed as aforesaid, the Engineer-in-charge may depute a subordinate to measure up the said work in the presence of the Contractor or his duly authorized agent whose counter signature to the measurement list shall be sufficient warrant, and the Engineer-in-charge may prepare a bill from such list which shall be binding on the Contractor in all respects.

Clause 11.

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

Clause 12.



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~~If the specification or estimate of the work provides for the use of any special description of materials to be supplied from the S.M.C. Store or if it is required that the Contractor shall use certain stores to be provided by the Engineer in charge (such materials and stores and the prices to be charged thereof as hereinafter mentioned being so far as practicable for the convenience of the Contractor but not so as in any way to control the meaning or effect of the contract specified in the schedule or memorandum hereto annexed) the Contractor shall be supplied with such materials and stores as may be required from time to time to be used by him for the purpose of the Contract only and the value of the full quantity of materials and stores so supplied shall be set off deducted from any sums then due, or thereafter to become due to the Contractor under the contract, or otherwise from the security deposit or the proceeds of sale thereof shall be held in Government securities; the same or a sufficient portion thereof shall in that case be sold for the purpose. All material supplied to the Contractor shall remain the absolute property of the Municipal Corporation, and shall on no account be removed from the site of the work, and shall at all times be opened to inspection by the Engineer in charge. Any such materials unused and in perfectly good condition at the time of completion or determination of the contract shall be returned to the Drainage Department store, if the Engineer in charge so requires by a notice in writing given under his hand, but the Contractor shall not be entitled to return any such materials except with such consent and he shall have no claim for compensation on account of any such materials supplied to him as aforesaid but remaining unused by him or for any wastage in or damage thereto.~~

Clause 13.

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

Clause 14.

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

Where, however, the work shall have to be executed according to the designs, drawings and



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specifications recommended by the Contractor and accepted by the competent authority the alteration above referred to shall within the scope of such designs drawings and specification appended to the tender.

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

Clause 15A

A. If at any time after the execution of the contract documents, the Engineer-in-charge shall for any reason whatsoever, require the whole or any part of the work as specified in the tender, to be stopped for any period or shall not require the whole or part of the work to be carried out at all or to be carried out by the Contractor, he shall give notice in writing of the fact to the Contractor who shall thereupon suspend or stop, the work totally or partially, as the case may be. In any such case, except as provided herein under, the Contractor shall have no claim to any payment or compensation whatsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not so derive in consequence of the full amount of the work nor having been carried out, or on account of any loss that he may be put to on account of materials purchased or agreed to be purchased, or for unemployment of labour recruited by him. He shall not also have any claim for compensation because any alteration having been made in the original specifications, drawings, designs and instructions may involve any curtailment of the work as originals contemplated. Where which however, materials have already been purchased or agreed to be purchased by the Contractor, before receipt by him of the said notice, the Contractor shall be paid for such materials at the rate determined by the Engineer-in-charge, whose decision shall be final. If the Contractor suffers any loss on account of his having to pay labour charges during the period during which to stoppage of work has been ordered under this clause the Contractor shall on application be entitled to such compensation on account of labour charges as the Engineer-in-charge, the labour could have been employed by the Contractor elsewhere for the whole or part of the period during which the stoppage of the work has been ordered as aforesaid.

Clause 15 B. Deleted

Clause 16.

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

Clause 17.

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

Clause 18.

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

Clause 19.

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

Clause 20.

The Contractor shall provide, erect and maintain proper sheds and temporary buildings for the



storage and protection of materials and goods and for the execution of work which may be fabricated or brought on the site.

Clause 21.

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

Clause 22.

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

Clause 23.

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

Clause 24.

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

Clause 25.

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



Clause 26.

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

Clause 27.

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

Clause 28.

The Contractor shall supply at his own cost all materials [except such special materials, if any, as may be supplied from the S.M.C. Stores in accordance with the contract]. Plant tools, appliance implements, ladders, cordage, tackle, scaffolding and any temporary works which may be required for the proper execution of the work, in the original; altered or substituted from, and whether included in these specification or, other documents forming part of the contract or referred to in these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage there for, to and from the work, the Contractor shall also supply without charge the requisite number of persons with the means and materials necessary for the purpose of setting out works and counting, weighing, and assisting in the measurement of examination at any time and from time to time of the work or materials, failing this the same may be provided by the Engineer-in-charge at the expense of the Contractor and the expense may be deducted from any money due to the Contractor under the contract, or from his security deposit or the proceeds of sale there for of sufficient portion thereof. The Contractor shall provide all necessary fencing and lights required to protect the public from accident; and shall also be bound to bear the expenses of every suit, action or other legal proceedings, at law, that may be brought by any person for injury sustained owing to negligence of the above precautions, and to pay damages and costs which may be awarded in any such suit, action or proceedings, to any such person, or which may with the consent of the Contractor be paid in compromising any claim by any such person.

Clause 29.

The Contractor shall make his own arrangements for drinking water for the labour employed by him.

Clause 30.

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



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

Clause 31.

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

Clause 32.

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

Clause 33.

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

Clause 34.

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

Clause 35.

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

Clause 36.

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

Clause 37.

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

**Clause 38.**

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

Clause 39.

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

Clause 40.**Taxes and Duties on Material**

All the taxes, duties, Vat, and such all incidentals and such incidental imposed in future must be borne by the Contractor only. "P", "D", or "C" form shall not be supplied by The Surat Municipal Corporation.

The bidder is advised, directed to take into consideration all the Central/State/ Local Self-Government taxes, levies. No tax/nor any Govt. levy shall be paid extra and/or separately. However, the deduction of Tax/Levy, if any, shall be ensured from payment due to be made time to time in accordance with the provisions of Central/State Govt. Laws, orders issued from time to time and remaining in force.

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

The bidder must consider the prevailing tax structure on last date of bid submission for quoting the tender. During the course of execution of Contract, if there is any change in Rate of GST (Goods and Service Tax) by the Government, the same shall be reimbursed / recovered separately by SMC, subject to the submission of Original Receipt / Proof for amount actually remitted by the successful Tenderer / Contractor to the competent Authority along with a certificate from Chartered Accountant of Contractor / Successful Bidder Certifying that the amount of GST paid to the Government and the same shall be intimated / submitted /claimed within 30 (Thirty) Days from the date of payment. Remittance of GST within stipulated period shall be the sole responsibility of the Successful Bidder / Contractor, failing which, SMC may recover the amount due, from any other payable dues with SMC and decision of Municipal Commissioner shall be final and binding of the Contractor / Successful Bidder in this regard. Further, the nonpayment 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, or 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.

**Clause 41.**

The Contractor shall be responsible for and shall pay any compensation to his workmen payable under the Workmen's Compensation Act 1923 [VIII of 1923] or any statutory modification thereof for injuries caused to workmen. The Workmen Compensation policy and all the insurances pertaining to Plant and Equipment, fire, burglary shall be in the Contractors scope. However, the events such as earthquake and flood shall be considered as a Force Majored and relevant clauses of the tender shall apply for the same.

Clause 42.

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

Clause 43.

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

Clause 44.

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

Clause 45.

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

Clause 46.

No Contractor shall employ any person who is under the age of 18 years. If any contractor found employing person or persons under the age of 18 years, during course of the construction at any stage, legal actions shall be taken against him as stipulated in Child Labour (Prohibition & Regulation) Act 1986 and also, a penalty of Rs.20,000/- (Rupees Twenty thousand) shall be imposed which shall be deposited with District Collector in Child Labour Rehabilitation cum Welfare Fund.

No Contractor shall employ donkeys or other animals with breeching of string or thin rope. The breeching must be at least three inches wide and should be of tape [Nawar].

No animals suffering from sores, lameness or emaciation or which is immature shall be employed on the work.

The Engineer-in-charge or his agent is authorized to remove from work any person or animal found working which does not satisfy these conditions and no responsibility shall be accepted by the Municipal Corporation for any delay caused in the completion of the work by such removal.

The Contractor shall pay fair and reasonable wages to the workmen employed by him in the contract undertaken by him in the event of any dispute arising between the Contractor and his workmen on the grounds that the wages paid are not fair and reasonable, the dispute shall be referred without delay to the Executive Engineer who shall decide the same.

The decision of the Executive Engineer shall be conclusive and binding on the Contractor, but such decisions shall not in any way affect the condition in the contract regarding the payment to be made by the Municipal Corporation at the sanctioned tender rates.

Clause 47.

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

**Clause 48.**

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

Clause-49

The work contract tax shall not be paid to the contractor.

Clause-50.

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

Clause-51

The following condition are being included in this tender and shall be considered as a part of tender document.

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

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

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

In such cases a fixed amount of Rs. 1000/- should be recovered from the original contract towards the cost of advertisement and other administrative charges incurred by the department in finalizing the contract for the remaining work.

In case a separate advertisement is issued for a single work actual cost of advertisement shall be recovered such recovery shall be in addition to the recovery to be made under clause-3 or such other relevant clauses.

Clause 52. Deleted**Clause 53.**

Amount on account of Earnest Money should be paid in pay order or demand draft only to the Municipal Commissioner. Earnest Money in the form of cheque will not be accepted. The amount will be forfeited in case after his quotation is accepted, the contractor does not complete the contract documents and pay the amount of Security Deposit of tender amount within the specified time as mentioned in clause 1 of condition of contract, otherwise it will be refunded. The work is to be completed within 16 (Sixteen) months (Excluding monsoon) from the date of written order to commence the work. The Insurance Company's bond will not be accepted against the Security Deposit.

Note: -100% EMD amount shall be in form of Cash or Demand Draft/ Pay Order crossed Demand Draft of Nationalised Bank payable at Surat.

**Clause 54.**

The contractor shall have to quote rate online only.

Clause 55.

No alteration in the form of quotation and in schedule of quantities and no additions in the shape of special stipulation will be permitted. Quotation which do not fulfill all or any of the above conditions or are incomplete in any respect are liable to be rejected.

Clause 56.

The tenderer must obtain for himself on his own responsibility and at his own expense all the information which may be necessary for the purpose of filling this tender and for entering into a contract for the execution of the same from the office of the Executive Engineer , Surat Municipal Corporation, Surat, during the office hours between 11:00 A.M. to 6:00 P.M. on weekdays except Sunday & Holidays and must examine the drawings and inspect site of the work and acquaint himself with all local conditions and matters pertaining thereto before submitting the tender.

Clause 57.

Each of the pages (having reference for signature of the contractor) of the tender documents is required to be signed by the person or persons submitting the tender in token of his/their having acquainted himself/themselves with General Conditions etc., as laid down. Any tender with any of the documents not so signed which will be rejected.

Clause 58. (Deleted)**Clause 59.**

The rates quoted by the contractor shall include all eventualities such as heavy rain, sudden floods, etc. which may cause damage to the executed work, or which may totally wash out the work. Until the completion certificate is issued to the contractors, S.M.C. shall not be responsible for such damage or wash out to the construction work.

Clause 60.

Time is the essence of the contract. The work should be completed within 16 (Sixteen) months (Excluding monsoon) from the date of the work order issued to the contractor to commence the work. The successful contractor will have to give a schedule of the various items of work to be done so that the work is completed within the stipulated time.

Clause 61.

Extra item 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 rate for extra item shall be derived from the Latest. S.O.R. (R&B Division Surat) or Latest GWSSB- SOR and quoted premium of the tender. If the rate of the extra item is not available in S.O.R. than it will be derived on prevailing market rates. However, the decision of the Engineer-in-charge shall be final and binding to the Contractor.

Clause 62.

In case of delay in execution of work the penalty at the rate of 0.2% of contract value per day subject to the maximum of 10% of the contract value, shall be payable by the contractor to the Corporation towards compensation.

Clause 63.

No claim for any extra or compensation for damage will be entertained on account of such variation, except where the quantity is increased by more than 30%. No claim for any extra or compensation for damages will be entertained on account of such variation where the quantity is decreased to any percentage or where the item is totally deleted.

Clause 64.

It should be noted that the contractor shall have to complete the work in stipulated time of 16 (Sixteen)



months (Excluding monsoon) as per the terms of the contract. The Contractor shall submit complete CPM/PERT chart and get it approved within one month of the award of the work.

Clause 65.

The Contractor shall also arrange to obtain the license from the competent Authority under the contract labour (regulation and abolition) Act 1970.

Clause 66. Deleted.

Clause 67.

The following additional information shall be forwarded by the tenderer along with the submission of the tender:

- a. A list of works of comparable nature executed, along with their value and time of completion.
- b. A list of works in hand showing the cost of the work to be completed against each with the certificate from the Head of the office concerned.
- c. A list of machinery in their possession and which they will bring for the proposed work.
- d. Solvency certificate without which such tenders are liable to be rejected. The Solvency certificate should be for the amount equal to 20% of the estimated value of the work.
- e. Every contractor shall furnish along with the tender, information regarding income-tax the circle of the district in which he is assessed for income-tax the reference No. and year of assessment.

Clause 68.

Acceptance of quotation will rest with the competent authority who does not bind himself to accept the lowest and reserves the right to reject any or all quotations/tenders and no reasons will be given for acceptance or rejection thereof. The tenderer whose quotation is accepted will have to enter into a regular contract and abide by all rules and regulations embodied in the tender.

Clause 69.

The tender will be liable to be rejected outright, if while submitting it ---

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.

- b Any of the pages of the tender are removed or replaced.
- c in the case of item rate tender, the rates are not entered in ink in figures and words and the total of each item and grand total are not struck by the tenderer in ink in the last column of Schedule 'B' under his signature.
- d Any errors are made by him in the tender.
- e All corrections and additions or pasted slips are not initiated by tenderers.
- f the tenderer or in the case of a firm each partner thereof does not sign, or the signature/signatures is/are not attested by a witness on page of the tender in the space provided for the purpose.
- g the tenderers which do not fulfill any of the conditions of those in the printed form and those tenders which are incomplete.

Clause 70.

The contractor has to make all arrangements for procuring the materials required on his own work.

Clause 71.

in case of any discrepancy with tender document the contractor may contact the Executive Engineer (Drainage), Surat Municipal Corporation, Surat.

Clause 72.



In view of the difficult position regarding the availability of foreign exchange, no foreign exchange would be released by the SMC for the purchase of plant and machinery required for the execution of the work contracted.

Clause 73.

The contractor will have to construct shed for storing valuable materials at works site having locking arrangement. The material will be taken for use in the presence of the SMC person. No materials will be allowed to be removed from the site of works.

Clause 74.

Tender once accepted shall be binding on the contractor even if the formal agreement is not signed.

Clause 75.

Tender once offered cannot be withdrawn except with the express permission of the Municipal Corporation.

Clause 76.

The successful tenderer may be required to furnish surety of 10% of the contract value on stamp paper if so desired by the Commissioner.

Clause 77.

The tenderers are requested to give complete specification of prices quoted.

Clause 78.

For all R.C.C. works such as Footings, Columns, Beams, Slabs, Chhajjas, Pardis, Lintels, etc., a 15 cm x 15 cm x 15cm sizes test cube as per the P.W.D. Standard will have to be taken by the contractor and as per instructions and directions of the Engineer-in-charge. These test cubes will be for 7 days and 28 days respectively. After 7 days, 28 days these test cubes will be tested in the Government (NABL) approved laboratory by the contractor at his own expense and results will be submitted directly to the respective head of the SMC.

Clause 79.

This tender document (Technical Bid – excluding drawings), which should be furnished along with earnest money deposit, duly filled in and signed. No pages can be removed from the conditions of contract, specifications of drawings, otherwise it will be considered as an intentional fault and the tender will be liable for rejection and the amount of earnest money deposit forfeited.

Clause 80.

If the work executed is found to be of inferior quality OR of any substandard quality not conforming to the specifications at any point of time during the inspection of by Engineer-in-charge or any Higher Authority, the contract shall be terminated without assigning any reasons there off and no payment shall be made towards the probable damages or loss caused to the contractor and materials purchased by him for this work and no compensation whatsoever either shall be paid to contract by Municipal Corporation.

Clause 81.

The Successful contractor shall take "all contract risk insurance policy" for the tendered cost of the work. "Work's man compensation policy" for all workers and labour of contractor and clients working at site and "Third party insurance policy" to fully cover all third-party type risk for the whole contract i.e., Construction, supply, installation, testing and commissioning and Operation & maintenance of sewage treatment plant. The insurance policy so taken by the contractor for such purpose shall be in the joint name of the contractor and the client and the policy shall be deposited with the clients.

Clause 82.

The Contractor should note that the conditional tenders shall be out rightly rejected.

Clause 83.

Out of the amount payable/creditable to contractor's account, the Central Government/State Government tax/taxes shall be deducted at source in accordance with the relevant laws/rules from time to time prevailing.



Clause 84.

Now no octroi is to be paid as the same is exempted and therefore the question of reimbursement does not arise. The contractors shall quote their rates considering this aspect of exemption of octroi.

Clause 85.

Surat Municipal Corporation shall not provide 'C' or 'D' Form for tax purposes.

Clause 86.

No Price variation or escalation shall be paid to the contractor.

Clause 87.

The final bill shall be paid only after successful completion the total work.

Clause 88.

Special Clause regarding EPF act 1952 and payroll and muster roll.

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

Further the contractors for services are required to produce the certified copies of related documents in respect of employees/workers employed by said contractor in respect of work allotted by Surat Municipal Corporation.

All the prevailing rules regarding labours, PF, Insurance etc. shall be followed by contractor and he shall be solely responsible for compliance of same. If be needed documents shall be submitted for the same.

Clause 89.

Liasoning with any Government- Semi Government Body Etc. public / private sector should be in the scope of Supplier/ Tenderer for related tender material.

Contractor has to collect the necessary data and drawing from Highway Authority/Railway Authority/ Irrigation/ Government Authority and also prepare and submit the essential documents and drawings, apply for the approvals, make necessary changes as proposed by Highway Authority/Railway Authority/ Irrigation/ Government Authority, follow up with Highway Authority/Railway Authority/ Irrigation/ Government Authority and get the final approval as per the norms of Highway Authority/Railway Authority/ Irrigation/ Government Authority. Contractor has to fulfill all requirements of Highway Authority/Railway Authority/ Irrigation/ Government Authority for approval of pushing & laying the line at his own cost. Surat Municipal Corporation will only pay the statutory fees for approval of pushing and laying of pipeline parallel to Railway/road/Highway/canal given by Highway Authority/Railway Authority/ Irrigation/ Government Authority.

Executive Engineer
Drainage Department,
Surat Municipal Corporation

SIGNATURE OF THE CONTRACTOR: -

ADDRESS: -

DATE: -

**16. SCHEDULE -A****CEMENT AND STEEL:**

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

Basic rate of cement at Rs. 5,500/- (Without GST) per MT. The rate of CRS steel is Rs. 52,500/- (Without GST) per MT and TMT Steel is Rs. 50,000/- (Without GST) per MT extension (RAC/Out/No.881, Dtd. 05.06.2025)

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:

- For Structure: Bridge, Fly over, Intake well, Tall Building and Specialized Structures.
 1. AMBUJA
 2. ULTRATECH
 3. SANGHI
 4. J. K. LAKSHMI
- For Structure: EWS Housing and other works.
 1. AMBUJA
 2. ULTRATECH
 3. SANGHI
 4. J. K. LAKSHMI
 5. HATHI
 6. SIDHEE

Confirming to IS 12269/87 (with its latest amendments) of OPC 53 grade only.

Approved make of CRS Fe 500 reinforcement steel:

- For Structure: Bridge, Fly over, Intake well, Tall Building and Specialized Structures.
 1. RINL
 2. TATA
 3. SAIL
 4. JSW STEEL LTD.
- For Structure: EWS Housing and other works.
 1. RINL
 2. TATA
 3. SAIL
 4. JSW STEEL LTD.
 5. ELECTROTHERM (INDIA) LTD.
 6. RAMSAROOP
 7. NATIONAL
 8. GALLANT METAL LTD.
 9. "POLAAD" TMT STEEL
 10. MONO STEEL INDIA LTD., Kutch Gujarat
 11. RAJURI STEEL & TMT BARS PVT. LTD, JALNA

Note: - (MONO STEEL INDIA LTD., Kutch Gujarat Brand is only use for Non-Specialized Structure (Compound Wall, Low Rise Building and EWS Housing Except High Rising Building))

Note: - (RAJURI STEEL & TMT BARS PVT. LTD, JALNA Brand is only use for Non-Specialized Structure (Compound Wall, Low Rise Building and EWS Housing Except High Rising Building))

Standing Committee R.No. 643/2017, Date:04/05/2017

Purchase bill / testing certificate of that product shall be obtained from company itself and the name of the contractor /work shall be appeared on the bill /testing report`.



SURAT MUNICIPAL CORPORATION

DRAINAGE DEPARTMENT

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

The cement content shall be between maximum and minimum values for various grades of controlled concrete as specified in the IS 456: 2003 and its latest amendments below:

Concrete Grade	Minimum (Kg/M ³)	Max. W/C Ratio
M15	240	0.60
M 20	350	0.55
M 25	375	0.50
M 30	415	0.45
M 35	425	0.45

For concrete with volumetric / nominal mix and other items with use of cement the same shall be as per prevailing Surat Municipal Corporation standards

WASTAGE OF CEMENT AND REINFORCEMENT STEEL:

As the contractor is to bring the cement and steel, the question of considering the wastage on the basis 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 TMT bar as mentioned in IS code No. 1786, IS-432 or IS-226.

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

Similarly, for cement also, the lesser 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.

Price Variation for Cement, Steel brought by Contractor:

Surat Municipal Corporation shall not issue cement and reinforcement steel to be used for this work and No price variation for Cement and steel shall be paid by SMC.

Executive Engineer
Drainage Department,
Surat Municipal Corporation

SIGNATURE OF THE CONTRACTOR: -
ADDRESS: -
DATE: -



17. SCHEDULE – B

AS PER SEPARATE PRICE BID uploaded.

Note:

1. All works shall be carried out as per Government of Gujarat's P.W.D. Handbook and our specifications contained in this document and as directed.
2. The Schedule of Quantities and Rates are to be read for the purpose of pricing in conjunction with instructions of tenderers, technical specifications, drawings and General conditions for contract for Civil works.
3. The price quoted in the summary of costs, sheets of schedule of quantities and rates shall be of all inclusive value for the work described including all costs and expenses which may be required in for the execution of the work described together with all general risks, liabilities and obligations set forth or implied in the document on which the tender is based.
4. The quantities furnished are approximate. In the event of actual quantities varying from those furnished herein below or items deleted or added, the percentage (Plus/Minus) quoted for the entire work shall remain, firm and no extra claims in this respect will be entertained. The payment shall be made based on the actual quantities executed for the completion of work.
5. All works shall be carried out strictly as per detailed specification whether actually specified or not. If not specified, as per directions of owner/Engineer-in-charge.
6. Percentage (Plus/Minus) quoted by tenderer shall be firm even if the contract is split.
7. Percentage (Plus/Minus) and the total amount entertained in the summary of cost, sheet of schedule of quantities and Rates shall be written in ink and shall be entered both in figures and words.
8. Detailed specifications of items of work are described under section Detailed Technical Specification for each item of schedule of quantities and Rates. The section gives guidelines to the reference of relevant clauses of specifications and mode of measurement. Tenderer shall read this in conjunction with other technical specifications and quote accordingly.
9. The measurements shall be as described in the detailed technical specification of items of work, all measurements being not in accordance with the drawings with no allowance for waste.
10. If Tenderers need any clarifications, they should obtain the same in writing from Owner/Engineer-in-charge. No notice will be taken of any verbal discussion in such matters.
11. Rates quoted include clearance of site (prior to commencement of work and at its close before handing over) in all respects and hold good for work under all conditions, site, moisture, weather etc.
12. If Tenderers need any clarifications, they should obtain the same in writing from Owner/Engineer-in-charge. No notice will be taken of any verbal discussion in such matters.



mm	Millimeters
cm	Centimeters
mt.	Meters
Km.	Kilometers
Sq.mt.	Square Meters
Cu.mt.	Cubic Meters
R.Mt.	Running Meters
No.	Numbers
C.I.	Cast Iron
R.C.C.	Reinforced Cement Concrete
Wt.	Weight
Kg.	Kilogram
M.T.	Metric Tonne
M.D.	Metre Depth
M.S.	Mild Steel
I.S.	Indian Standard

Executive Engineer
Drainage Department,
Surat Municipal Corporation

SIGNATURE OF THE CONTRACTOR: -
ADDRESS: -
DATE: -

**18. IMPORTANT INSTRUCTION TO TENDERER**

1.

Affix latest
passport size
photo of
tenderer

2.

Specimen Signature of the Contractor.

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

Specimen signature of all partners in case of partnership agency.

- i. _____
ii. _____
iii. _____
iv. _____

Submission of Registered Agreement is compulsory in case of partnership agency.

3. Submission of income tax clearance certificate of last three years is compulsory for tenderer submitting agency.
4. Submission of GST certificate, with proof of residence is compulsory for tenderer.
5. In case of Government royalty applicable to tenderer, it is compulsory to submit a receipt of royalty payment with tender.
6. The Photograph and specimen signature of contractor will be cross checked, whenever contractor receives payment in account section of SMC.
7. The specimen signature of contractor will be cross checked by Account Department of SMC, in case of representative of Contractor along with letter of authority of a person who signed an agreement, receives payment.
8. All partners of tenderer should put their specimen signature at the relevant places in the tender. A Passport size photograph of all partners who have signed the tender shall be affixed in the tender.

The successful tenderer shall be required to execute necessary agreement where in the same partners shall put on their signatures.

Executive Engineer
Drainage Department,
Surat Municipal Corporation

SIGNATURE OF THE CONTRACTOR: -
ADDRESS: -
DATE: -

**19. MEMORANDUM OF WORKS:**

I / We _____ the undersigned do hereby tender for carrying-out the work described in the schedule subject to the conditions annexed in Schedules attached herewith in tender documents.

1.	General Description of work	:	PROVIDING AND LAYING RCC NP3/NP4 SEWERAGE PIPE LINE ON VARIOUS T.P. SCHEMES UNDER EAST DRAINAGE ZONE A AND B OF SURAT MUNICIPAL CORPORATION. (2 nd Attempt)
2.	Estimated Cost	:	Rs. 1,95,21,739.43 (Excluding GST)
3.	Earnest Money Deposit	:	Rs. 1,96,000.00 100% EMD amount shall be in form of Cash or Demand Draft/ Pay Order crossed Demand Draft of Nationalised Bank payable at Surat.nalized Bank payable at Surat.
4.	Security Deposit:	:	
	(i) Pay order or F.D.R. or D.D or. Bank guarantee of any Nationalized Bank	:	As per Condition of Contract Clause 14.1.
	(ii) To be deducted from Running Bill in form of Retention Money: -	:	As per Condition of Contract Clause 14.1.
5.	Time Limit	:	16 (Sixteen) months (Excluding monsoon)
6.	Penalty for delay	:	0.2% (Zero Point Two percent) of the contract price per day, maximum up to 10% (Ten percent) of the Tender Amount.
7.	The progress of work should confirm to	:	15% of the work in 25% of the time. 35% of the work in 50% of the time. 66% of the work in 75% of the time. 100% of the work in 100% of the time. However, it shall be revised and modified subjected to various factors affecting progress of the work.
8.	Percentage to be retained from running account bills	:	Additional 5% of Total work done (Shall be released at the time of final bill)
9.	Defect Liability Period	:	12 Months (Twelve Months)
10.	Water Charges	:	As per 20 of special condition of contract.
11.	GST	:	Rate Quoted by bidder shall be inclusive of all taxes but Excluding GST. GST shall be paid extra as per prevailing rules.

SEAL & SIGNATURE OF THE CONTRACTOR: -
ADDRESS: -
DATE: -

Executive Engineer,
Drainage Department,
Surat Municipal Corporation



20. SPECIAL CONDITIONS OF CONTRACT

1.0 GENERAL CONDITIONS:

1.1 Location of site & accessibility

- i. The project site is located at East Drainage Zone within the jurisdiction of SMC and is as per location plan. Whereas the any changes in location/layout of laying of pipeline subjected to site condition is possible and shall be bounded to the contractor.
- ii. Service roads are laid within and up to the site of the work. These will be available to the contractor subject to any limitations imposed by SMC.
- iii. The contractor shall have to obtain tokens for himself and obtain gate passes for removing any of his materials outside the premises. The contractors' persons entry and exit will be by main gate only.
- iv. Non availability of access roads or railway siding or permits for entry of vehicles and equipment at any specific area shall in no case be the cause to condone any delay in the execution of the works or be the cause for any claims or extra compensations.
- v. Diameter and class of pipe mentioned in the drawing/ schedule B may change during execution subject to approval of divisional head of drainage department, based on work site condition, but the prior approval shall be taken before execution.
- vi. During replacement/ laying of new line, any material like pipes, machine hole frame cover & other shall be disposed off by contractor at his own risk and cost. The ownership if such discharged material shall be with contractor. In case, any items, reused with prior permission, payment of new item for that particular item shall not be made to contractor.
- vii. Please note that, while replacing connection chamber, the frame cover of the house connection is the property of Household unit. The material shall be returned to the owner of building & if written permission is given by owner.

1.2 Scope of Work

The proposed sewerage system for East Zone-A & B various location remaining or Augmentation.

Under this project, gravity network of sewer zone area is considered having approximate network length of 3.327 km.

This tender enquiry covers providing and laying RCC sewerage drain in SMC area. The schematic of scheme is shown in drawings.

The schedule of quantities is given separately in tender. The broad scope of work is as follows and shall be carried out strictly in accordance with specifications and instructions of Engineer-in-charge issued from time to time. The contractor shall provide all necessary materials, equipment, labour etc. for the execution and maintenance of work till completion unless otherwise mentioned in the tender documents. All materials that go with the work shall be approved by the Engineer in charge prior to procurement and use.

- Excavation of trenches and pits for laying of pipes and construction of machine holes, ventilating column etc., in all kinds of soil / soft rock etc., including dewatering whenever and wherever for the work under this contract is necessary and back filling including compacting as per item specification. Excavation of asphalt pavement of any thickness including demolishing the asphalt carpet, metal, soling etc. complete with stacking the materials. Excavation for granular bedding shall be paid as per relevant excavation depth.
- Providing and laying granular bedding as per item description and tender specifications.



- Laying of R.C.C. pipes including lowering, handling transportation where necessary and jointing the same with rubber ring joints.
- Construction of Machine holes, ventilating column etc. as specified in item.
- Testing R.C.C. pipes and machine holes for ascertaining water tightness.
- Construction of Machine hole Pumping by well sinking method.
- Laying of RCC pipes in higher depth shall be laid with the help of gabion, rubble filling etc. as directed.
- Any and all other works indicated and considered necessary for the execution of this work whether or not specifically mentioned or called for.
- Any type of service utilities such as electrical, telephone, any other cables damaged or disturb should be put in use at the cost of contractor. No payment will be given for such damages by SMC.
- Liasoning with any Government- Semi Government Body Etc. public / private sector should be in the scope of Supplier/ Tenderer for related tender material.

Contractor has to collect the necessary data and drawing from Highway Authority/Railway Authority/Irrigation/ Government Authority and also prepare and submit the essential documents and drawings, apply for the approvals, make necessary changes as proposed by Highway Authority/Railway Authority/ Irrigation/ Government Authority, follow up with Highway Authority/Railway Authority/Irrigation/ Government Authority and get the final approval as per the norms of Highway Authority/Railway Authority/ Irrigation/ Government Authority. Contractor has to fulfill all requirements of Highway Authority/Railway Authority/ Irrigation/ Government Authority for approval of pushing & laying the line at his own cost. Surat Municipal Corporation will only pay the statutory fees for approval of pushing and laying of pipeline parallel to Railway/road/Highway/canal given by Highway Authority/Railway Authority/ Irrigation/ Government Authority.

1.3 Water Supply & water charges

The contractor shall be allowed to make arrangement for necessary construction water in two ways.

- a) The contractor can make its own arrangement of water supply through private boreholes or through tankers. However, the contractor shall be required to inform Surat Municipal Corporation within 30 days of starting of the work and shall have to produce necessary test certificate that confirm the construction water grade as per relevant IS. Otherwise, water charge shall be recovered at rate of 3% of the work done amount from contractor's bill.
- b) If contractor wishes to use the Municipal water for construction purpose, he/she shall have to apply to get the water connection through licensed plumber from relevant zone office of Surat Municipal Corporation. He shall have to bear all the cost towards getting water connection. The contractor shall be liable to pay all the charges as per the prevailing rules and regulation of Surat Municipal Corporation for making use of water. Further, the contractor shall have to produce the copy of payment of water charges bill to the undersigned, otherwise the water charges shall be deducted from his running bills.

Where, the water supply network is not available, the contractor may borrow the tanker from any of the municipal water distribution center on the payment of necessary water charges, as per the prevailing rules and regulation.

Most importantly, the contractor shall be responsible for disconnecting the water connection on completion of work and shall have to inform the department accordingly.

If Municipal mains are not available nearby, the contractor shall have to make his own arrangement at his cost for water required for construction purpose.

For all the purposes connected with the work, the contractors shall be allowed to use water from the municipal mains wherever available at prevailing rates. The contractors, however, will have to make



their own arrangements to get at their cost necessary water connections from Municipal mains. If the water is, in the opinion of the Engineer, used improperly or wasted, the Engineer may cause the supply of water to be disconnected or the water will be supplied to the Contractors at double the prevailing rate of water for the quantity of water used. In order to prevent the misuse or wastage of water by the Contractors, the Engineer shall be at the liberty to engage a muqaddam at the cost of the Contractors on wage not exceeding Rs. 300/- [Rupees Three Hundred Only] per day [exclusive of other charges leviable by the Corporation under rules such as dearness allowance and supervision etc.] for supervising and controlling the use of water by the contractor's men.

Exemption for water charges shall be granted if contractor makes its own arrangement of water supply. Contractor has to inform within 30 days of starting of work for its own arrangement of water.

Contractor will be allowed to use treated wastewater for trench refilling- watering & spreading, subject to available of treated waste water, & the charges shall be paid by contractor. Please note that, contractor have to make his own arrangement for tanker & other tools-fuel – tackle- manpower for filling the water from STP.

1.4 Electric Supply for construction purpose:

The contractor shall make his own arrangements at his own cost for electric supply required for operating various plants and machineries required for the work and for general lighting purpose for site, office, labour colony etc. The energy bills shall also be paid by the contractor.

1.5 Land for labour camp Contractor's field office, godown and workshop:

Owner will not be in a position to provide land required for Labour and Supervisory Camp, Contractor's field office, godown and workshop. The Contractor shall have to make his own arrangement for the same.

2.0 SUBMISSION OF TENDER:

2.1 Tender must be submitted in original and without making any additions, alterations and as per details given in other clauses given here under. The requisite details shall be filled in by the contractor in the tender documents. The item rates shall be filled in the given schedules in this tender and bills of quantity should be clearly brought out in a separate letter.

2.2 Addenda / corrigenda to this tender document, if issued must be signed and submitted along with the technical bid (i.e. Cover-1).

The tenderer should write clearly the revised quantities in Bills of Quantity of tender documents and should price the work based on revised quantities when amendments for quantities are issued in addenda.

3.0 DOCUMENTS

3.1 The Tenders as submitted will consists of the following:

- i. Complete set of tender documents as sold duly filled in and signed by the tenderer as prescribed in different clauses of the tender documents.
- ii. Declaration showing all works as similar types and magnitudes carried out and on hand with the contractor and the value of works that remains to be executed in each case must accompany the tender.



- iii. The Bidder should submit Solvency Certificate minimum value of at least 20% of the total estimated cost put to the tender issued by Schedule Bank/Nationalized Bank only and should be effective and in force on the last date of receipt of bids, it will be the responsibility of the bidder to get the extension of the effectiveness of solvency certificate from corresponding bank, up to the tender validity period, if the same is getting expired before that, the same should be produced with necessary extension within 15 days of expiry of such solvency as and when asked by Surat Municipal Corporation, failing which will be liable for rejection of bid without assigning any reason thereof. (Considering validity as 1 year from date of issue of Solvency Certificate)
- iv. Demand draft or pay order for earnest money deposit must accompany the tender as instructed in this document. Tenderer may pay earnest money in the 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.
- v. The contractor shall have to furnish Income Tax Clearance Certificate before his tender is accepted and intimate Assessment No. & Ward under which he is assessed.
- vi. Tenderer should submit the True Copy of the Certificate of Registration along with the tender without which the tender will not be considered.

3.2 All pages to be initialed

All signatures in tender documents shall be dated as well as all the pages of the sections of tender documents shall be initialed at the lower right-hand corner and signed wherever required in the tender papers by the tenderer or by a person holding power of attorney, authorizing him to sign on behalf of the tenderer before submission of tender.

3.3 Rates to be in figures & words

The tenderer shall quote in English both in figures as well as in words the percentage rate in annexure /schedules.

3.4 Corrections & Erasures

All corrections and erasures in the entries of tender papers will be signed in full by the tenderer with date. No erasures or over-writings are permissible.

3.5 Discrepancies & Adjustments of Errors

Any error in quantity or amount in schedule 'B' showing items of works to be carried out shall be adjusted in accordance with the following rules ---

- a. In the event of a discrepancy between description in words & figures quoted by a tenderer in the 'rates' column, the descriptions in words shall be prevailed.
- 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 unit rate shall be regarded as firm and multiplications shall be amended on the basis of the rates.
- c. All the errors in totaling in 'amount' column and in carrying forward totals shall be corrected.
- d. Any rounding off of amounts against 'items' 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.

3.6 Signature of Tenderer

The tender shall contain the name, residence and place of business of person or persons making the tender and shall be signed by the tenderer with his usual signature. Partnership name by all the partners or by duly authorized representative followed by the name and designation of the person signing. Tender by a corporation limited company shall be signed by an authorized representative and a power of attorney in behalf shall accompany the tender. A copy of the constitution of the firm with the name of all the partners to be furnished.

3.7 Details of Experience

The tenderer should enclose documents to show that he has previous experience in having successfully completed in the recent past works of this nature, together with the names of owners, location on sites and values of contracts.

4.0 TRANSFER OF TENDER DOCUMENTS

Transfer of tender documents purchased by intending tenderer to another is not permissible.

5.0 VALIDITY

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

6.0 ADDENDA/CORRIGENDA

Addenda/Corrigenda to the tender documents may be issued prior to the date of opening of tenders to clarify documents or to effect modification in the design or contract terms. All addenda/corrigenda issued shall become part of tender.

7.0 RIGHT TO OWNER TO ACCEPT OR REJECT TENDER

The right to accept the tender will rest with the S.M.C., however, does not bind itself to accept the lowest tender and reserves the authority to itself to reject any or all the tenders received without assigning any reason whatsoever. Tenders in which any of the particulars and prescribed information are missing or are incomplete in any respect and/or the prescribed condition are not fulfilled are liable to be rejected.

In addition to the above, the tender will also be liable to be rejected outright if ---

- i. The tenderer proposes any alterations in the works specified or in the time allowed for carrying out the work or any condition or correction made in any code or mode of schedule 'B' or specifications.
- ii. Any of the page or pages of the tender is/are removed/modified or replaced.
- iii. All corrections, additions or pasted slips are not initialed by the tenderer.
- iv. The tenderer or in the case of a firm, each partner or person holding the power of attorney thereof does not sign or the signature(s) is/are not attested by a witness.



8.0 RETENTION MONEY

As per memorandum. This amount will be deducted progressively from each running bill of the contract by the SMC the above referred retention money will be released on virtual completion of work in the final bill/ as per prevailing rules of SMC.

9.0 COLLECTION OF DATA TENDERERS' RESPONSIBILITY

The tenderer shall visit the site and acquaint himself fully of the site and no claims whatsoever will be entertained on the plea of ignorance or difficulties involved in execution of work or carriage of materials.

10.0 SIGNING OF THE CONTRACT

The successful tenderer shall be required to execute an agreement in the proforma attached with the tender documents within ten days of the receipt by him of the notification of acceptance of tender. However, timely corrections in this Performa as per prevailing rules of SMC shall be bound to contractor. In the event of failure on the part of the successful tenderer to sign the agreement within the above stipulated period, the acceptance of the tender shall be considered as cancelled and Earnest Money Deposit amount will be forfeited.

11.0 CO-ORDINATION OF WORK

The Engineer-in-charge shall co-ordinate the works of various agencies engaged site to ensure minimum disruption of work carried out by different agencies. It must be the responsibility of the contractor to plan and execute the work strictly in accordance with bar charts and as per instruction of Engineer-In-Charge to avoid hindrance to the work being executed by other agencies.

12.0 INTERPRETATION OF CONTRACT DOCUMENTS

12.1 Except if and to the extent otherwise provided by the contract, the provisions of the General Conditions of Contract and special conditions shall prevail over those of any other documents forming part of the contract. Several documents forming the contract are to be taken as mutually explanatory, should there be any discrepancies, inconsistencies, errors or commissions in the contracts or any of them, the matter may be referred to the Engineer-in-charge who shall give his decisions and issue to the contractor instructions directing in what manner the work is to be carried out. The decision of the Engineer-in-charge shall be final and conclusive, and the contractor shall carry out the work in accordance with this decision.

12.2 Works shown upon the drawings but not mentioned in the specifications or described in the specifications without being shown on the drawings shall nevertheless be held to be included in the same manner as if they had been specifically shown upon the drawings and described in the specifications.

12.3 (i) The various documents forming the contract are the essential parts of the contracts and a requirement occurring in one is as binding as though occurring in all, They are intended to be mutually explanatory and complementary and to describe and provide for a complete work.

(ii) In the event of any discrepancies, the various documents forming the contract or in any one document, the following order of precedence should apply

a] Dimensions & quantities ---

i. Drawings.

ii. Schedule 'B' of the tender form.

iii. On drawings, figures, dimensions, unless obviously incorrect will be followed in preference to show 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/directions in what manner the work is to be carried out, it being understood that the best modern practice is to be followed. The contractor should forthwith comply with such instructions

The contractor should take no advantage of any apparent error or commission in drawings or specifications and the Engineer-in-charge shall make such corrections and interpretations as necessary to fulfill the intent of the plans and specifications.

13.0 FORCE MAJEURE

Any delays in or failure of the performance of either part hereto shall not constitute default hereunder or give rise to claims for damages, if any, to the extent such delays or failure of performance is caused by occurrences such as Acts of God or the public enemy; expropriation or confiscation of facilities by Government authorities, compliance with any order or request of any Governmental authorities, acts of war, rebelling or sabotage or fires, floods, explosions, riots or illegal strikes. The contractor shall keep records of the circumstances referred to above and bring these to the notice of the Engineer-in-charge in writing immediately on such occurrences.

14.0 FORFEITURE OF RETENTION MONEY

Whenever any claim against the contractor for the payment of a sum of money arises out of or under the contract, the S.M.C. shall be entitled to recover such sum by appropriating in part or whole of the retention money of the contractor. In case, the retention money is insufficient or if no retention money has been taken from the contractor, then the balance or the total sum recoverable, as the case may be, be deducted from any sum then due or which at any time thereafter may become due to the contractor. The contractor shall pay on demand any balance remaining due.

15.0 NO COMPENSATION FOR ALTERATION IN OR RESTRICTION OF WORK

If at any time after the commencement of the work, the corporation shall for any reason whatsoever not require the whole or part thereof as specified in the tender to be carried out, the Engineer-in-charge shall give notice in writing of the fact to 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 the execution of the work in full, but which he did not derive in consequence of the full amount of the work not having been by reason of any alterations having been made in the original specifications, drawings, designs and instruction which shall not involve any curtailment of the works as originally contemplated.

16.0 RIGHT OF THE CORPORATION TO DETERMINE/TERMINATE CONTRACT

The Corporation shall, at any time, be entitled to determine and terminate the contract, if in the opinion of the Corporation the cessation of the work becomes necessary owing to paucity of funds or for any other cause whatsoever, in which case the cost of approved materials at the site as verified and approved by the Engineer-in-charge and of the value of the work done to date by the contractor shall be paid for in full at the rate specified in the contract. A notice in writing from the Corporation to the Contractor of such determination and the reason, thereof shall be the conclusive proof of the fact that the contract has been so determined and terminated by the Corporation.

Should the contract be determined under sub-clause (i) of this clause and the contractor claims payments to compensate expenditure incurred by him in the expectation of completing the whole of the work, the



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Corporation shall consider and admit such claims as are deemed fair and reasonable and are supported by vouchers to the satisfaction of the Engineer-in-charge. The decision of the Commissioner on the necessity and propriety of any such expenditure shall be final and conclusive and binding on the contractor.

17.0 DRAWINGS TO BE SUPPLIED BY THE CORPORATION

17.1 The tender purpose drawings attached herewith give layout drawing and hydraulic flow diagram drawing.

17.2 The detailed construction drawings shall be issued by S.M.C. progressively during construction in line with civil general arrangement drawing and mechanical & electrical equipment's drawing, if any given by the contractor.

18.0 SETTING OUT WORKS

The Engineer-in-charge shall furnish the contractor with only the four corners of the work site and a level bench mark and the contractor shall set out the works and shall provide an efficient staff for the purpose and shall be solely responsible for the accuracy of such setting out.

19.0 RESPONSIBILITY FOR LEVEL & ALIGNMENT

The contractor shall be entirely and exclusively responsible for the horizontal and vertical alignment, the level and correctness of every part of the work and shall rectify any errors or imperfections therein. Such rectifications shall be carried out by the contractor at his own cost, when instructions are issued to that effect by the Engineer-in-charge.

20.0 DISCREPANCIES BETWEEN INSTRUCTIONS

If any discrepancy occur between the various instructions furnished to the contractor, his agents or staff, or any doubt arises as to the meaning of any such instruction or, should there be an misunderstanding between the contractor's staff and the Engineer-in-charge's staff, the Contractor shall immediately report the matter in writing to the Engineer-in-charge whose decision thereon shall be final and conclusive and no claim for losses alleged to have been caused by such discrepancies between instructions, doubts or misunderstanding shall in any event be admissible.

21.0 INSPECTION OF WORK

Contractor has to do entire work under observation of project Management consultancy (PMC) / Third Party Inspection (TPI) Agency appointed by SMC.

Contractors have to work under Inspection of TPI / PMC Agency. The tenderer/ bidder shall have to inform S.M.C. at least before 15 days regarding readiness of the lot of pipes. Representatives from S.M.C. and / or Third-Party Inspection (TPI) Consultant / Project Management Consultant (PMC) (if any) will visit the work site, manufacturer's factory for testing/inspection of the pipes. The manufacturer shall have to make all necessary arrangements for testing/inspection. All the charges towards testing/inspection including travelling charges of S.M.C. and / or Third-Party Inspection (TPI) Consultant / Project Management Consultant (PMC) representatives shall be borne by the manufacturer/contractor.

All the equipment shall be inspected and tested at manufacturer's site in presence of representative of SMC & TPI (Third party Inspection) before shipment and/or dispatch for the site. QAP is required to be submitted separately. The contractor is responsible for providing all tools, instruments and other requirements for conducting such inspection and testing by the Surat Municipal Corporation or its representative. However, the shop floor inspection of equipment by the SMC or its authorized



representative before shipment shall not prejudice the SMC's right for rejection of the equipment on the final inspection at site and also does not relieve the Contractor from the responsibility that all the equipment provided shall be free from defects and suited in all respects for the purpose intended to. Testing charges and other relevant costs shall be borne by the contractor and this matter is elaborate elsewhere in the tender document. Contractors have to arrange for railway ticket minimum two tiers AC for indigenous equipment for travelling time less than 14 hours and economy class Air fare for imported equipment as well as travelling time is more than 14 hours. All the testing charges of equipment/machineries and the transportation, lodging, boarding and any other relevant expense of the team of Surat Municipal Corporation (including TPI) which may consist maximum 2 personals shall be borne by the contractor.

Only routine tests as per relevant B.I.S./IEC/ specifications for the various items of equipment shall be performed at the Contractor's works/equipment manufacture's site in the presence of Engineer-in-Charge and test certificates furnished. Where the bought out items/equipment are such that it forms part of a system which is to be inspected, inspection shall be carried out at Contractor's works/manufacture's site as per the stipulation laid down in B.I.S./IEC specification. However, where independent equipment is so involved that it does not concern the assembly testing and can be directly dispatched to site, the test certificates shall be produced by the contractor/subcontractor and inspection shall be carried out at SMC site. However, during inspection if any defect found, the contractor at his risk & cost shall replace the same and cost within specified time limit. In this case no time limit extension will be given in the execution of overall plant.

Acceptance of any material or equipment shall in no way relieve the Contractor of his responsibility for meeting the requirements of the specifications, relevant standards and successful testing and commissioning at site.

All test equipment, operating personnel and consumables, testing charges, etc., required for carrying out tests at manufacture's work and at site shall be supplied by the Contractor at his own cost.

If required by the Surat Municipal Corporation the equipment shall be sent to recognized test lab for ascertaining the guaranteed parameters. The Contractor should agree to the same. The test results so obtained shall be binding to the Surat Municipal Corporation and to the contractor. If the results are found meeting test standards/certificates, the test charges shall be borne by the Surat Municipal Corporation otherwise the test charges shall be borne by the Contractor. But at the first instance the contractor to the concern institute/laboratory shall pay the charges.

The Engineer-in-charge and/or Third Party Inspection (TPI) Consultant/ Project Management Consultant (PMC) representative will have full power and authority to inspect the works at any time wherever in progress, either on the site or at the Contractor's premises/workshops wherever situated, premises/workshop of any person, firm or corporation where materials are being made or are to be supplied, and the contractor shall afford or procure for the Engineer-in-charge and/or Third Party Inspection (TPI) Consultant/ Project Management Consultant (PMC) representative every facility and assistance to carry out such inspection. The contractor shall at all times during the usual working hours and at all other times at which reasonable notice of the intention of the Engineer-in-charge and/or Third-Party Inspection (TPI) Consultant/ Project Management Consultant (PMC) representative to visit the works shall have been given to the Contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing present for the purpose. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the Contractor himself.

22.0 TESTS FOR QUALITY OF WORK

All workmanship shall be of the respective kinds described in the contract documents and as per prevailing criteria's of SMC in accordance with the instructions of the Engineer-in-charge and shall be subjected from time to time to such tests at Contractor's cost as the Engineer-in-charge may direct at the place of manufacture or fabrication or on the site or at all or any such places. The



Contractor shall provide assistance, instruments, labour and materials as are normally required for examining, measuring and testing any workmanship as may be required and selected by the Engineer-in-charge.

23.0 THE CORPORATION MAY DO PART OF THE WORK

Upon failure of the Contractor to comply with any instructions given in accordance with the provisions of this contract, the Corporation has the alternative right, instead of assuming charge of entire work, to place additional labour force, tools, equipment's and materials on such parts of the works, as the Corporation may designate or also engage another Contractor to carry out the work. In such cases, the Corporation shall deduct from the amount which otherwise becomes due to the Contractor, the cost of such work and materials with 10% added to overall departmental charges and should the total amount thereof exceed the amount due to the Contractor, the Contractor shall pay the difference to the Corporation.

24.0 The Corporation shall not accept any offer submitted by the contractor on its own design. It should be specifically noted that wherever bank guarantee is required to be submitted, it should be from Nationalized Banks only.

25.0 Contractor to note that SMC shall appoint Project Management Agency /Third Party Agency for the supervision / inspection of the work and contractors are obliged to work under them. However, decision of SMC shall be final.

26.0 CONTROLLED MATERIALS (ESSENTIALITY CERTIFICATE):

- i. As regards controlled materials, the corporation will help to arrange for the permit as far as possible and help the contractor in securing the same. All incidental charges not within procuring these materials shall be borne by the Contractor himself. Though the Corporation will help to manage for the permit as far as possible and help the Contractor in obtaining the materials it shall not accept any responsibility for any delay or loss on account of delay caused to the Contractor while obtaining the same.
- ii. The Contractor shall submit to Engineer-in-charge on close of every calendar month, the monthly returns in the prescribed forms as to the receipt and actual use of the controlled materials during the months.
- 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 representative(s) desire(s).

27. _PROCEDURE OF MEASUREMENT/BILLING OF WORK IN PROGRESS FOR EXTRA ITEMS :**MEASUREMENTS:**

27.1 All measurements shall be in metric system as specified by joints measured by the representative of the Engineer-in-charge and the Contractor authorized agent progressively. Such measurement will be got recorded in the measurement book by the Engineer-in-charge or his authorized representative and signed in token of acceptance by the contractor or his authorized representative.

27.2 All works shall be measured by standard measure and in accordance with the rules and custom of the Public Works Department without reference to any local custom.

27.3 The measurements of work will be taken according to the usual methods in use in the Public Works Department and no proposals to adapt alternative methods will be accepted. The Engineer-in-charge decision as to what is the usual method is use in the Public Works Department will be final.



27.4 Extra item 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 rate for extra item shall be derived from the Latest S.O.R. (R&B Division Surat) or Latest GWSSB- SOR and quoted premium of the tender. If the rate of the extra item is not available in S.O.R. then it will be derived on prevailing market rates. However, the decision of the Engineer-in-charge shall be final and binding to the Contractor.

28.0 ACCIDENT LIABILITIES:

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

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

29.0 INSURANCE:

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

30.0 Contractors shall have to use maximum machinery for the work as per the direction of Engineer-In-Charge.

31.0 If possible, space for stacking the surplus excavated earth will be provided by SMC. Otherwise the contractor shall arrange for the same at no extra cost to SMC.

32.0 DEFECTS LIABILITY PERIOD

The defects liability period as defined in General Conditions of Contract, shall be 12 months from the date of work completion.

For the failure of the contractors in the matter of guarantee, testing, trial run, performance, commissioning and handing over and meeting the defects liability, the owner shall have the full right to make necessary recovery from security deposit as may be necessary.

33.0 TERMS OF PAYMENT

Billing for the job executed, would be done progressively according to the prevailing rules and practice followed by SMC time to time.

34.0 The option for selection of the Make/product/Brand shall rest with Surat Municipal Corporation, i.e the contractor shall have to supply the materials, equipment's, plants of a make as approved by the Surat Municipal Corporation.

**35.0 INCOME TAX**

Income tax at the rate of 2% (or at the prevailing rate) on the gross amount billed shall be deducted from the contractor's bills as per section 194C of the Income Tax Act and relevant rules/laws from time to time prevailing.

36.0 INCOME TAX CLEARANCE CERTIFICATE

Attested copy of the latest income tax clearance certificate in the Performa prescribed by the Government of India should accompany the tender. The I.T.C. Certificate should be in the name of the firm/individual, quoting for the tender.

37.0 Wherever mentioned in the tender document, "Q.R.O." or "0" quantity means Quote Rates only and "B.O.Q." means Bill of Quantities.

38.0 No compensation of any item shall be paid in case any of the item is omitted i.e., not executed at all.

39.0 Responsibility of clear Construction and Demolition Waste (C.D. Waste)

It shall be sole responsibility of contractor to clear construction and Demolition waste (C. D. waste) by their own risk and cost. The contractor shall ensure that their site must be clear in all respect by disposing C. D. Waste generated during the work. If it's found that contractor is irregular and showing negligence to dispose C. D. Waste, then Surat Municipal Corporation is empowered to disposed the said C. D. Waste through Surat Municipal Corporation Authorized C. D. waste Contractor/ agency. All the necessary expenditure made towards disposal of this C. D. Waste shall be recovered from the contractor along with the administration charges and penalties. The Contractor shall have to dispose off Construction & Demolition waste at SMC suggested place/ site as per norms of SMC. Otherwise SMC will dispose the waste & charges decided by SMC will be recovered from contractor.

40.0 As a part of tender, the contractor shall have to carry out GIS mapping for project, as directed by engineer in charge. The contractor shall have to submit the certificates of concern GPS operator/ Lab or as directed by Engineer in Charge. All the expenditure/ Fees etc. for the GPS mapping shall have to be borne by the contractor. No extra payment shall be made for this.

41.0 Contractor has to collect the necessary data and drawing from Highway Authority/Railway Authority/ Irrigation/ Government Authority and also prepare and submit the essential documents and drawings, apply for the approvals, make necessary changes as proposed by Highway Authority/Railway Authority/ Irrigation/ Government Authority, follow up with Highway Authority/Railway Authority/ Irrigation/ Government Authority and get the final approval as per the norms of Highway Authority/Railway Authority/ Irrigation/ Government Authority. Contractor has to fulfill all requirements of Highway Authority/Railway Authority/ Irrigation/ Government Authority for approval of pushing & laying the line at his own cost. Surat Municipal Corporation will only pay the statutory fees for approval of pushing and laying of pipeline parallel to Railway/road/Highway/canal given by Highway Authority/Railway Authority/ Irrigation/ Government Authority.

42.0 Rate Quoted by bidder shall be inclusive of all taxes but Excluding GST.GST shall be paid extra as per prevailing rules.

43.0 No claim for any extra or compensation for damage will be permissible or entertained on account of either such variation in quantities or deletion of respective items.

SURAT MUNICIPAL CORPORATION



DRAINAGE DEPARTMENT
Executive Engineer
Drainage Department,
Surat Municipal Corporation

SIGNATURE OF THE CONTRACTOR: -
ADDRESS: -
DATE: -

**21. ADDITIONAL INSTRUCTIONS TO THE TENDERERS****(For Drainage Department Works only)**

1. The work shall have to be started by the contractor at as many places as ordered by the Executive Engineer.
2. Cement required for construction purpose for this work shall be supplied by the contractor at his own cost.
3. The fire wood, white Zink, sand, bricks, reinforcement steel, metal, gravel, machine hole frame cover, rubber packing, nuts, bolts etc. required for the work shall be provided by the contractor at his own cost.
4. The contractor shall take utmost care while doing excavation to protect existing underground utilities. All water main lines/ water connections, storm/sewage mains/house connections, electricity cables, telephone cables, gas pipeline or any other utilities and structures shall be protected by contractor. However, if met during excavation, any damages, caused shall be rectified by the contractor at the earliest and all the rectification cost shall be borne by the contractor only. SMC may recover the cost of damages/reinstatement charges from the contractor's bill if damaged works reinstated by the other agencies.
5. Contractor may construct machine hole intermittently/before laying of lines. But in case if any machine hole has to be abandoned due to any reason. Contractor has to bear the cost for the same.
6. The whole work of excavation, laying and jointing of pipes shall have to be carried out with the help of leveling instruments only. The leveling instrument to be used for the purpose shall be provided by the contractor. In no case the work shall be allowed to be carried out with help of boning rod.
7. THE LAYING OF R.C.C. PIPE DRAINS SHALL BE STARTED FROM THE OUTLET (MAIN LINE) TOWARDS TAIL END ONLY AND IN NO CASE ANY RELAXATION WILL BE ALLOWED IN THE MATTERS.
8. The contractor will have to construct shed for storing controlled and valuable materials like cement and other materials etc. purchased by the contractor or supplied by the department. The material will be taken for use in the presence of the Department person. No materials will be allowed to be removed from the site of work.
9. The contractor shall have to keep chowkidar and red lights (of a proper size) during night on open trenches during the progress of the work and until the trench or pit is completely refilled. Proper barricading shall be provided by the contractor to avoid accident during day and night time. Red flags road closing board etc. and such other precautionary measures shall have to be taken by the contractor. If the contractor fails carry out the above precautionary measures, Drainage Engineer shall engage, even without giving a notice to the contractor wherever the situation demands quick action for the chowkidar, places, necessary red lights and manage to guard the trenches all the expenditures so incurred shall be recovered from the contractor form his bill or deposit. The contractor will have no right to dispute the action taken by the Executive Engineer.
10. The contractor shall always have to inform the Electricity Co., Telephone and Telegraph office and Gujarat Gas Office or any other concern agencies before starting the excavation work.
11. It shall be the responsibility of the contractor to guard the cables etc. mentioned above wherever they exposed in an open trench and any damage done to then from what so ever reasons shall be made good at the risk cost of the contractor.
12. The trench excavated for the work shall be properly barricaded. Proper signals and caution, red flags, ares lamps etc. shall be displayed on both end of the trench and at every crossing and at suitable distance wherever found necessary. Similarly to avoid any accident the red lamps of proper size shall be displayed so as to make visible the danger or main road to distance at night.



If accident occurs for want of sufficient precautionary measures the entire responsibility is of the contractor only.

Contractor shall have to provide wooden planks etc., reasonable distance on the trench, for the purpose of crossing the trench for the public. The materials also shall be kept site in such away so that they may not cause any inconvenience to the traffic and passerby.

13. In case for want of necessary materials or the holding of any public function, marriage ceremonies, procession etc., If the order is issued to the contractor to fill up the trench to stop the progress of the work or to delay the begging of excavation of the work at any stage in any locality or localities he shall have to comply with such orders shall give no compensation for such delay and or stoppage of work.
14. The work shall be carried out in workman like manner, and best skilled worker should be employed. If any defect in the work is found out the contractor shall have to rectify within the time fixed by Executive Engineer. If the fails to rectify the defect Executive Engineer after giving due notice shall rectify the defect at the risk and cost of the contractor.
15. After the pipeline is laid and before refilling the trench in the materials used in the line shall be checked and noted in the presence of Executive Engineer or his Assistant and the contractor or his authorized representatives. After refilling the trenches surplus excavated earth should be carted and the road surface should be scraped and cleaned by the Contractor at his own cost, as directed by the Engineer-in-charge.
16. The surplus excavated earth, after backfilling the trenches shall have to be removed from the site as directed. However, surplus earth will be property of contractor and contractor may dispose off or stock the same at their own risk. No payment for the carting of surplus earth will be made separately

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

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

17. Land for labour camps, storage yards temporary site sheds etc., will be arranged by the Contractor at his own cost. Land for batching plant, casting yard shall be arranged by the contractor at his own cost. The employer may render all possible assistance to the contractor to enable him to obtain such lands as may be required for purposes of completion of this work but no guarantee can be given. Non-availability of Land will not be considered as a reason for delay in progress.

On written request from contractor, the SMC may allocate any land belonging to SMC and which is presently not required for concerned department and in that case, token rent at Rs. 10/Sqmt per month will be recovered from the contractor. The contractor shall have to return/ evacuate such land/ plot in original condition as and when needed by SMC within a week from intimation given by SMC. Further contractor shall have to return/ evacuate/ handover such land/ plot within 15 days after completion of the physical project on site or inauguration of the project. If the said land is not returned by the contractor within 15 days after the completion of the project as above then rent at the rate of Rs.15/sqmt. per month instead of Rs.10/sqmt. per month shall be charged/ levied. The contractor shall have to pay all the taxes levied by government/ SMC. No extra payment shall be made for same.

18. No compensation shall be paid if the work is stopped due to defective work or as per the instruction from Engineer-in-charge due to any reasons.
19. The contractor shall have to use his own tools, plants and machinery required for these works.



SURAT MUNICIPAL CORPORATION

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20. No advance payment of mobilization advance or payment against procurement shall be made /entertained.
21. S.M.C. shall not be responsible for any wastage of material. All wastage shall be \accounted on the part of the contractor. No payment for such wastage shall be made.
22. Surat Municipal Corporation will not give any amount of interest in case of delayed payment of running bill, final bill or any arise by the contractor.
23. In view of the different position regarding the availability of foreign exchange, no foreign exchange would be released by Department for the purchase of plants and machineries required for the execution of the work contracted for.
24. The Contractor shall take almost care during excavation to protect existing underground utilities. All water main lines/water connections, storm/sewage mains/house connections, electricity cable, telephone cables, gas pipelines or any other utilities and structures shall be protected by contractor. However, if met during excavation, any damages caused shall be rectified by the contractor at the earliest and all the rectification cost shall be borne by the contractor. If the bill for rectification work (if carried out by the concerned agencies/departments) is put by such agencies/department, the same shall be payable by the contractor, if not so it will be deducted and recovered from the running bills to be paid to contractor.
25. In view of the different position regarding the availability of foreign exchange, no foreign exchange would be released by Department for the purchase of plants and machineries required for the execution of the work contracted for.

Executive Engineer
Drainage Department,
Surat Municipal Corporation

SIGNATURE OF THE CONTRACTOR: -

ADDRESS:-

DATE:-



22. GENERAL SPECIFICATIONS

GENERAL:

- 1.1 All the items occurring in the work and as found necessary during actual execution shall be carried out in the best workman like manner as per specification and the written order of the Engineer-in-charge.
- 1.2 Extra claim in respect of extra work shall be allowed only if such work is ordered to be carried out in writing by the Engineer-in-charge.
- 1.3 The Contractor shall engage a qualified Engineer for the Execution of work who will remain present for all the time on site and will receive instructions and orders from the Engineer-in-charge or his authorized representative. The instruction and orders given to the contractor's representative on site shall be considered as it will be to the contractor himself.
- 1.4 The work order book as prescribed shall be maintained on the site of the work by the Contractor and the contractor shall sign the orders given by the inspecting officers and shall carry out them properly.
- 1.5 Quantities specified in the tender may vary at the time of actual execution and the contractor shall have no claim for compensation on account of such variation.
- 1.6 Figured dimensions of drawings shall supersede measurements by scale,. Special dimensions in the specification shall supersede all other dimensions.
- 1.7 Use of I. S. Code shall mean its latest applicable version for respective items.

Executive Engineer
Drainage Department,
Surat Municipal Corporation

SIGNATURE OF THE CONTRACTOR: -

ADDRESS: -

DATE: -



23. GENERAL TECHNICAL SPECIFICATION FOR BUILDING WORKS

GENERAL:

1. In the specification “as directed”/” Approved” shall be taken to mean “as directed”/approved by the Engineer-in-charge.
2. Wherever a reference to any Indian Standard appears in the specifications, it shall be taken to mean as a reference to the latest edition of the same in force on the date of agreement.
3. In “Mode of Measurement” in the specification wherever a dispute arises in the absence of specific mention of a particular point or aspect, the provisions on this particular point or aspects in the relevant Indian Standards shall be referred to.
4. All measurements and computations, unless otherwise specified, shall be carried out nearest to the following limits:
 - (i) Length, width and depth (height) 0.01 Mt.
 - (ii) Areas 0.01 Sq.Mt.
 - (iii) Cubic Contents 0.01 Cu.Mt.In recording dimensions of work.
The sequence of length, width and height (depth) or thickness shall be followed.
5. The distance which constitutes lead shall be determined along the shortest partial route and not necessarily the route actually taken. The decision of the Engineer-in-charge in this regard shall be taken as final.
6. Where no lead is specified, it shall mean “all leads”.
7. Lift shall be measured from plinth level.
8. Definite particulars covered in the items of work, though not mentioned or elucidated in its specifications shall be deemed to be included therein.
9. Reference to specifications of materials as made in the detailed specification the items of works is in the form of a designation containing the number of the specification of the material and prefix ‘M’ e.g. ‘M-s’.
10. Approval of the samples of various materials given by the Engineer-in-charge shall not absolve the contractor from the responsibility of replacing defective material brought on site or materials used in the work found defective at a later date. The contractor shall have no claim to any payment or compensation whatsoever on account of any such materials being rejected by the Engineer-in-charge.
11. The contract rate of the item of work shall be for the work completed in all respects.
12. No collection of materials shall be made before it is got approved from the Engineer-in-charge.
13. Collection of approved materials shall be done at site of work in a systematic manner. Materials shall be stored in such a manner as to prevent damage, deterioration or intrusion of foreign matter and to ensure the preservation of their quality and fitness for the work.
14. Materials, if and when rejected by the Engineer-in-charge, shall be immediately removed from the site of work.



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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 overloading of the various components of the structure during execution of after completion of the structure.
19. Special modes of construction not adopted in general Engineering practice, if proposed to be adopted by the Contractor, shall be considered only if the contractor provides satisfactory evidence that such special mode of construction is safe, sound and helps in speedy construction and completion of work to the required strength and quality. Acceptance of the same by the Engineer-in-chargeshallnot,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 dose 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.

SEAL &SIGNATURE OF THE CONTRACTOR: -

ADDRESS: -

DATE: -

Executive Engineer,
Drainage Department,
Surat Municipal Corporation

**24. SPECIFICATIONS OF MATERIALS**

Note: Latest addition of I.S. code shall be applied.

M-1 WATER:

- 1.1 Water shall not be salty or brackish and shall be clean, reasonably clear and free from objectionable quantities of silt and traces of oil and injurious alkalis, 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.
- 1.2 If required by the Engineer-in-charge it shall be tested by comparison with distilled water. Comparison shall be made by means of standard cement tests for soundness, time of setting and mortar strength as specified in I.S. 269-1989. 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.
- 1.3 Water for curing mortar, concrete or masonry should not be too acidic or too alkaline. It shall be free of elements which significantly affect the hydration reaction or otherwise interfere with the hardening of mortar or concrete during curing or those which produce objectionable stains or other unsightly deposits on concrete or mortar surfaces.
- 1.4 Hard and bitter water shall not be used for curing.
- 1.5 Portable water shall generally be found suitable for curing mortar or concrete.

M-2 LIME:

- 2.1 Lime shall be hydraulic lime as per I.S. 712-1984. Necessary tests shall be carried out as per I.S. 6932 (Parts I to X) 1995.
- 2.2 The following field tests for limes are to be carried out ---
 - a] A very rough idea can be formed about the type of lime by its visual examination i.e. fat lime bears pure white colour, lime in form of porous lumps of dirty white colour, indicates quick lime, and solid lumps the unburnt lime stone.
 - b] Acid tests for determining the carbonate content in lime. Excessive amount of impurities and rough determination of class of lime.
- 2.3 Storage shall comply with I.S. 712-1984. 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.
- 2.4 Field testing shall be done according to I.S. 162-1989 to show the acceptability of materials.

M-3 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.

M-4 WHITE CEMENT:

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

**M-5 COLOURED CEMENT:**

- 5.1 Colored cement shall be with white or grey Portland cement as specified in the item of the work.
- 5.2 The pigments used for colored cement shall be of approved quality and shall not exceed 10% of cement used in the mix. The mixture of pigment and cement shall be properly ground to have a uniform colour and shade. The pigments shall have such properties as to provide for durability under exposure to sun-light and weather.
- 5.3 The pigment shall have the property such that it is neither affected by the cement nor detrimental to it.

M-6 SAND:

- 6.1 Sand shall be natural sand, clean, well graded, strong, durable and gritty particles free from injurious amounts of dust, clay, kankar nodules, soft or flaky particles, shale, 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.
- 6.2 Course 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 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	30-100
2.36 mm	90-100	300 Micron	5-70
1.18 mm	70-100	150 Micron	0-60

- 6.3 Fine Sand: The fineness 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

M-7 STONE DUST:

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

M-8 STONE GRIT :

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



generally be cubical in shape and as far as possible flaky elongated pieces shall be avoided. It shall generally comply with the provisions of I.S. 383-1990. Unless a special stone of a particularly quarry is mentioned, grit shall be obtained from the best black trap or equivalent hard stone as approved by the Engineer-in-charge. The grit shall have no deleterious reaction with cement.

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

I.S. Sieve Designation	% 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%

- 8.3 The crushing strength of grit will be such as to allow the concrete in which it is used to build-up the specified strength of concrete.

- 8.4 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.

M-9 CINDER:

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

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

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

M-10 LIME MORTAR:

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

M-11 CEMENT MORTAR:

- 11.1 Water shall conform to specification M-1. Cement shall conform to specification M-3. Sand shall conform to M-5.
- 11.2 PROPORTION OF MIX: 11.2.1 Cement and sand shall be mixed to specified proportions, sand being measured by measuring boxes. The proportion of cement shall be by volume on the basis of 50 Kg./Bag of cement being equal to 0.0342 cu.m. The mortar may be hand mixed or machine mixed as directed.



- 11.3 **PREPARATION OF MORTAR:** 11.3.1 In hand mixed mortar, cement and sand in the specified proportions shall be thoroughly mixed dry on a clean impervious platform by turning over at least 3 times or more till a homogeneous mixture of uniform colour is obtained. Mixing platform shall be so arranged that no deleterious extraneous material shall get mixed with mortar or mortar shall flow out. While mixing, the water shall be gradually added and thoroughly mixed to form a stiff plastic mass of uniform colour so that each particle of sand shall be completely covered with a film of wet cement. The water cement ratio shall be adopted as directed.
- 11.4 The mortar so prepared shall be used within 30 minutes of adding water. Only such quantity of mortar shall be prepared as can be used within 30 minutes.

M-12 STONE COARSE AGGREGATE FOR NOMINAL MIX CONCRETE:

- 12.1 Coarse aggregate shall be of machine crushed stone of black trap or equivalent and be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar.
- 12.2 The aggregate shall generally be cubical in shape. Unless special stones of particular quarries are mentioned aggregates shall be machine crushed from the best black trap or equivalent hard stone as approved. Aggregate shall have no deleterious reaction with cement. The size of the coarse aggregate for plain cement concrete and ordinary reinforced cement concrete shall generally be as per the table given below. However, in case of reinforced cement concrete the maximum limit may be restricted to 6 mm. Less than the minimum lateral clear distances 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	-	-	10.0 mm	0.50	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.

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

M-13 BLACK TRAP OR EQUIVALENT HARD STONE COURSE:

- 13.1 Aggregate for Design Mix Concrete: Course aggregate shall be of machine crushed stone of black trap or equivalent hard stone and be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar.
- 13.2 The aggregates shall generally be cubical in shape, unless special stones of particular quarries are mentioned, aggregates shall be machine crushed from the best, black trap or equivalent hard stones as approved. Aggregate shall have no deleterious reaction with cement.
- 13.3 The necessary tests indicated in I.S. 383-1990 and I.S. 456-2000 shall have to be carried out to ensure the acceptability of the material.
- 13.4 If aggregate is covered with dust it shall be washed with water to make it clean.

**M-14 BRICK BATS AGGREGATE:**

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

M-15 BRICKS:

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

Length : + 4 mm

Width : + 2 mm

Height : + 2 mm

The physical characteristic of bricks shall be as follows:

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

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

M-16 STONE:

- 16.1 The stone shall be of the specified variety such as Granite/Trap stone/Quartzite or any other type of good hard stones. The stones shall be obtained only from the approved quarry and shall be



hard, sound, durable and free from defects like cavities, cracks, sand holes, flaws, injurious veins, patches of loose or soft materials etc. And weathered portions and other structural defects or imperfections tending to affect their soundness and strength. The stone with round surface shall not be more than 5% of dry weight. When tested in accordance with I.S. 1134-1985. The minimum crushing of the strength of the stone shall be 200 Kg./Sq.Cm. unless otherwise specified.

- 16.2 The samples of the stone to be used shall be got approved before the work is started.
- 16.3 The khanki facing stone shall be dressed by chisel as specified in the item for khanki facing in required shape and size. The face of the stone shall be so dressed that the bushing on the exposed face shall not project by more than 40 mm. from the general wall surface and on face to be plastered it shall not project by more than 19 mm nor shall it have depressions more than 10 mm from the average wall surface.

M-17 LATERITE STONE:

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

M-18 MILD STEEL BARS/TMT/CRS BARS:

- 18.1 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.
- 18.2 All the reinforcement shall be clean and free from dirt, paint, grease, mill scale or loose or thick rust at the time of placing.
- 18.3 For the purpose of payment the bar shall be measured correct up to 10 mm length and weight payable worked out as per the rate specified below:

(i)	6 mm	0.22 Kg/Rmt.
(ii)	8 mm	0.39 Kg/Rmt.
(iii)	10 mm	0.62 Kg/Rmt.
(iv)	12 mm	0.89 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	3.86 Kg/Rmt.
(xi)	28 mm	4.83 Kg/Rmt.
(xii)	32 mm	6.32 Kg/Rmt.
(xiii)	36 mm	8.00 Kg/Rmt.
(xiv)	40 mm	9.88 Kg/Rmt.



M-19 HIGH YIELD STRENGTH STEEL DEFORMED BARS:

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

M-20 HIGH TENSILE STEEL WIRES:

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

M-21 MILD STEEL BINDING WIRE:

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

M-22 STRUCTURAL STEEL:

- 22.1 All structural steel shall conform to I.S. 226-1975. The steel shall be free from the defects mentioned in I.S. 226- 1975 and shall have 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.
- 22.2 When the steel is supplied by the contractor test certificates of the manufacturers shall be obtained according to I.S. 226-1975 and other relevant Indian Standards.

M-23 GALVANISED IRON SHEETS:

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

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

- 23-A.1 The G.I. ridges and hips shall be of plain galvanized 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 galvanized sheet of thickness as specified in item. Valleys shall be 900 mm. Wide overall and flashing shall be 380 mm wide over all. They shall be bent to the required shape without damage to the sheet in the process of bending.

M-24 ASBESTOS CEMENT SHEETS:



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

24.2 Ridges and Hips:

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

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

M-25 MANGALORE PATTERN ROOF TILES:

25.1 The Mangalore pattern tiles shall conform to I.S. 654-1992 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.

M-26 SHUTTERING:

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

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

26.3 If at any stage of work during or after placing concrete in the structure, the form work sags or bulges out beyond the required shape of the structure, the concrete shall be removed and work redone with fresh concrete and adequately rigid form work. The complete form work shall be got inspected by and approved from the Engineer-in-charge, before the reinforcement bars are placed in position.

26.4 The props shall 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.

26.5 Double wedges shall further be provided between the sole plate and wooden props so as to facilitate tightening and easing of shuttering without jerking the concrete.

26.6 The timber used in shuttering shall not be so dry so as to absorb water from concrete and swell or bulge nor do so green or wet so as to shrink after erection. The timber shall be properly sawn and planed on the sides and the surface coming in contact with concrete. Wooden form work with metal sheet lining or steel plates stiffened by steel angles shall be permitted.

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

26.8 The surface of timber shuttering that would come in contact with concrete shall be well wetted and coated with soap solution before the concreting is done. Alternatively coat of raw linseed oil or oil of approved manufacture may be applied in place of soap solution. In case of steel shuttering either soap solution or raw linseed oil shall be applied after thoroughly cleaning the surface. Under no circumstances black or burnt oil shall be permitted.

26.9 The shuttering for beams and slabs shall have camber of 4mm per meter (1 in 250) or as directed by the Engineer-in-charge so as to offset the subsequent deflection. For cantilevers, the camber at free end shall be 1/50 of the projected length or as directed by the Engineer-in-charge.

M-27 EXPANSION JOINTS - PREMOULDED FILLER:



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

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

- 28.1 The item provides for expansion joints in R.C.C. frame structure for internal joints as well as for exposed joints with the use of necessary copper strip and holdfasts.
- 28.2 Copper sheet shall be 1.25 mm thick and of 1.25 mm with 'U' shape in the middle, copper strip shall have holdfast of 3 mm diameter copper rod fixed to the plate soldered on strip at intervals of about 30 cm. or as shown in the drawing or as directed. The width of each flange (horizontal side) of the copper plate to be embedded in the concrete work shall be 25 mm Depth of 'U' to be provided in the expansion joint, in the copper plate shall be of 25 mm.

M-29 SELECTED EARTH:

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

M-30 POLYPROPYLENE STEPS:

The polypropylene steps shall be clean, well-cast and they shall be free from air and sand holes, cold shuts and warping which are likely to impair the utility of the castings. The portion of the step which projects from walls of the machine hole shall have a raised required designed above the general plane of the top surface of the step along the edges of the tread to provide adequate non-slip grip. The steps shall be of dimensions 263 mm x 165 mm x 25 mm (as shown in drawings) with necessary holding arrangement and carting minimum weight of 0.90 Kg. confirming to an ASTM D-4101.

Executive Engineer
Drainage Department,
Surat Municipal Corporation

SIGNATURE OF THE CONTRACTOR :-

ADDRESS :-

DATE :-

**25. ITEMWISE DETAILED TECHNICAL SPECIFICATION****ITEM NO.1:**

Excavation in bituminous road as per required gradient and line including safety provisions using site rails and stacking excavated stuff including up to all required lead cleaning the site etc. complete for all lifts as specified.

In hard murrum, boulders incl. macadam road.

Detailed specification as per Item No.1.

ITEM NO.2:

Excavation for pipeline trenches for water supply sewerage line machine hole etc. all with shoring and strutting if required as per required gradient and line including safety provisions using site rails and stacking excavated stuff including up to all required lead cleaning the site etc. complete for all lifts and strata as specified

Excavation in Bituminous road

Item includes breaking and removing of the road surface up to the bottom of the base course, rubble soling etc. Item also includes stacking of useful material up to the lead of 50 meters.

Mode of measurement and payment: -

Payment shall be made on cubic meter basis.

ITEM NO.3:

Excavation for pipeline trenches for water supply sewerage line machine hole etc. all with shoring and strutting if required as per required gradient and line including safety provisions using site rails and stacking excavated stuff including up to all required lead cleaning the site etc. complete for all lifts and strata as specified.

In C.C. Road

Detailed specification as per Item No.1.

ITEM NO.4:

Excavation for pipeline trenches for water supply, sewerage line, machine hole etc. all with shoring and strutting if required as per required gradient and line including safety provisions using site rails and stacking excavated stuff including up to all required lead cleaning the site etc. complete for all lifts and strata as specified. In all sorts of soil and soft murrum

In all sorts of soil and soft murrum

(A) Up to 1.5 Mt. depth from G.L.

(B) 1.5 Mt. to 3.00 Mt. depth

(C) 3.0 Mt TO 4.50 Mt depth

(D) 4.5 Mt. to 6.00 Mt. depth

(E) 6.0 Mt TO 7.50 Mt depth

(F) 7.5 Mt. TO 9.00 Mt. Depth

(G) 9.0 Mt. TO 10.50 Mt. Depth

GENERAL:



Any soil which generally yields to the application of pickaxes and shovels of numbers of scarifies phawaraa rakes or any such excavating implement or organic soil gravel, silt, sand, loam, clay, peat etc., fall under this category.

CLEARING OF SITES:

The site on which the drain is to be laid shall be cleared and all obstructions, like loose, materials and rubbish of all kind, bush, wood and trees shall be removed as directed. The materials so obtained shall be the property of the Corporation and shall be conveyed and stacked as directed with 90 m. lead. The roots of the trees coming in the site shall be cut and coated with hot asphalt.

The rate of site clearance is deemed to be included in the rate of earthwork for which no extra payment will be paid.

SETTINGOUT:

All the center line of drain trenches shall be given by the Engineer-in-charge and it will be the responsibility of the contractor to install substantial reference marks, bench marks etc. and maintain them as long as required true to line, level, curve & slopes. The contractor shall assume full responsibility for alignment, elevation and dimensions of each and all parts of the work. The labour, materials etc. required for setting out and establishing bench marks and other reference marks shall be arranged by the contractor at his own cost.

EXCAVATION:

The excavation for the drain trenches shall include removal of all materials of whatsoever nature and whether wet or dry, necessary for the laying of pipe lines/construction of box drain and sub-structure exactly in accordance with lines, levels, grades and curves shown on the plans L-sections. Trenches shall be excavated to the exact width at of lowest portion of the trench and the sides shall be left vertical as far as possible or according to the angle of repose of various soils. The contractor shall notify the Engineer before starting excavation to enable him to take cross sectional levels for purpose of measurements before the ground is disturbed.

Excavation shall be carried out in strata's specified in item of schedule 'B'. The lift will be also as specified in Schedule 'B'. Excavated material shall be stacked at a minimum distance of 1.5 meters away from the edge of the trench. The leveling Instruments shall be used for checking the gradients of bed or trenches. Before the trench excavation is started, sight rails made of good timber shall fix truly vertical at a uniform height, above the invert. The center line shall be clearly marked on the sight rails. Depth of excavation shall be checked by leveling instruments only as per instructions of the Engineer-in-charge.

The bottom of the trenches shall be leveled both longitudinally and transversely or stepped as directed by the Engineer. The contractor shall, at his own cost, remove such portion of boulders or rock, as required to make the bottom of the trench level. No filling shall be allowed to being the bottom of the trench in level. If by contractor's mistake, Excavation is made deeper than shown on the plan ordered by the Engineer, the extra depth stuff duly watered and rammed as directed by the Engineer as at the cost of the contractor. All rock or other hard foundation shall be cleared off, all soft and loose material cut to a firm surface, either level, stepped as directed by the Engineer. The Engineer may order such changes in the dimensions and elevation of bottom of trenches and may be deemed necessary to secure satisfactory lying of pipe lines. The contractor shall at his own expense, make provision for all pumping, dredging bailing out of draining water and the trenches shall be kept free of water, during construction work.

Extra excavation to be done for joint pits shall be paid separately by SMC at the rate of the respective item of excavation but in any case extra width for excavation of Joint pits shall not exceeds 500 mm from outer face of joint on both sides as well as 100 mm in bottom and 600 mm in length on the either side.

After each excavation is completed, the contractor shall notify the Engineer to that effect and no trench will be allowed to be filled up until the Engineer or his authorized agent approved the depths and



dimensions of excavation and the nature of the strata met with and the level and/or measurements are recorded.

The work measured shall be maintained till completion and in case of collapse of sides or bottom of trenches due to any reasons, it shall be made good without any extra cost.

PROTECTION:

In case of excavation is to be done with sloping of stopping sides (i.e. to the given angle) as per the drawing details, then the rates for shoring and strutting shall be considered included in this item. Wherever required the shoring strutting may be done. It shall conform to specification of shoring and strutting which is explained in other item of this tender.

The drainage trenches shall be strongly fenced and red light signals shall be kept at night in charge of watchmen to prevent accidents. Sufficient care and protective measures shall be taken to see that the excavation shall not affect or damage the adjoining structure. The contractor shall be entirely responsible for any injury to life and damage to the properties etc. Necessary protection work such as guide ropes, crossing places, barricades, caution Boards etc. shall be provided by the Contractor. The wooden planks for crossing trenches by public as per requirement shall be provided by the contractor without any extra cost.

ADDITIONAL REQUIREMENTS :

At the joints drain the trench shall be excavated to an additional depth of 15 CMS. And width of 30 CMS. And length of 15 CMS. Beyond the edge of collar on both the sides or as directed by Engineer-in-charge. The rate includes for such extra excavation made at the joints. The trenches shall be excavated perfectly in straight line. The bottom of trench shall be kept as per invert level or as directed. In obtaining formation on the bottom trench, the usual method of levelling instruments shall adopted. The contractor shall have to provide and maintain levelling instruments without any extra cost.

If case of emergencies such as unexpected rains, important public occasions, dangers to properties etc. the contractor shall be required to fill up the excavation with necessary consolidation, which may be re-excavated for flow test and refilled for which no extra claim for payment and time limit shall be entertained.

If contractor fails or makes delay to give the flow test of the pipe line laid line any of the section, without any genuine reasons, he shall be responsible to get re-excavate any part of the length of trenches refill in such case (i.e. before testing for safety of pedestrian and / or vehicular traffic) as found necessary be the Engineer-in-charge without any extra cost, if found necessary and as directed by the Engineer-in-charge. The contractor shall have to excavate the refilled trenches during flow test without any extra cost.

In case of excavation across a road, permission of road authorities shall have to be obtained. At all road crossings, trenches shall be excavated maximum only for half width of the road and pipe shall be laid. The other half shall be excavated only after back filling over the laid pipe line making it suitable for the traffic. The contractor shall provided diversion when the pipe line is to be laid along the road as required and shall maintain the diversion or any part of it, of damaged without any extra cost. At all road crossings, the pipe shall be laid below the crust of the road.

The contractor shall break the road surface by Excavation of chiseling to the exact width and length as shown on the drawing. Separate provision should be made for cutting of road surface. However this item shall be paid separately as mentioned in Item No.1 or 2 whichever is applicable.

The excavated stuff shall be deposited in uniform layers to avoid mixing with other kind of materials at no objectionable place.

The contractor shall have to make his own arrangements for taking trial pits etc. at his own cost, as directed by the Engineer-in-charge.



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If necessary, temporary arrangements shall have to be made to divert or convey across all natural water ways or build up drains etc. without any extra cost.

All water pipes, cables; any structure shall be protected by the contractor as directed by the Engineer-in-charge, if met during excavation. Any damage caused shall be rectified without any extra cost.

Breaking of brick structures/R.C.C. works, cement concrete etc. coming in excavation shall be considered as excavation in strata shown in the item, as above and will be paid at the same rate.

All safety precautions shall have to be made by the Contractor.

The excavation in narrow streets, lanes shall have to be carried out with full precautions so as that no property may be damaged. Any compensation to be paid to the other party will be paid by the contractor for which the Surat Municipal Corporation will not be responsible.

All obstacles, structures etc. shall be removed and made good without further claim or extra cost.

DISPOSAL OF EXCAVATED STUFF:

No excavated stuff from foundation trenches of whatever kind they shall be placed even temporarily nearer 1.5 meter distance prescribed by the Engineer from the outer edge of excavation. The rate of excavation includes sorting out of useful materials and stacking them separately as directed within specified lead. The material suitable and useful for backfilling or other use shall be stacked in convenient places but not in such a way as to obstruct free of movement of men, animals and vehicles of encroach upon the area required for constructional purpose. The site shall be kept clean of all debris on completion of the work.

Disposal of excavated materials is subject to the following.

Useful materials obtained from cleaning site and excavation shall be stacked within a lead of 90m. Beyond the building area as directed.

Materials suitable for back filling shall be stacked at convenient places with in a lead of 90 m from the structure for reuse.

Useful stones from excavation shall be stacked nearly within lead of 90 m. and will allowed to be used by the Contractor on payment at rates laid down in the contract or if not so laid down at scheduled rates of the corporation or at a mutually agreed rates if there are no such rates in the schedule of rates.

DEWATERING:

Any water which may accumulate in the excavation during the progress of the work, either, by percolation, seepage, springs, rain or any other cause shall be bailed out by pumping and diverting surface flow if any by earthen binds or by any other means. The bunds shall be removed as soon as the work is completed.

The Contractor shall provide, maintain and operate sufficient number pumping equipment of approved capacity to keep the area of construction free from water and any sub soil water arising during the construction period.

Pumping shall be so controlled to dispose of water from adequate drainage ditches and shall not be rated so as to make in convenience in constructional operations in general. Precaution shall be taken by the Contractor to prevent any damage to the trench, pipe line of adjustment structure.

The excavation shall be kept free from water by the contractor (1) During excavation (2) When pipe laying and construction of joints are in progress and till the Engineer-in-charge considers that the mortar is sufficiently set. (3) During hydraulic testing inspection and measurements.

The contractor shall be paid separately for dewatering exceeds 5 HP.Hr. as per rate mentioned in Schedule-B.

MEASUREMENT AND PAYMENT:



SURAT MUNICIPAL CORPORATION

DRAINAGE DEPARTMENT

The payment of a various classes of excavation, depending upon the depth of excavation, shall be made at the unit rate per cubic meter for the quantity actually excavated and accepted by the Engineer limited to dimensions shown in the sanctioned plans L-Section or as directed by the Engineer. Excavation in excess of the sanctioned dimensions shall not be measured nor paid for and if so ordered by the Engineer. The contractor shall have to fill up the excess depth with selected excavated stuff duly watered and rammed as directed by the Engineer-in-charge without any extra payment to the Contractor.

Dimension shall be measured correct to two places of decimals of a meter and individual quantity shall be calculated to two places of decimals of a cubic meter.

The rate for the item of excavation shall include (Unless and otherwise mentioned).

- (a) Clearing of site.
- (b) Setting out work including all materials and labour.
 - I Refilling the drain trenches with approved materials and watering & consolidating up to original ground level.
- (d) Providing facilities for inspection and measurements at any time by the Concerned Corporation Officials.
 - I Compensation for injury to life and damage to property if caused during progress of work.

All measurement shall be take true vertical depth from bottom of pipe (i.e. I.L. + thickness of pipe).

ITEM NO.5:

Providing cutting of existing bituminous surface up to suitable depth in line and alignment using Mechanically operated cutter machine before excavating existing surface for utility laying including cost of all type of machinery, fuel, labour etc. and as per direction of engineer in charge.

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

The work shall be carried out by as directed by the Engineer-in-charge.

ITEM NO.6:

Supplying & Filling with fine sand in compacted thickness over the base including watering ramming, consolidating & dressing etc. complete. Item includes by using vibratory plates compacted machine and as directed by engineer in charge.

WORKMANSHIP:

The sand / granular material to be use for bedding shall be free from salts, organic or other foreign matter. All clods of sand shall be broken.

As soon as the work in foundation has been completed and measured the site of foundation shall be cleared of all derbies, bricks bats, mortar dropping etc. sand filled with sand in layers not exceeding 20cms. Each layer shall be adequately watered, rammed and consolidated before the succeeding layer is laid. The sand shall be rammed with iron rammers where feasible and with the butt ends of crowbars, where rammer cannot be used.

The final level of bedding shall be kept to shape intended to be given to excavation.

The consolidation may be done by hand rammers, where so specified. The extent of consolidation required shall also be as specified.

The sand/granular material shall be allowed to be used in bedding the trenches. Under no circumstances black cotton soil be used for filling the plinth.

Mode of measurement and payment: -



The payment shall be made for bedding the granular material as per drawings. No deduction shall be made for shrinkage or voids, if consolidated as instructed above.

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

ITEM NO.7:

Providing and supplying ISI Standard R.C.C. pipes in standard lengths of following class and diameter suitable for rubber ring joints including all taxes, insurance, transportation, freight charges, octroi, inspection charges, loading, unloading, conveyance to departmental stores, stacking etc. One rubber ring should be supplied with each full length socketed pipe, cost included in rates below. Lowering, laying and jointing R. C. C. pipes in C. M. 1:1 1/2 of following diameters in proper position, grade and alignment at all level as directed by Engineer-in-charge including conveyance from stores to site of work, labour, giving hydraulic testing as per IS code.

7.1.0 MATERIALS:

7.1.1 R.C.C. NP3 / NP4 Class spun pipes of various diameters of required length shall be supplied by the contractor as per terms and condition attached herewith at end of this item.

7.1.2 Water shall conform to M-1, Cement shall conform to M-3, Sand shall conform to M-6, and Cement mortar of required proportion shall conform to M-11 all the required materials for completing the items shall conform to relevant Indian Standard specification requirements.

7.1.3 Rubber Ring shall conform to IS: 5382-1985.

7.2.0 STACKING OF MATERIALS:

7.2.1 Reasonable care shall be exercised in loading, transporting and unloading of the pipes and specials. Gradual unloading shall be done by inclined plane or by chain block. Handling shall be done such as to avoid impact.

7.2.2 Before, the actual laying of pipe line started, the pipes and fittings in required quantity shall be arranged lengthwise, by the site of the excavated trench without causing any obstacles to the traffic. If necessary, the pipe shall be got cut by the contractor at his own cost to accommodate specials or fittings or for any other reason.

7.2.3 The contractor shall be fully responsible for safety of materials at site.

7.3.0 LAYING (SPIGOT AND SOCKET RUBBER RING ROLL ON JOINT)

7.3.1 Boning Staves and Sight Rails:

In various the pipes and fittings/specials the centre for each machine hole/chamber or pipeline shall be marked by a peg. Contractor shall dig holes for and set up two posts (about 100 x 100 x 1800 mm) at each machine hole/chamber or junction of pipelines at nearly equal distance from the peg and at sufficient distances there from to be well clear of all intended excavation. So arranged that a sight rail when fixed at a certain level against the post shall cross the centre line of the machine hole/chamber or pipelines. The sight rail shall not in any case be more than 30 m apart; intermediate rails shall be put up if directed by Engineer-in-charge.

Boning staves of 75 mm x 50 mm size shall be prepared by contractor in various lengths. Each length being of a certain whole number of meters and with a fixed tee head and fixed intermediate cross pieces, each about 300 mm long. The top-edge of the gross piece must be fixed below the top-edge of the tee-head at a distance equal to the outside. Diameter of the pipe or the thickness of the concrete bed to be laid as the case may be. The top of cross pieces shall indicate different levels such as excavation for pipe line, top of concrete bed, top of the pipe etc. as the case may be.

The sight rail of size 250 mm x 40 mm shall be screwed with the top edge resting against the level marks. The centre line of the pipe shall be marked on the rail and this mark shall denote also the



meeting point of the centre lines of any converging pipes. A line drawn from the top edge of one rail to the top edge of the next rail shall be vertically parallel with the bed of the pipe, and the depth of the bed of pipe at any intermediate point may be determined by letting down the selected boning staff until the tee head comes in the line of sight from rail to rail.

The post and rails shall be perfectly square and planed smooth on all sides and edges. The rails shall be painted white on both sides and the tee heads and cross piece of the boning staves shall be painted black.

For the pipes converging to a machine hole/chamber at various levels. There shall be a rail fixed for every different level when a rail comes within 0.50 m of the surface of the ground. A higher sight rail shall be fixed for use with the rail over the next point. The posts and rails shall in no case be removed until the trench is excavated. The pipes are laid and Engineer gives permission to proceed with the backfilling.

- 7.3.2 laying of Pipes and fittings shall be carefully cleaned before installation. Whenever pipelaying is interrupted for any reason. The open end of the pipeline shall be sealed with a suitable expanding stopper or a properly fitted temporary wooden stopper and exposed pipes shall be suitably protected from stones and other objects falling into the trench from above.

The permissible tolerance for pipe lines in trenches shall be 6 mm in level and 25 mm in line between machine holes. After the laying of a length of a pipeline but before testing the crown of the pipe shall be checked for level and alignment and any necessary adjustment made by un-jointing and removing the pipes concerned. Adjusting the bedding, relaying the pipes and rechecking for line and level. In addition, where a gravity pipeline is shown on the drawings as being straight between machine holes it will not be accepted unless a light can be sighted directly through the length concerned.

For pipeline jointing systems incorporating flexible jointing rings, pipes shall be laid with the spigot and pointing in the direction of flow and with a gap between the end of the spigot and the base of the socket, or between spigots rubber rings shall comply to IS-5382.

7.3.3 Jointing:

7.3.3.1 General:

Pipe section shall be joined utilizing spigot and socket flexible joint with rubber ring, as per IS-783. After jointing extraneous material, if any, shall be removed from the inside of the pipe and the newly made joints shall be thoroughly cured. The rubber sealing rings used for jointing shall conform to IS-5382.

7.3.3.2 Spigot and Socket Joint (Flexible)

The RCC pipe with the rubber ring accurately positioned on the spigot shall be pushed well home into the socket of the previously laid pipe by means of uniformly applied pressure with the aid of a jack or similar appliance. The RCC pipes shall be of spigot and socket type and rubber rings shall be used, and the manufacturer's instructions shall be deemed to form a part of these engineer's requirements. The rubber rings shall be lubricated before making the joint and the lubricant shall be soft soap water or an approved lubricant supplied by the manufacturer.

7.4.0 HYDRAULIC/FLOW TEST OF PIPES:

- 7.4.1 The contractor shall give at his own cost necessary hydraulic/flow test of pipe line laid.

- 7.4.2 Each section of drain shall be tested for water tightness preferably between machine holes. To prevent change in alignment and disturbance after the pipes have been laid, it is desirable to back fill the pipes up to the top, keeping at least 90 cm. length of pipe open at the joints. It is necessary at the pipe line are filled up with water for about a week before commencing the application of pressure to allow for the absorption by pipe wall. Pipes shall be tested after the cement mortar joints have been made.



- 7.4.3 The line shall be tested as per I.S.8127-1967 (code of practice for laying for glazed stone-ware pipes) or its latest edition.
- 7.4.4 The contractor shall provide at his own testing equipment of approved make. This shall be approved by the Engineer-in-charge.
- 7.4.5 All pipes, specials, joints found to be leaking or cracked or busted or observed unsuitable shall be removed and repaired. Contractor shall see that no end of any pipe length is kept open even temporarily and that all open ends are immediately at the end of every day's work covered up either layer gunny bag cloth bided, properly by means of mild steel wires without any claim for extra cost.
- 7.4.6 Filling above the drains to a depth of twice the diameter of the pipe line shall be completely free from boulders, stones, or brick bats and shall be composed of selected hard variety of murrum well consolidated but not heavily tempered. In the remaining depth, the trench shall be filled up by the selected stuff and murrum as ordered by the Engineer-in-charge.
- 7.4.7 For crossing of obstacles, natural or built up, such as culvert drains bridges etc. the contractor shall approach respective authorities to obtain permission for crossing them. Such work left remaining to be carried out due to want of permission shall be carried out at any later stage or period within a time to the satisfaction of the Engineer-in-charge.
- 7.5.0 GENERAL:**
- 7.5.1 After the satisfactory test of draining line the rubber plugs fitted to Y or T branches shall be taken out and ends shall have to be closed with cement concrete plugs or bricks bats as directed by the Engineer-in-charge. These plugs shall be fixed with mud mortar or cement mortar over the mud mortar of about 6 mm to 12 mm thick shall be plastered. All those works shall be done strictly as per instructions of the Engineer-in-charge. If directed, alternatively the branches of Y or T after fixing plugs shall be properly closed with a place of gunny bag and the same shall be tied with M.S. wire. The rate shall include the cost of all these materials and labour etc. complete.
- 7.5.2 If pipe-lines are laid in separate detached sections and not in continuous length due to any reasons, such as non-availability of pipes or due to obstacles or due to non-availability of permission etc., the contractor shall complete the work after words at the same rate as originally provided for the tenderer, without any claim for extra or compensation due to non-respect of permission or any other natural or unforeseen reasons and until the date of completion of work, shall be treated as in- complete.
- 7.5.3 Complete arrangements for water supply requirements for complete construction of work, hydraulic testing and for layout shall be done by the Contractor at his own cost. The water shall potable.
- 7.5.4 The contractor shall appoint a qualified site supervisor who can take the responsibilities and fixing the inner levels of the drains.
- 7.5.5 Temporary bench marks shall be provided and protected by the contractor at a minimum distance of every 150 meter at site without any extra cost. These bench marks shall be either of masonry or mass concrete or not less than 0.140 Cu.mt. The location of bench marks shall be kept as directed by the Engineer-in-charge.
- 7.5.6 The rate includes crossing of all obstacles such as electric wire, telephone cable, water pipes, sewer, drains, machine holes walls, culverts, khalkuvas, etc. coming in the laying of pipe lines work. Any damage done to this may be restored by the contractor without any extra claim. Any work of removing, repair of such structures or constructed in the process of laying pipe lines etc. shall be carried by the contractor without any claim for extra cost. Arrangements for dewatering and cleaning the khalkuvas shall be done by the contractor without any extra claim.

**7.6.0 MODE OF MEASUREMENT AND PAYMENT:**

- 7.6.1 The measurements shall be paid per meter length of the pipe line laid, jointed and tested and measured along the centre line and shall be paid according to the inner diameter of the pipes providing and as per the rates quoted by the tender in respective items of Schedule-B.
- 7.6.2 The pipes may be available in approximate size either in metric system, or British system. No additional payment or reduction in payment will be made for such approximate size.
- 7.6.3 No extra payment for dewatering or installing dewatering sets for pumping out such water shall be made. No extra payment for cutting of pipes, if required shall be made to the Contractor.
- 7.6.4 In absence of hydraulic/flow test 20% of the amount of the laying and jointing work of pipe line work will be withheld from the running bills till satisfactory hydraulic test is given. If level for invert of pipes is not maintained by the Contractor 100% payment shall be withheld.

Manufacturing of NP3 and NP4 class R.C.C. Pipes**1. MATERIALS:**

For precast concrete pipes, materials, complying with the requirements given below shall be used.

CEMENT:

Cement used for the manufacture of unreinforced and reinforced concrete pipes shall conform to I.S. 269-1967 or I.S. 455-1989 or I. S. 1489-1967 or 1489-1976 or IS – 8041-1978 or IS – 8043-1978 or IS – 8112-1976.

AGGREGATES:

Aggregates used for the manufacture of reinforced concrete pipes shall conform to I.S. 383-1976. The maximum size of aggregate should not exceed one third the thickness of the pipe or 20 mm whichever is smaller for pipes above 250 mm internal diameter of 80 to 250 mm the maximum size of aggregate should be 10 mm.

NOTE: It is preferable to have the size and grading aggregates conforming to IS-383-1970. It is also preferable that materials finer than 75 micron IS-Sieve is restricted to 3 percent by mass.

REINFORCEMENT:

Reinforcement used for the manufacture of the reinforced concrete pipes shall be mild steel grade I or medium tensile steel bars conforming to I.S. 432 (Part-I) 1982 or hard drawn steel wire conforming to I. S. 432 (Part-II) 1982 or structural steel (Standard Quality) bars conforming to IS-226-1975 where soft grade wire is used it shall conform to I.S. 280-1978.

NOTE: - Wire fabric conforming to IS-1566-1982 or deformed bars and wires conforming to IS-1786-1985 may also be used.

CONCRETE OR MORTAR:

Concrete used for manufacture of reinforced concrete pipes shall conform to I.S. 458-2021.

The concrete for non-pressure pipes shall have a minimum cement concrete of 360 Kg/Cu.mt. And a minimum compressive strength of 20 N/Sq.mm. at 28 days. If mortar is used it shall have a minimum cement content of 450 Kg/Cu.mt. and a compressive strength not less than 20 N/Sq.mm. at 28 days. The concrete for pressure pipes shall a minimum content of 450 Kg/Cu.mt. and a minimum compressive strength of 25 N/Sq.mm. at 28 days. If mortar is used, it shall have a minimum cement of 600 Kg/Cu.mt. and a compressive strength not less than 25 N/Sq.mm. at 28 days.

Where the process of manufacture is such that the strength the concrete or mortar in the pipe differs from that given by test on cubes the two may be related by a suitable conversion factor. If the purchaser required evidence of this factor, he shall ask for it before placing the order. The



conversion factor for 28 days compressive strength for spun concrete may be taken at 1.25 in the absence of any data.

Compressive strength tests shall be conducted on 15 cm cubes in accordance with the relevant requirements of I.S. 456-2000 and I.S. 516-1959. If so required by the purchaser the manufacturer shall give a certificate indicating the quantity of cement in the concrete mix.

DESIGN

REINFORCEMENT:

The reinforcement in the reinforced concrete pipe shall extend throughout the length of the pipe and shall be so designed that it may be readily placed and maintained to designed shape and in the proper position within the pipe mould during the manufacturing process. The circumferential and longitudinal reinforcement shall be adequate to satisfy the requirement specified in table-2.

For non-welded Lages spiral reinforcement of the same diameter shall be closely spaced at the end of the pipe for a length of 150 mm to minimize damage during handling. The spring of such end spirals shall not exceed 50 mm or half the pitch whichever is less than such spiral reinforcement at ends shall be part of the total spirals reinforcement specified in different table.

The pitch of the circumferential reinforcement shall be not more than the following:

- (a) 200 mm for pipes of nominal internal diameter 80 to 150 mm.
- (b) 150 mm for pipes of nominal internal diameter 200 to 350 mm.
- 1100 mm for pipes of nominal internal diameter 400 and above.

The pitch shall also be not less than the maximum size of aggregate plus the diameter of reinforcement bar used.

If so required by the purchaser, the manufacturer shall give a certificate indicating the details relating to quality quantity and dispersion of steel in the pipe as well as the clear cover to the steel provided in the pipe.

ENDS OF PIPES: - The ends of concrete pipes shall be suitable for butt and joints for all classes of pipe. Dimensions of collars shall be according the details given in table-2 the reinforcement for the collars shall be as given in table-2. The end of the collar reinforcement shall have a full ring at both ends and the longitudinal reinforcement shall be proportional to the length of the collar.

TABLE -1 : Attached Separately

TABLE -2 : Attached Separately

COVER: The minimum clear cover for reinforcement in pipe shall be as given below.

Barrel thickness	Minimum clear cover.
(1) Up to and including 25 mm	6
(2) Over 25 mm and up to & including 30 mm	8
(3) Over 30 mm and up to & including 75 mm	10
(4) Over 75 mm	15
(5) At the end of longitudinal	5

3. MANUFACTURE:

GENERAL

The methods of manufacture shall be such that the form and the dimensions of the finished pipe are accurate within the limit specified in Indian Standard No.458. The surface and edges of the pipes shall be well defined and true and their ends shall be square with the longitudinal axis.



The ends of the pipes shall be further reinforced by an extra ring of reinforced to avoid breakage during transportation.

CONCRETE MIXING:

Concrete shall normally be mixed in a mechanical mixer. Mixing shall be continued until there is a uniform distribution of the materials and the mass is uniform in color and consistency, but in no case shall the mixing be done for less than two minutes.

The concrete shall be placed before setting has commenced. It shall be ensured that the concrete is not dropped freely so as to cause segregation. The concrete shall be consolidated by spinning, vibrating, spinning combined with vibrations, or other appropriate mechanical means.

REINFORCEMENT CAGES:

Reinforcement cages for pipes shall extend throughout the pipe barrel and shall be wound round normal collapsible frames or drums. The cages shall consist of spiral or rings and straight of an nailed wire cold drawn wire or mild steel rod and may be circular cages shall be placed symmetrically with the thickness of the pipe wall.

The spiral shall end in a complete ring at both the ends of a pipe.

Pipes having barrel thickness 100 mm and above shall have double reinforcement cage and the amount of spiral steel in the outer cage shall be 75 percentage of the mass of spiral steel in the inner cage, while the total conform to requirements specified in the relevant table of this standard.

The mass of longitudinal in the outer cage and inner cage should be the same that is equal to half the total mass of longitudinal specified in the relevant tables.

Diagonal reinforcement may be provided in pipes for which the cages are not welded so as to help in binding the cage securely. It shall however be ensured that the clear cover for any reinforcement is not below the limit specified. The diagonal reinforcement is a process requirement and shall not be counted against longitudinal and spiral reinforcement.

It is preferable that single reinforcement cage should be located near the inner surface of the pipe with adequate clear cover.

CURING :**(i) Water Curing :**

Pipes manufactured in compliance with this standard shall be cured by immersion in water for a period of not less than two weeks in case of pipes made from ordinary Portland cement or 43 grade ordinary Portland cement, pipes may be water cured by immersing in water covering with water saturated material or by a system of perforated pipes, mechanical sprinklers porous hose, or by any other approved method that will keep pipe during the specified curing period. In the case of large pipe projecting partly above water level, the projecting portion shall be kept wet by any suitable means.

(ii) Steam Curing:

Steam curing of concrete pipes may be permitted provided the requirement of pressure and non-pressure steam curing is fulfilled and pipes conform to the requirements of this specification.

WORKMANSHIP AND FINISH:

Pipes shall be straight and free from cracks excepting craze cracks. The ends of the pipes shall be square with their longitudinal axis so that when placed in a straight in the trench on opening between ends in contact shall exceed 3 mm in pipes up to 600 mm diameter (inclusive) and 6 mm in pipes larger than 600 mm diameter.



The outside and inside surface of the pipes shall be smooth, dense and hard and shall not be coated with cement wash or other preparation unless otherwise agreed to between the purchaser and the manufacture or supplier. For better bends inner surface of the collar may be finished rough.

The pipes shall free from defects resulting from imperfect grading of the aggregate mixing or molding. Pipes shall be free from load bents or bulges greater than 3.00 mm in depth and extending ever a length in any direction greater than twice the thickness of barrel. Pipes may be repaired, if necessary, because of accidental injury during manufacture or handling and shall be accepted if in the opinion of the Corporation the repairs and mold and appropriately finished and cured and the repaired pipe forms to the requirements of this specification.

Deviation from Straight : The deviation in straight in any pipe throughout its effective length, tested by means of rigid straight edge parallel to the longitudinal axis of the pipe shall not exceed, for all diameters 3 mm for every meter run.

TESTING:

All pipes for testing purpose shall be selected at random from the stock of the manufacturer and shall be such as would not otherwise be rejected under this standard.

At production of each lot of pipe of each diameter the testing shall be done for each lot of pipes as per I.S. 3597-1998 & 458-2021.

- (A) The number of test specimens shall be taken as per table No.1 The following test shall be carried out for each lot.

(1) Three-edge bearing test or load test.

(2) Hydrostatic test.

(3) Dimensions.

(4) Workmanship & finish.

- (5) **Three edge bearing test or load test:**

Load shall be taken as per table-2

1.1 Apparatus:

- 1.1.1 Testing Machine: - Any mechanical or hand-powered device may be used in which the head that applies the load moves at such a speed as to increase the load at a uniform rate of approximately 200 percent of the expected crushing load per liner meter per minute. The loading device shall be calibrated within an accuracy of + / - 2 percent. The testing machine used for the load tests should produce a uniform deflection throughout the full length of the pipe and shall be so substantial and rigid throughout, that the distribution of the test load along the length of the barrel of the pipe will not be appreciably affected by the deform or yielding or any part of the machine during the application of the load lower and upper bearing shall be as per I.S. 3597-1998.

- 5.4.4 The equipment shall be so designed that the load will be distributed about the centre of the overall length of all pipe. The load may be applied either at a single point or at multiple points dependent on the length of the pipe being tested and the rigidity of the test frame.

1.1.3 Procedure :

The specimen shall be placed on the two bottom bearing strings in such a manner that the pipe rests firmly and with the most uniform possible bearing on each strip for the full length of the pipes less the socket portion, if any.



If mutually agreed upon by the manufacturer and the Corporation prior to the test, before the pipe is placed, a fillet of plaster of Paris not exceeding 25 mm in thickness may be cast on the surface of the upper and lower bearings. The width of the fillet cap, top or bottom, shall be not more than 25 mm per 300 mm diameter, but in no case less than 25 mm. .LM 10

1.1.3.2 Each end of the pipe at a point mid-way between the lower bearing strips shall be marked and then diametrically opposite points thereof shall be established. The top bearing block shall be so placed that it contracts the two ends of the pipe at these marks. After placing the specimen in the machine on the bottom strips, the top bearing shall be symmetrically aligned in the testing machine. Load shall be applied at the rate indicated in 1.1 until either the formation of a 0.25 mm wide crack or ultimate strength load, as may be specified, has been reached. If both the 0.25 mm crack and ultimate load are required, the specified rate of loading need not be maintained after the load at 0.25 mm crack has been determined.

1.1.3.3 The 0.25 mm crack load is the maximum load applied to the pipe before a crack having a width of 0.25 mm measured at close intervals, occurs throughout a length of 300 mm or more. The crack shall be considered 0.25 mm in width when the point of the measuring gauge penetrates 1.5 mm at close intervals throughout the specified distance of 300 mm. The ultimate load will be reached when the pipe will sustain no greater load.

1.1.3.4 **Calculation:** The crushing strength in Newton per linear meter of pipe shall be calculated by dividing the total load on the specimen by the nominal laying length.

NOTE: - In most machines the total load will include the dead weight of the top bearing plus the load applied by the loading apparatus.

2. HYDROSTATIC TEST:

2.1 **Test Specimen:** The specimens for determination of leakage under internal hydrostatic pressure shall be sound surface dry and full-size pipe.

2.2 Procedure:

2.2.1 The pipe shall be supported in such a way so that the longitudinal axis is approximately horizontal and the exterior surface excepting the supports can be examined readily.

2.2.2 The equipment for making the test shall be such that the specimen under test can be filled with water to the exclusion of air and subjected to the required hydrostatic pressure. Apply hydrostatic pressure to the whole pipe including the portion of socket and rebated joints that is subjected to pressure in the "as laid" condition.

2.2.3 The specimen shall be filled with water and the air expelled. Pressure shall be applied gradually the inside of the pipe until the specified test pressure is reached. The test pressure shall be maintained for 2.5 seconds per millimeter thickness of the pipe.

2.2.4 The specimen under test shall show no signs of leakage either in the barrel or socket. Moisture appearing on the surface of the specimen in the form of patches shall not be considered as leakage. If during the test, beads of water appear on the specimen for an additional period equal to the initial period required for the test and the specimen shall be accepted if the beads do not grow on run.

2.3 The NP3 and NP4 class R.C.C. Pipes shall be capable of withstanding a test pressure of 0.7 Kg/Sq.cm. (7.0 m head)

3. DIMENSIONS:

3.1 Pipes :- The internal diameter, wall thickness and length of barrel and collar of pipes, the minimum reinforcements and strength test requirements for the six classes of pipe shall be as specified in Table-2. For collar jointed pipes, effective length shall be 2 mt or 2.50 mt. up to 250



mm nominal diameter pipes and 2.5, 3.0, 3.5 or 4.0 mt. for pipes above 250 mm nominal diameter.

3.2 Tolerances: - The following tolerances shall be permitted:

Dimensions	Tolerances
(A) Overall length	: +/- 1 percent of standard length.
(B) Internal diameter of pipes or socket	
1) Up to and including 300 mm	: +/- 3 mm
2) Over 300 mm and up to and including 600 mm.	: +/- 5
3) Over 600 mm and up to and	: +/- 7 mm including 1200 mm.
4) Over 1200 mm	: +/- 10 mm
I Barrel wall thickness	
1) Up to and including 30 mm	: + 2 mm - 1 mm
2) Over 30 mm and up to and including 50 mm.	: - 1.5 mm + 3 mm
3) Over 50 mm and up to and including 65 mm.	: + 4 mm - 2.5 mm
4) Over 65 mm and up to and including 80 mm.	: + 6 mm - 3 mm
5) Over 80 mm and up to and including 95 mm.	: + 6 mm - 3 mm
6) Over 95 mm	: + 7 mm - 3.m mm

(4) SAMPLING AND INSPECTION:

- (A) LOT : In any consignment, all the pipes of same class, same size and belonging to the same mix of concrete shall be grouped together to constitute a lot for ascertaining the conformity of material to the requirements of this specification, samples shall be tested for each lot separately.

The No. of pipes to be selected from the lot shall depend on size of the lot and shall be according to the table below.

SCALE OF SAMPLING AND PERMISSIBLE NUMBER OF DEFECTIVES

No. of pipes in lot	FOR REQUIREMENTS UNDER 3 & 4		SAMPLE SIZE FOR TEST EXCLUDING ULTIMATE LOAD TEST
	Sample size	Permissible Number of defectives	
Up to 50	8	0	2
51 to 100	13	1	3
101 to 300	20	2	5
301 to 500	32	3	7
500 and above	50	5	10

(B) NUMBER OF TESTS AND CRITERIA FOR CONFORMITY:

- All the pipes selected according to above table shall be inspected for dimensional requirements, finish and deviation from straight. A pipe failing to satisfy one or more of these requirements shall be considered as defective.
- The lot shall be declared as conforming to these requirements if the number of defectives found in the sample does not exceed the number of defectives given in Col.3
- The lot having found satisfactory shall be further subjected to the tests except ultimate load test for this purpose, the number of pipes given in Col.4 of above table shall be selected from the lot.

(5) MARKING:

The following information be clearly marked on each pipe.



- (a) Class of pipe.
 (b) Date of manufacture and
 I Name of manufacturer or his registered trade mark or both.
 (d) Dia of pipe.

The above information shall be clearly marked on outside only for pipes up to 350 mm and including 350 mm internal diameter and both outside and inside for pipes above 350 mm internal diameter.

Design and strength test requirements of concrete pipes of class NP3.

Reinforced concrete – Medium duty Non-pressure pipes.

Nominal Internal Diameter of pipes	Barrel wall thickness	Reinforcement			Strength test requirements for three edge bear test	
		Longitudinal mild steel or hard drawn steel		Spiral hard drawn Kg./ Linear meter		
		Minimum	Kg/Linear meter		Load to produce 0.25 mm crack Kn/Linear	Ultimate load Kn/Linear meters
1.	2.	3.	4.	5.	6.	7.
80	25	6	0.59	0.17	13.00	19.50
100	25	6	0.59	0.24	13.00	19.50
150	25	6	0.59	0.49	13.70	20.55
200	30	6	0.59	0.68	14.50	21.75
225	30	6	0.59	0.86	14.80	22.20
250	30	6	0.59	1.05	15.00	22.50
300	40	8	0.78	1.53	15.50	23.25
350	75	8	0.78	1.58	16.77	25.16
400	75	8	0.78	1.60	19.16	28.74
450	75	8	0.78	1.90	21.56	32.34
500	75	8	0.78	1.97	23.95	35.93
600	85	8 or 6 + 6	1.18	2.82	28.74	43.11
700	85	8 or 6 + 6	1.18	4.87	33.53	50.30
800	95	8 or 6 + 6	2.66	6.87	38.32	57.48
900	100	6 + 6	2.66	11.55	43.11	64.67
1000	115	6 + 6	2.66	15.70	47.90	71.85
1100	115	6 + 6	2.66	20.42	52.69	79.00
1200	120	8 + 8	3.55	24.74	57.48	86.22
1400	135	8 + 8	3.55	46.21	67.06	100.60
1600	140	8 + 8	3.55	65.40	76.64	114.96
1800	150	12 + 12	9.36	87.10	86.22	129.33
2000	170	12 + 12	9.36	97.90	95.80	143.70
2200	185	12 + 12	9.36	133.30	105.38	158.07



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2400	200	12 + 12	14.88	146.61	114.96	172.44
2600	215	12 + 12	14.88	175.76	124.54	186.81

NOTE : 1 : The actual internal diameter is to be declared by the manufacturer and the tolerance is to be applied on the declared diameter.

NOTE : 2 : The longitudinal reinforcement given in this table is valid for pipes up to 2.5 mt effective length for internal diameter of pipe up to 250 mm and upto 3 mt. effective length for higher diameter pipes.

NOTE : 3 : Concrete for pipes above 1800 mm nominal diameter shall have a minimum compressive strength of 35 N/Sq.mm. at 28 days.

NOTE : 4 : If mild steel is used for spiral reinforcement, the weight specified in col.5 shall be measured to 140/125.

NOTE : 5 : Total mass of longitudinal reinforcement shall be calculated by multiplying the value given in Col. By the length of pipe and then deducting for the cover length provided at the two ends.

Design and strength test requirements of concrete pipes of class NP4.

Reinforced concrete – Heavy duty Non-pressure pipes.

Nominal Internal Diameter of pipes	Barrel wall thickness	Reinforcement			Strength test requirements for three edge bear test	
		Longitudinal mild steel or hard drawn steel		Spiral hard drawn Kg. / Linear meter	Load to produce 0.25 mm crack KN/Linear	Ultimate load KN/Linear meters
		Minimum	Kg/Linear meter			
1.	2.	3.	4.	5.	6.	7.
80	25	6	0.59	0.26	22.10	33.15
100	25	6	0.59	0.37	22.10	33.15
150	25	6	0.59	0.76	23.30	34.95
200	30	6	0.59	0.88	24.60	36.90
225	30	6	0.59	1.11	25.20	37.80
250	30	6	0.59	1.35	25.50	38.25
300	40	8	0.78	1.53	26.40	39.60
350	75	8	0.78	1.61	29.80	44.70
400	75	8	0.78	1.97	33.90	50.90
450	75	8	0.78	3.36	36.90	55.30
500	75	8	0.78	5.56	40.00	61.20
600	85	8 or 6 + 6	2.34	8.50	46.30	69.40
700	85	8 or 6 + 6	3.44	12.78	52.20	78.30
800	95	8 or 6 + 6	3.44	16.72	59.30	89.10
900	100	6 + 6	3.44	20.92	66.30	99.40

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1000	115	8 + 8	6.04	26.70	72.60	108.90
1100	115	8 + 8	6.04	38.02	80.40	120.60
1200	120	8 + 8	6.04	46.25	88.30	132.40
1400	135	8 + 8	9.36	59.20	99.10	148.65
1600	140	12 + 12	9.36	86.60	109.90	164.85
1800	150	12 + 12	14.88	103.30	120.70	181.05
2000	170	12 + 12	14.88	125.28	131.50	197.25
2200	185	12 + 12	14.88	154.94	142.20	213.30
2400	200	12 + 12	14.88	181.25	155.00	232.50
2600	215	12 + 12	14.88	208.25	166.70	250.00

NOTE : 1 : The actual internal diameter is to be declared by the manufacturer and the tolerance is to be applied on the declared diameter.

NOTE : 2 : The longitudinal reinforcement given in this table is valid for pipes up to 2.5 mt effective length for internal diameter of pipe up to 250 mm and upto 3 mt. Effective length for higher diameter pipes.

NOTE : 3 : Concrete for pipes above 1800 mm nominal diameter shall have a minimum compressive strength of 35 N/Sq.mm. At 28 days.

NOTE : 4 : If mild steel is used for spiral reinforcement, the weight specified in col.5 shall be measured to 140/125.

NOTE : 5 : Total mass of longitudinal reinforcement shall be calculated by multiplying the value given in Col. By the length of pipe and then deducting for the cover length provided at the two ends.



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DESIGN REQUIREMENTS OF REINFORCED CONCRETE COLLARS FOR PIPES OF NP3 AND NP4 CLASS

Nominal Internal Diameter of pipes	COLLAR DIMENSIONS			REINFORCEMENTS		
	Minimum caulking space	Minimum thickness	Minimum Length	Longitudinal or hard drawn Minimum Nos.	Mild steel weight Kg/ collar	Spiral hard drawn steel Kg/ Collar
1.	2.	3.	4.	5.	6.	7
80	13	25	150	6	0.08	0.07
100	13	25	150	6	0.08	0.08
150	13	25	150	6	0.08	0.10
200	13	25	150	6	0.08	0.12
225	13	25	150	6	0.08	0.14
250	13	25	150	6	0.08	0.16
300	16	30	150	8	0.11	0.22
350	19	32	200	8	0.15	0.40
400	19	32	200	8	0.15	0.50
450	19	35	200	8	0.15	0.60
500	19	35	200	8	0.15	0.70
600	19	40	200	8	0.23	1.05
700	19	40	200	8	0.23	1.85
800	19	50	200	8	0.23	2.05
900	19	50	200	8	0.33	2.25
1000	19	55	200	8	0.33	3.09
1100	19	65	200	8	0.33	4.11
1200	19	75	200	12	0.50	5.08
1400	19	80	200	12 or 8 + 8	0.67	6.55
1600	19	90	200	12 or 8 + 8	0.67	9.00
1800	19	100	200	12+12	1.00	12.15
2000	19	110	200	12+12	1.00	13.30

NOTE : 1 : Collars for sizes 2200 mm and above shall be made out of mild steel plate of 6 mm thickness, steel conforming to IS:226-1975 with outside painted.

NOTE : 2 : If mild steel is used for spiral reinforcement, the weight specified in Co.7 shall be increased by factor 140/125.

NOTE : 3 : Soft grade milds steel wire for spirals may be used for collars of pipes of internal diameter up to 150 mm only by increasing weight by a factor 140/84.



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DESIGN AND STRENGTH TEST REQUIREMENTS OF PIPES OF CLASS NP2 REINFORCED CONCRETE LIGHT-DUTY, NON-PRESSURE PIPES.

Internal Diameter of pipe	Barrel Dimension		Collar Dimension			Longitudinal mild steel at permissible stress of 1.265 Kg/SQ. Ca.	Spiral		Strength test requirement			
	Length	Minimum thickness	Minimum caulking	Minimum thickness	Minimum length		A Hard drawn steel wire at permissible stress of 1400 Kg/Sq.cm	Soft grade mild steel wire at permissible stress of 840 Kg/Sq.cm	Load to produce crack	ultimate load	Load to produce crack (Sand bearing test)	Ultimate load
1	2	3	4	5	6	7	8	9	10	11	12	13
m	mm	m	m	m	mm	Kg/ Liner m	Kg/ Liner m	Kg/ Liner m	Kg/ Liner m	Kg/ Liner m	Kg/ Liner m	Kg/ Liner m
80	2.0	25	13	25	150	0.863	0.083	0.138	1.040	1.560	1.560	2.340
100	2.0	25	13	25	150	0.863	0.166	0.277	1.040	1.560	1.560	2.340
150	2.0	25	13	25	150	0.863	0.219	0.365	1.040	1.560	1.560	2.340
200	2.0	25	13	25	150	0.863	0.710	-	1.040	1.710	1.560	2.565
225	2.0	25	13	25	150	0.863	0.710	-	1.040	1.710	1.560	2.565
250	2.0	25	13	25	150	0.863	0.710	-	1.040	1.710	1.560	2.565
300	2.0 or 2.5 or 3.0	30	16	30	150	1.00	1.295	-	1.200	1.800	1.800	2.700
350	2.0 or 2.5 or 3.0	32	16	32	150	1.00	1.750	-	1.200	1.800	1.800	2.700
400	2.0 or 2.5 or 3.0	32	16	32	150	1.00	2.250	-	1.360	1.040	2.040	3.060
450	2.0 or 2.5 or 3.0	35	19	35	200	1.00	2.750	-	1.480	2.220	2.220	3.330
500	2.5 or 3.0	35	19	35	200	1.25	3.220	-	1.660	2.490	2.490	3.735
600	2.5 or 3.0	40	19	40	200	1.25	4.90	-	1.900	2.850	2.850	4.275
700	2.5 or 3.0	40	19	40	200	1.78	6.05	-	2.100	3.150	3.150	4.725
800	2.5 or 3.0	45	19	45	200	1.78	9.10	-	2.300	3.450	3.450	5.170
900	2.5 or 3.0	50	19	50	200	1.78	11.35	-	2.500	3.750	3.750	4.625
1000	2.5 or 3.0	55	19	55	200	2.50	13.50	-	2.650	4.020	4.020	6.030

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120 0	2.5 or 3.0	65	19	65	200	2.50	18.20	-	2.8 80	4.320	7.320	6.48 0
140 0	2.5 or 3.0	75	19	75	200	3.36	22.60	-	2.9 80	4.470	4.70	6.70 5
160 0	2.5 or 3.0	80	19	80	200	3.36	28.30	-	2.9 80	4.470	4.470	6.70 5
180 0	2.5 or 3.0	92	19	90	200	3.36	36.00	-	2.9 80	4.470	4.470	6.70 5

NOTE :- If steel wires are used as longitudinal reinforcement, the weight specified in Column 7 shall be modified by a factor 1 265/1 400.

NOTE :- If mild steel is used for spiral reinforcement, the weight specified under Column 8 shall be increased to 1 400/1 265.

NOTE :- Use of soft grade mild steel wire for spiral reinforcement is not recommended for pipes of internal diameter larger than 150 mm.



TERMS AND CONDITIONS OF CONTRACT FOR SUPPLYING NP3 AND NP4 CLASS SPIGOT SOCKET FLUSH TYPE RUBBER RING JOINTS R.C.C. PIPES AND SPECIALS

1. The pipes and special mentioned in Schedule 'B' attached herewith shall be delivered on site as shown by the Executive Engineer, Drainage Department or stacked in the Company's premises till required by the Executive Engineer, Drainage Department.
2. The rates per meter for the supply of pipes of different categories shall include the cost of necessary collars requires to be supplied along with each pipe length and specials. The collars shall be machine moulded. Hand molded collars shall not be accepted.
3. The company will have to make their own arrangement for procuring steel and wire etc. required for the said works. The company shall neither claim any rise in rates due to any causes whatever for the supply of pipes and specials mentioned in schedule under Para (1) Nor shall the Municipal Corporation claim and reduction in rates for the same due to any causes whatsoever.
4. The pipes etc. shall manufactured to the I.S. specification 458- 2021 with the latest amendments of 1991.
5. At production of each lot of pipe of each size, the Contractor shall send the letter of offer for testing of pipes of Executive Engineer, Drainage Department. The authorized representative of Executive Engineer, Drainage Department shall test the pipes as per I.S. 3597-1998 & I.S. 458-2021 with latest amendments.
6. The Contractor shall use the reinforcement as specified in I.S. 458-2021 with latest amendment. 2% of the pipes may be broken to ascertain the weight of steel and if not found in accordance with I.S. Specification the whole lot shall be rejected or the payment shall be made at the reduced rate as settled by the Commissioner, S.M.C. The cost on the pipe broken for inspection shall be born by the Contractor in any case.
7. The successful tenderer shall deposit a sum equal to 2% of the tendered amount with the Surat Municipal Corporation for due fulfillment of various terms and conditions of contract and the same shall be returned to the company on presentation of certificate from the Executive Engineer, Drainage Department that the terms and conditions of the contract has been fulfilled.
8. If the company do not abide by any of the terms of the agreement, the Municipal Corporation will have the right to cancel the contract by giving 15 days' notice and the amount of 2% of Security Deposit shall be forfeited to the Municipal Corporation for the breach of the contract. The company shall further be liable to pay extra cost that right be incurred by the Municipal Corporation for the purchase of pipe and specials from any other source.
9. The Municipal Corporation is at liberty to curtail the quantity of pipes of each category as per the requirements.
10. The pipes shall have to be supplied within the time as shown in Memorandum (Failing which the Municipal Corporation shall be at liberty to penalty clause. The time limit shown in memorandum status from the date of placing order.



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TABLE-14: SPIGOT AND SOCKET DIMENSIONS OF NP2 AND NP3 CLASS PIPES (RUBBER RING ON JOINT) FROM 80 TO 900 MM DIAMETER

Pipe dia.	Rubber ring chart dia.	Rubber ring int. dia.	T	RS	DS	DS1	DS2	DS3	R	LS D	K	N	LT	HT	LSP	P	S	H	X	W	RI
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
80	11	102	25	32.5	70	8	28	34	3	5.5	6.5	95	84	34	50	7	5.5	19.5	1	1	5.5
100	11	120	25	32.5	70	8	28	34	3	5.5	6.5	95	84	34	50	7	5.5	19.5	1	1	5.5
150	11	170	25	32.5	70	8	28	34	3	5.5	6.5	95	84	34	50	7	5.5	19.5	1	1	5.5
200	11	230	30	38	83	11	38	34	5	6.5	6.5	113	97	39.5	50	7	5.5	24.5	1	1	5.5
225	11	255	30	38	83	11	38	34	5	6.5	6.5	113	97	39.5	50	7	5.5	24.5	1	1	5.5
250	11	275	30	38	83	11	38	34	5	6.5	6.5	113	97	39.5	50	7	5.5	24.5	1	1	5.5
300	12	340	40	51	90	12	42	36	6	7	7	130	130	53	55	7.5	6	34	1	1	6
350	16	435	75	75	120	16	56	48	8	10	10	158	135	78	72	10	8	67	2	2	8
400	16	480	75	75	120	16	56	48	8	10	10	158	135	78	72	10	8	67	2	2	8
450	16	525	75	75	120	16	56	48	8	10	10	158	135	78	72	10	8	67	2	2	8
500	16	570	75	75	120	16	56	48	8	10	10	158	135	78	72	10	8	67	2	2	8
600	20	625	85	85	150	20	70	60	10	12	12	193	153	88.5	90	12	10	75	2	2	10
700	20	765	85	85	150	20	70	60	10	12	12	193	153	88.5	90	12	10	75	2	2	10
800	20	875	95	95	150	20	70	60	10	12	12	197	171	98.5	90	12	10	85	2	2	10
900	20	970	100	100	150	20	70	60	10	12	12	200	180	103.5	90	12	10	90	2	2	10
900	20	970	100	100	150	20	70	60	10	12	12	200	180	103.5	90	12	10	90	2	2	10

ALL DIMENSIONS IN MILIMETERS

NOTE:-

1. Corners to be rounded off.

2. The dimensions DS2, DS3, LSP, IS, T, H, S, HT and K shall conform to the values given in this table as these are critical dimensions. Other dimensions are for guidance only. The following tolerance shall supply on the critical dimensions.

Dimensions

Tolerances

T and GT same as that of barrel wall thickness given in 8.2

TS and H half the tolerance on barrel wall thickness given in 8.2

DS2, DS3, The tolerance, in mm shall be as given below:

K & S

Chard Diameter	DS2	DS3	LSP	K	S
10	12	+/-3	+/-4	+/-1.25	+/-0.75
12	12	+/-3	+/-4	+/-1.25	+/-0.75
16	12.5	+/-3	+/-4	+/-2.00	+/-1.25
20	13	+/-3	+/-4	+/-2.25	+/-1.55



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TABLE-17: SPIGOT AND SOCKET DIMENSIONS OF NP3 / NP4 CLASS PIPES FROM 1000 TO 2600 MM DIAMETER

(RUBBER RING CONFINED JOINT)

ALL DIMENSIONS IN MILLIMETRES

Pipe Dia-meter	Rubber ring chart dia-meter	Rubber ring internal diameter	T	TS	LS	LSI	K	LSP	a	b	j	H	i	l	Id
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1100	20	920	115	58.0	114	20	13	114	25	28	39	42	4	9	1100
1100	20	1009	115	58.0	114	20	13	114	25	28	39	42	4	9	1202
1200	20	1095	120	60.5	114	20	13	114	25	28	39	44.5	4	9	1307
1400	25	1275	135	67.5	114	20	16	114	25	35	42.5	50	4	10	1520
1600	25	1445	140	72.5	114	25	16	114	25	35	42.5	50	4	10	1720
1800	25	1620	150	77.5	114	25	16	114	25	35	42.5	55	4	10	1930
2000	25	1810	170	87.5	114	25	16	114	25	35	42.5	65	4	10	2150
2200	25	1995	185	95.0	114	25	16	114	25	35	42.5	72.5	4	10	2365
2400	25	2180	200	102.5	114	25	16	114	25	35	42.5	87.5	4	10	2580
2600	25	2360	215	110.0	114	25	16	114	25	35	42.5	87.5	4	10	2995

NOTES:

1. Corners to be rounded off.
2. The dimensions LS, LSP, TS, T, H, L, b and K shall conform to the values given in this table as these are critical dimensions. Outer dimensions are for guidance only. The following tolerance shall apply on the critical dimensions.

Dimensions Tolerances

LS and LSP +7 mm

T Same as that of barrel wall thickness given in 8.2

H and TS Half the tolerance on barrel wall thickness given
In 8.2

L +0.5 MM

b +1 mm for 28 mm and +1.5 mm for 35 mm

K +1.75 mm for 20 mm rubber ring chord dimensions

+2.5 mm for 25 mm rubber ring chord dimensions

TABLE-20 WEIGHT OF SPIRALS (HARD DRAWN STEEL) IN SOCKET OF R/R JOINT R.C.C. PIPES OF DIFFERENT CLASSES (Kg. /Number)

Internal diameters of pipes

Internal diameters of pipes	NP2 Class	NP3 Class	NP4 Class	P1 Class	P2 Class	P3 Class
1.	2.	3.	4.	5.	6.	7.

80	0.08	0.08	0.08	0.08	0.08	0.08
100	0.09	0.09	0.09	0.09	0.09	0.09
150	0.12	0.12	0.12	0.12	0.12	0.15
200	0.14	0.14	0.21	0.14	0.21	0.35
225	0.15	0.15	0.26	0.15	0.26	0.43
250	0.16	0.16	0.31	0.16	0.31	0.51
300	0.45	0.45	0.53	0.45	0.53	0.84
350	0.51	0.64	0.64	0.51	0.74	1.24
400	0.56	0.71	0.71	0.56	0.99	1.66

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450	0.63	0.76	0.76	0.63	1.23	2.26
500	0.68	0.87	1.08	0.68	1.57	2.85
600	0.81	1.00	2.12	1.52	2.88	4.74
700	0.92	2.16	3.02	1.79	3.96	6.79
800	1.14	2.87	4.67	2.04	6.28	9.99
900	1.50	4.06	6.03	2.63	8.29	--
1000	1.91	--	--	3.33	1.29	--
1100	2.34	--	--	4.08	--	--
1200	2.84	--	--	4.90	--	--
1400	3.82	--	--	--	--	--
1600	5.64	--	--	--	--	--
1800	7.25	--	--	--	--	--
2000	11.78	--	--	--	--	--
2200	12.88	--	--	--	--	--

NOTES:

1. Longitudinal reinforcement shall be proportional to be the length of socket cage as given in Tables 2 to 11.
2. If mild steel is used for spiral reinforcement, the weight specified above shall be increased to 140/125.



SPECIFICATION FOR RUBBER RINGS FOR SEWERS: INDIAN STANDARD: 5382-1985

1. SCOPE:

- 1.1 This standard prescribes the requirements for materials used for vulcanized solid rubber sealing rings for drainage system, drain pipes, sewers and rainwater pipes, all at ambient temperature including gas connections. It covers joint rings for all pipe line materials including iron, steel, stoneware, asbestos cement concrete, pitch fiber, plastics and glass reinforced plastics.

2. TYPES:

- 2.1 This standard covers six types of pipe joint rings, namely, 1 to 6. These correspond to the respective nominal hardness of 40, 50, 60, 70, 80 and 88 IRHD.
- 2.2 Sealing rings having two different types of rubber are permitted.

3. REQUIREMENTS.

- 3.1 Material: The rubber shall be free from extractable substances which impart taste, odour of toxicity of water.
- 3.2 The rings shall be homogeneous, free from porosity, grit, excessive blooms, blisters or other visible surface imperfections.
- 3.3 Stretch Test: Stretch gaskets till the circumference is increased by 50 percent, then visually inspect for the following.
- 3.3.1 Gaskets shall be made of a properly vulcanized virgin rubber compound containing no scrap or reclaim.
- 3.2.2 The surface of the gasket shall be smooth free from pitting cracks, blisters, air marks, and any other imperfection that may affect its behavior in service. The body of the gasket shall be free from porosity and air pockets.
- 3.4 Unless otherwise specified, the materials shall be black.
- 3.5 Dimensions and Tolerances – All the dimensions and tolerances shall be as agreed to between the purchaser and the manufacturer/supplier.
- 3.6 Physical Requirements:
- 3.6.1 Hardness: Hardness when determined in accordance with Micro test method described in IS: 3400 (Part-I)-1980 (Methods of test for vulcanized rubber: Part-2 Hardness.). Hardness when determined in accordance with micro test method described in IS-3400 (Part-II) 1980 shall comply with the requirements given in Table-1. If the Dimensions of the ring are appropriate than 'Normal Test Method' specified in IS3400 (Part-II) 1980 may be used provided that the 'Micro Test Method' is used for reference purpose.
- 3.6.2 Tensile Strength and Elongation at Break: Determined by the method described in IS:3400 (Part-1)-1977 [Methods of test for vulcanized rubber: Part-1 Tensile stress-strain properties (first revision)].



- 3.6.3 Compression Set: Determined by the method described in IS: 3400 (Part-10)-1977. [Methods of test for vulcanized rubber: Part-10 Compression set at constant strain (first revision)]
- 3.6.4 Accelerated Ageing in Air: By the oven method described in IS-3400 (Part-4)-1983, the changes in hardness, tensile strength and elongation at break after ageing shall comply.
- 3.6.5 Water Immersion: Determined according to the method given in IS-3400(Part-6)-1983 after 7 days immersion in neutral water Ph 7 at 70°C.
- 3.6.6 Cold Resistance: When cooled in a chamber described in Appendix-B (IS-5382-1985), the increase in hardness, measured after 7 days at – 10°C, from the initial hardness, shall comply with the requirements given in as per IS.
- 3.6.7 Water Absorption: Sealing rings shall not absorb more than 10 percent (m/m) of water when tested according to the method prescribed in relevant IS.

4. MARKING:

- 5.4 Each sealing ring or packing or both shall be marked indelibly with:

- (5) The manufacturer's name or trademark, if any.

- (b) The month and year of manufacture; and

- I The type following by a word, such as 'Gas' or 'Water' or 'Sewers' depending on the application for which they are intended.

- 5.4.4 Each sealing ring or packing or both may also be marked with the Standard Mark.

Note: The use of the standard mark is governed by the provisions of the Bureau of Indian Standards Act 1986 and the Rules and regulations made there under. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing, and quality control which is devised and supervised by BIS and operated by BIS for conformity to that standard as a further safeguard. Details of conditions under which a license for the use of the Standard Mark may be obtained from the Bureau of Indian Standards.

5. PACKING:

- 5.1 The material shall be packed as agreed to between the purchaser and the supplier so as to protect them from undue exposure to light and heat and mechanical damages during transit and storage.

6. SAMPLING:

- 6.1 Scale of Sampling and Criteria for Conformity: For the purpose of ascertaining conformity to this standard the scale of sampling and criteria for conformity shall be as prescribed as per relevant I.S.

7. TIME LAPSE BETWEEN RECEIPT OF MATERIAL AND TESTING:

- 7.1 For all the test purposes, the minimum time between vulcanization and testing shall be 16 h.



7.1.1 For product tests, whenever possible, the time between vulcanization and testing should not exceed 4 months. In other cases, tests shall be made within 2 months from the date of receipt of the product by the customer.

8. TEST PIECE:

8.1 Wherever possible, for all tests, test pieces shall be cut from the finished article. Where this is not possible, the manufacturer shall provide test slabs from the same batch of rubber and vulcanized to the same degree and in the same manner as that of the rubber from which the sealing rings have been manufactured.

8.1.1 Wherever it is not possible to cut standard test piece from the rings, for determination of tensile strength and elongation at break, test piece as shown in drawing shall be used with the rate of traverse of moving grip as 15 cm/min.

APPENDIX-C

(Clause 3.7.8)

WATER ABSORPTION

C.1 PROCEDURE:

C.1.1 From the finished ring cut a piece of about 3 g. Weight it accurately. Put in 150 ml of distilled water. Boil under reflux with air condenser for 168 hours. Remove the piece and weigh again after surface water layer is dried up.

C.2 CALCULATION:

C.2.1 Calculate the water absorption as follows:

M₂ - M₁

Water absorption, percent by mass = $\frac{M_2 - M_1}{M_1} \times 100$

M₁

Where

M₁ = original mass in g of the test piece before immersion in water and

M₂ = mass in g of the test piece after immersion in water.

For prescribed limit see-3.6.7

APPENDIX-D

(Clause 6.1)

SAMPLING AND CRITERIA FOR CONFORMITY:

D.1 SCALE OF SAMPLING:

D.1.1 Lot – In a consignment all the sealing rings of the same type, dimensions, design and manufactured from the same type of rubber under essentially similar conditions of production shall be grouped together to constitute a lot.



D.1.2 Samples shall be selected and tested from each lot separately for ascertaining its conformity or otherwise to the requirements of this specification.

D.1.3 The number of sealing rings to be selected at random from a lot for different tests shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table-3

TABLE-3 SCALE OF SAMPLING AND PERMISSIBLE NUMBER OF DEFECTIVES

No. of sealing rings in the lots	For dimensions and finishing defects (see 3.2 and 3.3)		No. of tests for each characteristic for hardness, tensile strength, elongation compression test set, water absorption and stretch tests	No. of tests for each characteristic for ageing and water immersion test (Table:1 & 2)
	Sample size	Permissible No. of defective		
Upto 100	5	0		
101- 150	8	0	3	1
151 – 300	13	0		
300 – 500	20	0		
501 – 1000	32	1	5	2
1001 and above	50	3	8	3

D.1.3.1 The rings to be selected from the lot shall be chosen at random. In order to ensure the randomness of selection, random number tables shall be followed. In case random number tables are not available, the rings may be selected from the lot in the following manner:

Starting from any ring in the lot, the rings shall be counted as 1.2.....r and so on in one order, where r is the integral part of N/n (N and n being the lot size and sample size respectively). Every ring thus counted shall be withdrawn to constitute the sample.

D.1.3.2 If the rings are packed in bundles, at least 10 percent of the bundles shall be opened and the required number of rings shall be selected by taking approximately equal number of rings at random from each of the bundle.

D.2 NUMBER OF TEST AND CRITERIA AND CONFORMITY:

D.2.1 All the sealing rings selected according to D.1.3 shall be examined for dimensions and finishing defects. Any ring failing in one or more of these characteristics shall be considered as defective. If the number of defectives found in the sample is less than or equal to the corresponding permissible number given in col-3 of Table-3, the lot shall be declared as conforming to these requirements, otherwise not.

D.2.1.1 In the case of those lots when have been found unsatisfactory according to D.2.1 all the sealing ring may depending upon the agreement between the purchaser and the supplier, be inspected for these characteristics and the defective ones removed.

D.2.2 The lot having been found satisfactory for workmanship and dimensions according to D.2.1 shall then be examined for hardness, tensile strength, elongation strength, swelling, water absorption and compression characteristics. The number of tests to be conducted for such of



these characteristics is given in col-4 of Table-3. For this purchase, required number of rings shall be selected at random from those already selected under D.1.3 and if necessary, from the lot. For each of the characteristics the various tests shall be conducted on independent test pieces. The lot shall be declared as satisfactory if the medium value of the test results of compression characteristic satisfies the relevant requirements and for the remaining characteristics none of test fails.

D.2.3 The lot which has been found satisfactory according to D.2.2 shall then be subjected to relevant ageing and oil immersion tests. The number of independent tests to be conducted for each of the characteristics is given in col-5 of Table-3. For this purpose, required number of rings shall be selected from those which have been tested and found satisfactory under D-2.2. The lot shall be declared satisfactory with respect to ageing characteristic if none of the test fails.

ITEM NO.8:

Providing and constructing Sewer machineholes, scraper machine holes and unit house connection chamber, as per the type design in brick masonry in C. M. 1:5 and inside and outside 20mm thick plastering in C. M. 1:3 necessary 100 mm coping with reinforcement in R.C.C.M.200 fixing C. I. steps and fixing machine hole frame and covers (But excluding supply of machine hole frame and covers) over machine holes and house connection chambers and fixing machine hole covers (but excluding supplying of machine hole covers) over scraper machine hole etc. complete, providing and fixing safety chain wherever necessary as per the stipulations in the type design complete as per latest CPHEEO manual.(excl. excavation).

MATERIALS:

Water shall conform to M-1, Cement Conform to M-3, Stone course aggregate of 20 mm nominal size shall conform to M-12, Grit shall conform to M-8, and Steel reinforcement shall conform to M-18-19. Fly ash brick shall conform to M-15A, Cement mortar of specified proportion shall conform to M-11.

Machine hole cover with frame of required size and weight shall be procured by the contractor.

WORKMANSHIP:

The machine hole of different types and sizes as specified shall be constructed in sewer line at such place and to such levels and dimension as shown in drawing or as directed.

Excavation :- The excavation for construction of machine hole including dismantling of all types of roads surface guarding, barricading, lightening the trenches, dewatering if required, removing and replacing, shifting of telephone/electric cables, pipeline etc. and all other safety provisions like shoring and strutting etc. till refilling of trenches and completion of machine hole construction, stacking of excavated stuff within the specified lead, back filling of selected excavated earth, watering and consolidation etc. complete shall be carried out as per relevant specification of item No.1.

Concrete work :- The bed concrete in C.C. 1:3:6, Coping in C.C. 1:1.5:3 and benching concrete and in proportion c.c. 1:2:4 (1 Cement : 2 coarse sand : stone aggregate of 20 mm nominal size) by volume with necessary centering and shuttering work shall be mixed. Placed deemed and or vibrated and cured as directed by Engineer-in-charge.

REINFORCEMENT:

All the reinforcement bars shall be accurately placed in exact position shown on the drawings and shall be security held in position during placing of concrete by annealed No. 1 binding work not less than 1 mm is size and by using stay block or metal chair spacers, metal hangers, supporting wires or other approved devices it sufficiently close intervals. Bars shall not be allowed to bag between



supports nor displaced during concrete of any other operation of the work. 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.

Bars shall be bend cold to specified shape and dimensions or as directed, attain proper radius of bends, Bars shall not be bent or straightened in a manner that will injure the materials. Bars bend during transport of handling shall be straightened before being used on the work. Unless otherwise specified for mild steel a 'U' type hook at the end of each bar shall invariably be provided to main reinforcement.

In case 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 cold twisted steel bars shall be used or without hooks at the ends. Deformed bars without hooks shall however, comply with relevant anchorage requirements.

Bars crossing each other where required shall be secured by binding wires (annealed) of size not less than 1 mm in such a manner that they do not slip over each other at the time of fixing and concreting.

As far as possible bars of full length shall be used. In case this not possible over lapping of bars shall be done as directed. The overlaps shall be staggered for different bars and located at points along the span where either shear not bending moment is maximum.

When permitted or specified on the drawings joints of reinforcement bars shall butt welded so as to transmit their full stresses. Welded joints shall preferably 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. It shall be ensured that no voids are left in welding and when welding is done in two or three stages, previous surface shall be cleaned properly. Ends of the bars shall be cleaned of all loose scale, rust, grease, paint and other foreign matter before welding. Only competent welders shall be employed on the work.

BRICK MASONRY WORK:

Before masonry is to be laid on concrete footing the top of concrete shall be cleaned and moistened. The contractor shall obtain the Engineer's approval for one foundation, bed, before foundation masonry is started.

Wetting of Bricks: The brick required for masonry shall be thoroughly wetted with clean water for amount two hours before use or as directed. The cassation of bubbles, when the bricks are wetted with water is an indication of through wetting of bricks.

Brick shall be laid in English bond unless directed otherwise. Half or out bricks shall not be used except when necessary to complete to bond. Closers in such case shall be cut to required size and used bear the ends of walls.

A layer of mortar shall be spread on full width for suitable length of the lower course; each brick shall first be properly bedded and set home by gently tamping with handle of trowel or wooden mallet. It's inside face shall be flushed with mortar the next brick is laid and pressed again it. On completion of course, the vertical joints shall be fully sealed from the top with mortar.

The wall shall be taken up truly in plumb. All corners shall be laid truly horizontal and all vertical joint shall be truly vertical. Vertical joints in alternate course shall generally be directly one over the other. The thickness of brick course shall be kept uniform.



The brick shall be laid with from up wards. A set of tools comprising of wooden straight edges, monsoon spirit level, square half meter rub, and pins string and plumb shall be kept on the site of work for frequent checking during the progress of work.

Both the faces of walls of thickness greater than 23 cms. Shall be kept in proper place. All the connected brick work shall be kept not more than one meter over the rest of the work. Where this is not possible the work shall be raked back according to bond (and not left toothed) at an angle not stopper than 45 degrees.

All fixtures like pipe inlet and outlet of water C.I. Steps, machine hole cover and frame etc. which are required to be built in wall shall be embedded in cement mortar.

Brick shall be so laid that all joints shall not expose 12 mm. The face joints shall be raked out as directed by raking tool daily during the progress of work, when the mortar in still green so as to provided key for plaster or pointing to be done.

For the face of brick work, plastering is to be done joints shall be raked out to a depth not less than thickness of joints. The face of brick work shall be cleaned and mortar dropping removed on very same day that brick work is laid.

PLASTER WORK:

The surface shall be cleaned of all dust, loose mortar droppings, traces of algae efflorescence and other foreign mortar by water or by brushing. Smooth surface shall be roughened by wire brushing of it is not hard any by backing 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 surface where necessary shall be carried out to get an even surface.

The work shall be soaked but only damped evenly before applying the plaster. If the surface become dry, such areas shall be moistened again.

The plaster about 15 x 15 cms. Shall be first applied horizontally and vertically at not more than 2 meters intervals over the entire surface to serve as gauge. The surface of these gauges shall be truly in plane of the finished plastered surface. The mortar shall than 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 float accordingly excessive troweling of over working the float shall be avoided. All corners, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chambering corners, arises junctions etc. shall be carried out with proper templates the size required.

Cement mortar for plaster shall be used within half an hour after addition of water. And mortar for plaster which is partially set shall be rejected and removed forthwith from the site.

In suspending the work at the end of the day, the plaster shall be left out clean to the line both horizontally and vertically, when recommencing the plaster the edge of the old work shall be scraped clear and wetted with cement putty before plaster is applied to the adjustment areas to enable the two to properly together. Plastering work shall be closed at the end of the day on the body of the wall and nearer than 15 cm. to any corners or arises. It shall not be closed on the body of features such as plaster bends and cornices not at the corners or arises. Horizontal joints in plaster work shall not also occur on walls and copings these invariably lead to leakage. No portion of the surface shall be left out initially to be packed up latter on.

**POINTING:**

The flush pointing work shall be carried out with mortar of required proportion by volume before pointing to be started the joints shall be raked to such depth that the average of new mortar measured from eight the sunk surface of the finished pointing or from the edge of the brick shall be average 10 mm.

The mortar shall be pressed in to the raked out joints with a pointing trowel according to the type of pointing specified in item. The mortar shall not spread over the corner finished with the fixing of C.I. Steps and M.H. cover pointed tools.

FIXING OF POLY PROPYLENE STEPS AND MACHINEHOLE COVER:

During the construction of masonry wall of the machine hole the cement mortar of required proportion shall be used for embedding the Poly propylene steps in the wall masonry. The spacing of steps in the masonry shall be 300 mm centre to centre in the staggered position in the vertical direction with two staggered rows at 385 mm centre to centre in the horizontal direction the top of the machine hole shall not be more than 300 mm above the benching and the centre line of two staggered rows shall be the centre line of the shorter side of machine hole frame in the roof of chamber.

The detailed specifications for the "Poly propylene steps as below:

The Polypropylene conforming to an ASTM D-4101, injection molded around a 12 mm dia. IS 1786 grade Fe-415 steel reinforcing bar and should meet the load required 225 Kg. as per IS-5455. The measurement should be as per attached drawing. The tolerance in the length and width is +/- 5 mm and +/- 1 mm in thickness. The weight of the steps should not be less than 0.900 Kg.

Unchequered portion of the step shall be inserted with the risk cement mortar during the course of masonry work so constructed around the steps as to keep the step on its right position. The non-slip grap chaquered portion of the steps shall be well kept outside the masonry.

During fixing of the steps, the shall not be damaged and shall not vibrate or shall not shake during ascents and decants otherwise they shall have to be re fixed correctly as per the drawings or as mentioned above.

Machine hole frame shall be firmly and securely laid on top of shafts of conical tops in 25 mm thick cement mortar and shall be embedded in 150 mm the cement concrete of proportion 1:2:4 (1 Cement : 2 coarse sand : 4 Kapachi as aggregate of 20 mm nominal size) in such a way that the top of M.H. frame shall be flush with concrete surface and top surface neatly finished 25 mm thick with cement mortar 1:3 in conformity with ground or road levels.

OTHER REQUIREMENTS:

As per line and level and size of the machine hole pit shall be excavated as per drawing or as ordered by the Engineer.

The foundation concrete 1:3:6 with required thickness as per drawing or as directed shall be laid after compacting the bottom of the pit. The cement concrete shall conform to specified specification of Cement Concrete.

The clear inside chamber size of opening shall be as per the drawing or as directed by the Engineer-in-charge.

The masonry wall shall be plastered inside with 15 mm thick 1:3 cement mortar and outside with flush joint. The off set for the concrete foundation shall be 100 mm on all sides beyond walls of chamber.



Whenever pipes enter or leave the masonry chamber bricks on edge must be so laid around the upper half of the pipes so as to form the arch to prevent the weight of the masonry chamber over it.

On the top of masonry walls 1:1 cement mortar shall be laid and then R.C.C. slab of grade 1:2:4 necessary and as directed by the Engineer with coarse aggregate of trap metal of 20 mm nominal shall be laid necessary from work and centering shall have to be provided by the contractor at his own cost as per relevant specification of cement concrete.

In the bottom of machine hole the channel and benching shall be done in C.C. 1:2:4 (1 Cement : 2 Coarse sand : 4 graded stone aggregate of 20 mm nominal size) rising at a step in line from edge of the channel, the channel of the bottom of the chamber shall be plastered 15 mm thick in c.m. 1:3 (1 Cement : 3 fine sand) and steel trowel smooth.

Channels shall be in semi-circular in the bottom half and a diameter equal to the sewer. Above the horizontal diameter, the side shall be extended vertically to the same level as the crown of the outgoing pipe and the top edge shall be suitably rounded off. The branch channels shall also be similarly constructed with respect to the benching but at their junctions with the main channel an appropriate fall suitably rounded off in the direction of flow in the main channel shall be given.

For conical shaft of machine hole necessary conical portion shall be treated from 750 mm below the bottom of concrete of slab for fixing of machine hole cover and frame.

The item includes curing of all the cement work for 14 days.

MODE OF MEASUREMENTS & PAYMENTS:

Payment shall be made on the basis as per number of masonry machine holes chambers constructed with all constructing materials labours, refilling curing, finishing providing and fixing C.I. steps constructing laying half round gutter fixing R.C.C. machine hole cover etc. complete in all respect for incomplete item. Payment will be made on part rate basis.

The item will be paid per No. of construction of complete masonry machine hole chamber as shown in the drawing up to the depth specified and shown in the type design drawing. For every increase or decrease in the minimum specified depth of masonry machine hole chamber increase or decrease in rate shown in schedule B will be given taking in the construction every 10 CM increase or decrease depth of masonry chambers. For the purpose of payment of masonry chamber every increase or decrease of the 10 cm depth than the specified minimum depth of masonry machine hole chambers as shown in drawing, an extra increase or decrease payment of rupees as mentioned in Schedule-B will paid more or deducted for every 10 cm depth.

The measurements shall be made for such number of chambers construction. The surplus excavated stuff shall be disposed of within a radius of 10 Kms. As directed by Engineer-in-charge without any extra claim.

The depth of machine holes shall be the distance between the top machine hole cover and the invert level of the main drain. The rate includes all labours, materials, tools and plant etc. required for satisfactory completion of this item as directed above.

The item include :-

- i. Bed concrete slab concrete and copping with necessary reinforcement.
- ii. Necessary brick work with cement plaster inside and outside completely.
- iii. Providing and fixing polypropylene steps.



- iv. Carting, conveying and fixing of machine hole frame cover with necessary concrete and finishing.
- v. Refilling with necessary watering and consolidation.
- vi. Curing for 14 days.

ITEM NO.9:**Providing and Fixing in position R.C.C. ventilating column as per drawing****Materials:**

Water shall conform to M-1, Cement shall conform to M-3, Coarse Sand shall conform to M-6, Brick shall be conforming to M-15 and Reinforcement shall conform to M-18 and M-19, stone coarse aggregate of 20 mm nominal size shall conform to M-12, grit shall conform to M-8.

Workmanship:

The item covers construction of ventilating shaft of size 100 mm Dia inside opening and 200 x 200 mm outer dimension at top and 100 mm Dia inside opening and 250 mm x 250 mm outer dimension at bottom in Cement concrete 1:1.5:3 (1 Cement: 1.5 Coarse sand: 3 graded stone aggregate of 20 mm nominal size). Bedding concrete in C.C. 1:2:4 (1Cement: 2 coarse: sand: 4 graded stone aggregate of 20 mm nominal size). The shaft should stand vertical in proper line level as per direction of Engineer-in-charge. The shaft shall be connected with sewer machine hole by R.C.C. NP3 Class pipe of 100 mm dia. The item completed as per attached drawing of ventilating shaft. It should be colored as per the Instruction of Engineer-in-charge.

For different works the following specification shall be followed.**FOR EXCAVATION WORK**

As per Item no. 3

FOR R.C.C. WORK IN C.C. 1:1.5:3 AND C.C. 1:2:4.

(Respective grade of concrete shall be read for different items.)

Mode of Measurement and Payment:

The rate includes of tools, plants, machinery, materials require for satisfactory completion of item as a whole venti. Column.

The payment shall be made a unit of per number.

ITEM NO.10:**Dewatering by pumping set of required capacity including temporary platform carting pumping at site and fixing the same in position including all accessories, and fuel and labour etc. complete.**

(Note :- This item shall only be executed when bailing out of drainage/subsoil water is more than 5 H.P.hour).

For dewatering of drainage water from storm line and subsoil water if any shall be diverted with the help of necessary tools, bibs, plants, equipment, diesel pump, fuel etc. All the equipment required for dewatering shall be provided operated and maintained by the contractor himself. The necessary suction and delivery pipe shall be of sufficient length to divert the sewage/subsoil water from the trenches.

The Contractor must repair the leakage joints of storm/private drainage as early as possible as per instruction of Engineer-in-charge.



The rate includes all the tools, plants, machineries, pipes, labour, fuel etc. require for satisfactory completion of this item.

The mode of payment shall be as per the H.P.hour of pump so run.

ITEM NO.11:

Coloured RCC Precast Machine hole Frame & Cover Manufacture, supply & Delivery at store or at site of work precast RCC M-40 Grade Frame & Cover suitable to drainage machine hole and as per type design & drawing including cost of reinforcement M.S. Angles or Flat, curing mould work etc.

(Considered specification Here attached page no 1 to 3)

(a) For Circular machine hole of I.S.I. Mark

(b) For Scraper machine hole.

(c) For House Connection Chamber light duty

(a) For Circular machine hole of I.S.I. Mark

Outer diameter	: -	860 mm
Thickness	: -	175 mm
Protection for edge	: -	25 x 25 x 3 mm M.S. angle shall be provided to project the edges of frame with anti-corrosive paints.
Clear Opening	: -	560 mm
Tolerance	: -	+/- 5 mm.
Heavy duty Cover (Circular)	: -	
Outer diameter	: -	715 mm
Thickness	: -	100 mm
Lifting hooks	: -	16 mm Tot Bar welded to the bottom with steel. It shall be easily and quickly opened with crow bars and pickaxes.
Protection for edge	: -	Same as for frame.
Design Load and carrying capacity :		35 M.T.
Tolerance	:	+/- 5 mm

NOTES:-

(i) Cover shall conform I.S. 12592 (Part-I 1988.)

(ii) Frame shall conform I.S. 12592 (Part-II 1991)

After production of each lot of machine hole frame and cover the contractor shall send the offer letter for testing of same to Drainage Engineer. The authorized representative of Drainage Engineer shall select the specimens of cover as per I.S. for the load test, which should be carried out at S.V.R. College of Engineering, Surat. The specimens of frame should be checked for its reinforcement which must be provided as per detailed drawings attached with tender. The cost for testing of machine hole cover and frame broken for inspection shall be borne by the contractor in any case.

(b) For Scraper machine hole.

DIMENSIONS FOR EACH SLEEPER :

Length (L) 1100 mm
 Breadth (B) 350 mm
 Thickness (T) 100 mm

Protection for edge: - 25 x 25 x 3 mm. M.S. angle shall be provided to protect the edges of sleeper and the four sides of sleeper shall be covered with 100 mm width M.S. strip having thickness 2 mm.

Clear Opening of
 Scraper machine hole : - 900 mm x 1200 mm
 Reinforcement : - As show in drawing.



Frame	:- Frame shall be made from 2 mm thick M.S. plate as shown in drawing.
Lifting Hooks	:- 16 mm M.S. bar welded to the bottom steel. It shall be easily and quickly opened with crow bars and pickaxes.
Design load and Carrying capacity	:- 25 M.T.

NOTES:-

- 1) After production of each lot of sleepers the contractor shall send the offer letter for testing of same to Engineer-in-charge. The authorized representative of Engineer-in-charge shall select the specimens of sleepers as per I.S. for the load test which shall be carried out at S.V.R. College of Engineering, Surat. The cost of testing of sleeper for inspection shall be born by the Contractor in any case.
- 2) 4% of the sleepers will be selected for load test and if the sample fails to carry the designed load, the whole lot shall be liable for rejection.
- 3) 25% of the prepared lot shall be selected for physical (for dimension and workmanship) testing. The tolerance given below shall be strictly followed.
Length – 1100 mm +/-5 mm
Width – 350 mm +/-3 mm
Thickness – 100 mm +/-2.5 mm
- 4) Each sleeper shall be marked with your of manufacturing and notation of SMC-DRG.

Mode of Measurement and Payment:

The mode of payment shall be as per No.

ITEM NO.12

Providing and filling Rubble including hand packing and filling interstices with quarry spalls behind abutment and between returns as directed.

Scope of Work:

The work covered under this specification includes all type of soling work either by bricks or by rubble stones laid under floors/foundations, hand packed, complete as per under mentioned specification and applicable drawings.

The rubble stone shall be of best variety of black trap/granite/basalt or other approved variety of stone available locally. The stone shall be hard, durable, free from defects and of required size and shall be approved by the Engineer-in-Charge before incorporation in the work.

Preparation of Surface:

The bed on which rubble soling is to be laid shall be cleared of all loose materials, levelled, watered and compacted and got approved by the Engineer-in-Charge before laying rubble soling. Cable or pipe trenches if shown in the drawing and as required by the Engineer-in-Charge shall be got done before the soling is started.

Workmanship:

Over the prepared surface, the stone shall be set as closely as possible and well packed and firmly set. The stones shall be of full height and shall be laid so as to have their bases of the largest area resting on the sub-grade. Soling shall be laid in one layer of 230 mm. or 150 mm. or other specified thickness



and no stones shall be less than 230 mm. or 150 mm. depth or specified thickness of soling with a tolerance of 25mm.

After packing the stones properly in position, the interstices between them shall be carefully filled with quarry spoils or stone chips of larger size possible, to obtain a hard, compact surface. Spreading of loose spoils or stone chips is prohibited.

The entire surface shall be examined for any protrusions and the same shall be knocked off by a hammer and all interstices shall be filled with approved murrum. Excess murrum if any over the surfaces shall be removed. Unless otherwise specified, the murrum shall be supplied by the contractor at his own cost from the selected areas. The surfaces shall then be watered and consolidated with mechanical or sufficiently heavy wooden tampers and log-rammers as approved by the Engineer-in-Charge to give the required slope or level and dense sub-base. After compaction, the surface shall present clean look. Adequate care shall be taken by the contractor while laying and compacting the rubble soling to see that concrete surfaces in contact with soling are not damaged.

Mode of Measurement and Payment

The payment shall be made for bedding the granular material as per drawings.

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

ITEM NO.13:

Shoring or timbering for trench with 50 mm thick planks and suitable size struts etc. complete.

GENERAL:

This item is applicable only when the trench having more than 1.50 mt. depth and if the sides of trenches cannot be sloped or stepped due to any reason and the Engineer-in-charge feel the necessity for safety of trench and adjacent property and traffic. The Contractor should have to take previous approval from Engineer-in-charge before commencing this item.

MATERIALS:

Sheeting, planks, Wales, struts etc. required for shoring and strutting shall be of approved quality of wood or structural steel as per requirements of IS-3764-1966.

WORKMANSHIP:

The Contractor before execution shall get approval of design of shoring from Engineer-in-charge. The shoring shall be of sufficient strength to resist side pressure and ensure safety from slips and below and to prevent damage to work and to prevent injury to persons. It shall be removed after getting permission of Engineer-in-charge, after all items for which it is required area completed. Shoring and strutting shall conform to IS – 3764 – 1966 or its latest version.

The sheeting shall be placed against the side of trench so that length of each piece of sheeting is vertical.

The sheeting shall be held securely in place against the Wales by ensuring that sheeting is kept firmly placed against the wall of the trench. Where the trench is excavated in loose, sandy or soft soil or soil which has been previously excavated or soil which is under hydrostatic pressure, each piece of sheeting shall be driven into the bottom of trench so has to be firmly held in place.

Where two or more pieces of sheeting are used one above another, the sheeting shall be so arranged that



the lower piece of sheeting overlap the lowest Wales supporting the pieces of sheeting next above next above it. These pieces of sheeting shall be firmly driven in to the soil and securely supported by Wales and struts as the trench is made deeper.

The Wales shall be supported parallel to the bottom or the proposed bottom of the trench. Each wale shall be supported on cleats spliced to the sheeting or by posts set on the Wales next below it and in the case of lowest wale on the bottom of the trench itself. Where necessary, wedges may be provided between a wale and sheeting is supports to that roughly uniform support is given to all individual pieces of sheeting.

Struts shall be horizontal and at right angles to the Wales of sheeting supported thereby. Struts shall be cut to the proper length required to fit in tightly between Wales, where necessary, the struts shall be held securely in place by wedges, driven between struts and the Wales. Struts shall be placed on cleats spliced or bolted to posts supporting Wales.

The sizes and spacing of sheeting, Wales's struts and wedges used for shoring and timbering for different depth shall conform the requirement of IS-3764-1966 or its latest version.

The extra width of excavation that may be deemed necessary for the purpose of shoring and strutting will be under-stood to be covered in the rate for item of shoring and strutting for drain side.

The contractor shall have to make all the necessary arrangements while removing shoring strutting. However, if contractor fails to remove the shoring strutting safely, the corporation shall not be responsible for any type of damages and contractor shall have to bear all the cost for the same and the corporation shall not pay any extra payment for the same.

MODE OF MEASUREMENTS AND PAYMENT:

The item includes all labours, materials, equipment, tools etc. complete for whole the period for satisfactory completion of the item.

No extra payment shall be given for extra excavation that required to shoring and strutting.

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

No payment shall be made to any wood which has been left out by the contractor while removing the shoring, strutting, etc.

ITEM NO.14

Refilling the pipeline trenches incl. ramming, watering, consolidating disposal of surplus stuff as directed within a radius of 3 km.

Workmanship

The earth to be used for filling shall be free from salts, organic or other foreign matter. All clods of earth shall be broken.

As soon as the work of pipe laying has been completed and measured the site of drain shall be cleared of all debris, brick bats, mortar droppings etc. and filling with earth in layers not exceeding 20 cms. Each layer shall be adequately watered, rammed and consolidated before the succeeding layer is laid. The earth shall be rammed with iron or wooden rammers where feasible and with the butt ends



of crow, bars, where rammer cannot be used. When filling reaches finished level, the surface shall be flooded with water for at least 24 hours and allowed to dry and then rammed and consolidated and then rammed and consolidated the finish level of filling shall be kept the shape intended to be given to road surface. In short after the refilling is done the settlement of the trench shall be sole responsibility of the Contractor only.

In case where Engineer-in-charge feels necessary the consolidation may be done by power rollers. The extent of consolidation required shall be specified or as directed.

The excavated stuff of the selected type shall be allowed to be used in filling the trenches and plinth. Under no circumstances black cotton soil be used for filling the plinth.

Mode of Measurements & Payments

The payment shall be made for filling in plinth and trenches. No deduction shall be made for shrinkage or voids, if consolidated as instructed above.

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

ITEM NO.15:

Providing and constructing rectangular brick masonry chamber for house connection as per type design in brick masonry in C. M. 1:3 including M-100 in foundation M-150 in benching inside plastering in C. M. 1:3 and outside plastering in C. M. 1:3 coping in M200 and fixing RCC precast machine hole frame and covers, but Excl. supply of machine hole and cover etc. complete excl. excavation.

LOCATION

House connection chambers shall be constructed at places approved by the Employer's Representative. In case of machine hole along the river or drain the top of Machine hole shall be raised to safe height above the highest flood level of river /drain as directed by E.I.C.

EXCAVATION

Excavation, shoring, dewatering etc. for the pits of machine holes,/ House connection chamber laying of pipes and fittings/specials shall be done in accordance with Employer's Requirements described elsewhere in the document.

PLAIN CEMENT CONCRETE:

The water, sand, cement & stone aggregate of 40 mm nominal size shall be used of approved quality as per standard specification in I.S. 456. Detail specification of materials as given in General Technical Specification shall be observed.

Workmanship:

Before starting concrete the bed of foundation trenches shall be cleared of all loose materials, leveled, watered and rammed as directed.

Mixing:

The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may however be allowed for smaller quality of work if approved by the Engineer-in-charge. When hand mixing is permitted by the Engineer-in-charge in case of breakdown of machineries and in the interest of the work, it shall be carried out on a water tight platform and shall be taken to ensure that mixing is continued until the mass is uniform in color and consistency. However, in such cases 10% more cement than otherwise required shall have to be used without any extra cost. The mixing in mechanical mixer shall be done for a period of 1.5 to 2 minutes. The quantity of water shall be just sufficient to produce a dense concrete of required workability for the purpose.

**Transporting and placing the concrete:**

The concrete shall be handed from the place of mixing to the final position in not more than 15 minutes by the method as directed and shall be placed into the final position, compacted and finished within 30 minutes of mixing with water i.e. before the setting commences.

The concrete shall be laid as per the drawing dimension.

Compacting:

The concrete shall be rammed rapidly with heavy iron rammers to get the required compaction and to allow all the interstices to be filled with mortar.

Curing:

After the final set, concrete shall be kept continuously wet, if required by pounding for a period of not less than 7 days from the date of placement.

BRICKS

Bricks used for construction of sewer machine holes shall conform to the relevant Indian Standards IS: 4883-1988. They shall be sound, hard, and homogeneous in texture, well burnt in kiln without being vitrified, table molded, deep red, cherry or copper colored, of regular shape and size and shall have sharp and square and parallel faces. The bricks shall be free from pores, chips, flaws or humps of any kind. Bricks containing ungrounded particles and/or which absorb water more than $1/6^{\text{th}}$ of their weight when soaked in water for twenty-four hours shall be rejected. Over burnt or under burnt bricks shall be liable to rejection. The bricks shall give a clear ringing sound when struck and shall have ^a minimum crushing strength of 50 kg/sq.cm. Unless otherwise noted in drawings. The class and quality requirements of bricks shall be as laid down in relevant IS.

The size of the brick shall be 23.0 x 11.5 x 7.5 cm. unless otherwise specified; but tolerance up to ± 3 mm in each direction shall be permitted. Only full size brick shall be used for masonry work. Brickbats shall be used only with the permission of Employer's Representative to make up required wall length or for bonding. Sample bricks shall be submitted to the Employer's Representative for approval and bricks supplied shall conform to approved samples. If required by the Employer's Representative, brick sample shall be tested as per IS: 3495 by Contractor. Bricks rejected by the Employer's Representative shall be removed from the Site within 24 hours.

CEMENT MORTAR

Mortar for brick masonry shall be prepared as per IS: 2250. Machine holes shall be constructed in brick masonry with cement mortar (1:3) unless otherwise specified. Gauge boxes for sand shall be of such dimensions that one bag containing 50 kg. of cement forms one unit. The sand shall be free from clay, shale, loam, alkali and organic matter and shall be of sound, hard, clean and durable particles. Sand shall be as approved by the Employer's Representative. If required by the Employer's Representative Sand shall be thoroughly washed till it is free of any contamination. For preparing cement mortar, the ingredients shall first be mixed thoroughly in dry conditions. Water shall then be added and mixing continued to give a uniform mix of required consistency. Cement mortar shall be used within 25 minutes of mixing. Mortar left unused in the specified period shall be rejected.

The Contractor shall arrange for tests on mortar samples if so required by Employer's Representative. Re-tempering of mortar shall not be permitted.

BRICK MASONRY

All bricks shall be thoroughly soaked in clean water for at least one hour immediately before being laid. The cement mortar for brick masonry work of machine holes shall be in the proportion specified in drawing. Brick work 230 mm thick and over shall be laid in English Bond unless otherwise specified. 115 mm thick brick work shall be laid with stretchers. For laying bricks, a layer of mortar shall be spread over the full width of suitable length of the lower course. Each brick shall be pressed into the mortar and shoved into final position so as to embed the brick fully in mortar. Bricks shall be laid with frogs uppermost.

All brickwork shall be in plumb and square/ circular unless otherwise shown on drawing and true to



dimensions shown. Vertical joints in alternate courses shall come directly one over the other and be in line. Horizontal courses shall be leveled. The thickness of brick courses shall be kept uniform. For walls of thickness greater than 230 mm both faces shall be kept in vertical planes unless otherwise specified. All interconnected brickwork shall be carried out at nearly one level (so that there is uniform distribution of pressure on the supporting structure) and no portion of the work shall be left more than one course lower than the adjacent work. Where this is not possible, the work shall be raked back according to bond (and not saw toothed) at an angle not exceeding 45 degrees. But in no case the level difference between adjoining walls shall exceed 1.25 M. Workmanship 2212.

Brick shall be so laid that all joints are well filled with mortar. The thickness of joints shall not be less than 6 mm and not more than 10 mm. The face joints shall be raked to a minimum depth of 12 mm by raking tools daily during the progress of work when the mortar is still green, so as to provide a proper key for the plastering to be done. When plastering is not required to be done, the joints shall be uniform in thickness and be struck flush and finished at the time of laying. The face of brickwork shall be cleaned daily and all mortar droppings removed. The surface of each course shall be thoroughly cleaned of all dirt before another course is laid on top. If mortar in the lower courses has begun to set, the joints shall be raked out to a depth of 12 mm before another course is laid.

CEMENT PLASTER

All joints in masonry shall be raked to a depth of 12 mm with hooked tool made for the purpose when the mortar is still green and in any case within 48 hours of its laying. The surface to be rendered shall be washed with fresh clean water free from all dirt, loose material, grease etc. and thoroughly wetted for 6 hours before plastering work is commenced. Concrete surfaces to be rendered will however be kept dry. The wall should not be too wet but only damp at the time of plastering. The damping shall be uniform to get uniform bond between the plaster and the wall.

The proportion of the cement mortar shall be as approved on relevant drawings. Cement shall be mixed thoroughly in dry condition and then just enough water added to obtain a workable consistency. The quality of water, sand and cement shall be as per relevant I.S. The mortar thus mixed shall be used immediately and in no case shall the mortar be allowed to remain for more than 25 minutes after mixing with water.

Curing of plaster shall be started as soon as the applied plaster has hardened enough so as not to be damaged. Curing shall be done by continuously applying water in a fine spray and shall be carried out for at least 7 days.

Water proof Plastering shall be done on inner face of brick masonry in cement mortar (1:3) and 20 mm thick unless otherwise specified with required water proofing compared.

Plastering work shall be carried out in two layers, to the inner face the first layer being 14 mm thick and the second layer being 6 mm thick. The first layer shall be dashed against the prepared surface with a trowel to obtain an even surface. The second layer shall then be applied and finished leaving an even and uniform surface, trowel finished unless otherwise approved by the Employer's Representative.

CEMENT CONCRETE CHANNEL

The channel for the machine hole or chamber shall be constructed in cement concrete of M15 grade. Both sides of the channel shall be taken up to the level of the crown of the outgoing sewer. They shall be benched up in concrete and rendered in cement mortar (1:1) of 20 mm thickness and formed to a slope of 1 in 12 towards the channel.

PIPE ENTERING OR LEAVING MACHINE HOLE/ HOUSE CONNECTION CHAMBERS

Whenever a pipe enters or leaves a machine hole chamber, bricks on edge must be cut to a proper form and laid around the upper end of the pipe so as to form an arch. All around the pipes, there shall be a joint of cement mortar (1:2) 13 mm thick between it and the bricks.

SCAFFOLDING



For brick work in M.H., single scaffolding shall be permitted. In such cases, the inner end of the horizontal scaffolding pole shall rest in a hole provided only in the header course for the purpose. Only one header for each pole shall be left out. Such holes for scaffolding shall, however, not be allowed in pillars/columns less than one meter in width, or immediately near the skew backs of arches. The holes left in masonry works for scaffolding purpose shall be filled and made good before plastering.

Precast Machine hole Frame & cover shall be fixed on machine hole chamber in RCC M 30 as provided in a drawing.

Deformed / TMT bars confirming to relevant IS of grade Fe 415 shall be used with RCC coping work for fixing M.H. frame & cover on M.H.

C.I. STEPS:

The steps as per detail specification shall be fixed in the fashion narrated in drawing. If required as per drawing.

Where the depth of invert of machine hole chamber exceeds 800 mm, steps of approved pattern shall be fixed in the brickwork at the interval of 300 mm vertically and staggered at 380 mm horizontally center to center with C.C. M15.

75 mm all round vata in C.M. 1:3 shall be provided at bottom of outer periphery of masonry work over foundation concrete as per drawing.

COPING:

Coping in M-20 shall be carried out on all sides of House Connection chamber for 100 in thickness. No reinforcement is required.

FIXING:

Frame and Cover brought as per the item no.2 schedule B1 checked for creakiness or any damages, damages frame and cover will be rejected and remove for the site. Frame shall be fixed on laid coping on wall after placing rich cement slurry over it so that frame shall be fixed tightly.

CURING:

All PCC, R.C.C., Brick masonry, plaster, etc. Shall be kept wet for seven days. During this period it shall be suitably protected from all damages.

Mode of Measurement & payment:

The measurement of House connection chamber will be taken on Number basis as per type design for specified depth up to 0.9 mt.

ITEM NO.16:

Making connection with the machine hole by boring hole on the masonry of machine hole and jointing pipe with cement mortar in prop. 1:2 inside as well as outside of existing machine hole carting etc. complete as directed by Engineer-in-charge.

Connection of drainage line with existing machine hole by boring hole in required size on the wall of existing machine hole. The hole on the wall of machine hole shall be in required size and in correct position as per gradient of line to be connected. An attention shall be taken that the whole section of masonry shall not be disturbed during boring of hole. Laying and joint of pipe in hole. The line shall be in required gradient and the pipe shall be jointed with cement mortar in proportion of (1:2) (here 1 Cement and 2 sand) cement mortar vata shall be done over the periphery of existing machine hole walls outside and inside in full length and width of wall hole after inserting pipe in wall. Curing shall be done at least up to 7 days as per instruction of Engineer-in-charge.

General:



The excavation for connection shall be carried out for full depth of bottom of line to be connected. The pipe to be connected shall be well in gradient. The care shall be taken for making bore hole that there shall not be the defect to walls of machine hole and benching work. After successful jointing the refilling shall be done in proper manner and in layers of 0.25 mts. Each layer shall be well consolidated before laying successive layer above it.

ITEM NO.17:

Providing and supplying ISI Standard R.C.C. pipes in standard lengths of following class and diameter suitable for rubber ring joints including all taxes, insurance, transportation, freight charges, octroi, inspection charges, loading, unloading, conveyance to departmental stores, stacking etc. One rubber ring should be supplied with each full length socketed pipe, cost included in rates below.

Lowering, laying and jointing R. C. C. pipes in of following diameters in proper position, grade and alignment at all level as directed by Engineer-in-charge including conveyance from stores to site of work, labour, giving hydraulic testing as per ISI code.

100 mm dia NP2

150 mm dia NP2

Specification same as Item No. 7

ITEM NO. 18

Providing and supplying in standard length ISI mark rigid unplasticized PVC pipes suitable for potable water with ring fit joint including cost of rings, as per IS specification no. 4985/1988 including all local and central taxes, transportation, freight charges, octroi, inspection charges, loading, unloading, conveyance to the departmental stores and including cost of jointing material etc. complete. 6 kg/cm²

Lowering, laying, fixing and jointing PVC/UPVC/CPVC pipes and specials of following class and diameter including cost of conveyance from stores to site of works including cost of labour, material, cement solvent, giving satisfactory hydraulic testing as per ISI code.

(A) 75 mm dia

(B) 110 mm dia

(C) 140 mm dia

(D) 200 mm dia

MATERIALS:

The specified dia. P.V.C. spigot and socket soil or waste pipe shall conform M-68-A.

WORKMANSHIP:

The P.V.C. spigot and Socket soil or water pipe shall be joint as per following procedure.

Cut the P.V.C. pipe with a fine to the saw to the required length pipe should be cut square.

Chamfer the edge of the pipe to be inserted at an angle of about 15 to about 1/3 rd. the wall thickness, using a coarse file.

Make sure the spigot and socket are the roughly clean and dry.

Insert the pipe into the socket without the seal ring and mark along the pipe, when it is fully inserted.

Fix the rubber ring into the groove without twisting it.

Apply jointing lubricant to the chamfered end of the pipe, up to the mark made on spigot or to the socket end of the fitting.



Push the pipe firmly into the socket till the gap between the mark on the spigot and socket is about 10mm to allow for thermal expansion.

The pipe clips should be spaced at intervals of no more than ten times the outside diameter of pipes for horizontal runs & for vertical lines are spaced at intervals of one meter to a maximum of two meters according to pipe diameter.

All entry to main stacks should be protected with minimum 50mm water seal trap. Wherever there is mixing of soil & waste lines.

Smoke just should be avoided, and test plug/ socket plug should be used for testing the lines.

All soil pipes shall be carried up above the roof and shall have a wire balloon guard or a cowl.

The ventilation pipe or shaft shall be carried out to a height of at least one meter above the outer covering of the roof of the building or in the case of windows in a gable wall or a dormer two meters above the top of the windows. In case of flat roof to which access for use is provided, it shall be carried out up to a height of at least one meter above the parapet or two meters measured vertically from the top of any windows or opening which may exist up to a horizontal distance of five meters from the vent pipe into such building and in no case shall be carried out to a height less than three meters.

Where ventilating pipes are carried in pipe shafts, the shafts, shall be of a minimum size of one meter. If the shafts are also used to give light and air to rooms, the ventilating pipes must be carried out to a horizontal distance at roof level not less than five meter from the site of the shaft.

The connection between the main pipe and branch pipes shall be made by using branches and bends with access doors for cleaning.

The waste from lavatories, kitchens basins, sinks, baths and other floor traps shall be separately connected to respective stacks of upper floors. The waste stack of lavatories shall be connected directly to main hole while the waste stack of other shall be separately discharged over gully trap.

MODE OF MEASUREMENTS & PAYMENT:

The length of pipe shall be measured including all fittings along its length in running meters correct to a centimeter. No allowance shall be made for the portion of pipe length entered in the sockets of the adjacent pipe or fittings.

The rate includes all labour and materials, tool and plant etc. required for satisfactory completion of this item.

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

ITEM NO.19:

Work of Temporary diversion of sewage by plugging the machine holes at upstream and downstream of the sewer stretches proposed to be replaced. The rubber plug required for the plugging the drainage line shall be procured by the contractor and the same shall be the property of contractor.

150mm-400mm sewer line

450mm-600mm sewer line

700mm-1200mm sewer line



This item includes Temporary diversion of sewage by plugging the machine holes at upstream and downstream of the sewer stretches proposed to be replaced. The rubber plug required for the plugging the drainage line shall be procured by the contractor and the same shall be the property of contractor.

Specification of the Savatech-Plug-High Performance Sewer Plugs

No	Specification	Plug Size mm	Plug Size mm	Plug Size mm
		150-400	450-600	700-1200
1	Dia of the Plug without air	192 mm	322 mm	472 mm
2	Length of the Plug	635 mm	865 mm	1185 mm
3	Maximum Pressure	3.9 bar	3.9 bar	3.9 bar
4	Working Pressure	3.0 bar	3.0 bar	3.0 bar
5	Thickness of the sleeve (if any)	5-10 mm	5-10 mm	5-10 mm
6	Weight of the Plug	3.0 kg 127antha127.	8.4 kg 127antha127.	17.3 kg 127antha127.
7	Type of the Material (Sleeve)	Kevlar Reinforced Rubber	Kevlar Reinforced Rubber	Kevlar Reinforced Rubber
8	Type of the Material (End fittings)	Reinforced cap with metal plates	Reinforced cap with metal plates	Reinforced cap with metal plates
9	Make & Brand of the Plug	Savatect Plugy	Savatect Plugy	Savatect Plugy

The contractor shall have to bring all the tools, tackles including the rubber plug to complete the item. This item includes plugging of the machine holes on the sewer stretches proposed to be replaced. Both upstream and downstream machine holes of the proposed stretch shall be plugged in such a way that replacement activity could be carried out in the safe manner. The detailed specification of plugging is provided here under.

The contractor shall not be allowed to enter a person / labour into sewer machine hole to plug it. The contractor shall have first demolished the top portion of the machine hole and shall have to make it open up to safe environmental conditions and then after taking all safety measures he may start the machine hole plugging activities. The contractor shall be paid per nos. of plugging made to machine holes.

ITEM NO. 20

Providing & Installation of barricades incl. supplying, painting, with fluorescent paint and fixing, CGI sheets 24 SWG of 1.80 m height & M.S. posts angle 40 x 40 x 5 mm at 2.0 m c/c and dismantling the same after completion of work as directed by Engineer – in – Charge.

Specification

1. It is to be provided near excavation for pipeline trenches and for machine holes. It is to be carried out on existing roads' where the traffic is of mixed character viz. slow and freight traffic including pedestrian, cyclists etc. for enclosing and confining the area of the actual construction, a module of 1.2m height GI sheet fixed on MS angle posts shall be provided to cover area of working.
2. The Rate Covers all Labour and supply of required material viz. GI sheets, MS post angle (40x40x5), at site. Erecting including digging hole in pavement structure and fixing MS posts in the existing ground by any stable and fixed devices, painting with different colour sheds as approved by engineer in charge, providing road sign boards with blinkers as may be directed by the Engineer-in-charge.

Mode of Measurement and payment

The rate shall be paid on the basis of sq.mt area as may be required height of enclosure used.

**ITEM NO.21**

Carting and Re carting of excavated earth from any site to required place as per requirement and directed by engineer in charge.

- (A) Up to 0.50 K.M.
- (B) 0.50 K.M. TO 1.00 K.M.
- (C) 1.00 K.M. TO 1.50 K.M.
- (D) 1.50 K.M. TO 2.00 K.M.
- (E) 2.00 K.M. TO 2.50 K.M.
- (F) 2.50 K.M. TO 3.00 K.M.
- (G) 3.0 K.M. TO 3.50 K.M.
- (H) 3.50 K.M. TO 4.00 K.M.
- (I) 4.00 K.M. TO 4.50 K.M.
- (J) 4.50 K.M. TO 5.00 K.M.
- (K) Above 5.0 K.M. & Up to 10.0 K.M.

Workmanship

The contractor has to convey the surplus excavated stuff from the site to the place within the Municipal limit should be dumped and/or spread in such a way as not to obstruct the path of vehicles but it should also make approach to lay the earth beyond that dump. Neither any excuse for difficulties for passing the vehicle over the dumped earth shall be allowed nor any extra charge will be paid to the contractor for the same.

The conveying of earth shall be done in such a manner that it should not cause any delay in the progress of the work.

During the conveying of the earth due care should be taken that the earth should not be misused or wasted. The contractor shall have arranged to collect the mis-spread earth with his own cost.

The earth should be loaded, unloaded and spread or dumped in the presence of the Engineer-in-charge or his representative.

Mode of Measurement & Payment

The conveyed earth shall be measured by the measurement of the conveying vehicles. The measurement shall be recorded by the Engineer-in-charge or his representative and shall be countersigned by the contractor or his representative in token of his acceptance.

The rate shall be for a unit of a cubic meter.

ITEM NO.22:

Preparation of as built drawing of pipeline laid under this work by showing location of each and every pipe in two dimension-horizontal and vertical with respect to GIS System along with invert levels of the pipeline with respect to the GTS benchmark in a detailed drawing in a scale of 1:400. The Contractor shall submit two sets of as built drawings periodically, without which the subsequent R.A. Bill of the work will not be processed payment purpose. On completion of the entire work the contractor shall submit as built drawings for the whole work in six (6) sets along with two (2) soft copies as directed by the Engineer-in-charge. The item includes all required equipment's, materials, manpower for execution of complete item.

Mode of measurement and payment:

Payment shall be made on K.M. Basis.

**ITEM NO.23:**

Drilling of various dia Horizontal borehole for watermain pipeline crossing under the road incl in all strata with required length incl providing and fixing of various dia M.S casing pipe with pushing etc complete for various dia without Watermain & with Providing and Fixing of MS Casing pipe of following diameter

824 mm dia OD 12 mm thickness

1232 mm dia OD 16 mm thickness

Manufacturing

Purpose: To be used as Casing Pipe for crossing.

Material of Construction: Mild Steel having grade designation 'E250' and quality 'BR' conform to IS 2062:2011.

Pipe Manufacturing: The pipe shall be factory manufactured from steel plates or strips by butt welding longitudinally or spirally. The weld shall be continuous and shall be ERW.

Size (Inside Diameters), mm: as specified in the Bill of Quantity.

Length: 2.00 m. +/- 10 mm.

Tolerances:

Out Side Diameter: + 1 %

Wall Thickness: + 10 %

Pipe ends: Plain

M. S. Pipe Pushing:

The Various dia pipe shall be carted by the contractor to the site of work from the store or factory.

All the equipment and machinery required for pushing of MS Pipe, shall be brought to the site by the contractor at his own cost.

Stacking of Materials

Each and every pipe shall be examined from inside and outside before laying. All pipes shall be sound and free from visible defects. Any damaged pipe shall be removed immediately from the site of work at the cost and risk of the contractor.

Laying pipeline by pushing

Before laying the pipe in the pit for pushing, the level as per L Section and plans shall be checked by Engineer-in-Charge.

The pipe shall be laid in dry condition. The pipe shall be lowered by means of tripod and chain pulley block. If, however wet condition is met with, it shall be made dry by dewatering at contractor's own expense. No extra payment shall be made for the same.

Before the commencement of pushing of pipeline, the level of pipe shall be checked to avoid any deviation in line and level. Pipes shall be pushed gently as per instruction of Engineer-in-Charge.

Contractor should adopt proper technique for pushing so as to minimize/prevent movement of track during pushing operation. The details of this technique along with past experience of use of this technique will be indicated by the tenderer in his bid.

**Measurement**

The measurement for laying and jointing pipes shall be on running meter of net length along the centerline of the pipeline

ITEM NO. 24: -

Demolition/Dismantling RCC work or masonry work in any part of nearby concrete structure including stacking of serviceable/useful material and disposal of un-serviceable material with all lead and lift.

(a) Brick masonry work

(b) RCC work

(c) Unreinforced c.c.

Definitions:-

Demolition :- The term 'Demolition' implies breaking up. This shall consist of demolishing work or part of work including all relevant items as specified or shown on the drawings.

Dismantling :

The item 'Dismantling' implies carefully removing without damage (up or down). This shall consist of dismantling one or more part of the building as specified or shown on the drawings.

General :**Precautions:**

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

The demolition shall always be planned before hand and shall be done in reverse order of the one in which the structure was constructed. The scheme shall be got approved from the Engineer-in-charge before stating the work.

Necessary propping, the shoring and or under pinning shall be provided for the safety of the adjoining work or property before dismantling and demolishing is taken up and the work shall be carried out the such away no damage is caused to the adjoining work or property. Wherever specified temporary enclosures or partitions shall also be provided.

Necessary precautions shall be taken to keep down the dust nuisance.

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 the ground (as not thrown) and then properly stacked as directed by the Engineer- in-charge.

Where fixing is done by nails, screws, bolts, rivets etc. dismantling shall be done by taking out the fixing with proper tools and not by tearing or ripping off.

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 by the Engineer-in-charge.

All unserviceable materials rubbish etc. shall be disposed off as directed by the Engineer-in-charge.

The contractor shall maintain/disconnect service temporary or permanent, if required.

Rates :



The rate shall include the cost of all labour involved and tools and in used in demolishing and dismantling including scaffolding. The rate shall also include the charge of or separating out serviceable and in serviceable materials and stacking the same on site or at any store of Surat Municipal Corporation as directed by Engineer-in-charge.

The rate shall also include for temporary shoring for the safety of portions not required to be pulled down or of adjoining property and providing temporary and providing temporary, enclosures or partitions, there considered necessary. Item also includes dismantling any kind of masonry R.C.C. work, flooring work, plaster work, sanitary work etc. complete.

The payment shall be made on cubic meter basis for complete item.

ITEM NO. 25:

Providing and Casting in situ mass cement concrete in grade M10 proportion 1:3:6 (1 cement :3-coarse sand: 6- graded stone aggregate of 40 mm nominal size) using granite quartzite trap metal of size 12mm to 25mm including consolidation curing etc. complete(Without Formwork)

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 design by preliminary tests. The proportion of the concrete mix shall be 1:3:6 [1 cement: 3 coarse sand: 6 graded stone aggregate 20 mm nominal size] by volume Concrete work shall have exposed concrete surface or as specified 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, 1:1:1, ½: 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, 1:2 for fine aggregate to coarse aggregate by volume but subject to and upper limit of 1:1½ & lower limit 1:3	34 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 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, limitations 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:

General: - The bars shall be kept in position by the following method:

In case of beam and slab construction, sufficient number of precast cover blocks in cement mortar 1:2 [1 cement 2 coarse sand] about 4 x 4 cms. Section of thickness equal to the specified cover shall be placed between the bars and shuttering as to secure and maintain the requisite cover of concrete over the reinforcement.

In case of cantilevered or doubly reinforced beams or slabs, the main reinforcing bars shall be held in position by introducing cabin spacers or supports bars at 1.0 to 1.2 meters centers.

In case of columns and wall, the vertical bars shall be kept in position by means of timber templates with slots accurately cut in them, the templates shall be removed after concreting has been done below it. The bars may also be suitably tied by means of annealed steel wires to the shuttering to maintain their position during concreting.

All bars projecting from pillars, columns, beams, slabs etc. to which other bars and concrete are to be attached or bounded to later on, shall be protected with a coat of thin neat cement grout, if the bars are not likely to be incorporated with succeeding mass of concrete within the following 10 days. This coat of thin neat cement shall be removed before concreting.

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. Meter Boxes of suitable sizes shall be used for measuring sand and aggregate. The size of the boxes [internal] shall be 35x25 cms. And 40 cms. Deep while measuring the aggregate and sand, the boxes shall be filled without shaking, ramming or hammering. The proportioning of sand shall be on the basis of its dry volume and in case of damp sand, allowances for 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 the ingredients of concrete before and after adding water. Mixing platform shall be so arranged that no foreign material gets mixed with concrete or 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 has 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 false work and forms as to their strength, alignment and general fitness but such inspection shall not relieve the contractor of his responsibility for the safety of men, machinery, materials and for results obtained. Immediately before concreting, all forms shall be thoroughly cleaned.

Centering design and its erection shall be got approved from the Engineer-in-charge. One carpenter with helper shall invariably keep present throughout the period of concreting. Movement of labour and other persons shall be totally prohibited for reinforcement laid in position. For access to different parts suitable mobile platform shall be provided so that steel reinforcement in position is not disturbed. For ensuring proper cover, mortar blocks of suitable size shall be cast and tied to the reinforcement. Timber, kapachi or metal pieces shall not be used for this purpose.

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 form work shall be cleaned and made free from standing water dust snow or ice immediately before placing of concrete. No concrete shall be placed in any part of structure until the approval of Engineer-in-charge.

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 meter when internal vibrators are used and not exceeding 0.30 meter 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 trucking or chutes are used they shall be kept close and used in such a way as to avoid segregation. When concreting has to be resumed on a surface which has hardened, it shall be roughened, swept clean, thoroughly wetted, and covered with a 13 mm thick layer of mortar composed of cement and sand in the same ratio as in the concrete mix itself, this 13 mm layers of mortar shall be freshly mixed and placed immediately before placing of new concrete. Where concrete has not fully hardened, all laitance shall be removed by scrubbing the wet surface with wire or bristle brushes, care being taken to avoid dislodgement of any particles, of coarse aggregate. The surface shall then be thoroughly wetted, all free water removed, and then coated with neat cement grout, The first layers of concrete to be placed on this surface shall not exceed 150 mm in thickness and shall be well rammed against old work, particular attention being given to corners and close spot.

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 30minutes 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. Masonry work over foundation concrete may be started after 48 hours of its laying but curing of concrete shall be continued for a minimum period of 14 days.

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
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1-5 Cmt.	1
6-15 Cmt.	2
16-30 Cmt.	3
31-50 Cmt.	4
51-and above	4+one additional Sample for each Additional 50 cmt. Or part 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 135antha135hh 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 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 form work. While fixing the time for removal of form work, due consideration shall be given to local conditions, character of the structure, the weather & other conditions that influence the setting of concrete and of the materials used in the mix. In normal circumstances [generally where temperatures are above 20°c] and where ordinary concrete is used forms may be struck after expiry of period specified in the Item No.4 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 soffit is removed, the concrete surface shall be exposed, where necessary in order to ascertain that the concrete has sufficiently hardened. Centering 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 joints, all cavities produced by the removal of form ties and all other holes and depression, honeycomb spots, broken edges or corners and other defects, shall be thoroughly cleaned, saturated with water and carefully pointed and rendered true with mortar of cement and fine aggregate mixed in the proportions used in the grade of concrete that is being finished and so as dry consistency as is possible to use. Considerable pressure shall be applied in filling and pointing to ensure thorough filling in all 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 reinforcement.

[a] Ends of dissimilar materials such as joints, beams, posts, girders, rafters, purline, trusses, corbels and steps etc. up to 500 sq.cm. in section.

[b] Opening up to 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 form work.

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

ITEM NO. 26

Providing & construction brick work using Fly Ash bricks having crushing strength not less than 35 Kg./sq.cm. in foundation & plinth in C.M. 1:6 (1 cement:6 sand) etc. comp. Foundation and plinth

5.4 MATERIALS

Water shall conform to M-1, Cement shall conform to M-3, Sand shall conform to M-6, Fly ash Bricks shall conform to M-15, Cement mortar shall conform to M-11.

2.0 WORKMANSHIP

2.1 Proportion: The proportion of cement mortar shall be 1:6 (1 cement, 6 fine sand) by volume.

2.2 Wetting of bricks. The bricks required for masonry work shall be thoroughly wetted with clean water for about two hours before use or as directed. The cessation of bubbles, when the bricks are wetted with water is an indication of thorough wetting of bricks.

2.3 Laying: Bricks shall be laid in English bond unless directed otherwise. Half or cut bricks shall not be used except when necessary to complete the bond. Closures in such case shall be cut to required size and used near the ends of the walls.

A layer of mortar shall be spread on full width for suitable length of the lower course. Each brick shall first be properly bedded and set home by gently tapping with handle of trowel or wooden mallet. Its inside face shall be flushed with mortar before the next brick is laid and pressed against it. On completion of course, the vertical joints shall be fully filled from the top with mortar.

The walls shall be taken up truly in plumb. All courses shall be truly horizontal and all vertical joint shall be truly vertical. Vertical joints in alternate course shall generally be directly one over the other. The thickness of brick course shall be kept in uniform.

The brick shall be laid with frogs up wards. A set of tools comprising of wooden straight edges,



Manson's spirit level, square half meter rub, and pins, string and plumb shall be kept on the site of work for frequent checking during the progress of work.

Both the faces of walls of thickness greater than 23 cms. Shall be kept in proper place. All the connected brick work shall be kept not more than one meter over the rest of the work. Where this is not possible, the work shall break back according to bond (and not left toothed) at an angle not steeper than 45 degrees.

All fixtures, pipes, outlet of water, hold fasts of doors and windows etc. which are required to be built in wall shall be 137antha137h in cement mortar.

2.4 Joints: Bricks shall be so laid that all joints are quite flush with mortar. Thickness of joints shall not exposed 12 mm. The face joints shall be raked out as directed by raking tool daily during the progress of work, when the mortar is still green so as to provide key for plaster or pointing to done.

The face of brick shall be cleaned the very day on which the brick work is laid and all mortar dropping removed.

2.5 Curing: Green work shall be protected from rain suitably. Masonry work shall be kept moist on all the faces for a period of seven days. The top of masonry work shall be kept well wetted at the close of the day.

2.6 Preparation of Foundation Bed : If the foundation is to be laid, directly on the excavated bed, the bed shall be leveled, cleared of all loose materials, cleaned and wetted before starting masonry.

If masonry is to be laid on concrete footing the top of concrete shall be cleaned and moistened. The contractor shall obtain the engineer's approval for the foundation bed, before foundation masonry is started. When pucca flooring is to be provided flush with the top to plinth, the inside plinth of set shall be kept lower than the outside plinth top by the thickness of the flooring.

2.7 Fixtures - The frames of doors, windows, cup-boards etc. shall be housed into the brick work at the correct location and level as directed. The heavy steel doors, window frames etc. shall be built in with brick work, but for ordinary steel doors and windows required opening for frames, hold-fasts etc. shall be left in the wall and frames 137antha137h later on in order to avoid damage to the frames.

2.8 Scaffolding – Necessary scaffolding shall be provided. The supports of the scaffolding shall be sound and strong tied together with horizontal pieces, over which the scaffolding plunks shall be fixed. Simple scaffolding shall be allowed normally. In this case scaffolding hole shall rest in hole header horizontal course only. Minimum number of holes shall be left in brick work for supporting horizontal scaffolding poles. The contractor is responsible for providing and maintaining sufficiently strong scaffolding so as to withstand all loads likely to come upon it.

2.9 Packing out of Joints – For the face of brick work, where plastering is to be done, joints shall be raked out to a depth not less than thickness of joints. The false of brick work shall be cleaned and mortar dropping removed on very same day that brick work is laid.

3.0 MODE OF MEASUREMENTS & PAYMENT:

3.1 The measurements of this item shall be taken for the brick masonry fully completed for limiting dimensions not exceeding those shown on the plans or as directed shall be final.



3.2 No deductions shall be made from quantity of brick work. No extra payment will be made for embedding in masonry holes in respect of the following items ---

- i. Ends of joints, beams, posts, girders, rafters, purlins, trusses, corbel, steps etc. where cross sectional area does not exceed 500 Sq.Cm.
- ii. Opening not exceeding 100 Sq.Cm.
- iii. Wall plate and bed plates, bearing of slab, chajjas, and like whose thickness does not exceed 10 Cms. And the bearing does not extend the full thickness of wall.
- iv. Drainage holes and recesses for cement concrete blocks to embed hold fasts for doors, windows etc.
- v. Iron fixtures; pipes up to 300 mm. dia. Hold fasts of doors and windows built into masonry and pipes etc. for concealed wiring.
- vi. Forming charges of section not exceeding 350 Sq.Cm. in masonry.
- vii. Apertures for fire places, shall not be deducted nor shall extra labour required to make splaying of jams, throating and making trenches over the aperture be paid for separately.

3.3 The rate shall be for a unit of the cubic metre.

ITEM NO. 27

Providing & Applying 15mm.th.cement plaster in single coat on brick/ concrete walls similar surfaces for plastering & finished even & smooth with a floating coat of cement slurry mixed with admixture of lime or neeru in required proportion etc. comp. in C.M 1:3 (1 cement: 3 sand) (A) For wall and similar surfaces -- Ground Floor

Materials

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

Workmanship

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.

Preparation of Background –

The surface shall be cleaned of all dust, loose mortar droppings, traces of algae, efflorescence 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.

Application of plaster

The plaster about 15 x 15 Cms. Shall be first applied horizontally and vertically at not more than 2 meters 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 or wooden float according as a smooth or a sandy granular texture is required. Excessive troweling or overworking the float shall be avoided. All corners, arises, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chamfering, corners, junctions etc. shall be carried out with proper templates to the size required.

Cement plaster shall be used within half an hour after addition of water. Any mortar or plaster which is partially set shall be rejected and removed forthwith from the site.

In suspending the work at the end of the day, the plaster shall be left out clean to the line both horizontally and vertically. When recommencing the plaster, the edges of the old work shall be scrapped clean and wetted with cement putty before plaster is applied to the adjacent areas to enable the two to properly join together. Plastering work shall be closed at the end of the day on the body of the wall and nearer than 15 cms. To any corners or arises. It shall not be closed on the body of features such as plaster bands and cornices not at the corners or arises. Horizontal joints in plaster work shall not also occur on parapet tops and copings as those in variably 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 matting or gunny bags on the outside of the plaster and keeping them wet.

Mode of Measurements & Payment

The rate shall include the cost of all materials, labour and scaffolding etc. involved in the operations described under workmanship.

All plastering shall be measured in square meters unless otherwise specified. Length, breadth or height shall be measured correct to a centimeter.

Thickness of the plaster shall be exclusive of the thickness of the key i.e. grooves or open joints in brick work, stone work etc. or space between laths. Thickness of plaster shall be average thickness with minimum 10 mm. at any point on this surface.

This item includes plastering up to floor two level.

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.



Soffits of stairs shall be measured as plastering on ceilings. Blowing soffits shall be measured separately.

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.

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.

In case of opening of area above 3 Sq.Mts. each deduction shall be made for opening but jambs, soffits and sills shall be measured.

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

ITEM NO. 28

Providing and 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) Foundation, footing, Base of columns and Mass concrete.

Materials

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

Workmanship

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.

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 retarded 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.

Application of plaster

The plaster about 15 x 15 Cms. Shall be first applied horizontally and vertically at not more than 2 meters 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 or wooden float according as a smooth or a sandy granular texture is required. Excessive troweling or overworking the float shall be avoided. All corners, arises, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chamfering, corners, junctions etc. shall be carried out with proper templates to the size required.

Cement plaster shall be used within half an hour after addition of water. Any mortar or plaster which is partially set shall be rejected and removed forthwith from the site.

In suspending the work at the end of the day, the plaster shall be left out clean to the line both horizontally and vertically. When recommencing the plaster, the edges of the old work shall be scrapped clean and wetted with cement putty before plaster is applied to the adjacent areas to enable the two to properly join together. Plastering work shall be closed at the end of the day on the body of the wall and nearer than 15 cms. To any corners or arises. It shall not be closed on the body of features such as plaster bands and cornices not at the corners or arises. Horizontal joints in plaster work shall not also occur on parapet tops and copings as those in variably 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.

Mode of Measurements & Payment

The rate shall include the cost of all materials, labour and scaffolding etc. involved in the operations described under workmanship.

All plastering shall be measured in square meters unless otherwise specified. Length, breadth or height shall be measured correct to a centimeter.

Thickness of the plaster shall be exclusive of the thickness of the key i.e. grooves or open joints in brick work, stone work etc. or space between laths. Thickness of plaster shall be average thickness with minimum 10 mm. at any point on this surface.



This item includes plastering up to floor two level.

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.

Soffits of stairs shall be measured as plastering on ceilings. Blowing soffits shall be measured separately.

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.

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.

In case of opening of area above 3 Sqmt. each deduction shall be made for opening but jambs, soffits and sills shall be measured.

The rate shall be for a unit of one Sqmt.

ITEM NO. 29

**Providing & fixing IS Mark TMT Bar FE 415 reinforcement for R.C.C. work incl. bending, binding & placing in position etc. comp. Up to G.L./P.L.
MATERIALS**

Mild steel bars shall conform to M-18 Thermo Mechanically Treated steel bars (high yield strength steel deformed bars) shall conform to M-19, Mild steel binding wires shall conform to M-21.

WORKMANSHIP

The work shall consist of furnished 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 accurately to the dimensions given in the bar bending schedules shown on relevant drawings. Bars shall be bent cold to specified shape and dimensions or as directed, using a proper bar bender, operated by hand or power to attain proper radius of bends, bars shall not be bent or straightened in a manner that will injure the material. Bars bent during transportation or handling shall be straightened before being used on the work. They shall not be heated to facilitate bending. Unless otherwise specified for mild steel a “U” type hook at the end of each bar shall invariably be provided to main reinforcement. The radius of the bend shall not be less than straight part of the bar beyond the end of the curve shall be at least four times the diameter of the bar. In case which are not round and in case of deformed bars, the diameter shall be taken as the diameter of the circle having an equivalent effective area. The hooks shall be suitably encased to prevent any splitting of the concrete. The cold twisted steel bars shall be used without hooks at the ends. Deformed bars without hooks shall, however, comply with relevant anchorage requirements.

All the reinforcement bars shall be accurately placed in exactly the same position as shown on the drawings, and shall be securely held in position during placing of concrete by annealed binding wire not less than 1 mm. in size, and by using stay blocks or metal chair spacers, metal handers, supporting wires or other approved devices at sufficiently close intervals. Bars shall not be allowed to sag between supports nor displaced during concreting or any other operations of the work. All devices used for positioning shall be of non-corrodible material. Wooden and metal supports shall not extend to the surface of the concrete, except where shown on the drawings. Placing bars on layers of freshly laid concrete as the work progresses for adjusting bar spacing shall not be allowed. Pieces of broken stone or brick wooden blocks shall not be used. Layers of bars shall be separated by spacer bars, pre-cast mortar blocks or other approved devices. Reinforcement after being placed in position shall be maintained in a clean condition until completely embedded in concrete. Special care shall be exercised to prevent any displacement of reinforcement in concrete already placed. To prevent reinforcement from corrosion, concrete cover shall be provided as indicated on drawings. All the bars are to be spliced and which are likely to be exceeding 10 days shall be protected by a thick coat of neat cement grout.

Bars crossing each other where required shall be secured by binding wires (annealed) of size not less than 1 mm. in such a manner that they do not slip over each other at the time of fixing and concreting.

As far as possible, bars of full length shall be used, in case this is not possible, overlapping of bars shall be done as directed. When practicable, overlapping bars shall not touch each other, but be kept apart by 25 mm. or 125 times the maximum size of the coarse aggregate whichever is greater between them. Where not feasible, overlapping bars shall be bound with annealed wires, not less than 1 mm. thick twisted tight. The overlaps shall be staggered for different bars and located at points, along the span where neither shear nor bending moment is maximum.

Where ever indicated on the drawings or desired by the Engineer-in-charge, bars shall be joined by couplings which shall have a cross section sufficient to transmit the full stresses of bars. The ends of the bars that are joined by coupling shall be upset for sufficient length so that the effective cross section at the base of threads is not less than the normal cross section of the bar. Threads shall be standard threads. Steel for coupling shall conform to I.S-226.

When permitted or specified on the drawings, joints of reinforcement bars shall be welded so as to transmit their full stresses. Welded joints shall preferably be located at points when steel will not be subjected to more than 75% of the maximum permissible stresses and welds so staggered that at any one section not more than 20% of the rods are welded. Only electric welding using a process which excludes air from molten and conforms to any or all other special provisions for the work



shall be accepted. Suitable means shall be provided for holding bars securely in position during welding. It shall be ensured that no voids are left in welding and when welding is done in two or three stages, previous surface shall be cleaned properly. Ends of the bars shall be cleaned of all loose scale, rust, grease, paint and other foreign matter before welding. Only competent welders shall be employed on the work. The M.S. electrodes used for welding shall conform to I.S. 814. Welded pieces of reinforcement shall be tested. Specimen shall be taken from the actual site and their number and frequency of test shall be as directed.

MODE OF MEASUREMENT & PAYMENT

For the purpose of calculating consumption, wastage shall not be permitted beyond 7.5%. Excess consumption over 7.5% will be charged at penalty rate.

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 do lap joints, such joints shall be measured for payment as equivalent length of overlap as per design requirement. From the length so measured, the weight of reinforcement shall be calculated in tones on the same basis of as per M-14 even though steel is supplied to the contractor by the department on actual weight. Length shall include hooks at the ends. Wastage and annealed steel wire for binding shall not be measured and the cost of these items shall be deemed to be included in the rate for reinforcement.

The rate for reinforcement includes cost of steel, binding wires, its transporting from departmental store to work site, cutting, bending, placing and fixing in position as shown on the drawings and as directed. It shall also include all devices for keeping reinforcement in approved position, cost of joining as per approved method and all wastage and spacer bars.

The rate shall be for unit of one M.T.

ITEM NO. 30

Warning tape WARMAT ® Brand PE warning tape with Anti Rodent Properties (Con Toxic, Non Hazardous Eco friendly ROHS Compliance & 100% recyclable) Moc : LDPE, Roll length : 250 Mtr, Color : Green, Text : Black / White, Length with non-delectable high abrasion.

(5) Size: 300 mm width x 100 Micron thk.

Self-explanatory and as directed by Engineer-in-charge

MODE OF MEASUREMENT AND PAYMENT:

The measurements shall be paid per meter length of the tape laid and measured along the center.

ITEM NO.31

Providing and laying in trenches galvanized mild steel tubes (medium- grade) TATA, ZENITH, ASIAN ZINDAL make of the following nominal bore & tube fittings etc. comp.

(A) 25 mm dia

(B) 40 mm dia

(C) 65 mm dia

MATERIALS

PVC tubes of specified dia. Nominal bore shall conform to I.S. 1239-1968. The galvanized fittings, clamps, etc. required for specified dia. Bore pipes shall be of best quality and make as approved by the Engineer-in- charge. (Galvanized iron pipes and fittings shall conform to IS Specification)

WORKMANSHIP



Cutting, Laying & Jointing – When the tubes are to be cut or rethreaded, the ends shall be carefully filed out so that no obstruction to bore is offered. The ends of the tubes shall then be threaded conforming to the requirements of I.S. 554- 1955 with pipe dies and taps carefully in such a manner as will not result in slackness of joints when the two pieces are screwed together.

The taps and dies shall be used only for straightening screw threads which have become bent or damaged and shall not be used for turning of the threads so as to make them slack as the latter procedure may not result in a water tight joint. The screw threads for the tube and shall be protected from edge until they are fitted.

In jointing the tubes, the inside of the socket screwed end of the tubes shall be oiled and smeared with white or red lead and wrapping around with a few turns of fine spun yarn round the screwed end of the tube. The end shall then be tightly screwed in the socket, tees, etc. With a pipe wrench. Care shall be taken that all pipes and fittings are properly jointed so as to make the joints completely water tight and pipes are kept at all times free from dust and dirt during fixing. Burr from the joints shall be removed after screwing. After laying the open ends of the pipes shall be temporarily plugged to prevent access of water, soil or any other foreign matter.

Any threads exposed after jointing shall be painted or in the case of underground piping thickly coated with approved anti-corrosive paint to prevent corrosion.

Laying in Trenches- The width and depth of the trenches for different diameters of the tubes shall be as – For 15 to 80 mm. dia. Tube width of trenches shall be 30 cms. And depth of trenches 60 cms.

At joints, the trench width shall be widened where necessary. The work of excavation and refilling shall be done true to line and gradient in accordance with general specifications of earth work in trenches.

The pipes shall be painted with two coats of anti-corrosive bitumastic paint of approved quality. The pipe shall be laid on a layer of 75 mm. sand filling up to 150 mm. above the pipe if so specified. The remaining portion of trench shall be then filled with excavation earth. The surplus earth shall be disposed of as directed.

When the excavation is done in rock the bottom shall cut deep enough to permit the pipe to be laid and cushion of sand 75 mm. In case of bigger diameter of tube where pressure is very high, thrust block of cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate of 20 mm. nominal size) shall be constructed on all bends to transmit the hydraulic thrust without imparting the ground and spreading it over a sufficient area if so specified.

Fixing of tube fitting to wall ceiling and floors:

In case of fixing of tubes and fittings to the walls of ceilings, there shall run on the surface of the wall of ceiling (not in chase) unless otherwise specified. The fixing shall be done by means of standard patten, holder clamps keeping the pipes about 15 mm. Clear of the wall. When it is found necessary to conceal the pipes and when specified so, chasing may be adopted or pipe fixed in ducts or recesses etc. provided that there is sufficient space to work on the pipe with usual tools. The pipe shall not ordinarily be buried in walls or solid floors, where unavoidable, pipes may be buried for short distances provided that adequate protection is given against damage and where so required joints are not buried. Where required M.S. tube shall be fixed at a place a pipe is passing through a wall or floors, it should be painted with anti-corrosive bitumastic paint of approved quality. The pipe shall not come in contact with lime mortar or lime concrete as the pipe is affected by lime. Under the floors the pipe shall be laid in layer of sand filling.

All pipes and fittings shall be fixed truly vertical and horizontal unless unavoidable. The pipes shall be



fixed to walls with standard pattern clamps of required size and shape, one end of which shall be properly plugged or cemented into walls with cement mortar 1:3 (1 Cement: 3 coarse sand and the other tightened round the pipes of bold in securely. These clamps shall be spaced at regular intervals in straight lengths at 2 M C/C interval in horizontal run and 25 m. interval in vertical run. For pipe of 15 mm dia up to 25 mm dia. The holes in the walls and floors shall be made by drilling with chisel or jumper and not be dismantling the brick work or concrete. However, for bigger diameter pipes the holes shall be carefully made of the smallest required size. After fixing the pipe, the holes shall be made good with cement mortar 1:3 (1 Cement: 3 coarse sand) and properly finishing to match the adjacent surface.

Testing of Joints:

After laying and jointing, the pipes and fittings shall be inspected under working conditions of pressure and flow. Any joint found leaking shall be redone, and all leaking pipes removed and replaced without extra cost.

The pipes and fittings after they are laid shall be tested to hydraulic pressure of 6 Kg. /Sq.Cm. The pipe shall be slowly and carefully charged with water allowing all air to escape and avoiding all stock and water hammer. The draw off takes and stock shall then be closed and specified hydraulic pressure shall be applied gradually. The pressure gauge must be accurate. The pipes and fittings shall be in sections as the work of laying proceeds, veering the joints exposed for inspection during the testing.

MODE OF MEASUREMENTS & PAYMENTS

The description of each item, shall unless otherwise stated, be held to include where necessary, conveyances and delivery, handling, unloading, storing, fabrication hoisting, all labor for finishing to required shape and size setting fitting in position, straight, cutting and waste, return of packing etc.

The length shall be measured on running meter basis of finished work. The length shall be taken along the center line of the pipe and fittings. The pipes fixed to walls, ceiling floors etc. shall be measured and paid under this item. 14.3.3 All the work shall be measured in decimal system as fixed in its place, subject to tolerance given below unless otherwise stated.

- [i] Dimension shall be measured to the nearest 0.01 meter.
- [ii] Area shall be worked out to the nearest 0.01 Sq.mt.

In case of fittings of unequal bore, the largest bore shall be measured for the test.

Testing of pipe lines, fittings and joints included for providing all plant and appliances necessary for obtaining access to the work to be tested and carrying out the tests.

The rate includes PVC tubing with screwed socket joints, together with all fittings (such as bends, sockets, springs, elbows, tees, crosses, short pieces, clamps and plug unions etc.) and fixing complete with clamping wall-hooks, wooden plugs etc. and also cutting screwing and waste and for making forged (or handmade) bends on piping as required. The rate also includes cutting through walls, floors etc. and their making good and painting exposed threads with anti-corrosive paint as above and testing. Where tubes are to be fixed to wall, ceiling and flooring, the rates shall not include painting of pipes, providing sleeves and sand filling under floor for which separate payment shall be made.

The rate includes painting of pipes and sand filling all round tubes for which separate payment shall not be made. The length shall be measured on running meter basis.

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

ITEM NO.32



Providing, maintaining up to the required period safe guarding, and lightening the excavated trenches with proper barricading, fencing with timber ballies, bamboos, G.I. sheets, red flag and red lights along with the provision of the chowkidars as directed by the Engineer-in-charge.

FENCING, WATCHING, LIGHTING:

The tenderer shall at his own cost make all proper provision for protecting the work by fencing and red flags by watching and lighting at night, or otherwise as may be directed by the Engineer. The posts of the fencing shall be of timber, securely fixed in the ground, not more than 3.0 meter apart, they shall not be less than 3" in diameter and approximately 2.0 mt. above the surface of the ground. There shall be two rails of horizontal members. One near top of the posts & the other about 0.50 mt. above the ground and each shall be from 2" to 3" in diameter and sufficiently long running from post to post, to which they shall be bound with G.I. Sheets. The G.I. sheets shall be marked with painting of 'Danger' or 'Caution' notice, which should be clearly visible in nights indicating the work is under progress. Red flags shall be tied to the posts for the guidance of the vehicular traffic at all turning points and conspicuous intermediate points. The method of projecting rails beyond the posts and tying them together where they meet will not be allowed on any account. All along the edges of the excavated trenches a bank of about 1.0 mt. High shall be formed where required by the Engineer for further protection at free of cost. Proper provision shall be made for lighting at night and watchmen shall be kept to see that this is properly done. In the event of the tenderer not fully complying with the provisions of this clause, the Engineer, may with or without notice to the tenderer, put up fencing or improve the fencing already put up, or provide or improve the lighting, provide suitable number of red flags or adopt such other measures as he may deem necessary. All the cost of such measures as may be adopted by the Engineer shall be borne by the tenderer.

The fencing along the trenches with red flags shall be maintained, and lighted during night hours by the tenderer until the road surface has been reinstated to the satisfaction of the Engineer.

Arrangements shall be made by the tenderer to divert traffic whenever work in thorough fares is in progress. Entire work shall be carried out in such a manner that flow of traffic shall not be obstructed in any way. If any extra policemen required for the management of the traffic at the junction, the same shall be employed at the cost of the tenderer.

The trench shall be barricaded and warning boards shall be fixed as directed. Red lights shall be hanging at night time at sufficiently closed intervals to indicate the danger and the chowkidar shall be employed to see that the lights are properly burning. The contractors shall be solely responsible for any accident due to any default in barricading, sign posting or red lights and shall bear the consequences.

Mode of measurement: -

The payment for this item will be made on per square meter basis for which the fencing/barricading has been provided and maintained including all the other safety measures stated/included as above.

ITEM NO.33

Temporary diversion of sewage from House connection chambers, Intermediate machine holes and Tee chambers through 150 mm dia corrugated Hose pipe supported at suitable distances from the side and conveying the sewage by gravity to the downstream machine hole.

The contractor shall have to bring all the tools, tackles to complete the item, including hose pipes and pumps, if required. However, the SMC shall provide necessary plugs for the works at free cost, which shall have to be returned back to the SMC at the end of work. The contractor shall be paid per running meter of temporary diversion provided in form of hose pipe.

ITEM NO. 34



Providing & construction simple chamber of 23 cm. th' B.B. Masonry in C.M 1:5 with cement plaster 15 mm th' in C.M. 1:3 inside & outside to exposed faces, R.C.C. top slab with 1:2:4 mix (1 cement: 2 Sand : 4 Grade stone aggregate 20mm size) ,Foundation concrete 1:5:10 & fixing precast RCC heavy duty cover etc. comp. Inside dimension, 455 x 610 mm & 450 mm deep for single pipe

(A) Same as above but Precast RCC heavy duty Cover instead of C.I. Cover

Extra for every additional depth of 0.1 mt be young 0.45 mt

Materials:

Water shall confirm M-1. Cement shall confirm to M-3. Coarse sand shall confirm to M-6. Brick shall confirm to M-15 Cement mortar shall confirm to M-11.

Workmanship: -

The item covers the construction of simple chamber of clear size 0.45 x 0.60 mts. With 23 thick brick walls in C.M.1:8 and smooth plaster 12 mm thick C.M. 1:4 Bedding concrete of C.C. 1:5:10, 150 mm thick, the projected bed concrete beyond chamber wall shall be of 75 mm. The chamber cover shall be of 25 mm thick rough kola stone fixed with C.M. 1:1 etc. comp.

Specification for item No.4 shall be read for excavation, & specification for Item No.25 shall be adopted for P.C.C. and specification for Item No.26 shall be read for B.B. Masonry and specification for Item No.27 shall be read for plaster work except that the thickness of plaster shall be 12 mm thick in CM 1:4.

Mode of Measurements and payments: -

- [1] The rates including all labors, materials, tools and plats etc. required for satisfactory completion of this work.
- [2] The rate shall be for a unit of one number.

ITEM NO. 35

Removing of existing pipeline incl.removal of specials, valves jointing material including carting and stacking of removed material from{ site of work to the department store as directed excl. excavation and refilling. D.I./ C. I. S. & S. Spun Pipes suitable for tyton joints.

As directed by Engineer in charge

ITEM NO.36

Providing, Laying and jointing on true line and level UPVC pipe (SCH-40) line of Prince/Supreme/Jain/Astral/ Tulsi/Finolex make including fittings make or equivalent as approved by engineer-in-charge. Pipe shall be fixed on the wall the help of clamp at every two meter C/C or shall be concealed as directed including necessary fittings etc. including testing of pipe and joints and fixing the same with adhesive solvent, including cost of all materials.

15 mm Dia

25 mm Dia

40 mm Dia

50 mm Dia

MODE OF MEASUREMENTS & PAYMENT:

The length of pipe shall be measured including all fittings along its length in running meters correct to a centimeter. No allowance shall be made for the portion of pipe length entered in the sockets of the adjacent pipe or fittings.

The rate includes all labour and materials, tool and plant etc. required for satisfactory completion of this item.

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

**ITEM NO.37**

Providing constructing brick masonry inlet chamber of 750 x 600 x 1500 mm internal dimension with necessary excavation refilling 350 mm thick brick masonry in CM 1:4, 150 mm thick PCC and benching in CC 1:2:4, 12 mm thick plaster in CM 1:3 for inside and cement pointing in CM 1:3 for outside, providing and fixing pre-cast RCC frame and cover of M-30 grade as per drawing and specifications – Rate for 1.5 m depth. Add or ded. Rs. 571 for every 10 cm increase or decrease in depth

MATERIALS

WATER: Water shall conform to M-1 of detailed specification of materials.

SAND: Fine aggregate 0.15 mm to 5.00 (about 0.00597 to 3/16") I.S. sieve No.15 to 480 shall conform to M-6 of detailed specifications of material.

COARSE AGGREGATE

Coarse aggregate 5 mm to 40 mm shall conform to the latest version of relevant I.S. Specification and M-12 of detailed specification of material.

SIZE:

The maximum size of coarse aggregate shall be as large as possible normally not greater than $\frac{1}{4}$ of the minimum thickness of concrete member. In case of R.C.C., this size present no difficulty to surround the reinforcement thoroughly and fill up the form work fully and is less than the minimum cover by 6 mm for plain concrete. Maximum size of the coarse aggregate shall be up to 40 mm subject to the above limitation and provided no limiting size is specified in the special provisions.

Generally, a maximum size of 20 mm shall be found satisfactory for reinforced concrete work.

The grading between the maximum size and minimum size of 5 mm shall be such as to produce a dense concrete of specified proportion and consistency that will work readily in to position without any aggregate and without the use of excessive water content.

CEMENT MORTAR:

Sand or fine aggregate size 0.15 to 5 mm I.S. Sieve No.15 to 480 confirming to relevant specification shall be supplied by the contractor and it shall be mixed with Portland cement in require proportion by volume. It shall be mixed dry and then requirement quantity of water shall be added before final mixing to have thoroughly mix mortar paste. Mortar shall preferably mixed in mixer.

FLY ASH LIME BRICK:

Fly ash lime brick shall be used for this item and shall comply with specification or relevant I.S. (latest version). Sample of Fly ash lime bricks shall be got approved by the Engineer, who will keep it in his office for reference.

WORKMANSHIP:

The chamber of different types and sizes as specified shall constructed in storm line at such places and such levels and dimensions as shown in drawing or as directed. PCC shall be in 1:4:8 cement concrete.

Bed Concrete:

The inlet chamber shall be built in bed of cement concrete 1:2:4 as shown in drawing or as directed. The relevant specification if Item No. 4 shall be followed for 1:2:4 concrete proportion by volume.

WALLS :



The walls of chamber shall be constructed using Fly ash lime bricks, having crushing strength not less than 75 Kg/Sq.cm. in C.M. 1:4 (1 Cement : 4 fine sand). The Fly ash lime brick masonry shall confirm to relevant specification of M-6A of detailed specification of material. The jointing face of such Fly ash lime brick shall be well buttered with cement mortar before laying so as to ensure that full joints are filled up with mortar.

PLASTER :

The inside of wall shall be plastered with 12 mm thick C.M. 1:3 (1 Cement : 3 fine sand) and finished with floating coat of neat cement. All angles shall be rounded to 7.50 cms. Radius and all rendered internal surfaces shall have impervious finish obtained by a steel trowel. The external joints of masonry shall be finished smooth as directed.

CHANNELS AND BENCHING

Channels shall be semicircular in the bottom half and of diameter equal to the pipe of drain. Above the horizontal of diameter, the sides shall be extended vertically to the level as the crown of the outgoing pipe and the top edge shall be suitably rounded off. The branch channels shall also be similarly constructed with respect to the benching but at their junction with the main channel with appropriate fall, suitably rounded off in the direction of flow in the main channel, shall be given.

The channel and benching shall be done in 1:2:4 grade rising at a slope in line from edges of channel. The channels of the bottom of the chamber shall be plastered with C.M. 1:2 (1 Cement; 2 coarse sand) and troweled smooth.

FRAME FITTING:

Perforated Precast R.C.C. Jali in CC M-30 as per drawing shall be fitted firmly in the precast frame which shall be laid over plaster on top of masonry. Cement mortar shall be 1 part cement and 2 parts of sand and layer shall be 25 mm thick.

TESTING:

Chamber shall be tested by filling with water up to top as directed.

After completion of work, chamber covers shall be sealed by means of thick grease.

MODE OF MEASUREMENTS AND PAYMENTS:

The rate includes all labours, materials, curing for 14 days, tools and plant, etc. required for satisfactory completion of this item as per drawing and as directed by the Engineer-in-charge.

The rate shall be for a unit of one chamber including RCC cover with frame

ITEM NO. 38

Providing, Supplying and fixing brass ferrule of approved make of following sizes inclusive all taxes, insurance, transportation, freight charge, inspection charge etc. complete.

(i) 15 mm dia (1/2")

The brass ferrule shall be best quality and make as approved by Engineer-in-charge.

The work shall be carried out in good workmanship manner as directed by the Engineer-in-charge with proper fixing of ferrule as required.

The payment shall be made as per number basis.

**ITEM NO. 39**

**Providing, supplying, lowering and laying of DI K-9 pipes of following diameter with internal cement lining including all taxes, freight, insurance, transportation, inspection charges octroi, loading, unloading, conveyance to site.
450 mm dia.**

Material:

The material in general shall be conforming to IS:1387:1993.

Method for Brinell Hardness test of material shall conform to IS:1500:1983.

Sampling criteria for the various tests, unless specified in this specification shall be as laid down in IS 11606:1986.

Pipe shall be suitable for push on joint rings conforming to IS:5382:1985 and IS:12820:1989.

EPDM (Ethylene Propylene Diene Monomer) rubber gasket shall conforming to IS:5382:1985 with ISI mark.

Manufacture :

The metal used for the manufacture of pipe shall conform to the appropriate as grade specified in IS 8329:2000. It shall be prepared at the discretion of the manufacture in a cupola, an active mixer of other suitable furnace or any other suitable standard method.

The pipes shall be stripped with all precautions to avoid warping shrinkage defects, detrimental to their good quality. The pipes showing shall be sound and free from surface or the defects. Pipes showing shall imperfections which result from the method of manufacture and which do not affect their serviceability shall not be rejected on that account alone. Minor defects arising out of manufacturing process may be rectified with the consent of the purchaser.

The pipes shall be such that they could be cut, drilled or machined. In case of dispute the pipes may be accepted provided hardness measured on the external unmachined surface does not exceed 230 HBS.

Pipes centrifugally cast shall be heat treated in order to achieve the necessary mechanical properties and to relieve casting stresses; accordance with IS:13655:1993.

If necessary, the pipes may be subjected to reheat treatment to ensure that Brinell hardness does not exceed the specified value.

In case of push-on joint, the spigot ends shall be suitably chamfered for smooth entry of pipes in the socket fitted with the rubber gasket. Socket and Spigot dimensions including chamfer must be checked and a test certificate to the effect shall be submitted for each and every pipe without which payment will be released for the same.

The socket dimensions shall be perfectly suitable for Rubber Gaskets conforming to IS 12820:1989.

The socket and spigot dimensions including chamfer shall be strictly as per Table-2 of IS:8329:1994.

Sampling:

Sampling criteria for the various tests, unless specified shall be as laid down in IS 11606:1986.

Mechanical Test:

Mechanical tests shall be carried out during manufacture. One tests shall be conducted for every batch of production. Total no. of pipes for each batch would be as per Clause 10.1 of IS 8329:2000.

Ring Test and Tensile Test :

Two test pieces obtained by cutting rings or bars from the spigot end of two pipes selected for testing except for pipes manufactured under controlled cooled process described in 10.1.1 when tested in accordance with the methods specified in IS: 8329 shall satisfy the requirements mentioned in it.

Brinell Hardness Test :

When tested in accordance with IS:1500:1993, the Brinell Hardness shall not exceed 230 HB on the external unmachined surface.

Retest :



If any piece representing a lot fails in the first instance two additional tests shall be made on test pieces selected from two other pipes from the same lot. If both the results satisfy the specified requirement, the lot shall be accepted. Should either of these additional test pieces fail, the lot shall be deemed as not complying with IS: 1536:1989 and shall be liable for rejection.

In the event of lot not found conforming to this standard, the same may be reoffered for inspection after reheat treatment.

Hydrostatic Test :

All Pipes shall be tested hydrostatically at the pressure specified in Table 1 of IS 8329:2000 as appropriate. To perform the test, the pressure shall be applied internally and shall be steadily maintained for a period of minimum 10 seconds during which pipes may be struck moderately with a 700 g hammer. The pipes shall withstand the pressure test and shall not show any sign of leakage, sweating or other defects. As far as possible the hydrostatic test shall be conducted before coating the lining of pipes.

Works Test Requirements :

Socket and spigot pipes shall withstand hydrostatic test pressure as specified in relevant IS codes.

Sizes and mass :

The range of nominal diameter, DN, of pipes and flanges is as follows:

100, 150, 200, 250, 300, 400, 450, 500, 600, 700, 750 and 800 mm or as specified in Schedule-'B'

NOTE :

Nominal diameter is a number used to classify pipes and corresponds approximately to their clear internal diameter.

Working lengths 'L' of socket and spigot pipes.

(a) Socket and Spigot Pipes: 5.5 and 6.0 m. NOTE:

Approximately 90% of the ordered quantity of pipes ranging from 100 mm dia and above shall be of 5.5 mts.

Dimensions and mass of uncoated socket and barrel of the pipes shall conform to IS:8329.

Mass for sockets and pipes barrels as specified in IS 8329 shall have density of Cast as 7050 Kg/Mt³.

Tolerance :

Tolerance in Diameter :

The tolerance of external diameter of Barrel for all type of pipes unless specified shall be as per Table- 7 of Clause 15.1.1 of IS:8329:2000.

For requirement of interchangeability all pipes should be within the tolerance specified. Push-On flexible joints may need closer tolerance for its effective performance.

Tolerance on Ovality:

Pipes shall be as far as possible circular internally and externally. The tolerance for out of roundness of the socket and spigot ends in the jointing zone for Push-on joint are given in Table below:

In case of oval spigot ends for push-on joints (DE), the minor axis is permitted to be less than the minimum allowable diameter by the value given below provided the mean diameter DE measured by circumferential tape, comes within the minimum allowable dimensions of DE (Table-2) after applying the tolerance:

Table Allowable Ovality for Push-on Joint Pipes

Nominal Diameter DN mm	Allowable Difference Between Minor Axis and DE min mm
1	2



80 to 300	1.0
350 to 600	1.75
700	2.0
750 to 800	2.4

Tolerance on Thickness

The tolerance on the wall thickness 'e' and of pipes shall be as follows :

Dimensions	Tolerance in mm
Wall thickness	- (1.3 + 0.001 DN)
*. No limit for the plus tolerance is specified.	

Tolerance on length

The tolerance on length of pipes shall be as follows :

Type of Casting	Tolerance in mm
Socket and spigot end	+ 100

Permissible Deviation from a Straight Line :

The pipes shall be straight. When rolled along two gentries separated by approximately two-thirds the length of the pipe to be checked, the maximum deviation from a straight line in mm shall not be greater than 1.25 times the length 'L', in meters of the pipe, thus:

$f_m \leq 1.25 L$ Where

f_m = maximum deviation from straight line, and L = length of the pipe.

Tolerance on Mass

The permissible tolerance on standard mass of pipe shall be +8 percent for sizes up to and including 200 DN and + 5 percent for sizes above 200 DN

The pipes of heavier mass than the maximum shall be accepted provided they comply in every other respect with the requirements of the specifications.

Coating : Pipe shall be supplied with internal and external coating. External protection:-

Each pipe shall be coated externally with metallic zinc coating with finishing layer as mentioned in Annexure-A of IS:8329-2000.

Coating shall not be applied to any pipe unless their surface is clean, dry and free from rust.

The pipes shall be coated by spraying process in which metallic zinc material is heated to a molten state and projected in small droplets.

The coating material shall set rapidly with good adherence and shall not scale off.

The metallic zinc coating shall cover the outside diameter of the pipe end and shall be free from such defects as bare patches or lack of adhesion.

Damaged area of zinc coating caused by handling are acceptable provided that the damaged is less than 5 cm²/m² of coated surface and provided that the minor dimensions of the damaged area do not exceed 5 mm.

The average mass of zinc coating shall be not less than 130 g/m² with a local minimum of 110 g/m².

**Internal Coating:**

When the pipes are to be used for conveying sewage water the inside coating shall not contain any constituent soluble in such water or any ingredients which could impart any taste or whatsoever to the sewage water and suitable washing of the mains.

All the pipes must be supplied with internal cement mortar of Ordinary Portland Cement lining strictly conforming to provision of IS:8329:2000.

Cement used for centrifugal lining must be of the best brand available conforming to relevant Indian Standard.

The sand used for preparation of mortar shall have controlled granulametric distribution from fine to coarser elements, it shall be clean and free from dust, clay or any kind of impurities.

The water used for preparation of the mortar shall not contain substances deteriorous to the mortar nor to the water as it is eventually intended to transport in the pipe.

The mortar of the lining shall be composed of cement, sand and water.

The mortar shall be thoroughly mixed and shall have a consistency which results in dense and homogeneous lining.

Condition of the interior surface of the pipe before application of the lining.

All foreign bodies, loose scale of any other material which could be detrimental to good contract between the metal and the lining shall be removed from the surface which the lining is to be applied.

The inner surface of the pipe shall also be free of any metal projections likely to project beyond 50% the thickness of the lining.

Application of the lining.

The mortar of the lining is cast centrifugally inside the pipes.

Apart from the inner surface of the joint, the parts of the pipe coming into contact with transported water shall be entirely covered with mortar.

The mortar shall be free of any cavities or visible air bubbles, and care shall be taken to ensure maximum density at all points. The centrifuging the pipe shall be controlled so that segregation of the sand in the lining is reduced to a minimum.

Once centrifuging is finished, the lining shall be cured at temperatures greater than 0 degree C. Any loss of water from the mortar by evaporation shall be sufficiently slow that hardening is not impeded.

Repairs to damaged or defective areas are allowable. The damaged mortar shall first be removed from these areas. The defective part shall be repaired by using, for example, a trowel within fresh mortar so that a continuous lining having a constant thickness is again obtained.

For the repair operation, the mortar shall have a suitable consistence. If necessary, additives may be included to obtain good adhesion against the side of the existing under-aged mortar.

Thickness of the lining.

The normal thickness of the lining and the minimum permissible mean and local values are given in the table.

At the pipe ends, the lining may be reduced to values below the minimum thickness. The length of the chamfer shall be as small as possible but, in any case, shall be less than 50 mm.

Determination of lining thickness

The thickness of the lining will be checked on the freshly centrifuged mortar by the insertion of a steel pin, or on the hardened mortar by means of a non-destructive method of measurement.

The thickness of the lining shall be measured at both ends of the pipe in at least one section perpendicular to the pipe axis.

In each, section, which shall be at least 200 mm from the pipe end measurements shall be taken at four points spaced at 90

The values for the thickness of the lining shall be reported to the nearer 0.1 mm.

The lining thickness measured at any one point in the pipe shall not be smaller than the minimum value given in the table.

The arithmetic means of the four measurements in each section shall not be less than the minimum mean value specified in the IS:8329:2000.

Surface condition of the hardened lining

The surface of the cement mortar lining shall be uniformly smooth. Only isolated grains of sand are



allowed to appear on the surface of the lining.

The lining shall not be friable and shall be free from corrugations or ridges that could reduce the thickness of the lining to less than the minimum value at one point, as specified in the table.

On contraction of the lining, the formation of cracks cannot be avoided. These cracks, together with other isolated crack which may result from manufacture or any develop during transportation, are acceptance up to a width of 0.8 mm.

The structure of the lining is related to the centrifuging process.

On the inner surface of the lining, a thin layer of fine sand and cement is formed which may extend up to approximately one quarter of the total thickness of the mortar.

Thickness of the lining

The thickness of the lining shall be inspected on at least one pipe per section and per centrifuging installation, for each diameter manufactured, which is as per Table-15, Clause B-5 of IS 8329:2000.

Appearance of the lining

Each pipe shall be inspected for the appearance of the lining with special reference to the surface condition and the finish of the ends.

Any repairs considered to necessary after this examination shall be carried out in accordance with the method described in Clause B-4 of IS:8329:2000

Table-Thickness of the cement mortar lining

All dimensions are in millimeters

DN	Thickness		Maximum Crack Width/Radial Displacement
	Nominal Value	Tolerance	
1.	2.	3.	4.
80 to 300	3.0	-1.5	0/8
350 to 600	5.0	-2.0	1/0
700 to 1200	6.0	-2.5	1/2
1400 to 200	9.0	-3.0	1/5

NOTE:- Fittings ends may have a chamfer of maximum length 50 mm.

Marking:

Each pipe shall have cast, stamped or indelibly painted on it the following appropriate marks:

- Manufacturer's name, initials or identification mark;
- The nominal diameter;
- Class reference;
- Mass of pipe;
- The last two digits of the year of manufacture.
- Name of the purchaser: SMC.
- ISI Certification Mark.

Marking may be done On the socket faces of pipe centrifugally cast in metal mould.

MODE OF MEASUREMENTS AND PAYMENTS :

The rate for this item includes the cost of all the materials like all the jointing material like rubber gasket for making joints.

The rubber gasket joints shall be done only at the joints with specials and fittings. The item includes the rubber gasket for making joints.



The rate shall include all the charges like loading, stacking, handling, laying, jointing and hydraulic testing.

The rates shall be quoted for all the materials and labour necessary for completion of this item except the cost of D.I. fittings specials and valves. Any variation in cost of necessary materials due to any reason shall not at all be accepted i.e. price variation due to any reasons will not be accepted.

The measurement shall be paid per meter length of pipe line laid, jointed, tested and measured along the center line and shall be paid according to the inner diameter of the pipes at the rates quoted by the contractor in price-bid.

ITEM NO. 40

Purchasing, transporting, unloading, erection RCC Sewer machine holes using RCC M40 and steel reinforcement of TMT FE-500 for following different sections for sizes of PVC steps at site as per required depth including all materials and taxes etc. complete (Excluding Machine hole Cover)

This item shall be carried out as per engineer-in-charge.

SEAL & SIGNATURE OF THE CONTRACTOR: -

ADDRESS: -

DATE: -

Executive Engineer,
Drainage Department,
Surat Municipal Corporation



26. TENDERER'S / CONTRACTOR'S CERTIFICATE / UNDERTAKING

I/We hereby declare that I/We have perused in detail and examined closely the specifications / general terms and conditions / special terms/important instructions/notes described in the tender documents. I/We hereby agree to be bound by and comply with all such specifications/terms, conditions, etc.

I/We also certify that I/We have visited the site and inspected the location of the proposed work and have collected all information required before quoting my / our rates.

SIGNATURE AND SEAL OF THE CONTRACTOR:

NAME AND ADDRESS:

DATE:



27. BANK GAURANTEE FORMAT FOR DEPOSITING SECURITY DEPOSIT

BANK GUARANTEE NO. /20....

DATE:.... /.... /20....

Amount Rs./- (Rs. Only)

Validity: Till .../.... /20...

**To,
The Commissioner,
Surat Municipal Corporation
Surat.**

1. In consideration of the terms and conditions of an Agreement made between the Commissioner, **Surat Municipal Corporation**, Surat (hereinafter called "**Surat Municipal Corporation**") andhaving Principal office at.....(hereinafter called "Contractor") for the work of " **PROVIDING & LAYING NEW DRAINAGE LINES ON VARIOUS REMAINING T.P. ROADS AND AUGMENTATION OF OLD DRAINAGE LINES AS PER REQUIREMENTS IN EAST ZONE-A (VARACHHA) & OTHER ZONE AREA WITH IN SURAT MUNICIPAL CORPORATION. (2nd Attempt)** "Against the **Work order no. DNG/Out/W/No.dated** for the security deposit for the due fulfillment by the contractor of the term and conditions contained in the said agreement. We **Bank,** Branch, Name of City (herein referred to as the "Bank") at the request ofdo hereby undertake to pay the **Surat Municipal Corporation**, an amount not exceeding **Rs./- (Rs.Only) (Security Deposit)** against any loss or damage caused to or suffered by **Surat Municipal Corporation**, reason of any breach of any term or condition contained in the said agreement by the said Contractor.
2. We**Bank,** Branch, Name of city do hereby undertake to pay the amount due and payable under this Guarantee without any demur merely on a demand from the **Surat Municipal Corporation** stating that the amount claimed in due by way of loss of damage caused to or would be caused to or suffered by the **Surat Municipal Corporation**, by the reason of any breach by the said Contractor of any of the terms and conditions in the said agreement of by reason of the Contractor failure to perform the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee shall be restricted to an amount not exceeding **Rs./- (Rs.Only).**
3. We undertake to pay the **Surat Municipal Corporation** any money so demanded not withstanding dispute or disputes raised by the Contractor. In any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.
The payment so made under this bond shall be valid discharge of our liability for payment there under and the Contractor shall have no claimed us for making such payment.
4. We**Bank,**Branch, Name of City further agree that the guarantee herein contained shall remain in full force and effective during the period that would taken for the performance of the said agreement and that under or by virtue of said agreement full paid and its claim satisfied or discharged or till Commissioner, **Surat Municipal Corporation** clarifies that the terms and conditions of the said agreement have been fully and properly carried out by the said Contractor and accordingly discharge this guarantee. Unless demand or claim under



- this agreement is made on us in writing on or before We shall be discharge from all liability under this Guarantee thereafter.
5. We **Bank**,Branch, Name of city further agree with the **Surat Municipal Corporation** that the **Surat Municipal Corporation** shall have the fullest liberty without consent and without any manner our obligations here under to very and of the terms and conditions of the said agreement or to extend the time of performance by the said Contractor from time to time or to postpone for any time or time to time any of the power exercisable by the **Surat Municipal Corporation** against the said Contractor and to Forbes or enforce any of the terms and conditions relating to the said agreement and we shall not be relived from our liability by reason of my variation or extension being granted to the said Contractor or for any béarnaise, act of indulgence by the part of the **Surat Municipal Corporation** to the said Contractor or by such matter or thing whatsoever which under the law relating to sureties would but for his provision have of a reliving us.
6. This guarantee will not be discharge due to the change in the constitutions of the Bank or the Contractor.
7. We**Bank**,Branch, name of city lastly undertake not to revoke during its currency, except with the previous consent of the **Surat Municipal Corporation** in writing.
Any claim under this Guarantee must be received by us before the expiry of this Bank Guarantee. If no such claims have been received by us by the said date, the right of **Surat Municipal Corporation** under this Guarantee will cease. However, if such claims has been received by us by the said date, all the rights of **Surat Municipal Corporation** under this Guarantee shall be valid and shall not cease until we have satisfied that claim.
Notwithstanding anything contained herein above,
1. Our liability under this guarantee is restricted to **Rs./- (Rs. Only)**.
2. This Bank Guarantee shall be valid up to
3. We are liable to pay Guarantee amount or any part thereof under this bank guarantee at Surat, only and only, if **Surat Municipal Corporation** serve upon us a written claim or demand on or before

This Bank Guarantee contains pages.

Bank's authorized signature

Seal, Stamp & Signature of

**28. BANK GAURANTEE FORMAT FOR EMD**

To,
The Commissioner,
Surat Municipal Corporation,
SURAT.

[1] In consideration of the Terms and Conditions of an Agreement made between Commissioner, Surat Municipal Corporation, Surat (herein after called " Surat Municipal Corporation") and (Contractor) (hereinafter called "Contractor") for the work of **PROVIDING & LAYING NEW DRAINAGE LINES ON VARIOUS REMAINING T.P. ROADS AND AUGMENTATION OF OLD DRAINAGE LINES AS PER REQUIREMENTS IN EAST ZONE-A (VARACHHA) & OTHER ZONE AREA WITH IN SURAT MUNICIPAL CORPORATION (2nd Attempt)** (Name of work) for the Earnest Money deposit for the due fulfillment by the contractor of the terms and conditions contained in the said agreement, We Bank of....., (Hereinafter referred to as the Bank) at the request of (Name of Contractor) do hereby undertake to pay the Surat Municipal Corporation an Amount not exceeding (**i.e., 50% of Total E.M.D. Amount**) against any loss or damage caused to or suffered by Surat Municipal Corporation by reason of any breach of any term or condition contained in the said agreement by the said Contractor.

[2] We Bank of....., do hereby undertake to pay the amount due and payable under this Guarantee without any demur merely on a demand from the Surat Municipal Corporation stating that the amount claimed in due by way of loss of damage caused to or would be caused to or suffered by the Surat Municipal Corporation by the reason of breach by the said contractor of any of the terms and conditions in the said agreement of by reason of the contractor failure to perform the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee shall be restricted to an amount not exceeding (**50% of Total of Amt. of EMD**)

[3] We undertake to pay the Surat Municipal Corporation any money so demanded notwithstanding dispute or disputes raised by the contractor. In any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by under this bond shall be a valid discharge of our liability for payment there under and the contractor shall have no claim against us for making such payment.

[4] We Bank of....., further agree that the guarantee herein contained shall remain in full force and effecting during the period that would be taken for the performance of the said agreement and that under or by virtue of said agreement have been fully paid and its clime satisfied or discharged or till Commissioner, Surat Municipal Corporation, Surat clarified that the terms and conditions of the said agreement have been fully and properly carried out by the said contractor and accordingly discharge this guarantee. Unless a demand or claim under this agreement is made on us in writing on or before dt. ----- we shall be discharged from all liability under this Guarantee thereafter.

[5] We Bank of....., further agree with the Surat Municipal Corporation that the Surat Municipal Corporation shall have the fullest liberty without our consent and without in any manner our obligations hereunder to vary and of the terms and conditions of the said agreement or to extend the time of performance by the said contractor from time to time or to postpone for any time or time to time any of the power exercisable by the Surat Municipal Corporation against the said contractor and to Forbes or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability



by reason of any variation or extension being granted to the said contractor or for any béarnaise, act or omission of the part of the Surat Municipal Corporation or any indulgence by the Surat Municipal Corporation to the said contractor or by any such matter or thing whatsoever which under the law relating to sureties would but for his provision have of a relieving us.

- [6] This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.
- [7] We Bank of, lastly undertake not to revoke during its currency except with the previous consent of the Surat municipal Corporation in writing.
- [8] Notwithstanding anything contained here-in-above our liability under this guarantee is restricted to **(50% Amt. of EMD)** shall remain in force untilunless a claim or demand under the guarantee is made against us in writing and received on or before dt.----- all your rights under the said guarantee shall be forfeited and we shall be relieved discharged from all liabilities there under.

Seal, stamp and signature
of Bank's authorized signatory



29. DRAWINGS

THE ATTACHED DRAWING ARE FOR REFERENCE PURPOSE ONLY CHANGES ARE SUBJECTED.