

# RAJKOT MUNICIPAL CORPORATION

e-Tender No.: RMC/SJMMSVY/ PROJECT/2020-21/128



**Bid Documents For**  
Providing, Lowering, Laying, Jointing, Testing and Commissioning of 1100 mm Dia DI  
Pipe on route Popatpara MPS to Madhapar STP in New Ward No.-3 under SJMMSVY  
**January - 2021**

## Volume- I

### General Conditions of Contract

:: Milestone dates of e-Tendering ::	
1. Downloading of e-Tender documents	15-01-2021 to 30-01-2021 up to 18.00 Hrs.
2. Pre-bid Queries to be submitted by e-mail at mail ID <a href="mailto:hnsbeth@rmc.gov.in">hnsbeth@rmc.gov.in</a> Pre-bid Meeting in Office of the City Engineer, RMC. at West Zone Office Room No.3	18-01-2021 at 11.00 Hours
3. Online submission of e-Tender	30-01-2021 up to 18.00 Hrs.
4. Submission of EMD, Tender fee, Documents required for pre-qualification and other necessary documents by Hand Delivery / Regd. Post. A.D. / Speed Post.	Up to 03-02 -2021 up to 18.00 Hrs
5. Opening of online Primary Bid (Technical Bid)	04-02-2021 at 10.30 Hrs. onwards
6. Verification of submitted documents (EMD, Tender fee, Documents required for pre-qualification and other necessary)	upto 06-02-2021 at 10.30 Hours onwards
7. Opening of online Commercial Bid (Price Bid) for technically qualified bidders only.	08-02-2021 at 10.30 Hrs. onwards (If possible)
8. Bid Validity	One eighty (180) calendar days

**CITY ENGINEER  
DRAINAGE PROJECT DEPARTMENT  
RAJKOT MUNICIPAL CORPORATION  
SHRI HARISINHJI GOHIL ZONAL OFFICE  
WEST ZONE, ROOM NO.3 (G.F.),  
150 FEET RING ROAD,  
RAJKOT - 360 005**

# **RAJKOT MUNICIPAL CORPORATION**

## **Bid Documents For**

Providing, Lowering, Laying, Jointing, Testing and Commissioning of 1100 mm Dia DI Pipe on route Papatpara MPS to Madhapar STP in New Ward No.-3 under SJMMSVY

## **Volume- I**

### **General Conditions of Contract**

Section-1 Invitation for Bid, Information to the Tenderer, e-Tender declaration Form, Instructions to Tenderer and Formats.

Section-2 General Conditions of Contract

## **ABBREVIATIONS**

Statement showing the details of abbreviations.

<b>Full Form</b>	<b>Abbreviation</b>
Rajkot Municipal Corporation	RMC
City Engineer	CE
Operation and Maintenance	O&M
Net Present Value	NPV
Engineering Procurement and Construction	EPC
Paschim Gujarat Vij Company Limited	PGVCL
Critical Path Method	CPM
Reinforced Cement Concrete	RCC
High Ground Level Reservoir	HGLR
Kilometer	KM
Mild Steel	MS
Bureau of Indian Standard	BIS
American Water Works Association	AWWA
American Petroleum Industries	API
Million Liter per Day	MLD
High Yield Strength Deformed bar	HYSD
Corrosion Resistant Steel	CRS
Ordinary Portland Cement	OPC
American Standard for Testing of Material	ASTM
Flux Compensated Magnetic Amplifier	FCMA
Cost Insurance and freight	CIF
Free On Board	FOB
EX - Works	EXW
General Condition	GC
Sewage Pumping Station	SPS

# I N D E X

<b>Sr No</b>	<b>Particulars</b>
1	Invitation to Bid
2	Information to the Tenderer
3	e-Tender Declaration Form
4	Instruction to the Tenderer
5	Common Formats
6	Formats for Pumping Station Civil works
7	Formats for Rising Main Pipeline work
8	Formats for Pumping Machinery work
9	General Conditions of Contract

# **VOLUME- I**

## **SECTION - 1**

### **INVITATION FOR BIDS**

**RAJKOT MUNICIPAL CORPORATION**  
**INVITATION FOR BIDS**  
**e-Tender Notice**

Rajkot Municipal Corporation, Drainage Project Department, Shri Harisinhji Gohil Zonal Office, West Zone, Room No.3 (G.F.), 150 Feet Ring Road, Rajkot-360005, invites e-Tenders with two bid system from the experienced contractors registered in appropriate class in GWSSB / State Government/ Central Government for below mentioned work under Rajkot underground sewerage project under "AMRUT" scheme.

Sr. No.	Name of work	a) Estimated cost. b) Amount of EMD c) e-Tender fee d) Registration Class e) Time limit for completion of work
1	Providing, Lowering, Laying, Jointing, Testing and Commissioning of 1100 mm Dia DI Pipe on route Popatpara MPS to Madhapar STP in New Ward No.-3 under SJMMSVY	a) Rs. 15,29,00,000/- b) Rs. 15,29,000/- c) Rs. 23,500/- d) "AA" Class e) 12 Months

**:: Milestone dates of e-Tendering ::**

1	Downloading of e-Tender documents	15-01-2021 to 30-01-2021 up to 18.00 Hrs.
2.	Pre-bid Queries to be submitted by e-mail at mail ID <a href="mailto:hnsbeth@rmc.gov.in">hnsbeth@rmc.gov.in</a> Pre-bid Meeting in Office of the City Engineer, RMC. at West Zone Office Room No.3	18-01-2021 at 11.00 Hours
3.	Online submission of e-Tender	30-01-2021 up to 18.00 Hrs.
4.	Submission of EMD, Tender fee, Documents required for pre-qualification and other necessary documents by Hand Delivery / Regd. Post. A.D. / Speed Post.	Up to 03-02 -2021 up to 18.00 Hrs
5.	Opening of online Primary Bid (Technical Bid)	04-02-2021 at 10.30 Hrs. onwards
6.	Verification of submitted documents (EMD, Tender fee, Documents required for pre-qualification and other necessary)	upto 06-02-2021 at 10.30 Hours onwards
7.	Opening of online Commercial Bid (Price Bid) for technically qualified bidders only.	08-02-2021 at 10.30 Hrs. onwards (If possible)
8.	Bid Validity	One eighty (180) calendar days

All bidders must submit tender fee and bid security in person as above either directly deposited in Account No.01018640000035 (Rajkot Municipal Corporation) IFSC Code HDFC0000101 or submit at the below mentioned address in form of Demand draft in favour of "Rajkot-Municipal Corporation", Rajkot, from any Nationalized Bank or Scheduled Bank (except Co-operative Bank) in India. The required documents to be submitted for verification should be duly certified by Gazetted Officer.

**Office of the City Engineer**  
**Drainage Project Department,**  
**Rajkot Municipal Corporation,**  
**Shri Harisinhji Gohil Zonal Office,**  
**West Zone, Room No.3 (G.F.),**  
**150 Feet Ring Road,**  
**Rajkot-360005**

- **The pre-qualification requirement is as under:**

- i) **Financial Criteria:**

1. An average annual turnover of last seven financial years should not be less than the 50% of estimated tender cost.
2. Working capital must not be less than 25% of estimated cost.
3. Available Bid Capacity-ABC must be more than the estimated tender cost.
4. Bidder shall have a solvency Solvency Equal to or more than Rs. 300 Lacs. The solvency shall be in form of certified banker's statement not older than 6 months shall be attached.

- ii) **Experience Criteria for each work:**

The bidder should possess following minimum experience. Bidder should have completed the work/works of rising main (Pressure) pipeline carrying any type of fluid like; sewer, water, oil etc. of either Government or Semi-Government as a main contractor in period of last seven years

(a) One work of 60% OR (b) two works of 40% OR (c) three works of 30% magnitude of Rising Main Work

- Bidder should have enough machinery and experienced personnel to supervise the whole work.

Note:

1. Enhancement factor at 10 % per year for last seven years will be applicable to arrive average annual turnover and finalize the magnitude of work done in last seven years.

	<b>Financial Year</b>	<b>Multiplying factor</b>
	2020-21 (Base Year)	1.00
1	2019-20	1.10
2	2018-19	1.21
3	2017-18	1.33
4	2016-17	1.46
5	2015-16	1.61
6	2014-15	1.77
7	2013-14	1.95

2. Available Bid Capacity (ABC) will be derived by the following method.

ABC is calculated as  $ABC=2*A*N-B$

Where,

A = Maximum value of works executed in any one year during the last five years (updated to present price level by applying enhancement factor) taking into account the completed as well as works in progress.

N = Number of years prescribed for completion of the works for which tenders are invited.

B = Value (present price level by applying enhancement factor) of existing commitments and on-going works to be completed during that next N year (period of completion of the works for which the tenders are invited.)

### 3. Joint Venture (JV)

Joint Venture will not be permitted for this tender. However, experience of JV shall be considered for individual JV partner based on the proportionate share of each individual partner in the JV for the purpose of qualification criteria and based on this qualification individual JV partner can bid in the same name and style of individual company forming part of JV. For this purpose, the bidder shall enclose the notarized copy of JV agreement along with physical submission of technical bid.

### 4. The Bidder shall have necessary class registration from competent authority.

- While furnishing Experience Data & Bank Documents, the agency submitting the tender shall have to provide the Contact Address, Phone No., Fax No, e-mail address of the authorities issuing the Experience Certificate for confirmation by this office. In case of failure of confirmation, the tender will be liable to be rejected out rightly.
- After opening of online Technical Bid, the procedure for the pre-qualification shall be adopted and the e-Price Bid of only successful qualified bidder shall be opened for final evaluation of the contract. The decision of Municipal Commissioner regarding the pre- qualification shall be final and binding to all the bidders.
- The Tender of those bidder(s) those who fail to submit the required documents physically within the stipulated date and time will be treated as none responsive and their Price Bid will not be opened.
- The bidder should not have been Black Listed by Government of India / Government of Gujarat or any State Board / Corporations, since inception of the firm / Company. A Declaration in this regard on Rs.300/- Stamp Paper duly Notarized, shall have to be submitted as per Annexure, along with the tender documents.
- The bidder should provide accurate information on any litigation history or arbitration resulting from contracts completed or under execution by him over the last ten years. This should also include such cases, which are in process / progress. A consistent history of awards against the bidder may result in failure of the bid. In case the bidder has not provided such information and has come to the notice of the authority, the tender will be rejected at what so ever stage and in such case all the losses that will arise out of this issue will be recovered from the tenderer / bidder and he will not have any defense for the same.
- Conditional Tenders will be out rightly rejected.
- Commissioner, Rajkot Municipal Corporation, Rajkot, reserves the right to accept / reject any or all e-Tender(s) without assigning any reasons thereof.

**Commissioner  
Rajkot Municipal Corporation**



**: INFORMATION TO THE TENDERER :**

	Name of Work	Providing, Lowering, Laying, Jointing, Testing and Commissioning of 1100 mm Dia DI Pipe on route Papatpara MPS to Madhapar STP in New Ward No.-3 under SJMMSVY
1.	Tender validity period	180 (one hundred eighty ) days
2.	Amount of tender security bond (Earnest money	Rs. 15,29,000/-
3.	Minimum amount of performance bond price (Security Deposit)	5 ( Five ) percent of contract price
4.	Time of completion	12 (Twelve) Months from notice to proceed
5.	Period of liability for defects	1 (One) Years (after completion of Works)
6.	Compensation for delay	0.1 ( zero point one ) percent of the contract value per each day of delay subject to a maximum up to 10 ( ten ) percent of the contract value or as decided by the Municipal Commissioner
7	Retention Money Deposit	@ 5% of RA Bill amount from each RA Bill
8.	Miscellaneous Deposit from each RA Bill	(a) Road Restraining @ 0.5% of RA Bill amount (b) Drawing Deposit @ 0.1% of RA Bill amount
9.	Last date downloading of e-Tender documents	Up to 30-01-2021 up to 18.00 hrs.
10.	Pre-Bid meeting	18-01-2021 at 11.00 Hours.
11.	Last date of online submission of e-Tender	30-01-2021 up to 18.00 hrs.
12.	Remarks	Municipal Commissioner reserves the right to reduce scope of work and entrust to any other agency without assigning any reason.

**City Engineer (Drainage Project)  
Rajkot Municipal Corporation**

## e-TENDER DECLARATION FORM

**TO**  
**The Commissioner**  
**Rajkot Municipal Corporation**  
**Rajkot.**

**Name of Work :**

Providing, Lowering, Laying, Jointing, Testing and Commissioning of 1100 mm Dia DI Pipe on route Popatpara MPS to Madhapar STP in New Ward No.-3 under SJMMSVY

Ref :

Dear Sir,

I/We the undersigned have carefully gone through and clearly understood the tender documents comprising Notice Inviting Tenders, Articles of Agreement, Scope of work, Definition of terms, Instruction to Tenderer, Condition of Contract, Special condition of contract, Appendices, Specification, Schedule of quantities and tendered drawing furnish by The Rajkot Municipal Corporation. I/We have satisfied myself/ourselves as to the location of site, examined drawings.

I/We do hereby offer to execute and complete the whole of work within the time specified all in accordance with the specifications, designs, drawing and instructions in writing referred to in the said documents and with such materials as are provided for at the respective rates which I/We have quoted in the schedule-B or at such other rates as may be fixed under provisions of these conditions.

In the event of this tender being accepted I/We agree to enter into agreement as and when required and execute the contract, according to your Form of Agreement or in default where of I/We myself/our self to forfeit the 'Earnest Money' Deposit.

I/We understand that if I/We shall not enter in agreement within 10 days from the date of receipt of letter of acceptance, you will forfeit the earnest money paid by me/us and take necessary action as deemed fit.

I/We have enclosed a DEMAND DRAFT as an "**Earnest Money Deposit**" fo the sum of **Rs. 15,29,000/-** the full value of which is to be absolutely forfeited to the Owner should I/We fail to commence the works specified. Otherwise the said sum shall be retained by the Owner as on account of such 'Security Deposit' as provided for in the aforesaid documents.

I/We agree not to employ Sub-Contractors other than those that may be approved in accordance with conditions in the aforesaid documents.

I/We understand that you are not bound to accept the lowest or any tender which you may receive.

I/We am/are bound to execute the job if the work order is issued within 180 days from the date opening of the tender.

I/We agree to pay the Government Income-Tax, Service Tax, Sales Tax (Central & State), Sales Tax on contraction, Value Added Tax, Labour Cess, Professional Tax, GST and Other Taxes prevailing from time to time on such items on which the same leviable and the rates quoted by me/us are inclusive of the same.

**Date:-**\_\_\_\_\_

**Yours faithfully,**

\_\_\_\_\_

**Signature of Contractor**

**Address:**

**Contractor**.....

**City Engineer (Drainage Project)  
Rajkot Municipal Corporation**

# **INSTRUCTIONS TO THE TENDERER**

# INSTRUCTIONS TO THE TENDERER

## IT 1. GENERAL

The contract documents may be secured in accordance with the Notice Inviting e-TENDER for the work called. The work shall include supply of materials necessary for construction of the work.

## IT 2. INVITATION TO e-TENDER

The Rajkot Municipal Corporation hereinafter referred as the Corporation will receive e-Tenders for the work of as per the specifications and schedule of prices in the e-Tender document. The e-Tenders shall be opened online as specified in the e-Tender notice in the presence of interested Tenderers or their representatives. The Corporation reserves the right to reject the lowest or any other or all e-Tenders or part of it which in the opinion of the Corporation does not appear to be in its best interest, and the Tenderer shall have no cause of action or claim against the Corporation or its officers, employees, successors or assignees for rejection of his e-Tender.

## IT 3. LANGUAGE OF e-Tender

e-Tenders shall be submitted in English, and all information in the e-Tender shall also be in English / Gujarati, Information in any other language shall be accompanied by its translation in English/Gujarati. Failure to comply with this may make the e-Tender liable to rejection.

## IT 4. QUALIFICATIONS OF TENDERERS

- A. The Tenderers shall abide by the laws of the Union of India and of Gujarat State and legal jurisdiction of the place where the works are located. i.e. this contract shall be construed according to and subject to the laws of India and the State of Gujarat and under the jurisdiction of the Courts of Gujarat at Rajkot city only.
- B. The Tenderer shall furnish a written statement of financial and technical parameters with details and documents along with his e-Tender which contains namely as below:
  - i. The Tenderer's experience in the fields relevant to this contract.
  - ii. The Tenderer's financial capacity/resources and standing over at least 7 (Seven) years.
  - iii. The Tenderer's present commitments (Jobs on hand).
  - iv. The Tenderer's capability and qualifications of himself and his regular staff etc.
  - v. Plants and Machinery available with the Tenderer for the work Tendered.

### C. Joint venture

Joint Venture will not be permitted for this tender. However, experience of JV shall be considered for individual JV partner based on the proportionate share of each individual partner in the JV for the purpose of qualification criteria and based on this qualification individual JV partner can bid in the same name and style of individual company forming part of JV. For this purpose, the bidder shall enclose the notarized copy of JV agreement along with physical submission of technical bid.

#### **IT 5. e-Tender DOCUMENTS**

The e-Tender documents and drawings shall comprehensively be referred to as e-Tender document. The several sections form in the document are the essential parts of the contract and a requirement occurring in one shall be as binding as though occurring in all, they are to be taken as mutually, explanatory and describe and provide for complete works.

#### **IT 6. EXAMINATION BY TENDERERS**

- A. At this own expense and prior to submitting his e-Tender, each Tenderer shall (a) examine the Contract Documents, (b) visit the site and determine local conditions which may affect the work including the prevailing wages and other pertinent cost factors, (c) familiarize, himself with all central, state and local laws, ordinance, rules regulations and codes affecting the material supply including the cost of permits and licenses required for the work and (d) correlate his observations, investigations, and determinations with the requirements of the e-Tender Documents, site & subsoil investigation.
- B. The e-Tender is invited on **% rate** and Contractor shall have to quote his price on % bases **above or below in the schedule -B/ Price Schedule**. The works shall have to be completed in all respect as stated in the e-Tender document to the satisfaction of the Corporation.
- C. The following comprises in Contract Documents at a price of **Rs. 23,500/-**

**e-Tender Document:**

#### **Volume-I**

#### **General Conditions of Contract**

1. Notice inviting Tenders.
2. Information to the Tenderer.
3. e-TENDER declaration form
4. Instructions to the Tenderer.
5. Common Formats.
6. Formats for Rising Main Pipeline work.
7. General conditions of contract

#### **Volume-II**

#### **Technical specifications & Drawings (Rising Main Pipeline work)**

#### **Volume-III**

#### **Price Bid**

- Bill of Quantities with price)
- Bid form (with price)
- Preamble to Price schedule

- D. Copy of the e-TENDER Document should be completed, checked in a responsible manner, digitally signed, and submitted. Tender security Bond shall be submitted in person by the stipulated date, which shall form the e-Tender.

The e-Tender is required to be completed with all the pages in which entries are required to be made by the Tenderer are contained in the e-Tender documents and the Tenderer shall not take out or add to or amend the text of any of the documents except in so far as may be necessary to comply with any addenda issued pursuant to Clause IT. 16 hereof.

#### **IT 7. EARNEST MONEY DEPOSIT:**

- A. Each Tenderer must submit a receipt of deposit as Tender guarantee towards **Earnest money** amounting to **Rs. 15,29,000/-** in the form of crossed Demand Draft in favor of "Rajkot Municipal Corporation", from any Scheduled bank (except Co-operative Bank) in India acceptable to owner payable at Rajkot. The Tender Bond, shall be valid for a period of not less than hundred and eighty (180) days from the date the e-Tenders are opened and shall comply with the requirements for Bond as stipulated in the General conditions of contract. The Tender guarantee bond will be held by the owner as a guarantee that the Tenderer, if awarded the contract, will enter into the contract agreement in good faith and furnish the required bonds. Any e-Tender not accompanied by a Tender guarantee in the form of earnest money deposited for the sum stipulated in the e-Tender Document will be summarily rejected.
- B. The Earnest Money Deposit will be refunded to the unsuccessful Tenderers after an award has been finalized.
- C. The Earnest Money Deposit (Tender Guarantee) will be forfeited in the event, the successful Tenderer fails to accept the contract and fails to submit the "Performance Guarantee Bonds to the Owner as stipulated in this e-Tender document within ten days. (10) days after receipt of notice of award of contract.
- D. The Earnest Money Deposit of the successful Tenderer shall be returned after the performance guarantee bond, as required, is furnished by the Contractor.
- E. Within 10 (ten) days from the date of issue of the letter accepting his tender, the successful Bidder shall furnish the required Security Deposit for performance and plus additional security if any for unbalanced bids in accordance with the condition of the contract and attend the office of the Engineer In-charge for execution of the contract documents. If he fails to furnish the Security Deposit for performance or enter into an agreement to execute the contract for the work offered to him, his Earnest Money Deposit will be forfeited and the Bidder will be Black Listed / Debarred from tendering for further works of Rajkot Municipal Corporation for the period of three years.
- F. No interest shall be paid by the owner on any e-Tender guarantee.

#### **IT 8. PREPARATION OF e-TENDER DOCUMENTS**

Tenderers are required to note the following while preparing the e-TENDER Documents:

- A. e-TENDER shall be submitted on the e-TENDER form bound here in English. All statements shall be properly filled in. Numbers shall be stated both in words and in figures where so indicated.

- B. All entries or prices and arithmetic shall be checked before submission of the e-Tenders. If there is discrepancy between the rates quoted in figures and in words, the rates expressed in words shall be considered as binding.
- C. Each e-Tender shall be accompanied by the prescribed e-Tender security bond and other required documents and drawings. All witnesses and sureties shall be persons of status and probity and their full names, occupations and addresses shall be stated below their signature.
- D. Variation to the contract Documents requested by the Tenderer may be affixed and duly signed and stamped. Such variations may be approved or refused by the Corporation is not obliged to give reason for his decisions.

#### **IT 9. SUBMISSION OF e-TENDER DOCUMENTS**

Tenderers are requested to submit the e-TENDER Documents on following lines.

- A. Volume containing following documents:
  - I. e-TENDER security bond (Earnest Money )
  - II. Certificates as registered Contractor with Government of Gujarat or appropriate authority.
  - III. Tenderer's financial capability and standing over at least past seven Years
  - IV. Current Income Tax clearance certificate. **(DELETED)**
  - V. Tenderer's experience in the field relevant to this contract.
  - VI. A list of the equipment the Tenderer possesses and that which he proposed to acquire and use for the purpose related to the work.
  - VII. Tenderer should submit All the drawings which they have received along with e-Tenders

The time limit for receipt of e-Tender shall strictly apply in all cases. The Tenderers should therefore ensure that their e-Tender is received by the competent authority **The Rajkot Municipal Corporation** at the required place before expiry of the time limit. No delay on account of any cause for receipt of e-Tender shall be entertained.

The e-Tender must contain the name address and residence and place of business of the person or persons submitting the e-Tender and must be digitally signed.

e-Tenders by partnership firm must be furnished with the full names and addresses of all partners and be signed by one of the members of the partnership or by a legally authorized representative holding power of attorney followed by signature and designation of the person of person signing.

E-Tenders by corporations/companies must be signed with the legal name of the Corporation/Companies by the president/or by the secretary or other person or persons legally authorized to bind the Corporation/Company in the matter.

#### **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.

#### **IT 10 TENDER VALIDITY PERIOD**

The validity period of the e-Tender submitted for this work shall be of One eighty (180) calendar days from the date of opening of the e-Tender and that the Tenderer shall not be allowed to withdraw or modify the e-Tender offer on his own during the validity period. The Tenderer will not be allowed to withdraw the e-Tender or make any modifications or additions in the terms and conditions on his own e-Tender. If this is done then the owner shall, without prejudice to any other right or remedy, be at liberty to reject the e-Tender and forfeit the earnest money deposit in full.

#### **IT 11 GENERAL PERFORMANCE DATA**

Tenderers shall present all the information which sought for in the e-Tender document in form of various schedules if given. E-Tenders may not be considered if left blank or the schedules are not properly filled in.

#### **IT 12 SIGNING OF E-TENDER DOCUMENTS**

If the e-Tender is made by an individual it shall be signed with his full name above his current address. If the e-Tender is made by a proprietary firm, it shall be signed by the proprietor above his name and the name of his firm with his current address.

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

If the e-Tender is made by a limited company or a limited corporation, it shall be signed by a duly authorized person holding the power of attorney, shall accompany the e-Tender. Such limited company or corporation may be required to furnish satisfactory evidence of its existence before the contract is awarded.

If the e-Tender is made by a group of firms, the sponsoring firm shall submit complete information pertaining to each firms in the group and state along with the bid as to which of the firms shall have the responsibility for e-Tendering and for completion of the contract documents and furnish evidence admissible in law in respect of the authority to such firms on behalf of the group of firms for e-Tendering and for completion of contract documents. The full information and satisfactory evidence pertaining to the participation of each member of the group of firms in the e-Tender shall be furnished along with the e-Tender.

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

**IT 13 WITHDRAWAL OF TENDERS**

If, during the tender validity period, the Tenderer withdraws his Tender, Tender security (Earnest Money) shall be forfeited and Tenderer will be debarred for next three years to quote in R.M.C.

**IT 14 INTERPRETATIONS OF e-TENDER DOCUMENTS**

Tenderers shall carefully examine the e-Tender document and fully inform themselves as to all the conditions and matters which may in any way affect the work or the cost thereof. If a Tenderer finds discrepancies, or omission from the specifications or other documents or should be in doubt as to their meaning, he should at once address query to the City Engineer (Drainage Project) , R.M.C. The result of interpretation of the e-Tender will be issued to all Tenderers as addendum.

**IT 15 ERRORS AND DISCREPANCIES IN e-TENDERS**

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

**IT 16 MODIFICATION OF DOCUMENTS**

Modification of specifications and extension of the closing date of the e-Tender, if required will be made by an addendum. Each addendum will be made available online to all Tenderers. These shall form a part of e-Tender. The Tenderer shall not add to or amend the text of any of the documents except in so far as may be necessary to comply with any addendum.

**ADDENDA**

Addenda form part of the Contract Documents, and full consideration shall be given to all Addenda in the preparation of e-Tender. Tenderers shall verify the number of Addenda issued, if any and acknowledge the receipt of all Addenda in the e-TENDER Failure to so acknowledge may cause the e-Tender to be rejected.

- A. The Owner may issue Addenda to advise Tenderers of changed requirements. Such addenda may modify previously issued Addenda.
- B. No addendum may be issued after the time stated in the notice inviting e-Tenders.

**IT 17.TAX AND DUTIES ON MATERIALS**

All charge on account of excise duties, Central / State, sales tax, work contract tax, GST and other duties etc. on materials obtained for the works from any source shall be borne by the Contractors. (P) or 'C' or 'D' form shall not be supplied by the owner.

**IT 18 EVALUATION OF e-TENDERS**

While comparing e-Tenders, the Rajkot Municipal Corporation shall consider factors like price offer is workable with the market price, efficiency and reliability of construction method proposed, compliance with the specifications, relative quality, work done in past with Rajkot Municipal Corporation or other Government Organizations, litigation issues etc. Evaluation criteria specifically mentioned in the specification will also be taken into consideration in the evaluation of e-Tenders.

#### **IT 19 TIME REQUIRED FOR COMPLETION**

The completion period mentioned in this schedule is to be reckoned from the date of notice to proceed. Total completion period is **12 (Twelve) calendar months** from the date of issue of notice to proceed and Contractor should adhere to this completion time. However, actual monsoon period or minimum 3 month will be considered as non-working period and that shall be excluded in time limit. Actual dates will be notified.

#### **IT 20 POLICY FOR TENDER UNDER CONSIDERATION**

TENDER shall be termed to be under consideration from the opening of the e-Tender until such time any official announcement or award is made. While e-Tenders are under consideration, Tenderers and their representative or other interested parties are advised to refrain from contacting by any means any Corporations personnel or representatives on matters related to the e-Tenders under study.

The Corporation's representatives if necessary will obtain clarification on e-Tenders by requesting such information from any or all the Tenderers, either in writing or through personal contact, as may be necessary. The Tenderer will not be permitted to change the substance of his e-Tender after e-Tenders have been opened. This includes any post Tender price revision. Non-compliance with his provision shall make the Tender liable for rejection.

#### **IT 21 PRICES AND PAYMENTS**

The Tenderer must understand clearly that the prices quoted are for the total works or the part of the total works quoted for and include all costs due to materials, labour, equipment, supervision, other services, royalties, taxes etc. and to include all extra to cover the cost. No claim for additional payment beyond the prices quoted will be entertained and the Tenderer will not be entitled subsequently to make any claim on any ground.

#### **IT 22 PAYMENT TERMS**

The terms of payment are defined in the General Conditions of Contract and Technical specifications. The Corporation shall not under any circumstances relax these terms of payment and will not consider any alternative payment terms. Tenderers should therefore in their own interest note this provision to avoid rejection of their e-Tenders.

#### **IT 23 AWARD**

Award of the contract or the rejection or e-Tenders will be made during the Tender validity period. A separate Schedule-B (Price Schedule) is given. The Contractors are requested to quote their price offer **in % below or above on the given price in the schedule-B only.**

- A. After all contract contingencies are satisfied and the Notice of Award is issued, the successful Tenderer shall execute the Contract Agreement within the time stated and shall furnish the Bond as required herein. The contract Agreement shall be executed, in form stipulated by the Owner.
- B. If the Tenderer receiving the Notice of Award fails or refuses to execute the Contract Agreement within the stated time limit or fails or refuses to furnish the Bond as required herein. The Owner may annul his award and

declare the e-Tender security forfeited and will take action as deemed fit.

- C. A corporation, partnership firm or other consortium acting as the Tenderer and receiving the award shall furnish evidence of its existence and evidence that the officer signing the contract agreement and Bonds for the corporation, partnership firm or other consortium acting as the Tenderer is duly authorized to do so.

#### **IT 24 SIGNING OF CONTRACT**

The successful Tenderer shall be required to execute the contract agreement within 10 days of receipt of intimation to execute the contract, failing which the Corporation will be entitled annul to the award and forfeit the Earnest Money Deposit. The person to sign the contract document shall be person as detailed in Article IT. 12 (signing of e-Tender documents).

#### **IT 25 DISQUALIFICATION**

- A e-Tender shall be disqualified and will not be taken for consideration if,
- (a) The Tender Security Deposit is not deposited in full and in the manner as specified as per Article IT. 7 i.e. Earnest Money Deposit.
  - (b) The e-Tender is in a language other than English or does not contain its English Translation in case of other language adopted for e-Tender preparation.
  - (c) The e-Tender documents are not signed by an authorized person (as per Article IT. 12 i.e. signing of e-Tender documents).
  - (d) The general performance data for qualification is not submitted fully (as per Article IT 11 i.e. General performance Data).
  - (e) Tenderer does not agree to payment terms defined as per Article IT. 22 i.e. payment terms.

#### **A. An e-Tender may further be disqualified if,**

- (a) Price variation is proposed by the Tenderer on any principle other than those provided in the e-TENDER Documents.
- (b) Completion schedule offered is not consistent with the completion schedule defined and specified in e-Tender document.
- (c) The validity of e-Tender is less than that mentioned in Article IT. 10 i.e. e-Tender validity period.
- (d) Any of the page or pages of e-Tender is/are removed or replaced.
- (e) Any condition which affect the cost.

#### **IT 26 PERFORMANCE GUARANTEE (SECURITY DEPOSIT)**

As a contract security the Tenderer to whom the award is made shall furnish a performance guarantee (Security deposit) for the amount of **5%** of the contract price to guarantee the faithful performance, completion and maintenance of the works of the contract in accordance with all conditions and terms specified herein and to the satisfaction of the Engineer-in-charge, and ensuring the discharge of all obligations arising from the execution of contract in the forms mentioned below:

- a. By a Demand Draft on the Rajkot Branch of any Nationalized Bank or Scheduled Bank except co-operative bank.
- b. A fixed deposit receipt of any Nationalized Bank or Schedule Bank except Co-operative Bank duly endorsed in favour of the **Rajkot Municipal Corporation, Rajkot.**

- c. A Bank Guarantee of any Nationalized Bank or Schedule Bank except Co-operative Bank duly endorsed in favour of the **Rajkot Municipal Corporation, Rajkot.**

The performance guarantee shall be delivered to the Corporation within ten (10) days of the notice of award and at least three (3) days before the contract agreement is signed unless otherwise specified by the Engineer-in-charge. On due performance and completion of the contract in all respects, **the performance guarantee will be returned to the contractor without any interest after the defect liability period of concern component is over.**

#### **IT 27 STAMP DUTY**

The successful Tenderer shall have to enter into an agreement on a Non-Judicial stamp paper of amount as per Stamp Duty Act in the form of the agreement approved by the Corporation. The cost of stamp paper and adhesive stamp shall be borne by the contractor. The same shall be paid as per circular of Superintendent of Stamps, Gandhinagar. At present, the rate of stamp duty is 4.90% of amount of FDR of security deposit but it shall be levied actual as applicable from time to time.

#### **IT 28 BRAND NAMES**

Specific reference in the specifications to any material by manufacturer's name, or catalogue shall be constructed as establishing a standard or quality and performance and not as limiting competition and the Tenderer in such cases, may at his option freely use only other product, provided that it ensures an equal or higher quality than the standard mentioned and meets Corporation approval.

#### **IT 29 NON TRANSFERABLE**

e-TENDER documents are not transferable.

#### **IT 30 COST OF e-Tendering**

The owner will not defray expense incurred by Tenderers in e-Tendering.

#### **IT 31 EFFECT OF e-Tender**

The e-Tender for the work shall remain for a period of 180 calendar days from the date of opening of the e-Tenders for this work and that the Tenderer shall not be allowed to withdraw or modify the offer in his own during the period. If any Tenderer withdraws or makes any modification or additions in the terms and conditions of his own e-Tender, then the Corporation shall, without prejudice to any other right or remedy, be at liberty to reject the e-Tender and forfeit the earnest money in full.

#### **IT 32 CHANGE IN QUANTITY**

The Corporation reserves the right to waive any information in any e-Tender and to reject one or all e-Tenders without assigning any reasons for such rejection and also to vary the quantities of items or group as specified in the scheduled of prices as may be necessary.

#### **IT 33 NEW EQUIPMENT AND MATERIAL**

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

**IT 34 RIGHTS RESERVED**

The owner reserves the right to reject any or all e-Tenders, to waive any informality or irregularity in any e-Tender without assigning any reason. The owner further reserves the right to withhold issuance of the notice to proceed, even after execution of the contract agreement. No payment will be made to the successful Tenderer on account of such withholding. The owner is not obliged to give reasons for any such action.

**IT 35 ADDITIONAL RIGHTS RESERVED**

The Commissioner, Rajkot Municipal Corporation, reserves right to reduce the scope of work & split the e-Tender on two or more parts without assigning any reason even after the awards of contract.

**IT 36 MOBILIZATION ADVANCE**

No mobilization advance or advance on machinery will be given.

**IT 37 CONDITIONAL e-Tenders**

The scope of work is clearly mentioned in the e-Tender documents. The Contractor shall have to carry out the work in accordance with the details specifications. No condition will be accepted. The conditional e-Tender will liable to be rejected.

**IT 38 1% CESS & REGISTRATION:**

For the welfare of labour working under construction Industry, the agency shall have to take the registration with competent authority as per Circular No. CWA/2004/841/M-3 dated 30-01-2006 of Government of Gujarat. Rajkot Municipal Corporation will deduct 1% Cess of the value of work and will deposit the same in Government.

**IT 39 PROFESSIONAL TAX**

The bidder shall have to pay the Professional Tax up to current financial year imposed by Government of Gujarat, and also produced Enrollment Certificate for the same.

**IT-40 APPLICATION OF EMPLOYEES' PROVIDENT FUND & MISCELLANEOUS PROVISIONS ACT-1952**

The bidder shall have to follow all the rules and regulations as per "Application of employees' provident fund and miscellaneous provisions ACT-1952".

**A.E.  
R.M.C.**

**D.E.E.  
R.M.C.**

**C.E. (Drainage Project)  
R.M.C.**

# Common Formats

**Application Form (1)  
General Information**

*All individual firms and each partner of a consortium applying for qualification are requested to complete the information in this form. Nationality information to be provided for all owners or applicants who are partnerships or individually-owned firms.*

*Where the Applicant proposes to use named sub-Contractors for critical components of the works, or for work contents in excess of 10 percent of the value of the whole works the following information should also be supplied for the specialist sub-Contractor(s).*

1.	Name of Firm	
2.	Head office address	
3.	Telephone	Contact
4.	Fax	Telex
5.	Place of incorporation/registration	Year of incorporation/ registration

**Signature of Contractor**



	<b>Nationality of owners</b>	
	<b>Name</b>	<b>Nationality</b>
1.		
2.		
3.		
4.		
5.		

**Signature of Contractor**

<b>Name of Bidders officers / Persons to be contacted</b>			
<b>Name.</b>	<b>Address</b>	<b>Phone Nos.</b>	<b>Fax.</b>

**Signature of Contractor**

**Application Form (1A)**

**Structure and Organization**

<p><b>The applicant is</b>  an individual  a proprietary firm  a firm in partnership  a Limited Company or Corporation  a group of firms/consortium (if Yes, give completion information in respect of each partner)</p>	
<p>Attach the Organization Chart showing the structure of the organization including the names of the Directors and position of officers</p>	
<p>Number of years of experience :  as a Prime Contractor (Contractor shouldering major responsibility in own country  other countries (specify country)</p>	
<p>in a consortium  in own country  other countries (Specify country)</p>	
<p>as a sub-Contractor (specify main Contractor)  in own country  other countries (Specify country)</p>	
<p>Name and address of any associates the applicant has in India (in case the applicant happens to be from foreign country) who are knowledgeable in the procedures of customs, immigration, taxes and other information necessary to do the work.</p>	
<p>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? Whether any new fields were added in your organization? And if so, when?</p>	

**Signature of Contractor**

Were you ever required to suspend construction for a period of more than six months continuously after you started? If so, give the name of project and give reasons therefore.	
Have you ever left the work awarded to you incomplete? If so, give name of project and reasons for not completing work.	
In which fields of civil engineering construction do you claim specialization and interest?	
Give details of your experience in mechanized cement concrete lining and in modern concrete technology for manufacture and quality control.	
Give details of your experience in using heavy earth moving equipment and quality control in compaction of soils.	
Give details of your experience in Underground Drainage work in rocky area.	
Give details of civil work for sewage pumping station	
Give details for construction of sewage treatment plant	
Give details for pumping machinery in drainage pumping station	

**Signature of Contractor**

## APPENDIX - M

### (DECLARATION on Stamp Paper worth s.300/-)

Name of Work :-

**Providing, Lowering, Laying, Jointing, Testing and Commissioning of 1100 mm Dia DI Pipe on route Popatpara MPS to Madhapar STP in New Ward No.-3 under SJMMSVY**

I/We hereby declared that I/We am/are not partner(s) black listed or connected with firm blacklisted/Debarred in any States, CPWD / MES / Railways or any Government, Semi- Government or Private body.

My / our firm is / are not partner(s) blacklisted/ Debarred or connected with firm blacklisted/ Debarred in any States, CPWD / MES / Railways or any Government, Semi- Government or Private body.

I/We hereby declared that no contract of my/our firm with Rajkot Municipal Corporation has been terminated

I/We hereby declared that no contract of my/our firm with Rajkot Municipal Corporation is under Court or Arbitration procedurals or any other such dispute.

I/We hereby declared that no contract of my/our firm with Rajkot Municipal Corporation is under any litigation or in any dispute.

At present I/We am/are registered as approved contractor (s), firms in State, CPWD / MES / Railways.

We, the partners / owners of this firm, hereby give an undertaking that we are jointly and severally responsible to meet all the liabilities ever and above the business of this firm and make good the above financial loss sustained by the Rajkot Municipal Corporation as a result of our abandoning the works entrusted to us.

**Date:**

**Seal and Signature of the Bidder**

**APPLICABILITY OF PROVIDENT FUND AND MISCELLANEOUS PROVISIONS ACT 1952**

Successful bidder i.e. the agency whose tender is accepted by the RMC shall have to comply the necessary formalities under the employees provident fund and Miscellaneous Provisions Act, 1952 as Contributory Provident Fund Scheme is applicable to labourers engaged in construction activity and shall have to submit proofs regarding deduction of provident fund and other dues and depositing the same with government department under the act and the scheme regularly on monthly basis failing which no running / final bill payment will be made by the RMC to the contractor in any circumstances.

**A certificate to the above effect has to be given by the contractor as under.**

**Declaration  
Of  
Depositing Provident Fund contribution**

This to certify that we have deducted the employees' P.F. and deposited the same along with employer's contribution towards provident fund on labour charges / wages paid by us to the labourers engaged for the work of \_

\_\_\_\_\_with Provident

Fund Authority under our Provident Fund Code No. \_\_\_\_\_

We produce herewith the copies of the challans for the provident fund deduction and contribution deposited as mentioned above.

**Date:**

**Seal and Signature of the Bidder**

**APPENDIX – A**

**STATEMENT OF FINANCIAL PARAMETERS**

1. Annual turnover for last financial seven years

	Turnover Rs. In Lacs							
Financial year	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	Average of last Seven years

2. Working Capital

Working Capital (in Rs).	
as on Dt.31-03-2020	

Note: - The bidder shall have to submit the copies of Audited Report of last Seven Financial Years. The bidder shall also have to submit the Certificate regarding Turnover and Working Capital from the registered Chartered Accountant

**Signature of Contractor**

**APPENDIX-B**

**ENGINEERING PERSONNEL**

<b>Sr. No</b>	<b>Name of person</b>	<b>Qualification</b>	<b>Experience</b>	<b>Since long with the firm and designation</b>	<b>Whether he will be spared for RMC work for months time.</b>

**Signature of Contractor**



APPENDIX-C

DETAILS OF PLANTS & EQUIPMENTS AVAILABLE WITH FIRM

Sr No	Name of plants/ equipments	Make of Plants/ equipments	Model & Year of purchase	Details of R.T.O. Registration	Cost of plants / equipments	Location where the plants / equipments located	Hours utilized	Condition at present	Will be deployed on work or not?

Signature of Contractor

**APPENDIX-D**

**INFORMATION ON BID CAPACITY (WORK FOR WHICH BIDS HAVE BEEN SUBMITTED AND WORKS WHICH ARE YET TO BE COMPLETED) AS ON THE DATE OF THIS BID (A) EXISTING COMMITMENTS AND ON-GOING WORKS**

Sr. No.	Description of Work	Place and state	Contract No. & Date	Name and Address of the Owner	Value of Contract Rupees in Lacs	Stipulated period of Completion	Value of works remaining to be completed	Anticipated date of completion.
	1	2	3	4	5	6	7	8

**Signature of Contractor**

**APPENDIX-E**

**WORKS FOR WHICH BIDS ALREADY SUBMITTED**

Sr. No.	Description of work	Place and State	Estimated Value of works Rs. In Lakh	Stipulated period of completion	Date when decision is expected	Remarks if any

**Signature of Contractor**

**APPENDIX – F**

**General Information Details**

Estimated Amount		Tender Fee & EMD	PAN, GST, Certi. Details	Mention Annexure no/pagination no of concern documents							
Rs.											
Name of Agency		Registration No./Class "AA" Class)	Detail	Professional Tax Details		Turnover Details ( Last Seven Years)		Solvency	Available Bid Capacity (working Capital) As per Formula $ABC = 2 * A * N - B$ (Minimum)	Details of Certificate attached for Experience of Min. of single work.	
		Issuing Authority			Year	enhancement factor to be multiplied	Turn Over in Rs. with enhancement factor	Bidder shall have a solvency as per NIT Certified banker's statement not older than 6 months shall be attached.	Maximum Value of work Executed by applying enhancement factor --- 10% above) years taking in to account	Name of Work which is to be considered for this tender  Amount of completed work as per 3A certi.	
Address		Class	Name of Bank & Bank Code, City	Vendor Registration Details	2013-14	1.95		Name of Bank & Bank Code, City	Value (present price level by applying enhancement factor) of existing commitments and on-going works to be completed during that next N year (period of completion of	----Do ---- with enhancement factor	
					2014-15	1.77					
					2015-16	1.61					
Phone		Permission No.	Draft No.		2016-17	1.46		Solvency No.	Number of years prescribed for completion of the works for which tenders are invited		
Fax		Date :-	Draft Date		2017-18	1.33		Certi. Issue Date	A= Max Value x Enhancement factor		
E-mail Address		Letter No			2018-19	1.21			N = Next N Year		
		Permission valid Up to			2019-20	1.10			B = Present Value	For Rising Main Work (Civil Work)	
						Average				Bid Capacity = $(2 * A * N) - B$	
									Attach the Calculation sheet and Mention Figure Here		
Above all Details are True							Above Financial Details are True				
Contractor Sign & Seal							Chartered Accountant Sign & Seal				

APPENDIX - G

EXPERIENCE OF EXCAVATION IN HARD ROCK BY CONTROLLED BLASTING IN URBAN AREA

Sr. No	Name of work	Name of Department/ Client	Qty. of Excavation in hard rock by controlled blasting ( in M <sup>3</sup> )	Actual Contract period (Start date & End date)	Whether project under litigation (Y/N) and reason thereof

Signature of Contractor

**APPENDIX - H**

**EXPERIENCE FOR RISING MAIN (PRESSURE) PIPELINE WORK  
(DI, CI, MS, GRP, AC PRESSURE pipeline carrying any type of fluid like; sewer, water, oil etc.)**

Sr. No	Name of the work and location	Contract Cost (Rs. In Lacs.)	Contract period (Start date & End date)	Actual Cost at the end of contract (Rs. In Lacs.)	Actual Contract period (Start date & End date)	Dia. of pipe	Material of pipeline	Total Length in RMT	Name of Department / Client	Whether time limits extended and reason thereof	Whether project under litigation (Y/N) and reason thereof

Note :- The bidder shall have to give completion certificate from the concerned Department/Client. In absence of such certificate, experience shall not be considered for tender evaluation.

**Signature of Contractor**

**APPENDIX - I**

**EXPERIENCE IN MECHANIZED ROCK EXCAVATION WORKS**

<b>Sr. No</b>	<b>Name of Work</b>	<b>Name of Department/ Client</b>	<b>Qty. of Excavation in rock by mechanized manner  ( in M<sup>3</sup> )</b>	<b>Actual Contract period (Start date &amp;  End date)</b>	<b>Whether project under litigation (Y/N) and reason thereof</b>

**Signature of Contractor**

**APPENDIX - J**

**EXPERIENCE OF EXCAVATION IN HARD ROCK BY CONTROLLED BLASTING IN URBAN AREA**

<b>Sr. No</b>	<b>Name of Work</b>	<b>Name of Department/ Client</b>	<b>Qty. of Excavation in hard rock by controlled blasting ( in M<sup>3</sup> )</b>	<b>Actual Contract period (Start date &amp; End date)</b>	<b>Whether project under litigation (Y/N) and reason thereof</b>

**Signature of Contractor**



**SECTION - 2**

**GENERAL CONDITIONS OF CONTRACT**

**:: TABLE OF CONTESTS ::**

<b>No.</b>	<b>Description</b>
GC-1	Definitions and Interpretations
GC-2	Location of site and accessibility
GC-3	Scope of work
GC-4	Ruling language
GC-5	Interpretation of Contract Document
GC-6	Contractor to understand himself fully
GC-7	Errors in submissions
GC-8	Sufficiency of E-TENDER
GC-9	Discrepancies
GC-10	Performance Guarantee (Security Deposit)
GC-11	Inspection of work
GC-12	Defect Liability
GC-13	Power of Engineer-in-charge, to give further instructions.
GC-14	Programme
GC-15	Sub-letting of work
GC-16	Sub-Contracts for temporary works, etc.
GC-17	Time for completion
GC-18	Extension of time
GC-19	Contract Agreement
GC-20	Liquidated damages
GC-21	Forfeiture of Security Deposit
GC-22	Action of Forfeiture of Security Deposit
GC-23	No compensation for alteration in or restriction in work
GC-24	In the event of death of Contractor
GC-25	Members of the owner not individually liable
GC-26	Owner not bound by personal representations
GC-27	Contractor's office at site
GC-28	Contractor's subordinate staff and their conduct
GC-29	Termination of sub-contract by owner
GC-30	Power of entry
GC-31	Contractor's responsibility with the other Contractor and Agencies.
GC-32	Other Agencies at site
GC-33	Notices
GC-34	Rights of various interests
GC-35	Price adjustments
GC-36	Terms of Payment
GC-37	Retention Money
GC-38	Payments due from the Contractor
GC-39	Contingent Fee
GC-40	Breach of Contract by Contractor
GC-41	Default of Contractor
GC-42	Bankruptcy
GC-43	Ownership
GC-44	Declaration against waiver
GC-45	Laws governing the contract
GC-46	Over payment and under payment
GC-47	Settlement of disputes
GC-48	Disputes of differences to be referred to
GC-49	Interpretation Related To Tender
GC-50	Termination of the Contract

GC-51	Special risks
GC-52	Change in Constitution
GC-53	Sub-contractual relations
GC-54	Patents and Royalties
GC-55	Lien
GC-56	Execution of work
GC-57	Work in monsoon
GC-58	Work on Sundays and Holidays
GC-59	General Conditions for construction work
GC-60	Drawings to be supplied by the Owner
GC-61	Drawings to be supplied by the Contractor
GC-62	Setting out work
GC-63	Responsibilities of Contractor for correctness of work
GC-64	Materials to be supplied by the Owner
GC-65	Conditions of issue of materials by the Owner
GC-66	Materials procured with assistance of the Owner
GC-67	Materials obtained from dismantling
GC-68	Article of value of treasure found during construction
GC-69	Discrepancies between instructions
GC-70	Alternations in specifications and designs and extra work.
GC-71	Action when no specifications are issued
GC-72	Abnormal rates
GC-73	Assistance to Engineer-in-charge,
GC-74	Tests for quality of work
GC-75	Action and compensation in case of bad workmanship
GC-76	Suspension work
GC-77	Owner may do part of the work
GC-78	Possession prior to completion
GC-79	Completion Certificate
GC-80	Schedule of Rates
GC-81	Procedure for measurement of work in progress
GC-82	Running account payments to be regarded as advances
GC-83	Notice for claim for additional payment
GC-84	Payment of Contractor's Bill
GC-85	Final Bill
GC-86	Receipt for payment
GC-87	Completion Certificate
GC-88	Taxes, Duties, etc.
GC-89	Insurance
GC-90	Damage to Property
GC-91	Contractor to Indemnify Owner
GC-92	Implementation of Apprentice Act 1954
GC-93	Health and Sanitary arrangements for workers
GC-94	Safety Code
GC-95	Accidents
GC-96	Expenditure Reimbursement and Approval from Other
GC-97	Waste Disposal
GC-98	Deduction of Road Restraining and Drawing Submission
GC-99	Work-order/Notice to start for O & M Work

**GC-01**

**DEFINITIONS AND INTERPRETATIONS :**

- 1.0 In the contract (as hereinafter defined) the following words and expressions shall, unless repugnant to the subject or context thereof, have the following means as signed to them.
- 1.1 The "**Owner / Corporation**" shall mean **Rajkot Municipal Corporation** and shall include its Municipal Commissioner or other Officers authorized by the Corporation and also include owner's successors and assignees.
- 1.2 The "**Contractor**" shall mean the person or the persons, firm or Company whose e-Tender has been accepted by the Owner and includes the Contractor's legal representative, his successors and permitted assignees.
- 1.3 The "**Engineer-in-charge**" shall mean the person designated as such by the owner from time to time and shall include those who are expressly authorized by the Corporation to act for and on its behalf for all functions pertaining to the operation of this contract.
- 1.4 "**Engineer-in-charge's Representative**" shall mean any resident Engineer or Assistant to the Engineer-in-charge, appointed from time to time by the owner to perform duties set forth in the E-TENDER Document whose authority shall be notified in writing to the Contractor by the Engineer-in-charge.
- 1.5 "**E-TENDER**" – the offer or proposal of the Tenderer submitted in the prescribed form setting for the prices for the work to be performed, and the details thereof.
- 1.6 "**Contract Price**" shall mean total money payable to the Contractor under the contract.
- 1.7 "**Addenda**" shall mean the written or graphic notices issued prior to submission of e-Tender which modify or interpret the contract documents.
- 1.8 "**Contract Time**" – the time specified for the completion of work.
- 1.9 "**Contract**" shall mean agreement between the parties for the execution of works including therein all contract documents.
- 1.10 "**Contract Document**" shall mean collectively the e-Tender documents, designs, drawings, specifications, agreed variations, if any and such other documents constituting the e-Tender and acceptance thereof.
- 1.11 "**The Sub-Contractor**" shall mean any person, firm or company (other than the Contractor) to whom any part of the work has been entrusted by the Contractor with the written consent of the Engineer-in-charge and the legal representative successors and permitted assignee of such person, firm or company.
- 1.12 The "**Specifications**" shall mean all directions, the various Technical Specifications, provisions and requirements attached to the contract which pertain to the method and manner of performing the work, to the quantities and qualities of the work and the materials to be furnished under the contract for the work and any order(s) or instruction(s) there under. It shall also mean the latest Bureau of Indian Standard Specification relative to the particular work or part thereof, so far as they are not contrary to the E-TENDER specifications and in absence of any

other Country applied in Indian as a matter of standard engineering practice and approved in writing by the Engineer-in-charge with or without modification.

- 1.13 The "**Drawings**" shall include maps, plans, tracings, or prints thereof with any modification approved in writing by the Engineer-in-charge and as such other drawings as may, from time to time, be furnished or approved in writing by the Engineer-in-charge in connection with the work.
- 1.14 The "**Work**" shall mean the works to be executed in accordance with the contract or the part thereof as the case may be and shall include extra, additional, altered or substituted works as required for the purpose of the contract. It shall mean the totality of the work by expression or implication envisaged in the contract and shall include all materials, equipment and labour required for or relative or incidental to or in connection with the commencement, performance and completion of any work and / or incorporation in the work.
- 1.15 The "**Permanent Work**" shall mean works which will be incorporated in and form part of the work to be handed over to the owner by the Contractor on completion of the contract.
- 1.16 The "**Temporary Work**" shall mean all temporary works of every kind required in or about the execution, completion and maintenance of the work.
- 1.17 "**Site**" shall mean the land and other places, on, under, in or through which the permanent works are to be carried out and any other lands or places provided by the Corporation for the purpose of the contract together with any other places designated in the contract as forming part of the site.
- 1.18 **The "Construction Equipment"** shall mean all appliances / equipment of whatever nature required in or for execution, completion or maintenance of works or temporary works (as herein before defined) but does not include materials or other things intended to form or forming part of the permanent work.
- 1.19 "**Notice in writing or written Notice**" shall mean a notice written, typed or in printed form delivered personally or sent by Registered Post to the last known private or business address or Registered Office of the Contractor and shall be deemed to have been received in the ordinary course of post it would have been delivered.
- 1.20 The "**Alteration / variation order**" shall mean an order given in writing by the Engineer-in-charge to effect additions or deletions from or alterations in the work.
- 1.21 "**Final Test Certificate**" shall mean the final test certificate issued by the owner within the provisions of the contract.
- 1.22 The "**Completion Certificate**" shall mean the certificate to be issued by the Engineer-in-charge when the work has been completed and tested to his satisfaction.

- 1.23 The "**Final Certificate**" shall mean the final certificate issued by the Engineer-in-charge after the period of defects liability is over and the work is finally accepted by the owner.
- 1.24 "**Defects Liability Period**" shall mean the specified period between the issue of Completion Certificate and the issue of final certificate during which the Contractor is responsible for rectifying all defects that may appear in the works.
- 1.25 "**Approved**" shall mean approved in writing including subsequent confirmation in writing of previous verbal approval and "Approval" means approved in writing including as aforesaid.
- 1.26 "**Letter of Acceptance**" shall mean an intimation by a letter to Tenderer that his e-Tender has been accepted in accordance with the provisions contained therein.
- 1.27 "**Order**" and "**Instructions**" shall respectively mean any written order or instruction given by the Engineer-in-charge within the scope of his powers in terms of the contract.
- 1.28 "**Running Account Bill**" shall mean a bill for the payment of "On Account" money to the Contractor during the progress of work on the basis of work done and the supply of non-perishable materials to be incorporated in the work.
- 1.29 "**Security Deposit**" shall mean the deposit to be held by the owner as security for the due performance of the contractual obligations.
- 1.30 "**Retention Money**" shall mean the money retained from R.A.Bills for the due completion of the "LET WORKS".
- 1.31 Unless otherwise specifically stated, the masculine gender shall include the feminine and neuter genders and vice-versa and the singular shall include the plural and vice-versa.

**GC-02 LOCATION OF SITE AND ACCESSIBILITY:**

The work is to be carried out in city area. Non-availability of access roads shall in no case be the cause to condone delay in the execution of the work and no claim or extra compensation will be paid. Also work is to be carried out in residential area and as such excavation will be carried out in hard rock by mechanical equipments or by controlled blasting and at low charge.

**GC-03 SCOPE OF WORK :**

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

**Power Supply :**

The Contractor shall make his own arrangement for power supply during installation.

**Land for Contractor's Field Office, Godown Etc.:**

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

**GC-04**

**RULING LANGUAGE :**

The language according to which the contract shall be construed and interpreted shall be English/Gujarati. All entries in the contract document and all correspondence between the Contractor and the **Corporation** or the Engineer-in-charge shall be in English/Gujarati. All dimensions for the materials shall be given in metric units only.

**GC-05**

**INTERPRETATION OF CONTRACT DOCUMENT :**

1. The provision of the General Conditions of Contract and Special Conditions of Contract shall prevail over those of any other documents of the contract unless specifically provided otherwise, should there be any discrepancy, inconsistency, error or omission in the several documents forming the contract, the matter may be referred to the Engineer-in-charge for his instructions and decision. The Engineer-in-charge's decision in such case shall be final and binding to the Contractor.
2. Works shown upon the drawings but not described in the specifications or described in the specifications without showing on the drawings shall be taken as described in the specifications and shown on the drawings.
3. The headings and the marginal notes to the clause of these General Conditions of Contract or to the specifications or to any other part of e-Tender documents are solely for the purpose of giving a concise indication and not a summary of contents thereof. They shall never be deemed to be part thereof or be used in the interpretation or construction of the contract.
4. Unless otherwise states specifically, in this contract documents the singular shall include the plural and vice-versa wherever the context so requires. Works imparting persons shall include relevant Corporations / Body of individual / firm of partnership.
5. Notwithstanding the sub-division of the documents into separate section and volumes every part of each shall be supplementary to and complementary of every other part and shall be read with and into the context so far as it may be practicable to do so.
6. Where any portion of the General Conditions of Contract is repugnant to or at variance with any provisions of the Special Conditions of Contract, then, unless a different intention appears, the provisions of the special conditions of contract shall be deemed to over ride the provisions of General Conditions of Contract to the extent of each repugnancy of variance.
7. The materials, design, and workmanship shall satisfy the relevant ISS, and codes referred to. If additional requirements are shown in the specifications, the same shall be satisfied over and above ISS and other codes.
8. If the specifications mention that the Contractor shall perform certain work or provide certain facilities, it shall mean that the Contractor shall do so at his own cost.
9. **"Contractor to Collect His Own Information" –**

The details given in the e-Tender are arranged making necessary investigations for framing an estimate. However, when the work is being executed, changes in soil conditions are likely to be met with in view of the formation of soil, strata in Rajkot District. It is, therefore, desirable that the Contractor makes his own investigations or additional investigations as may be required for correctly assessing the cost of different items of work and submit his e-Tender accordingly. Any change in description or quantity of an item shall not vitiate the contract or release the Contractor from executing the work comprised in the contract according to the drawings and specifications at the e-Tendered rates.

He is deemed to have known the scope, nature and magnitude of the work and the requirements of materials and labour involved and as to whatever work he has to complete in accordance with the contract. The Contractor is expected to visit the site and surroundings to satisfy himself as to the nature of all existing structures, if any, and also as to the nature and the conditions of railways, roads, bridges and culverts, means of transport and communications whether by land, air or water and as to possible interruptions thereto and the access and gross from the site, to have examined and satisfied himself as to the sites for obtaining sand, stones, bricks and other materials, the site for disposal of surplus materials, the available accommodation and make such enquiries as may be necessary for executing and completing the work, to have local enquiries as to the sub-soil, subsoil water and variation thereof, storms, prevailing winds, climatic conditions and all other similar matters, effecting work. He is expected to be familiar with his liability for payment of Government taxes, customs and excise duty and other charges etc. in contract with the execution of this contract.

**GC-06**

**CONTRACTOR TO UNDERSTAND HIMSELF FULLY :**

The Contractor by e-Tendering shall be deemed to have satisfied himself, as to all considerations and circumstances affecting the e-Tender price, as to the possibility of executing the works as shown and described in the contract and to have fixed his prices according to his own view on these matters and to have understood that no additional allowances except as otherwise expressly provided, will afterwards be made beyond the contract price. The Contractor shall be responsible for any misunderstanding or incorrect information, however, obtained.

**GC-07**

**ERRORS IN SUBMISSIONS :**

The Contractor shall be responsible for any errors or omissions in the particulars supplied by him, whether such particulars have been approved by the Engineer-in-charge or not.

**GC-08**

**SUFFICIENCY OF e-Tender :**

The Contractor shall be deemed to have satisfied himself before e-Tendering as to the correctness of the e-Tender rates which rates shall, except as otherwise provides for, cover all the Contractor's liabilities and obligations set forth or implied in the contract for the proper execution of the work for compliance with requirements of Article GC-19 thereof.



**GC-09      DISCREPANCIES :**

The drawings and specifications are to be considered as mutually explanatory of each other, detailed drawings being followed in preference to small-scale drawings and figured dimensions in preference to scale and special conditions in preference to General Conditions. The special directions or dimensions given in the specifications shall supersede all else. Should any discrepancies however, appear or should any misunderstanding arise as to the meaning and intent of the said specifications or drawings, or as to the dimensions or the quality of the materials or the due and proper execution of the works, or as to the measurement or quality and valuation of the work executed under this contract or as extra there upon, the same shall be explained by the Engineer-in-charge and his explanation shall be subject to the final decision of the Municipal Corporation in case reference be made to it, be binding upon the Contractor and the Contractor shall execute the work according to such explanation and without addition or to deduction from the contract price and shall also do all such works and things necessary for the proper completion of the works as implied by the drawings and specifications, even though such works and things are not specially shown and described in the said specifications. In cases where no particular specifications are given for any article to be used under the contract, the relevant specifications of the Bureau of Indian Standard Institution shall apply.

**GC-10 PERFORMANCE GUARANTEE (SECURITY DEPOSIT)**

As a contract security the Tenderer to whom the award is made shall furnish a performance guarantee (Security deposit) for the amount of **5%** of the contract price to guarantee the faithful performance, completion and maintenance of the works of the contract in accordance with all conditions and terms specified herein and to the satisfaction of the Engineer-in-charge, and ensuring the discharge of all obligations arising from the execution of contract in the forms mentioned below:

- a. By a Demand Draft on the Rajkot Branch of any Nationalized Bank or Scheduled Bank except co-operative bank.
- b. A fixed deposit receipt of any Nationalized Bank or Schedule Bank except Co-operative Bank duly endorsed in favour of the **Rajkot Municipal Corporation, Rajkot.**
- c. A Bank Guarantee of any Nationalized Bank or Schedule Bank except Co-operative Bank duly endorsed in favour of the **Rajkot Municipal Corporation, Rajkot.**

**PERFORMANCE GUARANTEE (SECURITY DEPOSIT) shall be submitted for duration of 3 Year from the date of Agreement.**

The performance guarantee shall be delivered to the Corporation within ten (10) days of the notice of award and at least three (3) days before the contract agreement is signed unless otherwise specified by the Engineer-in-charge. On due performance and completion of the contract in all respects, **the performance guarantee will be returned to the contractor without any interest after the defect liability period is over.**

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

**GC-11      INSPECTION OF WORK :**

1. The Engineer-in-charge, shall have full power and authority to inspect the work at any time wherever in progress either on the site or at the Contractor's or any other manufacturer's workshop or factories wherever situated and the Contractor shall afford to Engineer-in-charge, every facility and assistance to carry out such inspection. Contractor or his authorized representative shall, at all time during the usual working hours and all times when so notified, remain present to receive orders and instructions.

Orders given to Contractor's representative shall be considered to have the same force as if they had been given to the Contractor himself. Contractor shall give not less than ten (10) days notice in writing to the Engineer-in-charge, before covering up or otherwise placing beyond reach of inspection and measurement any work in order that the same may be inspected and measured. In the event of breach of the above, the same shall be uncovered at Contractor's expenses for carrying out such inspection or measurement.

2. The material shall be dispatched from Contractor's store on site of work after obtaining approval in writing of the Engineer-in-charge. Contractor shall provide at all times during the progress of work and maintenance period of proper means of access with ladders, gangways, etc. and make necessary arrangement as directed for inspection or measurement of work by Engineer-in-charge.

**GC-12      DEFECT LIABILITY:**

1. Contractor shall guarantee the work for a period for Defects for 1 (One) Year after completion of Work Any damage or defect that may arise or that may remain undiscovered at the time of issue of Completion Certificate connected in any way with the equipment or materials supplied by him or in the workmanship shall be rectified or replaced by Contractor at his own expense as desired by Engineer-in-charge, or in default Engineer-in-charge, may cause the same to be made good by other agency and deduct expenses of which the certificate of Engineer-in-charge, shall be final from any sums that may then or any time thereafter become due to Contractor or from his security deposit or the proceeds of sale thereof or of a sufficient portion thereof.
2. From the commencement to completion of work Contractor shall take full responsibility for the care of the work including all temporary works and in case any damages, occur from any cause whatsoever he shall at his own cost, repair and make good the same so that on completion, work shall be in good order and in conformity, in every respect, with the requirements of contract and as per the instructions of the Engineer-in-charge.
3. If at any time before the work is taken over, the Engineer-in-charge -
  - a) Decide that any work done or materials used by the Contractor are

defective or not in accordance with the contract or that work or any portion thereof is defective or do not fulfill the requirements of contract (all such materials being herein after called defects in this clause) he shall, as soon as reasonably practicably, give notice to Contractor in writing of the said defect specifying particulars of the same then Contractor shall at his own expense and with all speed make good the defects so specified.

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

**GC-13      POWER OF ENGINEER-IN-CHARGE TO GIVE FURTHER INSTRUCTIONS:**

The Engineer-in-charge shall have the power and authority from time to time and at all times to give further instructions and directions as may appear to him necessary or proper for the guidance of the Contractor and the works and efficient execution of the works according to the terms of the specifications, and the Contractor shall receive, execute, obey and be bound by the same, according to the true intent and meaning thereof, as fully and effectively as though the same had accompanied or had been mentioned or referred to in the specifications. No work which radically changes the original nature of the contract shall be ordered by the Engineer-in-charge and in the event of any deviation being ordered, which in the opinion of the Contractor changes the original nature of the contract, he shall nevertheless carry it out and any disagreement as to the nature of the work and the rate to be paid to thereof shall be resolved.

The time of completion of works shall, in the event of any deviations being ordered resulting in additional cost or reduction in cost over the contract sum, be extended or reduced reasonably by the Engineer-in-charge. The Engineer-in-charge's decision in the case shall be final and binding.

**GC-14      PROGRAMME:**

The time allowed for execution of works shall be the essence of the contract. The contract period shall commence from the date of notice of intimation to proceed. The Tenderer at the time of submitting his e-Tender shall indicate in the construction schedule his programme of execution of work commencement with the total time specified. The Contractor shall provide the Engineer-in-charge, a detailed programme of time schedule for execution of the works in accordance with the specifications and the completion date. The entire programme to be finalized by the Contractor, has to conform to the execution period mentioned along with the Bill of Quantities in the e-Tender documents. The Engineer-in-charge, upon scrutiny of such submitted programme by Contractor, shall examine suitability of it to the requirement of contract and suggest modifications, if found necessary.

**GC-15      SUB-LETTING OF WORK:**

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

**GC-16**      **SUB-CONTRACTS FOR TEMPORARY WORKS ETC.**

The owner may give written consent to sub-Contractors for execution of any part of the works at the site, being entered upon the Contractor provided each individual contract is submitted to the Engineer-in-charge, before being entered into and is approved by him. List of sub-Contractors to be supplied.

Notwithstanding any subletting with such approval as aforesaid and notwithstanding the Engineer-in-charge, shall have received of any sub-Contractors, the Contractor shall be and shall remain solely responsible for the quality and proper and expeditious execution of the works and the performance of all the conditions of contract in all respects as if such subletting or subcontracting had not taken place and as if such works had been done directly by the Contractor.

**GC-17**      **TIME FOR COMPLETION:**

1.      The work covered under this contract shall be commenced from the date the Contractor is served with a notice to proceed with the work and shall be completed before the date as mentioned in the time schedule of work. The time is the essence of the contract and unless the same is extended as mentioned in Clause GC-18 "Extension of Time", the Contractor shall pay liquidated damages for the delay.
  
2.      The general time schedule for construction is given in the e-Tender document. Contractor shall prepare a detailed weekly or monthly construction programme in consultation with the Engineer-in-charge soon after the agreement and the work shall be strictly executed accordingly.

The time for construction includes, the time required for testing, rectifications, if any, retesting and completion of the work in all respects to the entire satisfaction of the Engineer-in-charge except the time consumed for process of scrutiny of Drawing-Design and for items which are not coming in the way to commission the project . However, actual monsoon period or minimum 3 month will be considered as non-working period and that shall be excluded in time limit. Actual dates will be notified if found necessary.

**GC-18**      **EXTENSION OF TIME:**

Time shall be considered as the essence of the contract. If, however, the failure of the Contractor to complete the work as per the stipulated dates referred to above arises from delays on the part of Corporation in supplying the materials or equipment, it has undertaken to supply under the contract or from delays on the quantity of work to be done under the contract, or force majeure an appropriate extension of time will be given by the Corporation. The Contractor shall request for such extension within one month of the cause of such delay with undertaking that he will not claim in terms of law and will not claim for price escalation and in any case before expiry of the contract period. **If time limit is extended no price escalation will be paid and no relief in other tender clause will be given i.e. agency has to work as per rate and terms condition sanctioned originally.** No financial claim will be entertained in this regard. No dispute shall be arised by contractor in this regard. The Contractor shall submit the undertaking in this regard.

**GC-19**      **CONTRACT AGREEMENT:**

The successful Tenderer shall enter into and execute the contract agreement within 10 (ten) days of the notice of award, in the form shown in e-Tender documents with such modifications as may be necessary in the

opinion of the Corporation. It shall be incumbent on the Contractor to pay the stamp duty and the legal charges for the preparation of the contract agreement.

**GC-20      LIQUIDATED DAMAGES:**

If the Contractor fails to complete the work or designated part thereof within the stipulated completion date for the work or for the part, he shall pay liquidated damages at 0.1 (zero point one) percent of contract value for per day of delay subject to maximum of 10% of the contract value or as decided by Municipal Commissioner.

The Contractor shall complete one-sixth quantum of work within one fourth period, four-tenth quantum of work within one-half period and eight-tenth quantum of work within three-fourth period, failing which, the Contractor shall be liable to pay liquidated damages an amount as specified above, or as decided by Municipal Commissioner.

The amount of liquidated damages shall, however, be subjected to a maximum of 10 percent of the contract value.

**GC-21      FORFEITURE OF SECURITY DEPOSIT:**

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

**GC-22      ACTION OF FORFEITURE OF SECURITY DEPOSIT:**

In any case in which under any Clause or Clauses of the contract, the Contractor shall committed a breach of any of the terms contained in this contract, the owner shall have power to adopt any of the following courses as he may deem best suited to his interest.

- a) To rescind the contract (of which recession notice in writing to the Contractor under the hand of the owner shall be conclusive evidence) in which case the security deposit of the Contractor shall stand forfeited and be absolutely at the disposal of the owner.
- b) To employ labour and to supply materials to carry out the balance work debiting Contractor with the cost of labour employed and the cost of materials supplied for which a certificate of the Engineer-in-charge shall be final and conclusive against the Contractor and 10% of costs on above to cover all departmental charges and crediting him with the value of work done at the same rates as if it has been carried out by the Contractor under the terms of his contract. The certificate of Engineer-in-charge as to the value of the work done shall be final and conclusive against the Contractor.
- c) To measure up the work of the Contractor and to take such part thereof as shall be unexecuted out of his hand and give it to another Contractor to complete, the same. in this case the excess expenditure incurred than what would have been paid to the original Contractor, if the whole work had been executed by him, shall be borne and paid by the original Contractor and shall be deducted from any money due to him by the owner under the contract or otherwise and for the excess expenditure, the certificate of the Engineer-in-charge shall be final and conclusive.

In the event any of the above courses being adopted by the owner, the Contractor shall have no claims for compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any agreements or made any advance on account of or with a view to the execution of the work or the performance of the contract. In purchase the Contractor shall not be entitled to recover or be paid any sum for any work actually performed under this contract unless the Engineer-in-charge will certify in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

In the event of the owner putting in force the powers as stated in a, b, c, above vested in him under the proceeding clause, he may, if he so desires, take possession of all or any tools and plant, materials and stores in or upon the works or the site thereof belonging to the Contractor, or procured by him and intended to be used for the execution of the work or any part thereof paying or allowing for the same in account at the contract rates to be certified by the Engineer-in-charge. The Engineer-in-charge may give notice in writing to the Contractor or his representative requiring him to remove such tools, plant, materials or stores from the premises within the time specified in the notice and in the event of the Contractor failing to comply with any such notice, the Engineer-in-charge may remove them at the Contractor's expenses or sell them by auction or private sale on account of the Contractor and his risks in all respects without any further notice as to the date, time or place of the sale and the certificate of Engineer-in-charge as to the expense of any such removal and the amount of the proceeds and the expenses of any such sale shall be final and conclusive against the Contractor.

**GC-23**

**COMPENSATION FOR ALTERATION IN OR RESTRICTION IN WORK:**

If at any time from the commencement of the work, the owner shall for any reasons whatsoever not require the whole work or part thereof as specified in the e-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 full amount of the work not having been carried out. He also shall not have any claim for compensation by reasons of any alterations having been made in original specifications, drawings, designs and instructions which shall involve any curtailment of the work as originally contemplated.

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

- GC-24**      **IN THE EVENT OF DEATH OF THE CONTRACTOR:**  
Without prejudice to any of the rights or remedies under the contract, if the Contractor dies, the owner shall have the option of terminating the contract without compensation to the Contractor.
- GC-25**      **MEMBERS OF THE OWNER NOT INDIVIDUALLY LIABLE:**  
No official or employee of the owner shall in any way be personally bound or liable for the acts or obligation of the owner under the contract, or answerable for any default or omission in the observance or performance of any acts, matters or things, which are herein, contained.
- GC-26**      **OWNER NOT BOUND BY PERSONAL REPRESENTATIONS:**  
The Contractor shall not be entitled to any increase on the schedule of rates or any other rights or claims whatsoever by reason of representation, promise or guarantees given or alleged to have been given to him by any person.
- GC-27**      **CONTRACTOR'S OFFICE AT SITE:**  
The Contractor shall provide and maintain an office at the site for the accommodation of his agent and staff and such office shall remain open at all reasonable hours to receive information, notices or other communications.
- GC-28**      **CONTRACTOR'S SUBORDINATE STAFF AND THEIR CONDUCT:**  
The Contractor on award of the work shall name and depute a qualified Engineer having experience of carrying out work of similar nature, whom equipments, materials, if any, shall be issued and instructions for work given. The Contractor shall also provide to the satisfaction of Engineer-in-charge sufficient and qualified staff, competent sub-agents, foreman and loading hands including those specially qualified by previous experience to supervise the type of works comprised in the contract in such manner as will ensure work of the best quality and expeditious working. If, in the opinion of the Engineer-in-charge additional properly qualified supervision staff is considered necessary, it shall be employed by the Contractor, without additional charge on account thereof. The Contractor shall ensure to the satisfaction of the Engineer-in-charge that sub-Contractors, if any, shall provide competent and efficient supervision over the work entrusted to them.
2.            If and whenever any of the Contractor's or sub-Contractor's agents, sub-agents, assistants, foreman or other employees shall, in the opinion of the Engineer-in-charge be guilty of any misconduct or be incompetent or insufficiently qualified or negligent in the performance of their duties or that in the opinion of the owner or Engineer-in-charge, it is undesirable for administrative or any other reason for person or persons to be employed in the works, the Contractor if so directed by the Engineer-in-charge, shall at once remove such person or persons from employment thereon. Any person or persons so removed shall not again be re-employed in connection with the works without the written permission of the Engineer-in-charge. Any person, so removed from the works shall be immediately replaced at the expense of the Contractor by a qualified and competent substitute. Should the Contractor be required to repatriate any person removed from the works he shall do so after approval of Engineer-in-charge and shall bear all costs in connection therewith.
3.            The Contractor shall be responsible for the proper behavior of all the staff, foreman, workmen and others and shall exercise proper control over them and in particular and without prejudice to the said generality, the Contractor shall be bound to prohibit and prevent any employee from trespassing or acting in any way detrimental or prejudicial to the interest

of the community or of the properties or occupiers of land and properties in the neighborhood and in the event of such employees so trespassing, the Contractor shall be responsible therefore and relieve the owner of all consequent claims, actions for damages or injury or any other ground whatsoever. The decision of the Engineer-in-charge upon any matter arising under this claim shall be final.

4. If and when required by the owner, the Contractor's personnel entering upon the owner's premises shall be properly identified by badges of a type acceptable to the owner which must be worn at all times on owner's premises.

**GC-29      TERMINATION OF SUB-CONTRACT BY OWNER:**

If any sub-Contractor engaged upon the works at the site execute any work which in the opinion of Engineer-in-charge is not accordance with the contract documents, the owner may by written notice to the Contractor request him to terminate such sub-contract and the Contractor upon the receipt of such notice shall terminate such sub-contracts and the latter shall forthwith leave the works, failing which, the owner shall have the right to remove such sub-Contractors from the site.

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

**GC-30      POWER OF ENTRY:**

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

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

The owner shall have the power to enter upon the works and take possession thereof and of the materials, temporary works, constructional plant and stores therein and to revoke the Contractor's license to use the same and to complete the works by his agents, other Contractor or workmen, to relate the same upon any terms to such other person firm or Corporation as the owner in his absolute discretion may think proper to employ, and for the purpose aforesaid to use or authorize the use of any materials, temporary works, constructional plant, and stores as aforesaid with making payments or allowance to the Contractor for the said



materials other than such as may be certified in writing by the Engineer-in-charge to be reasonable and without making any payment or allowance to the Contractor for the use of said temporary works, constructional plant and stock or being liable for loss or damage thereto. If the owner shall be reason of his taking possession of the works or of the work being got completed by other Contractor incurred excess expenditure be deducted from any money which may be due for the work done by the Contractor under the contract and not paid for. Any deficiency shall forthwith be made good and paid to the owner by the Contractor and the owner shall have power to sell in such manner and for such price as he may think fit all or any of the constructional plant, materials etc., consist constructed by or belonging to and to recoup and retain the said deficiency or any part thereof out of the proceeds of the sale.

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

Without repugnance to any other conditions, it shall be the responsibility of the Contractor executing the work, to work in close co-operation and co-ordination with other Contractors or their authorized representatives and the Contractor will put a joint scheme with the concurrence of other Contractors or their authorized representatives showing the arrangements

for carrying his portion of the work to the Engineer-in-charge and get the approval. The Engineer-in-charge before approving the joint scheme will call the parties concerned and modify the scheme if required. No claim will be entertained on account of the above. The Contractor shall conform in all respects with the provisions of any statutory regulations, ordinances or bylaws of any local or duly constituted authorities or public bodies which may be applicable from time to time to works or any temporary works. The Contractor shall keep the owner indemnified against all penalties and liabilities of every kind arising out of non-adherence to such statutes, ordinance, laws, rules, regulations etc.

**GC-32**      **OTHER AGENCIES AT SITE:**

The Contractor shall have to execute the work in such place and condition where other agencies will also be engaged for other works, such as site grading, filling and leveling, electrical and mechanical engineering works etc. No claim shall be entertained for works being executed in the above circumstances.

**GC-33**      **NOTICES:**

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

**GC-34**      **RIGHTS OF VARIOUS INTERESTS:**

The owner reserves the right to distribute the work between more than one Contractor. Contractor shall co-operate and afford reasonable opportunity to other Contractors for access to the works, for the carriage and storage of materials and execution of their works. Whenever the work being done by department of the owner or by other Contractor employed by the owner is contingent upon work covered by this contract, the respective rights of the various interests shall be determined by the Engineer-in-charge to secure the completion of various portions of the work in general harmony.

- GC-35      PRICE ADJUSTMENTS:**  
No adjustment in price shall be allowed and no price escalation will be allowed.
- GC-36      TERMS OF PAYMENT:**  
The payment of bills shall be made progressively according to the rules and practices followed by the Corporation. The progressive payment unless otherwise provided in the contract agreement or subsequently agreed to by the parties shall be made generally monthly on submission of a bill by the Contractor in prescribed form of an amount according to the value of the work performed less the price of materials supplied by owner, aggregate of previous progressive payments and as required by Clause GC-37 (Retention of Money) herein. All such progressive payments shall be regarded as payments by way of advance against final payment. Payment for the work done by the Contractor will be based on the measurement at various stages of the work, in accordance with the condition at clause GC-81 (measurement of work in progress).
- GC-37      RETENTION MONEY:**  
Pursuant to Clause-36 (Term of Payment) on at money due to the contractor for work done the, the corporation will retain five (5) Percent of the gross R.A.Bill amount as mentioned in clause GC-82 (Running Account Payment) and same will be paid with the final bill. The same will be kept as deposit format and released individually with final bill.
- GC-38      PAYMENTS DUE FROM THE CONTRACTOR:**  
All costs, damages or expenses, for which under the contract, Contractor is liable to the Corporation, may be deducted by the Corporation from any money due or becoming due to the Contractor under the contract or from any other contract with the Corporation or may be recovered by action at law or otherwise from the Contractor.
- GC-39      CONTINGENT FEE:**
- i) The Contractor warrants that he has not employed a person to solicit or secure the contract upon any agreement for a commission, percentage, and brokerage contingent fee. Breach of this warranty shall give the Corporation the right to cancel the contract or to take any drastic measure as the Corporation may deem fit. The warranty does not apply to commission payable by the Contractor to establish commercial or selling agent for the purpose of securing business.
  - ii) No officer, Owner or agent of the Corporation shall be admitted to any share or part of this contract or to any benefit that may rise there from.
- GC-40      BREACH OF CONTRACT BY CONTRACTOR:**  
If the Contractor fails to perform the work under the contract with due diligence or shall refuse or neglect to comply with instructions given to him in writing by the Engineer-in-charge in accordance with the contract, or shall contravene the provisions of the contract, the Corporation may give notice in writing to the Contractor to make good such failure, neglect, or contravention. Should the Contractor fail to comply with such written notice within 14 (fourteen) days of receipt, it shall be lawful for the Corporation, without prejudice to any other rights the Corporation may have under the contract, to terminate the contract for all or part of the works, and make any other arrangements it shall deem necessary to complete the work outstanding under the contract at the time of termination / **Black List / Debar the agency for the period of three years from the works of RMC.** In this event, the performance Bond shall immediately become due and payable to the Corporation. The value of

the work done on the date of termination and not paid for shall be kept as deposit for adjustment of excess expenditure incurred in getting the remaining work completed and the Corporation shall have free use of any works which the Contractor may have at the site at the time of termination of the contract.

If Contractor fails to carry out the work in timely manner as mentioned in GC-20, Rajkot Municipal Corporation may give notice in writing to the Contractor to expedite the progress of work, so that the work can be completed as per time schedule. If Contractor fails to expedite the progress of work within 14 days, Rajkot Municipal Corporation may terminate the contract and put the Contractor in Black List for three years and the remaining work will be executed through other agency at the risk and cost of the Contractor.

**GC-41**      **DEFAULT OF CONTRACTOR:**

- i) The Corporation may upon written notice of default to the Contractor terminate the contract circumstances detailed as under :
  - a) If in the opinion of the Corporation, the Contractor fails to make completion of works within the time specified in the completion schedule or within the period for which extension has been granted by the Corporation to the Contractor.
  - b) If in the opinion of the Corporation, the Contractor fails to comply with any of the other provisions of this contract.
  
- ii) In the event, the Corporation terminates the contract in whole or in part as provided in Article GC-50 (Termination of the Contract) the Corporation reserves the right to purchase upon such terms and in such manner as it may be deem appropriate, plant similar to one which is not supplied by the Contractor and the Contractor will be liable to the Corporation for any additional costs for such similar plant and / or for liquidated damages for delay until such time as may be required for the final completion of works.
  
- iii) If this contract is terminated as provided in this paragraph GC-30 (Power of Entry), the Corporation in addition to any other rights provided in this clause, may require the Contractor to transfer title and deliver to the Corporation.
  - a) Any completed works
  - b) Such partially completed information and contract rights as the Contractor has specifically produced or acquired for the performance of the contract so terminated.
  
- iv) In the event, the Corporation does not terminate the contract as provided in the paragraph GC-50 (Termination of Contract) the Contractor shall continue performance of the contract, in which case, he shall be liable to the Corporation for liquidated damages for delay until the works are completed and accepted.

**GC-42**      **BANKRUPTCY:**

If the Contractor shall become bankrupt or insolvent or has a receiving order made against him, or compound with his creditors, or being the Corporation commence to be wound up not being a member voluntary winding up for the purpose of amalgamation or reconstruction, or carry on its business under a receiver for the benefit of his creditors or any of them, the Corporation shall be at liberty to either (a) terminate the contract forthwith by giving notice in writing to the Contractor or to the receiver or liquidator or to any person or Organization in whom the contract may become vested and to act in the manner provided in Article GC-41 (Default of Contractor) as though the last mentioned notice had

been the notice referred to in such article or (b) to give such receiver, liquidator or other persons in whom the contract may become vested the option of carrying out the contract subject to his providing a satisfactory guarantee for the due and faithful, performance of the contract up to an amount to be agreed. In the event that the Corporation terminates the contract in accordance with this article, the performance bond shall immediately become due and payable on demand to Corporation.

**GC-43**

**OWNERSHIP:**

Works hand over pursuant to the contract shall become the property of the Corporation from whichever is the earlier of the following times, namely;

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

**GC-44**

**DECLARATION AGAINST WAIVER:**

The condemnation by the Corporation of any breach or breaches by the Contractor or an authorized sub-Contractor of any of the stipulations and conditions contained in the contract, shall in no way prejudice or affect or be construed as a waiver of the Corporation's rights, powers and remedies under the contract in respect of any breach or breaches.

**GC-45**

**LAWS GOVERNING THE CONTRACT :**

This contract shall be construed according to and subject to the laws of India and the State of Gujarat and under the jurisdiction of the Courts of Gujarat at Rajkot city only.

**GC-46**

**OVER PAYMENT AND UNDER PAYMENT :**

Whenever any claim for the payment of a sum to the Corporation arises out of or under this contract against the Contractor, the same may be deducted by the Corporation from any sum then due or which at any time thereafter may become due to the Contractor under this contract and failing that under any other contract with the Corporation (which may be available with the Corporation), or from his retention money or he shall pay the claim on demand. The Corporation reserves the right to carry out post payment audit and technical examinations of the final bill including all supporting vouchers, abstracts etc. The Corporation further reserves the right to enforce recovery of any payment when detected, notwithstanding the fact that the amount of the final bill may be included by one of the parties as an item of dispute shall be resolved as per GC-49 (Interpretation Related To Tender Conditions or Contract Agreement) of this contract and notwithstanding the fact that the amount of the final bill figures as resolved through GC-49. If as a result of such audit and technical examinations any over payment is discovered in respect of any work done by the Contractor or alleged to have been done by him under the contract, it shall be recovered by the Corporation from the Contractor as prescribed above. If any under payment is discovered by the Corporation, the amount due to the Contractor under this contract, may be adjusted against any amount then due or which may at any time thereafter become due before payment is made to the Contractor.

**GC-47**

**SETTLEMENT OF DISPUTES :**

Except as otherwise specifically provided in the contract, all disputes concerning questions of fact arising under the contract shall be decided by the Engineer-In-Charge subject to a written appeal by the Contractor to the Engineer-In-Charge and those decisions shall be final and binding on the parties hereto. Any disputes or differences including those considered

as such by only one of the parties arising out of or in connection with this contract shall be to the extent possible settled amicably between the parties. If amicable settlement cannot be reached then all disputed issues shall be settled as provided in Article GC-48 (Disputes or differences to be referred to) and Article No.GC-49 (Interpretation Related To Tender Conditions or Contract Agreement).

**GC-48 DISPUTES OF DIFFERENCES TO BE REFERRED TO :**

If at any time, any question, disputes or differences of any kind whatsoever shall arise between the Engineer-In-Charge and the contractor upon or in relation to or in connection with this contract either party may forthwith give to the other, notice in writing of the existence of such question, dispute or difference as to any decision, opinion, instruction, direction, certificate or evaluation of the Engineer-In-Charge. The question, dispute or differences shall be settled by the Municipal Commissioner, Rajkot Municipal Corporation, who shall state his decision in writing and give notice of same to the Engineer-In-Charge and to the Contractor. Such decision shall be final and binding upon both parties.

**GC-49 INTERPRETATION RELATED TO TENDER CONDITIONS OR CONTRACT AGREEMENT :**

For any interpretation related to tender conditions or contract agreement conditions, the decision of Municipal Commissioner, Rajkot Municipal Corporation shall be considered as final and binding and in the event of any dispute arising pertaining to tender conditions or contract agreement conditions the jurisdiction shall be Rajkot Civil Court /Commercial Court of Rajkot City only.

**GC-50 TERMINATION OF THE CONTRACT:**

- i) If the Contractor finds it impracticable to continue operation owing to force majeure reasons or for any reasons beyond his control and/or the Corporation find it impossible to continue operation, then prompt notification in writing shall be given by the party affected to the other.
- ii) If the delay or difficulties so caused cannot be expected to cease or become unavoidable or if operations cannot be resumed within two (2) months then either party shall have the right to terminate the contract upon 10 (ten) days written notice to the other. In the event of such termination of the contract, payment to the Contractor will be made as follows:
  - a) The Contractor shall be paid for all works approved by the Engineer-in-charge and for any other legitimate expenses due to him.
  - b) If the Corporation terminates the contract owing to Force Majeure or due to any cause beyond its control, the Contractor shall additionally be paid for any work done during the said two (2) months period including any financial commitment made for the proper performance of the contract and which are not reasonably defrayed by payments under (a) above.
  - c) The Corporation shall also release all bonds and guarantees at its disposal except in cases where the total amount of payment made to the Contractor exceeds the final amount due to him in which case the Contractor shall refund the excess amount within thirty (30) days after the termination and the Corporation thereafter shall release all bonds and guarantees. Should the Contractor fail to refund the amounts received in excess within the said period such amounts shall be deducted from the bonds or guarantees provided.

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

**GC-51 SPECIAL RISKS:**

If during the contract, there shall be an outbreak of war (whether war is declared or not), major epidemic, earthquake or similar occurrence in any part of the world beyond the control of either party to the contract which financially or otherwise materially affects the execution of the contract, the Contractor shall unless and until, the contract is terminated under the provisions of this article use his best endeavors to complete the execution of the contract, provided always that the Corporation shall be entitled at any item after the onset of such special risks, to terminate the contract by giving written notice to the Contractor and upon such notice being given this contract shall terminate but without prejudice to the rights of either party in respect of any antecedent breach thereof.

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

**GC-52 CHANGE IN CONSTITUTION:**

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

**GC-53 SUB-CONTRACTUAL RELATIONS:**

All works performed for the contract by a sub-Contractor shall be pursuant to an appropriate agreement between the Contractor and the sub-Contractor, which shall contain provision to:

- a) Protect and preserve the rights of the Corporation and the Engineer-in-charge with respect to the works to be performed under the sub-contracting party will not prejudice such rights.
- b) Require that such work be performed in accordance with the requirements of contract documents.
- c) Require under such contract to which the Contractor is a party, the submission to the Contractor of application for payment and claims for additional costs, extension of time, damages for delay or otherwise with respect to the sub-contracted portions of the work in sufficient time, that the Contractor may apply for payment comply in accordance with the contract documents for like claims by the Contractor upon the Corporation.

- d) Waive all rights the contracting parties may have against one another for damages caused by fire or other perils covered by the property insurance except such rights as they may have to the proceeds of such insurance held by the Corporation as trustee and,
- e) Obligate each sub-Contractor specifically to consent to the provisions of this Article.

**GC-54**

**PATENTS AND ROYALTIES:**

1. Contractor, if licensed under any patent covering equipment, machinery, materials or composition of matter to be used or supplied or methods and process to be practiced or employed in the performance of this contract agrees to pay all royalties and license fees, which may be due with respect thereto. If any equipment, machinery, materials, composition matters, to be used or supplied or methods practiced or employed in the performance of this contract, is covered by a patent under which Contractor is not licensed, then the Contractor before supplying / using the equipment, machinery, materials, compositions, methods of process shall obtain such license and pay such royalties and license fees as may be necessary for performance of this contract. In the event Contractor fails to pay such royalty or to obtain any such license, any suit for infringement of such patents which is brought against the Contractor or the owner as a result of such failure will be defended by the Contractor at his own expenses and the Contractor will pay any damages and costs awarded in such suit. The Contractor shall promptly notify the owner if the Contractor has acquired knowledge of any plant under which a suit for infringement could be reasonably brought because of the use by the owner of any equipment machinery, materials, and process methods to be supplied in hereunder. Contractor agrees to and does hereby grant to owner together with the right to extend the same to any of the subsidiaries of the owner an irrevocable royalty fee license to use in any Country, any invention made by the Contractor or his employees in or as a result of the performance of work under contract.
2. With respect to any sub-contract entered into by Contractor pursuant to the provisions of the relevant clause hereof, the Contractor shall obtain from the sub-Contractor an understanding to provide the owner with the same patent protection that contracts is required to provide under the provisions of the clause.
3. The Contractor shall indemnify and save harmless the owner from any loss on account of claims against owner for the contributory infringement of patent rights arising out of and based upon the claim that the use by the Corporation of the process included in the design prepared by the Contractor and used in the operation of the plant infringes on any patent rights.

**GC-55**

**LIEN:**

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

- GC-56**      **EXECUTION OF WORK:**  
The whole work shall be carried out in strict conformity with the provisions of the contract document, detailed drawings, specifications and the instructions of the Engineer-in-charge from time to time. The Contractor shall ensure that the whole work is executed in the most substantial, and proper manner with best workmanship using materials of best quality in strict accordance with the specifications to the entire satisfaction of the Engineer-in-charge.
- GC-57**      **WORK IN MONSOON:**  
When the work continues in monsoon if required, the Contractor shall maintain minimum labour force required for the work and plan and execute the construction and erection work according to the prescribed schedule. No extra rate will be considered for such work in monsoon. During monsoon and entire construction period, the Contractor shall keep the site free from water at his own cost. However, actual monsoon period or minimum 3 month will be considered as non-working period and that shall be excluded in time limit. Actual dates will be notified if found necessary.
- GC-58**      **WORK ON SUNDAYS AND HOLIDAYS:**  
No work except curing shall be carried out on Sunday and holidays. However, if the exigencies of the work need continuation of work on Sundays and Holidays, written permission of the Engineer-in-charge shall be obtained in advance.
- GC-59**      **GENERAL CONDITIONS FOR CONSTRUCTION WORK:**  
Working hours shall be eight every day. The overtime work in two shifts could be carried out with the written permission of the Engineer-in-charge but no compensation shall be paid for the same. The rate quoted shall include this. The Contractor shall plan his work in such a way that his labourers do not remain idle. The owner will not be responsible for idle labour of the Contractor. The Contractor shall submit to the owner progress report every week. The details and Performa of the report will be as per mutual agreement.
- GC-60**      **DRAWINGS TO BE SUPPLIED BY THE OWNER:**  
The drawings attached with the e-Tender documents shall be for general guidance of the Contractor to enable him to visualize the type of work contemplated and scope of work involved. Detail working drawings according to which the work is to be done shall be prepared by the Contractor for executing the work.
- GC-61**      **DRAWINGS TO BE SUPPLIED BY THE CONTRACTOR:**  
Where drawings, data are to be furnished by the Contractor they shall be as enumerated in special conditions of contract and shall be furnished within the specified time. Where approval of drawings has been specified it shall be Contractor's responsibility to have these drawings got approved before any work is taken up with regard to the same. Any changes becoming necessary in those drawings during the execution of the work shall have to be carried out by the Contractor at no extra cost. All final drawings shall bear the certification stamp as indicated below duly signed by both the Contractor and Engineer-in-charge.



Certified true for  
.....  
Project Agreement No .....  
Signed .....

**Contractor** **Engineer-in-charge.**

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

**GC-62**      **SETTING OUT WORK:**

The Contractor shall set out the work on the site handed over by the Engineer-in-charge and shall be responsible for the correctness of the same. The work shall be carried out to the entire satisfaction of Engineer-in-charge. The approval thereof or partaking by Engineer-in-charge or setting out work shall not relieve Contractor of any of his responsibilities. The Contractor shall provide at his own cost all necessary level posts, pegs, bamboos, flags, ranging rods, strings and other materials and labourers required for proper setting out of the work. The Contractor shall provide fix and be responsible for the maintenance of all stakes, templates, level markets, profiles and similar other things and shall take all necessary precautions to prevent their removal or disturbance and shall be responsible for the consequences for such removal or disturbance. The Contractor shall also be responsible for the maintenance of all existing survey marks, boundary marks, and distance marks and centerline marks either existing or face lines and cross lines shall be marked by small masonry pillars. Each pillar shall have distance mark at the center for setting up the theodolite. The work shall not be started unless the setting out is choked and approved by Engineer-in-charge in writing but such approval shall not relieve the Contractor of his responsibilities about the correctness of setting out. The Contractor shall provide all materials, labour and other facilities necessary for checking at his own cost. Pillars bearing geodetic marks on site shall be protected by the Contractor. On completion of the work, the Contractor shall submit the geodetic documents according to which the work has been carried out.

**GC-63**      **RESPONSIBILITIES OF CONTRACTOR FOR CORRECTNESS OF THE WORK:**

The Contractor shall be entirely and exclusively responsible for the correctness of every part of the work and shall rectify completely any errors therein at his own cost when so instructed by Engineer-in-charge. If any error has crept in the work due to non-observance of this clause, the Contractor will be responsible for the error and bear the cost of corrective work.

**Materials to be supplied by the Contractor:**

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

**GC-64**

**MATERIALS TO BE SUPPLIED BY THE OWNER:**

1. If the contract provided certain materials or stores to be supplied by the owner, such materials and stores transported by the Contractor at his cost from owner's stores or Railway Station. The cost from Contractor for the value of materials supplied by the owner will be recovered from the R.A.Bill on the basis of actual consumption of materials in the work covered and for which R A Bill has been prepared. After completion of the work, the Contractor has to account for the full quantity of materials supplied to him.
  
2. The value of store materials supplied by owner to the Contractor shall be charged at rates shown in the contract document and in case any other material not listed in the schedule of materials is supplied by the owner, the same shall be charged at cost price including carting and other expenses incurred in procuring the same. All materials so supplied shall remain the property of the owner and shall not be removed from the site on any account. Any material remaining unused at the time of completion of work or termination of contracts shall be returned to owner's store or any other place as directed by the Engineer-in-charge in perfectly good condition at Contractor's cost. When materials are supplied free of cost for use in work and surplus and unaccounted balance thereof are not returned to the owner, recovery in respect of such balance will be effected at double the applicable issue rate of the material or the market rates whichever is higher.

**GC-65**

**CONDITIONS OF ISSUE OF MATERIALS BY THE OWNER : (N.A.)**

The materials specified to be issued by the owner to the Contractor shall be issued by the owner at his store and all expenses for it carting site shall be borne by the Contractor will be issued during working hours and as per rules of owner from time to time.

Contractor shall bear all expenses for storage and safe custody at site of materials issued to him before use in work.

Material shall be issued by the owner in standard / non-standard sizes as obtained from manufacturer.

Contractor shall construct suitable godowns at site for storing the materials to protect the same from damage due to rain, dampness, fire, theft etc.

The Contractor should take the delivery of the materials issued by the owner after satisfying himself that they are in good condition. Once the materials are issued, it will be the responsibility of the Contractor to keep them in good condition and in safe custody. If the materials get damaged or if they are stolen, it shall be the responsibility of the Contractor to replace them at his cost according to the instructions of the Engineer-in-charge.

For delay in supply or for non-supply of materials to be supplied by the owner, on account of natural calamities, act of enemies, other difficulties beyond the control of the owner, the owner carries no responsibilities. In no case the Contractor shall be entitled to claim any compensation for loss suffered by him on this account.

None of the materials issued to the Contractor, shall be used by the Contractor for manufacturing items which can be obtained from the

manufacturers. The materials issued by the owner shall be used for the work only and no other purpose.

Contractor shall be required to execute indemnity bond in the prescribed form for the safe custody and account of materials issued by the owner.

Contractor shall furnish sufficiently in advance a statement of his requirements of quantities of materials to be supplied by the owner and the time when the same will be required for the work, so as to enable Engineer-in-charge to make arrangements to procure and supply the materials.

A daily account of materials issued by the owner shall be maintained by the Contractor showing receipt, consumption and balance on hand in the form laid down by Engineer-in-charge with all connected paper and shall be always available for inspection in the site office.

Contractor shall see that only the required quantities of materials are got issued and no more. The Contractor shall be responsible to return the surplus materials at owner's store at his own cost.

**GC-66**

**MATERIALS PROCURED WITH ASSISTANCE OF THE OWNER:**

Notwithstanding anything contained to the contrary in any of the clauses of this contract, where any materials for the execution of the contract are procured with the assistance of the owner either by issue from owner's stock or purchase made under orders or permits or licenses issued materials as trustees for owner, and use such materials not disposed them off without the permission of owner and unserviceable materials that may be left with him after completion of the contract or at its termination for any reason whatsoever on his being paid or credited such price as Engineer-in-charge, shall determine having due regard to the conditions of the materials. The price allowed to Contractor shall not exceed the amount charged to him excluding the storage of breach of the aforesaid condition, the Contractor shall in terms of license or permits and/or for criminal breach of trust be liable to compensate owner at double the rate or any higher rates. In the event of these materials at that time having higher rate or not being available in the market than any other rate to be determined by the Engineer-in-charge at his decision shall be final and conclusive.

**GC-67**

**MATERIALS OBTAINED FROM DISMANTLING:**

If the Contractor, in the course of execution of work, is called upon to dismantle any part of work for reasons other than on account of bad or imperfect work, the materials obtained from dismantling will be property of the owner and will be disposed off as per instructions of Engineer-in-charge in the best interest of the owner.

**GC-68**

**ARTICLE OF VALUE OF TREASURE FOUND DURING CONSTRUCTION:**

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

**GC-69**

**DISCREPANCIES BETWEEN INSTRUCTIONS:**

If there is any discrepancy between various stipulations of the contract documents or instructions to the Contractor or his authorized

representative or if any doubt arises as to the meaning of such stipulation or instructions, the Contractor shall immediately refer in writing to the Engineer-in-charge and shall hand over the same to the owner.

**GC-70**

**ALTERATIONS IN SPECIFICATIONS & DESIGNS & EXTRA WORK:**

The Architect / Engineer-in-charge shall have power to make any alterations in, omission from, addition to substitution for, the schedule of rates, the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of work and the Contractor shall be bound to carry out such altered / extra / new items of work in accordance with any instructions which may be given to him in writing signed by Engineer-in-charge and such alteration omissions, additions or substitutions, shall not invalidate contract and any altered, additional or substituted work shall be carried out by the Contractor on the same conditions of contract. The time of completion may be extended by Architect as may be considered just and reasonable by him. The rates for such additional altered or substitute work shall be worked out as under:

- a) If the rates for additional, altered or substitutes work are specified in the contract for work, the Contractor is bound to carry out such work at the same rates as specified in the contract.
- b) If the rates for additional, altered or substituted work are not specifically provided in the contract for the work, the rates will be derived from the rates of similar items of work in the contract work. The opinion of Engineer-in-charge as to whether the rates can be reasonably so derived the items of contract will be final and binding to the Contractors.
- c) If the rates of altered, additional or substitute work cannot be determined as specified in (a) or (b) above, the rate shall be paid as per current S.O.R. of RMC and if the same is not available in RMC current S.O.R. the same can be adopted from current GWSSB.
- d) If the rates of altered, additional or substitute work cannot be determined as specified in (a) or (b) or (c) above, the Contractor shall within seven days of the receipt of order to carry out the work inform the Architect / Engineer-in-charge of the rate which he intends to charge for such work supported by rate analysis and the Architect / Engineer-in-charge will determine the rate on the basis of prevailing market rates of materials, labour cost at schedule of labour plus 15% there on as Contractor's supervision overheads and profit. The opinion of Architect / Engineer-in-charge as to the market rates of materials and the quantity of labour involved per unit of measurement will be final and binding on Contractor.

But under no circumstances, the Contractor suspends work or the plea of non settlement of items falling under this clause.

**GC-71**

**ACTION WHEN NO SPECIFICATIONS ARE ISSUED:**

In case of any class of work for which no specifications is supplied by the owner in the e-Tender documents, such work shall be carried out in accordance with relevant latest ISS and if ISS do not cover the same, the work shall be carried out as per General Technical Specification for building work; and if not covered in then it is to be with standard Engineering Practice subject to the approval of Engineer-in-charge.

- GC-72**      **ABNORMAL RATES:**  
Contractor is expected to quote rate for each item after careful analysis of cost involved for the performance of the completed item considering all specifications and conditions of contract.
- GC-73**      **ASSISTANCE TO ENGINEER-IN-CHARGE.:**  
Contractor shall make available to Engineer-in-charge free of cost all necessary instruments and assistance in checking of any work made by the Contractor setting out for taking measurement of work etc.
- GC-74**      **TESTS FOR QUALITY OF WORK:**
1.            The Contractor shall be required to give satisfactory hydraulic test where required and shall rectify the defects, if any, free of cost. The necessary water, power, labour etc., required for the hydraulic test shall also be arranged by the Contractor at his own cost.
  2.            All workmanship shall be of the best kind described in the contract documents and in accordance with the instructions of 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 of fabrication or on the site or at any such place. Contractor shall provide assistance, instruments, labour and materials as are normally required for examining, measuring and testing of any work of workmanship as may be selected and required by Engineer-in-charge.
  3.            All tests necessary in connection with the execution of work as decided by Engineer-in-charge shall be carried out at an approved laboratory at Contractor's cost.
  4.            Contractor shall furnish the Engineer-in-charge for approval when requested or if required by the specification, adequate samples of all materials and finished goods to be used in work sufficiently in advance to permit tests and examination thereof. All materials furnished and finished goods applied in work shall be exactly as per the approved samples.
- GC-75**      **ACTION AND COMPENSATION IN CASE OF BAD WORKMANSHIP:**  
If it shall appear to the Engineer-in-charge that any work has been executed with materials of inferior description, or quality or are unsound or with unsound, imperfect or unskilled workmanship or otherwise not in accordance with the contract, the Contractor shall, on demand in writing from Engineer-in-charge or his authorized representative specifying the work, materials or articles complained of, notwithstanding that the same may have been inadvertently passed, certified and paid for, forthwith rectify or remove and reconstruct the work, so specified. In the event of failure to do so within a period to be specified by the Engineer-in-charge in his aforesaid demand, Contractor shall be liable to pay compensation at the rate of 0.1 (zero point one) percent of the value of work for per day of delay limited to a maximum of ten (10%) percent of the value of work while his failure to do so continues and in the case of any such failure, the Engineer-in-charge may on expiry of the notice period rectify and remove and re-execute the work or remove and replace with others at the risk and cost of the Contractor. The decision of the Engineer-in-charge as to any question arising under this clause shall be final and conclusive.
- GC-76**      **SUSPENSION WORK:**  
Contractor shall, if ordered in writing by Engineer-in-charge or his representative temporarily suspended the work or any part thereof for such time (not exceeding one month) as ordered and shall not after

receiving such written notice proceed with the work until he shall have received a written order to proceed therewith. The Contractor shall not be entitled to claim compensation for any loss or damage sustained by him by reason of temporary suspension of work as aforesaid. An extension of time for completion of work will be granted to the Contractor corresponding to the delay caused by such suspension of work if he applies for the same provided the suspension was not consequent upon any default or failure on the part of the Contractor.

**GC-77      OWNER MAY DO PART OF THE WORK:**

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

**GC-78      POSSESSION PRIOR TO COMPLETION:**

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

**GC-79      COMPLETION CERTIFICATE:**

As soon as the work has been completed in accordance with contract (except in minor respects that do not affect their use for the purpose for which they are intended and except for maintenance thereof) as per General Conditions of Contract the Engineer-in-charge shall issue a certificate (hereinafter called completion certificate) in which shall certify the date on which work has been completed and has passed the said tests and owner shall be deemed to have taken over work on the date so certified. If work has been divided in various groups in contract, owner shall be entitled to take over any group or groups before the other or others and there upon the Engineer-in-charge will issue a completion certificate, which will, however, be for such group or groups so taken over.

In order that Contractor could get a completion certificate, he shall make good will all speed any defect arising from the defective materials supplied by Contractor of workmanship or any act or omission of Contractor that may have been discovered or developed after the work or groups of works has been taken over. The period allowed for carrying out such work will be normally, one month. If any defect be not remedied within the time specified, owner may proceed to do work at Contractor's (Agency, or Firm) risk and expenses and deduct from the final bill such amount as may be decided by owner. If by reason of any default on the part of the Contractor, a completion certificate has not been issued in respect of every portion of work within one month after the date fixed by contract for completion of work, owner shall be at liberty to use work or any portion thereof in respect of which a completion certificate has been issued, provided that work or the portion thereof so used as aforesaid shall be afforded reasonable opportunity for completion of that work or the portion thereof so used as aforesaid shall be afforded reasonable opportunity for completion of that work for the issue of completion certificate.

**GC-80****SCHEDULE OF RATES:**

1. The rates quoted by the Contractor shall remain firm till the completion of the work and shall not be subject to escalation. Schedule of rates shall be deemed to include and cover all costs, expenses and liabilities of every description and risks of every kind to be taken in executing, completing and handing over the work to owner by Contractor. The Contractor shall be deemed to have known the nature, scope, magnitude and the extent of work and materials required though contract documents may not fully and precisely furnish them. He shall make such provision in the Schedule of Rates as he may consider necessary to cover the cost of such items of work and materials as may be reasonable and necessary to complete the work. The opinion of Engineer-in-charge as to the item of work which are necessary and reasonable for completion of the work shall be final and binding on Contractor although the same may be not shown on drawings or described specifically in contract documents.
2. The Schedule of Rates shall be deemed to include and cover the cost of all constructional plant, temporary work, materials, labour and all other matters in connection with each item in Schedule of Rates and the execution of work or any portion thereof finished complete in every respect and maintained as shown or described in the contract document or as may be ordered in writing during the continuance of the contract.
3. The Schedule of Rates shall be deemed to include and cover the cost of all royalties and fees for the articles and processes, protected by letters patent or otherwise incorporated in or used in connection with work, also all royalties, rents and other payments in connection with obtaining material of whatsoever kind for work and shall include an indemnity to owner which Contractor hereby gives against all action, proceedings, claims, damages, costs and expenses arising from the incorporation in or use on the works of any such articles, processes or materials. Other Municipal or local Board charges if levied on material, equipment or machineries to be brought to site for use on work shall be borne by the Contractor.
4. No exemption or reduction of custom duties, excise duties, sales tax, GST or any other taxes or charges of the Central or State Government or of any Local Body whatsoever will be granted or obtained and all such expenses shall be deemed to have been included in and covered by Schedule of Rates. Contractor shall also obtain and pay for all permits or other privileges necessary to complete the work.
5. The Schedule of Rates shall be deemed to include and cover risk on account of delay and interference with Contractor's conduct of work which may occur from any cause including orders of owner in the exercise of his powers and on account of extension of time granted due to various reasons.
6. For work under unit rate basis, no alteration will be allowed in the Schedule of Rates by reasons of work or any part of them being modified, altered, extended, diminished or omitted.

**GC-81****PROCEDURE FOR MEASUREMENT OF WORK IN PROGRESS:**

1. All measurements shall be in metric system. All the work in progress will be jointly measured by the representative of Engineer-in-charge and Contractor's authorized agent. Such measurements will be got recorded in the Measurement Book by the Engineer-in-charge or his authorized representative and signed by the Contractor or his authorized agent in token of acceptance. If the Contractor or his authorized agent fails to be

present whenever required by the Engineer-in-charge for taking measures for every reason whatsoever, the measurement will be taken by the Engineer-in-charge or his authorized representative notwithstanding the absence of Contractor and these measurements will be deemed to be correct and binding on the Contractor.

2. Contractor will submit a bill in approved Performa in quadruplicate to the Engineer-in-charge of the work giving abstract and detailed measurements of various items executed during a month as mutually agreed. The Engineer-in-charge shall verify the bill and the claim, as far as admissible, adjusted if possible, within 10 days of presentation of the bills.

**GC-82      RUNNING ACCOUNT PAYMENTS TO BE REGARDED AS ADVANCES:**

1. All running account payments shall be regarded as payments by way of advance against the final payment only and not as payment for work actually done and completed and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be removed and taken away and reconstructed or rejected or to be considered as an admission of the due performance of contract or any part thereof.
2. Five (5) percent of the gross R A Bill amount shall be retained from each bill as retention amount and the same will be paid with the final bill.

**GC-83      NOTICE FOR CLAIM FOR ADDITIONAL PAYMENT:**

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

**GC-84      PAYMENT OF CONTRACTOR'S BILL:**

1. The price to be paid by the owner to Contractor for the work to be done and for the performance of all the obligations undertaken by the Contractor under contract shall be based on the contract price and payment to be made accordingly for the work actually executed and approved by the Engineer-in-charge.
2. No payment shall be made for work costing less than Rs.10,00,000/- till the work is completed and a certificate of completion given. But in case of work estimated to cost more than Rs.10,00,000/-. Contractor on submitting the bill thereof will be entitled to receive a monthly payment proportionate to the part thereof, approved and passed by Engineer-in-charge, whose certificate of such approval and passing of the sum so payable shall be final and conclusive against contractor. This payment shall be made after necessary deductions as stipulated elsewhere in the contract documents for materials, security deposit etc. The payment shall be released to the Contractor within Two (2) month of submission of the bill duly pre-occupied on proper revenue stamp. Payment due to Contractor shall be made by the owner by Electronic clearing system or RTGS only in Indian currency. Successful bidder must furnish his details for the ECS/RTGS.



- GC-85**      **FINAL BILL:**  
The final bill shall be submitted by Contractor within one (1) month of the date of physical completion of work, otherwise the Engineer-in-charge's certificate of the measurement and of total amount payable for work shall be final and binding on all parties.
- GC-86**      **RECEIPT FOR PAYMENT:**  
Receipt for payment made on account of work when executed by a firm must be signed by a person holding Power of Attorney in this respect on behalf of Contractor except when described in the e-Tender as a limited company in which case the receipt must be signed in the name of the Company by one of its principal officers or by some person having authority to give effectual receipt for the Company.
- GC-87**      **COMPLETION CERTIFICATE:**
1.      When the Contractor fulfils his obligation as per terms of contract, he shall be eligible to apply for Completion Certificate. Contractor may apply for separate Completion Certificate in respect of each such portion of work by submitting the completion documents along with such application for Completion Certificate.  
The Engineer-in-charge, shall normally issue to Contractor the Completion Certificate within one (1) month after receiving an application thereof from Contractor after verifying, from the completion documents and satisfying himself that work has been completed in accordance with and as set out in the construction and erection drawings and the contract documents. Contractor after obtaining the Completion Certificate is eligible to present the final bill for work executed by him under the terms of contract.
  2.      Within one month of completion of work in all respects Contractor shall be furnished with a certificate by the Engineer-in-charge of such completion but no certificate shall be given nor shall work be deemed to have been executed until all (i) scaffolding, surplus materials and rubbish is cleaned off site completely, (ii) until work shall have been measured by the Engineer-in-charge whose measurement shall be binding and conclusive and, (iii) until all the temporary works, labour and staff colonies etc. constructed are removed and the work site cleaned to the satisfaction of the Engineer-in-charge. If Contractor shall fail to comply with the requirements as aforesaid or before date fixed for the completion of work, the Engineer-in-charge may at the expense of Contractor remove such scaffolding, surplus materials and rubbish and dispose off the same as he thinks fit.
  3.      The following documents will form the completion documents: -
    - a) Technical documents according to which the work has been carried out.
    - b) Three sets of construction drawings showing therein the modifications and corrections made during the course of execution signed by the Engineer-in-charge.
    - c) Completion Certificate for "Embedded" or "Covered" up work.
    - d) Certificate of final levels as set out for various works.
    - e) Certificate of test performed for various work.
    - f) Material appropriation statement for the materials issued by owner for work and list of surplus materials returned to owner's store duly supported by necessary documents.
    - g) Operation and maintenance manual (If necessary)

4. Upon expiry of the period of defect liability and subject to Engineer-in-charge being satisfied that work has been duly maintained by Contractor during the defect liability period of fixed originally or as extended subsequently and that Contractor has in all respects made up any subsidence and performed all his obligations under contract, the Engineer-in-charge (without prejudice to the rights of owner in any way) give final certificate to that effect. The Contractor shall not be considered to have fulfilled the whole of his obligation until final certificate shall have been given by the ENGINEER-IN-CHARGE.
5. **Final Certificate only evidence of completion:**  
Except the final certificate, no other certificate of payment against a certificate or on general account shall be taken to be an admission by owner of the due performance of contract or any part thereof of occupancy or validity or any claim by the Contractor.

**GC-88      TAXES, DUTIES, ETC. :**

1. Contractor agrees to and does hereby accept full and exclusive liability for the payment of any and all taxes including Sales Tax, GST, Duties, Income Tax, Value Added Tax, Professional Tax, Labour cess, etc., now or hereinafter imposed, increased or modified from time to time in respect of work and materials and all contributions and taxes for unemployment, compensation, insurance and old age pension or annuities now or hereinafter imposed by the Central or State Government authorities with respect to or covered by the wages, salaries or other compensation paid to the persons employed by Contractor.  
  
If the Contractor is not liable to Sales Tax assessment, a certificate to that effect from the Competent Authority shall be produced without which final payment to the Contractor shall not be made. P, 'C' and 'D' Form shall not be supplied by the owner, and the Contractor shall be required to pay full tax as applicable.
2. Contractor shall be responsible for compliance with all obligations and restrictions imposed by the labour law or any other law affecting Owner-employee relationship.
3. Contractor further agrees to comply and to secure the compliance of all sub Contractors with applicable Central, State, Municipal and local laws and regulations and requirement. Contractor also agrees to defend, indemnify the hold harmless the owner from any liability or penalty which may be imposed by Central, State or local authority by reasons of any violation by Contractor or sub Contractor of such laws, regulations or requirements and also from all claims, suits or proceedings that may be brought against owner arising under, growing out of or by reasons or work provided for by this Contract by third parties or by Central or State Government authority or any administrative Sub-Division thereof.  
The Sales Tax/Value Added Tax/GST on work contract will be borne by the Contractor.
4. **The prevailing rate for GST for these works is 12% whereas it will be presumed that the agency has quoted their rates including GST as may be applicable at the time of last date of submission of the tender. If there is any variation in the rate of GST during the specified time limit / extended time limit for the work then the same will be considered in Running / Final Bill which will effect after the relevant time i.e. if there is any reduction in the rate of GST then the amount of difference will be deducted from the bill of agency at the relevant time accordingly**

**and the agency shall have to submit their Tax Invoice accordingly. Accordingly, if there is any increase in the rate of GST then the amount of difference will be paid to the agency in the relevant bill and the agency shall have to submit their Tax Invoice accordingly.**

**GC-89      INSURANCE:**

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

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

Contractor agrees to fill in with the Employees State Insurance Corporation, the declaration form and all forms which may be required in respect of Contractor's or sub-Contractor's employees whose aggregate remuneration is Rs.400/- p.m. or less and who are employed in work provided for or those covered by ESI from time to time under the agreement. The Contractor shall deduct and secure the agreement of the sub-Contractor to deduct the employees contribution as per the first schedule of the Employees State Insurance Act from wages. Contractor shall remit and secure the agreement of sub-Contractor to remit to the State Bank of Indian Employees State Insurance Accounts, the employee's contribution as required by the Act. Contractor agrees to maintain all cards and records as required under the Act in respect of employees and payments and Contractor shall secure the agreements of the sub Contractors to maintain in such records, any expenses incurred for the contributions, making contributions or maintaining records shall be to Contractors or sub-Contractors own account. Owner shall retain such sum as may be necessary from the contract value until Contractor shall furnish satisfactory proof that all contribution as required by the Employees State Insurance Act, 1948 have been paid.

2. **Workman's compensation and employee's liability insurance:**  
Insurance shall be affected for all Contractors employees engaged in the performance of this contract. If any part of work is sublet, Contractor shall require the sub-Contractor to provide workman's compensation and Owner's liability insurance, which may be required by owner.
3. Other Insurance required under law of regulations or by owner Contractor shall also carry and maintain any and all other insurance which may be required under any law or regulation from time to time. He shall also carry and maintain any other insurance, which may be required by owner.

**GC-90      DAMAGE TO PROPERTY:**

1. Contractor shall be responsible for making good to the satisfaction of owner any loss of and any damage to all structures and properties belonging to owner or being executed or procured or being procured by owner or of other agencies within the premises of all work of owner, if

such loss or damage is due to fault and / or the negligence of willful act or omission of Contractor, his employees, agent, representatives or sub-Contractors.

2. Contractor shall indemnify and keep owner harmless of all claims for damage to properties other than property arising under by reasons of this agreement; such claims result from the fault and / or negligence or willful act or omission of Contractor, his employees, agent's representative or sub-Contractor.

**GC-91      CONTRACTOR TO INDEMNIFY OWNER:**

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

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

3. In every case in which by virtue of any provision applicable in the workman's Compensation Act, 1923 or any other Act, owner be obliged to pay compensation to workmen employed by Contractor the amount of compensation so paid, and without prejudice to the rights of owner under Section-(12) Sub-section-(2) of the said Act, owner shall be at liberty to recover such amount from any surplus due to on to become due to the Contractor or from the security deposit. Owner will not be bound to contest any claim made under Section-(12) Sub-section-(2) of the said act except on written request of Contractor and giving full security for all costs consequent upon the contesting of such claim.

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

**GC-92      IMPLEMENTATION OF APPRENTICE ACT 1954:**

Contractor shall comply with the provisions of the apprentice Act 1954 and the orders issued there under from time to time. If he fails to do so, it will be a breach of contract.

**GC-93      HEALTH AND SANITARY ARRANGEMENTS FOR WORKERS:**

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

**GC-94      SAFETY CODE:**

**General:**

Contractor shall adhere to safe construction practice and guard against

hazardous and unsafe working conditions and shall comply with owner's rules as set forth herein.

**1.0 First Aid and Industrial Injuries:**

1.1 Contractor shall maintain First-Aid facilities for its employees and those of his sub-Contractors.

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

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

**2.2 General Rules:**

2.2 Carrying and striking, matches, lighters inside the project area and smoking within the job site are strictly prohibited. Violators of smoking rules shall be discharged immediately. Within the operation area, no hot work shall be permitted, without valid gas, safety, fire permits. The Contractor shall also be held liable and responsible for all lapses of his sub-Contractors / employees in this regard.

**2.2 Contractor's Barricades:**

3.1 Contractor shall erect and maintain barricades without any extra cost, required in connection with his operation to guard or protect during the entire phase of the operation of this contract for –

- a) Excavation
- b) Hoisting areas
- c) Areas adjudged hazardous by Contractor's OR Owner's inspectors.
- d) Owner's existing property liable to be damaged by Contractor's operations, in the opinion of Engineer-in-charge / Site Engineer.
- e) Rail road unloading spots.

3.2 Contractor's employees and those of his sub-Contractors shall become acquainted with owner's barricading practices and shall respect the provisions thereof.

3.3 Barricades and hazardous areas adjacent to but not located in normal routes of travel shall be marked by red lantern at night.

**4.0 Scaffolding:**

4.1 Suitable scaffolding shall be provided for workman for all works that cannot safely be done from ladders. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well suitable footholds and handholds shall be provided on the ladder and the same shall be given an inclination not steeper than 1 in 4 (1 horizontal and 4 vertical).

4.2 Scaffolding or staging, more than 3.6 M. (12') above the ground or floor, swing or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise fixed at least 1.0 M (3') high above the floor or platform or scaffolding or staging and extending along the entire length of the outside

ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

4.3 Working platforms, gangways, and stairways should be so constructed that they should not sag unduly or inadequately and if the height of the platform or the gangway of the stairway is more than 3.6 (12') above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in 4.2 above.

4.4 Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 1.0 M (3'.0").

4.5 Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9.0 M. (30') in length while the width between the side rails in rung ladder shall in no case be less than 30 cms (12 inches) for ladder up to and including 3.0 M. (10'), in longer ladders this width would be increased at least 6 mm (1/4") for each addition 30 c.m. (1.0) of length. Uniform step spacing shall not exceed 30 cms. (12"). Adequate precaution shall be taken to prevent danger from electrical equipment. No materials on any of the side of work shall be so stacked or placed as to cause danger or inconvenience to any person or public. The Contractor shall also provide all necessary all necessary fencing and lights to protect the workers and staff from accidents, and shall be bound to bear the expenses of defense of every suit action or other proceedings at law that may be brought by any persons for injury sustained owing to neglect of the above precautions and to pay damages and costs which may be awarded in any such suit or action or proceedings to any such person, or which, may be with the consent of the Contractor be paid to compromise any claim by any such person.

**5.0 Excavation:**

5.1 All trenches 1.2 M (4') or more in depth shall at all time are supplied with at least one ladder.

5.2 Ladder shall be extended bottom of the trench to at least 3" above the surface of the ground. The sides of the trench which are 1.5 M (5') or more in depth shall be stopped back to give suitable slope, or securely held by timber bracing, so as to avoid the danger of sides to collapse. The excavated materials shall not be placed within 1.5 M (5') of the trench of half of the trench depth whichever is more. Cutting shall be done from top to bottom. Under no circumstances, undermining or under cutting be done.

**6.0 Demolition:**

6.1 Before any demolition work is commenced and also during the progress of the work all roads and open area adjacent to the work site shall either be closed or suitably protected.

6.2 No electric cable or apparatus which is liable to be a source of danger shall remain electricity charged.

6.3 All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion of flooding. No floor or other part of the building shall be so over loaded with debris or materials as to render it unsafe.

## **2.2 Safety Equipment:**

- 2.2 All necessary personal safety equipment as considered necessary by the Engineer-in-charge should be made available for the use of persons employed on the site and maintained in a condition suitable for immediate use, and the Contractor should take adequate steps to ensure proper use of equipment by those concerned.
- 2.2 Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective gloves.

## **8.0 Risky Place:**

- 8.1 When the work is done near any place where there is a risk of drowning, all necessary safety equipment shall be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision should be made for prompt first-aid treatment of all injuries likely to be sustained during the course of the work.

## **9.0 Hoisting Equipment:**

- 9.1 Use of hoisting machines and tackles including their attachments, and storage and supports shall conform to the following standards or conditions.
- 9.2 These shall be of good mechanical construction, sound material and adequate strength and free from patent defect and shall be kept in good condition and in good working order.
- 9.3 Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength and free from patent defects.
- 9.4 Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in-charge of any hoisting machine including any scaffolding.
- 9.5 In case of every hoisting machine and of every chain ring hook, shackle, swivel and pulley block used in hoisting or lowering or as means of suspension, the safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load and the conditions under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.
- 9.6 In case of departmental machine, the safe work load shall be notified by the Engineer-in-charge as regards Contractor's machine, the Contractor shall, notify, the safety working load of the machine to the Engineer-in-charge. Whenever the Contractor brings any machinery to site of work he should get it verified by the Engineer-in-charge concerned.

## **10.0 Electrical Equipment:**

Motors, gears, transmission, electric wiring and other dangerous parts of hoisting appliances shall be provided with efficient safeguards, hoisting appliances should be provided with such means when will reduce to the

minimum the risk of accidental descent of the load, adequate precautions shall be taken to reduce to the minimum the risk of any part or a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energized, insulating mats, wearing apparel such as gloves, and booths as may be necessary shall be provided. The workers shall not wear any rings, watches and carry keys or other materials which are good conductors of electricity.

**11.0 Maintenance of Safety Devices:**

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

**12.0 Display of Safety Instructions:**

The safety provisions should be brought to the notice of all concerned by display on a Notice Board at a prominent place at the work spot. The persons responsible for compliance of the safety code shall be named therein by the Contractor.

**13.0 Enforcement of Safety Regulations:**

To ensure effective enforcement of the rules and regulations relating to safety precautions, the arrangement made by the Contractor shall be open to inspection by the Welfare Officer, Engineer-in-charge or Safety Engineer of the owner or their representatives.

**14.0 No Exemption:**

14.1 Notwithstanding the above clause 1.0 to 13.0 there is nothing to exempt the Contractor from the operations of any other Act or Rules in force in the Republic of India.

14.2 In addition to the above, the Contractor shall abide by the safety code provisions as per C.P.W.D. safety code framed from time to time.

**GC-95 ACCIDENTS:**

It shall be Contractor's responsibility to protect against accidents on the works. He shall indemnify the owner against any claim for damage or for injury to person or property resulting from, and in the course of work and also under the provisions of the workman's compensation Act. On the occurrence of an accident arising out of the works which results in death or which is so serious as to be likely to result in death, the Contractor shall within twenty-four hours of such accident, report in writing to the Engineer-in-charge the facts stating clearly and in sufficient details the circumstances of such accident and the subsequent action. All other accidents on the works involving injuries to person or damage to property other than that of the Contractor shall be promptly reported to the Engineer-in-charge stating clearly and in sufficient details the facts and circumstances of the accidents and the action taken. In all cases, the Contractor shall indemnify the owner against all loss or damage resulting



directly or indirectly from the Contractor's failure to report in the manner aforesaid. This includes penalties or fines, if any, payable by the owner as a consequence of failure to give notice under the Workman's Compensation Act, or failure to conform to the provisions of the said act in regard to such accidents.

In the event of an accident in respect of which compensation may become payable under the Workman's Compensation Act VIII of 1923 including all modification thereof, the Engineer-in-charge may retain out of money due and payable to the Contractor such sum of sums of money as may in the opinion of Engineer-in-charge be sufficient to meet such liability. On receipt of award from the Labour Commissioner in regard to quantum of compensation, the difference in amount will be adjusted.

**GC-96 Expenditure Reimbursement and Approval from Other Departments :**

**In case of obtaining approval from State / National Highway / Railways / GSPC / PGVCL / IOCL / Forest / Telecom etc., all relevant procedure is to be done by the agency including subsequent follow-up till the approval is received, however, Rajkot Municipal Corporation will recommend the relevant department for the approval. All expenses towards Fee / charges, Insurance Premium and deposit etc. for obtaining aforesaid approval(s) is to be done in the own name of the agency and expenses shall be borne by the agency. All expenses except amount of deposit, will be reimbursed to the agency upon submission of documentary evidences to RMC.**

**GC-97 Waste Disposal**

**The additional soil / C&D (Construction & Demolition) Waste of these works is to be disposed off only at the dedicated sites as per the Notification of Hon'ble Municipal Commissioner. The aforesaid Notification is attached herewith which is to be scrupulously followed, failing which, penalty will be imposed accordingly. The agency shall have to submit documentary evidence for the C&D Waste disposed off at the dedicated sites, only after which, the procedure for making the payment for the same will be done.**

**GC-98 Deduction of Road Restraining and Drawing Submission**

- a The deduction of Road Restraining Deposit will be applicable only on the bill amount of component work of only Rising Main Pipeline.
- b In these works, the drawings provided with the tender for pumping station civil work are indicative and tentative. The Agency shall have to prepare and submit the GAD for these works as per the site condition and as per the instructions of Engineer-In-Charge. Based on the approval of GAD by Engineer-In-Charge / PMC Agency, the Agency shall have to submit the Structural Design / Drawings. Upon approval for structural design / drawing by Engineer-In-Charge / PMC Agency, the agency shall have to execute the work(s) accordingly. If there is/are any change(s) in the location / depth then the agency shall have to carry out and execute the work at their approved rates of the Tender.

**GC-99 Work-order/Notice to start for O & M Work**

Separate work-order/Notice to start the work will be issued after successful commissioning of Pumping Machinery for each pumping station for 5 Years comprehensive O & M. As per the present rules there is no GST applicable on O & M Works. Hence, agency shall have to quote their rates accordingly.

**A.E.  
R.M.C.**

**D.E.E.  
R.M.C.**

**C.E.(Drainage Project)  
R.M.C.**

# RAJKOT MUNICIPAL CORPORATION

e-Tender No.: RMC/SJMMSVY/ PROJECT/2020-21/128



## Bid Documents For

Providing, Lowering, Laying, Jointing, Testing and Commissioning of 1100 mm Dia DI Pipe on route Popatpara MPS to Madhapar STP in New Ward No.-3 under SJMMSVY

January - 2021

## Volume- II

### Technical Specifications (Rising Main Pipeline)

:: Milestone dates of e-Tendering ::	
1. Downloading of e-Tender documents	15-01-2021 to 30-01-2021 up to 18.00 Hrs.
2. Pre-bid Queries to be submitted by e-mail at mail ID <a href="mailto:hnsbeth@rmc.gov.in">hnsbeth@rmc.gov.in</a> Pre-bid Meeting in Office of the City Engineer, RMC. at West Zone Office Room No.3	18-01-2021 at 11.00 Hours
3. Online submission of e-Tender	30-01-2021 up to 18.00 Hrs.
4. Submission of EMD, Tender fee, Documents required for pre-qualification and other necessary documents by Hand Delivery / Regd. Post. A.D. / Speed Post.	Up to 03-02 -2021 up to 18.00 Hrs
5. Opening of online Primary Bid (Technical Bid)	04-02-2021 at 10.30 Hrs. onwards
6. Verification of submitted documents (EMD, Tender fee, Documents required for pre-qualification and other necessary)	upto 06-02-2021 at 10.30 Hours onwards
7. Opening of online Commercial Bid (Price Bid) for technically qualified bidders only.	08-02-2021 at 10.30 Hrs. onwards (If possible)
8. Bid Validity	One eighty (180) calendar days

**CITY ENGINEER  
DRAINAGE PROJECT DEPARTMENT  
RAJKOT MUNICIPAL CORPORATION  
SHRI HARISINHJI GOHIL ZONAL OFFICE  
WEST ZONE, ROOM NO.3 (G.F.),  
150 FEET RING ROAD,  
RAJKOT - 360 005**

# **RAJKOT MUNICIPAL CORPORATION**

## **Bid Documents For**

Providing, Lowering, Laying, Jointing, Testing and Commissioning of 1100 mm Dia DI Pipe  
on route Popatpara MPS to Madhapar STP in New Ward No.-3 under SJMMSVY

## **Volume- II**

### **Technical Specifications (Rising Main Pipeline)**

Section-1    Technical Specifications

Section-2    Schedule of Drawings

# I N D E X

<b>Sr No</b>	<b>Particulars</b>
1	Technical specifications
2	Schedule of Drawings

**VOLUME-II**  
**TECHNICAL SPECIFICATIONS**  
**CONTENT**

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3	Completion Schedule
4	General Technical Guideline
5	Classification of Strata
<b>B</b>	<b>DETAILED TECHNICAL SPECIFICATION</b>
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1	Providing and testing of GRP Pipe Line
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2	Providing and laying Sand/Granular bedding for Pipes
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## **:: TECHNICAL SPECIFICATIONS::**

- **GENERAL**

- **SCOPE OF CONTRACT :**

The works entitled “Manufacture, supply, Laying, Jointing and Testing & commissioning of Ductile iron pipeline ( DI K-9 ) of specified size with inside cement lining and DI specials shall comprise of manufacture, supply and delivery of goods to site or work, excavation of trenches with shoring and strutting wherever required, bailing or pumping out water wherever necessary, laying of pipes, jointing of pipes including materials of jointing and testing as per specifications of various works stipulated in the tender.

- **e-TENDER PRICE:**

The rates quoted in the bill of quantities shall cover everything necessary for the due and complete execution of the work according to the drawings and other condition and stipulations of the contract including specifications of the evident, intend and meaning of all or either of them or according to customary usage and for periodical and final inspection and test and proof of the work in every respect and for measuring, numbering or weighing the same, including setting out and laying or fixing in position and the provision of all materials, power, tools, rammers, labour, tackle, platforms with impervious lapped joints for scaffolding, ranging roads, straight edged, cantering and boxing, wedges, moulds, templates, posts, straight rods, straight edged, cantering and boxing, wedges, moulds, templates, posts, straight rails, boning staves strutting, barriers, fencing lighting pumping apparatus, temporary arrangement for passage of traffic access to premises and continuance to drainage water supply and lighting (if interrupted by contractor’s work) temporary sheds, painting, varnishing, polishing establishment for efficient supervision and staging arrangements for the efficient protective of life and property and all requisite plant and machinery of every kind.

The contractor shall keep every portion of the work clear of accumulation from time to time and shall leave every portion of the work clean, clear, perfect and at the conclusion of whole, providing at their own cost all such material implement, appliances and labour as the Engineer in charge may require to prove if it to be so.

- **COMPLETION SCHEDULE:**

The contract period shall be **18 (Eighteen) Calendar months** from the date of notice to proceed. The Contractor shall submit his completion schedule and the program of works together with this e-TENDER in conformity with completion schedule given in the documents.

- **Packing and Handling:**

- a. Necessary care shall be taken and required packing shall be provided to avoid damage to pipe barrels and the edges of the pipe ends in transit.
- b. Where the goods are required to be dispatched at Railway risk, special packing as per IRCA rules are absolutely necessary, which would be payable by the contractor himself.

c. The contractor shall use proper handling equipment or follow suitable standard handling method for **DI pipes & DI Specials** as approved by the Engineer-in-charge to unload the materials at the delivery site to prevent damage to the goods.

• **GENERAL TECHNICAL GUIDELINE:**

- 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 specifications and the written order of the Engineer in charge
  - 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
- 4.3 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 representative on site shall be considered as it given to the contractor himself.
- 4.4 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.
- 4.5 Quantities specified in the e-TENDER may vary at the time of actual execution and the contractor shall have no claim for compensation on account of such variation
- 4.6 Unexcavated lengths shall be left wherever required and so directed by the Engineer in charge during the currency of the contract and shall be tackled. If required, before completion of work.
- 4.7 Diversion of road, if necessary, shall be provided and maintained during the currency of the contract by the contractor at his cost.
- 4.8 Figured Dimensions of drawing shall supersede measurements by scale, special dimensions or directions in the specifications shall supersede all other dimensions.
- 4.9 All levels are given on drawings and the contractor shall be responsible to take regular level on the approved alignment before actually starting the work. The levels shall be commensurate to the G.T.S. levels and shall be got approved from the Engineer in charge
- 4.10 If the arrangement of temporary drainage is required to be made during any work of this Contract, this shall be made by the Contractor without claiming any extra cost.

**5 CLASSIFICATION OF STRATA:**

- 5.1 All materials encountered in excavation will be classified in the following groups irrespective of mode of excavating the materials and the decision of the Engineer in charge in this regard shall be final and binding to the contractor.
- 5.2 Soils :  
Soils of all sorts, silt, sand, gravel, soft murrum, stiff clay, kunkar and other soft excavation not covered in the items mentioned hereunder.
- 5.3 Hard Murrum :  
Hard Materials comprising of all kinds of disintegrated rock or shale or indurate conglomerate interspersed with boulders, weathered and decomposed rock which could be removed with pick, bar, shove, wedges and hammers, though not without some difficulties.



5.4 Soft – Rock:

This shall include all materials which is rock but which does not need blasting and can be removed with a pick bar, wedges, pavement breakers, pneumatic tools etc.

5.5 Hard Rock:

This shall include rock accusing in mass or boulders which need blasting, this will also include rock to be removed by chiseling or any other method where blasting is not permissible.

Signature of contractor

## **B. DETAILED TECHNICAL SPECIFICATIONS**

## **B-1 MATERIAL SPECIFICATION**

### **1.0 SLUICE VALVES**

#### **1.1.1 GENERAL**

This specification describes design, construction, inspection and testing features of Sluice Valves.

#### **1.1.2 CODES AND STANDARDS**

The design and manufacture of the valves shall comply with all applicable codes, standards, regulations and safety codes. Nothing in this specification shall relieve the Contractor of his responsibility. Valves shall be conforming to IS 2906 for sizes above 300 mm and IS 780 for sizes up to 300 mm.

#### **1.1.3 DESIGN REQUIREMENTS**

Valves shall be provided with back seating arrangement.

Direction of flow shall coincide with the flow direction indicated by “arrow” cast on the valve body.

Renewable body and wedge rings shall be provided.

Drain plugs of gunmetal shall be provided for all valves.

Stuffing box gland shall be of bolted type.

Valves shall be with non-rising spindle type.

Face to face dimension shall be as per IS 2906 above 300 mm. size and IS 780 up to 300 mm. size.

#### **1.1.4 CONSTRUCTIONAL FEATURES**

1.0	Standard	IS 14846
2.0	Stem	Non rising
3.0	Ends	Flanged, flat faced flanges having off center bolt holes
4.0	Bonnet	Bolted
5.0	Disc.	Solid wedge
6.0	Operation	Electrically operated / Hand wheel operated
7.0	Seat	Body - Renewable Disc - Renewable
8.0	Other requirements	Valves shall close in clockwise rotation of the hand wheel.
9.0	Body & bonnet	C.I. IS 210 GR 260
10.0	Disc	C.I. IS 210 GR 260
11.0	Stem	S.S. AISI – 410
12.0	Body seat	S.S. AISI – 316
13.0	Disc seat	S.S. AISI – 316
14.0	Stem nut	Bronze IS 318 Gr LTB2
15.0	Stuffing box	C.I. IS 210 GR 260
16.0	Gland	C.I. IS 210 GR 260
17.0	Packing	Graphited Asbestos
18.0	Bolts, studs & nuts	Carbon Steel IS 1367 Class 4.6 / 4

### **1.1.5 CLEANING AND PAINTING**

Prior to factory inspection, all manufacturing waste such as metal chips, debris and all other foreign material shall be removed from the interior of the valve. All mill scale, rust, oil, grease, chalk and all other material shall be removed from the interior and exterior surfaces.

Valves shall first be given two coats of zinc base primer after completely cleaning the surface and then it shall be coated with three coats of coal tar epoxy paint. The resulting coating shall be uniform and smooth and adhere perfectly to the surface.

The inside coating shall not contain any constituent soluble in water or any ingredient which could impart any taste or odour to the water.

### **1.1.6 TESTS AND INSPECTION**

Valves shall be offered for visual inspection and dimensional check. The hydrostatic testing shall be witnessed by the Employer.

Valves above 300 mm size shall be tested as per IS 2906. Valves upto 300 mm size shall be tested as per IS: 780.

Valve shall be dispatched only after owner's approval for dispatch.

### **1.1.7 FIXING OF VALVES:**

Loading at store and unloading at site of works shall be done carefully using suitable mechanical handling devices such as crane, chain pulley etc. The arrangement of housing the valves with chambers and stable and firm foundations. The chamber and top roof cover with removable lid shall be provided so that it shall be possible to remove or replace or recondition the valves seats and to remove the parts without removing the valves from the pipe work. For this suitable flange adapters may be provided. Butterfly valves shall have high nitrile rubber seats, preferably metal reinforced, unless otherwise specified and shall be installed in the pipe work in such a manner that they can be removed from the line for dismantling and replacement of rubber seats.

Where the valves are required to be operated electrically, actuators shall be sized to guarantee valves closures at maximum possible differential pressure across the valve. Each actuator shall be supplied with installation, instructions and wiring diagrams and sufficient spare parts.

Valves used on pipeline shall be straight through type and non chokable. Each valve or its operation equipment shall bear an approved name plate stating its function. All operation spindles, gears and head stocks shall be provided with adequate points for lubrications.

The tightening of nut and bolts shall be done smoothly in such a way that no excessive strain occurs on any one side. The nuts shall be tightened on diametrically opposite site at a time.

### **1.1.8 INFORMATION REQUIRED**

Following documents/drawings shall be submitted by Bidder along with the quotation.

Preliminary outline dimensional drawings.

Typical cross section drawings.

Supplier's data sheet showing valve size, pressure rating, test pressures, list of tests to be conducted etc.

List of spares for two years operation.

### **1.2 DOUBLE ACTING KINETIC (H-42K) AIR VALVE WITH ISOLATION VALVE**

#### **1.2.1 GENERAL:**

The double air valves shall have two ball chambers, having one outlet of large capacity for admission and release of bulk volume of air during emptying and filling of the main and another having small outlet for escape of smaller quantities of entrapped air. This type of air valves shall be of flanged type with full conformation with IS:1538.

The ball sealed orifice always remains open while air is exhausting and is immediately closed when water rises in the chamber, lift the ball and seals the orifice. It shall also ensure that there are no recesses or pockets, sheltering, escaping air for the large orifice (low pressure) valve to drop into when the valve is open. Turbulent air at the time of filling of pipe shall not circulate in such cavities and cause the ball to blown into when the valve is open. Turbulent air at the time of filling of pipe shall not circulate in such cavities and cause the ball blown into the discharging air streams, blowing the valve shut prematurely.

The cone angle of the lower pressure chamber shall be such that even at the critical velocity of air escape at 300 m/sec. The total impact force on the ebonite covered ball is less than the suction force on the angular area between the ball and the cone. The design of the valve should be such as to allow maximum free air discharge at various pressure differentials. The tenderer shall submit with the tender full set of curves showing discharge of free set of curves showing discharge of free air valves pressure differential for all sizes of valves offered by him.

Under no circumstances shall be large orifice ball blow shut prematurely.

The low pressure cover shall be massive and designed to withstand full operating thrust in working conditions.

Air valve shall be design to prevent premature closure prior to all air having been discharge from the line. The orifice shall be positively sealed in the close position but float (Ball) shall only be raised by the liquid and not by mixer of air and liquid. The sealing shall be design to prevent the float sticking after long period in the close position.

All branched outlets including outlets for Air valves will be with compensation pads (Dia. of Main / for branch Di ratio greater than 3). Diameter of compensation pad will not be less than 1.75 times the O.D. of the branched outlet. Plate thickness for pads will be same that of the main.

For Outlets with above ratio less than three, then the joints will be of plate reinforcement type.

All branched outlets including air valve tee's will be provided with one ½ “BSP coupling duly plugged for measurement of pressure in due course. The closing plug will be in Stainless Steel (AISI 304 or equivalent) with Hex. Head, and will be provided with copper washed for sealing.

The neoprene seat ring shall be held securely in place under the low pressure cover by a joint support ring to prevent it from sagging when the ball is not sealing the orifice.

The valve body, the orifice cover, cowl of the air valves shall be made of cast iron of grade 2 of IS:210.

Where tenderer considers necessary a suitable drain plug shall be provided.

#### **1.2.2 JOINTING MATERIAL:**

Each valve shall be supplied with all necessary joint ring, nuts, bolts and washers for completing the joints such that it will ensure effective sealing of large orifice even at low pressures. The weights of floats of the same size and type shall not differ by more than 2%.

The timber, if used in the manufacture of floats shall be seasoned and those provided in large orifice shall be ebonite coated. The float provided in high pressure chamber, if manufactured from seasoned wood, shall be coated with “ethylene propylene Rubber” (EPDM).

#### **1.2.3 HIGH PRESSURE ORIFICE:**

The high pressure orifice and the high pressure chamber shall be so designed that the orifice is effectively sealed in working conditions by “EPDM” coated float.

The material of the orifice shall be gunmetal. The orifice shall be of size not less than 3 mm and tapering to 100 mm suitable to release accumulated air within the pipe. The profile of the orifice shall be carefully chosen to avoid damage to the float surface. The orifice shall be protected by a suitable plug of stainless steel.

#### **1.2.4 VALVE FLANGES:**

All valves flanges shall be designed to withstand the stresses to which they would be subjected under hydraulic tests. Flanges shall be machined flat. The flanges shall be drilled in accordance with IS: 1538 (part – I to XXII) – 1976 (specifications for C. I. Fittings for pressure pipes for water etc.)

#### **1.2.5 COATING:**

The casting shall be such that it shall not impart any taste or smell to water. The coating shall be smooth, glossy and tenacious, sufficiently hard so as not to flow when posed to a temperature of 770 C and not so brittle at a temperature of 150 C as to chip off when scratched lightly with the point of penknife.

Alternatively, two coats of black Japan conforming to type 8 of IS 341-1971 (Or latest edition) or paint conforming to type – 2 of IS 158-1969 (OR latest edition) shall be applied.

The sluice shall be provided and fixed as per specifications given in Tender item and as per IS-14846 with its latest edition.

**1.2.6 TESTING:**

The air valves shall withstand 1.5 times the working pressure. The joints and air valve shall be water tight. During test if the joints of air valve are found leaking or the air valve is found not functioning properly then the same shall be got rectified or replaced by the contractor to the satisfaction of Engineer-in-charge.

**1.2.7 JOINTING MATERIAL:**

The contractor shall have to provide all the jointing material like bolts, nuts, packing, branch (up to 1 Mt long) with flange, white zinc etc. at his cost.

## **B2 LABOUR SPECIFICATION**

### **1. EXCAVATION AND REFILLING:**

Excavation for sewer line trenches, manholes and house connection chambers etc. with shoring strutting bailing our water form trencher wherever necessary including excavation in khal kuvas or soak pits encountered in the work and making the good after the work and all safety measures and provisions such as site rails fencing lighting watching and stacking excavated stuff up to a lead of cleaning the site etc, as stipulated in the e-TENDER specifications complete for lifts and soil strata as specified below :-

- (i) In all sorts of soil & soft murrum including macadam road, khal kuvas and soak pits.
- (ii) In hard murrum boulders.
- (iii) In soft rock, masonry structures like in C.M., L.M. or lime concrete.
- (iv) In hard rock, in C.C. 1:2:4 or R.C.C. with controlled blasting and or chiseling

#### **1.1. EXCAVATION FOR PIPELINE TRENCHES IN ALL SORT OF SOILS AND SOFT MURRRUM INCLUDING MACADAM ROAD (WBM), KHAL KUVAS AND SOAK PITS INCLUDING DEWATERING.**

- 1.1.1. The item shall include dry or wet excavation and removal of excavated material and its stacking and disposal in a manner hereinafter specified. The water met with if any, shall be bailed or pumped out by the contractor as necessary.
- 1.1.2. The contractor shall provide all materials and perform all labour necessary for the excavation and completion of the work in accordance with the drawings and specifications and the intent thereof.
- 1.1.3. The Contractor shall provide necessary protection to labour materials, equipment etc. to ensure safety against risk and accident. The B.I.S. standard in this regard shall be followed (IS 3764 – 1966)
- 1.1.4. The Contractor shall be liable to pay compensation for injury to life, and damage to property, if any, caused due to any operation connected with this item.
- 1.1.5. The Contractor shall hand over the site of work in neat and tidy condition after completion of work and shall remove all rubbish arising out of construction work.
- 1.1.6. The contractor shall carry out the work of trial hole of the sizes and depths and at places as directed by the Engineer-in-charge to accurately locate and determine the portions of services like water mains and drains, electric cables, telephone cables .etc, and shall fill them back as required and as ordered. The work shall be paid as per the item of excavation.



1.1.7 Widths of excavation for different diameter of pipes

The width of trenches for different diameters of pipes are to be given I.D. of pipe + 0.60m and it shall be paid as per actual excavation done but limited to ID of pipe +0.90m in case of more width done by the contractor. Contractor shall have to keep in mind that the working space at the bottom for easy laying and jointing of pipes.

1.1.8. Depth of Excavation of Trenches:

The depths of excavation for the trenches shall be calculated from the surface to the bottom of the foundation, No payment shall be made for any excavation, beyond the width and depth, as specified above.

1.1.9 A Grip to be cut for pipe collar:

Where a collars be provided or where socket of the pipe comes a grip shall be cut in the bottom of the trench or bedding as necessary below the bed of the pipes so that the pipe may have a fair bearing on its shaft and not rest upon its collars. Such grip shall be maintained clear until the joint has been passed by the Engineer – in – charge.

1.1.10 Trenches in Rocky Ground:

The trenches in stony or rock ground shall be excavated all along to the full depth such that the bottom of the excavation shall not be higher at any point than the bottom of the concrete bedding layer below the sewer pipe.

1.1.11 Measurement of length of Excavation:

The length of excavation for trenches shall be measured in the horizontal plane

The excavation shall be taken up at such places and in such lengths as shall be approved by the Engineer-in-charge. The excavation shall proceed in such portions at one time as the Engineer-in-charge may direct. No permanent works shall be started unless the Engineer-in-charge approves the excavations. The length of trench excavated ahead of the laying and the length of trench which may remain open at any time shall at all times be subject to the approval of the Engineer-in-charge. It shall be at no time, longer than can properly be protected from caving. In case of tapering in excavation, average width in measurement shall be taken in to account.

The materials from the excavation shall be deposited on either side of the trench leaving a clear berm on each side at least 40cm wide or at such further distances from the edges of the trench, as may be necessary. To

prevent the weight of materials from causing the side of the trench to slip or fall, or at such distance and in such a manner as to avoid covering fire-hydrants, sluice valves, gas siphons, manhole covers and the like and so as to avoid abutting any wall or structure or causing inconvenience to the public or other persons, or otherwise as the Engineer-in-charge may direct.

In case, where the Engineer-in-charge decides that the width of the road or lane, where he work of excavations to be carried out is so narrow as to warrant stacking of excavated materials away from the site of the work the contractor shall have to remove the same if so directed within the lead of 250M. The excavated stuff shall be brought back for refilling the trenches when required. The surplus material shall be removed as directed. No claims for stacking the excavated stuff away from the site of work or bringing it back for refilling trenches shall be entertained.

1.1.12. Bottom of Trenches and foundation to be saturated with water

The bottom of all trenches and the foundations of all structure shall be saturated with water and well rammed wherever the Engineer may consider it necessary to do so.

1.1.13. Excess Excavation due to nature of sub-soil for additional foundation

If in any place, the Engineer-in-charge considers on account of the nature of sub soil additional foundations of concrete, rubble or other wise necessary or if at any place, for any purpose whatsoever he required the excavation to be carried out deeper than shown on the plans or described in the specifications, the same shall be carried out as may be ordered by the Engineer-in-charge and such additional works shall be measured and paid for to the contractors according to the rates. Excavation and necessary dewatering and shoring strutting for chambers, Main holes, Vent shafts etc, is also included in this item and no extra shall be paid for excavation for chambers manholes, Vent shafts etc.

1.1.14. Unauthorized excess excavation:

Where excavations are made in excess of the width and depth indicated on the drawings, either by error or by accident the hollows so formed shall be filled in with lime concrete or rubble masonry or otherwise as directed by the Engineer-in-charge to his full satisfaction at the expense of the contractor.

1.1.15. Fencing / Lighting and Watching:

The contractor shall make all proper provisions for protecting the work by fences and by watching and lighting at night, or otherwise as may be directed by the Engineer-in-charge. The posts of the fencing shall be of timber or of other approved material securely fixed in the ground not more

that 3M apart. The timber posts shall not be less than 75mm in dia, and shall not be less than 1.2 M above the surface of the ground.

There shall be two rails one near the top of the posts and the other about 150mm above the ground and shall be 50 mm to 70mm dia and sufficiently long to run from post to post to which they shall be securely fixed as per direction of the Engineer-in-charge. The method of projecting rails beyond the posts and tying them together where they meet will not be allowed on any account al along the edges of the excavated trenches a bank of earth about 1.20m high shall be formed where required by the Engineer-in-charge for additional protection Adequate number of red lights wherever required shall be provided at night. Also a watchman shall be engaged to see that the lights are properly maintained during night.

In the event of contractor not fully complying with the provisions of this clause, the Engineer may with or without notice to the contractor put up a fence, improve the lighting and adopt such other measures as he may deem necessary for the safety and all costs of such works including penalty as may be decided by the Engineer-in-charge shall be paid by the contractor the contractor shall also provide and display special Boards painted with fluorescent paints indicating the progress of the work along a particular road.

1.1.16 Maintenance of Water Pipes, Gas Pipes, Telephone lines, Electric lines and Drains Khal-kuvas, Sewers during Excavation:

The contractor shall at the rates entered in the bill of quantities and rates, carry out all excavation as the Engineer-in-charge may require in order to locate the positions of water pipes, Gas Pipes, Telephone lines, Electric lines, drains, khal-kuvas, sewers, or any other structures in connection with them and shall properly maintain and protect these services by means of shoring strutting planking over padding or otherwise as the Engineer-in- charge may direct during works resulting from the same shall be made good and effectively remedied by the contractor at his cost if the contractor fails to comply with the requirements, the Engineer-in-charge will got it repaired from any other agency at the expense of the contractor. If however, the Engineer-in-charge considers it impracticable for the contractor to maintain any such water pipes, drains, Khal-kuvas, sewers or other works and that exigencies of the work necessitate the breaking down removal, or diversion of any such water pipes, drains, khal-kuvas, sewers, or other work, them he may direct the contractor to break down or remove any of the above mentioned services and ask the contractor to provide such chutes pumps or other equipment of raising and temporary passage of the water or sewerage. The cost of pumping out or otherwise removing any water or sewerage which may escape from any such broken water pipes, drains, khal-kuvas, and sewers shall be borne by the contractor.

1.1.17. Shoring:

1.1.17.1 Wherever shoring is found necessary by the Engineer-in-charge the contractor shall provide the same in the best possible manner with the materials as required and as directed by the Engineer-in-charge to his complete satisfaction. The contractor shall employ such kind or kinds of shoring as the Engineer may consider the exigencies of the work to require and it is to be distinctly understood that the word 'shoring' is to comprise all classes of such work and all appliances and appurtenances, including polling Corporations, sheet piling and runners (whether the joints be butt., groove and tongue, feather edge and grove, birds mouth and double splay, rebate or otherwise), together with walkways, strut, props point blank shores, raking shores, blocks, wedges, Iron dogs, bolts, screws, nails and everything that may be required for due execution of the work.

1.1.17.2 Contractors responsibility for secure shoring and / or all damages:

The contractor shall be responsible for providing secured shoring and for taking every other precaution which may be necessary or proper for protecting any building or any other structure from getting damaged by the excavation of any trench or otherwise by the execution of the works in the vicinity of such building of structure.

If the Engineer-in-charge shall require the adoption of any special or extra measures, or precautions, the contractor shall forthwith adopt and supply the same. However, this revision shall not in nay degree relieve the contractor from his responsibility or from liability under the conditions of the contract in respect of any claim made against the Corporation for loss or damage which might be caused to any such building or structures by the execution of any works or otherwise.

After the work is completed near building, the contractor shall remove the shoring safety without slipping of soil of trenches if any and make good any cutting out or other damage that might have been done.

1.1.17.3 Liability of Timbering:

No work approved by the Engineer-in-charge or his representative about timbering shall absolve the contractor from his responsibility and he will be responsible for making good damage caused as about result of the failure of timbering to give proper support to the sides of the excavation.

The timbering to the sides of excavation for structures shall be carried out in such a way that there is no obstruction caused to the fixing of form work for the walls. The supporting struts and walling shall be removed by the contractor in stage to facilitate progress of concreting pipe laying etc.

If the Engineer-in-charge finds that the standard of timbering is not according to requirements or that the sides of the excavations have not been secured in a manner to render such excavations safe for working may be one hour after notifying the contractor of his representative in writing about this shall employ his own men to mend the timbering and the cost of

such workmen and materials employed including penalty shall be paid by the contractor.

1.1.17.4 Removing shoring:

No part of the shoring shall nay time be removed by the contractor without obtaining permission of the Engineer-in-charge While out shoring planks, the hollows if any, formed shall simultaneously be filled in with soft earth well rammed with rammers after watering.

1.1.17.5 Shoring left in Trenches:

The Engineer-in-charge may order in writing portions of shoring to be left in the trenches at such places where it is found absolutely necessary to do so, so at to avoid any damage to buildings, cables, water mains, sewers, etc. in close proximity of the excavation.

The contractor shall not claim, anything, whatsoever for the shoring which might have been left in the trenches.

1.1.17.6 Steel trench sheeting:

Where the subsoil conditions meet with are of a soft and unstable in trench excavation the normal methods of timbering will not prove sufficient to avoid subsidence of the adjoining road surface and other services. In such circumstances, the contractor will be required to use steel trench sheeting or sheet steel piling adequately supported by timber struts, welling etc. without any extra cost. The contractor shall supply, and subsequently remove trench sheeting or piling where no longer required.

1.1.18. Constructing Temporary bunds & sumps:

For the purpose of keeping the excavations dry the work shall, if necessary he divided into sections or separate portions, to be determined by the Engineer-in-charge and temporary bunds shall be put up by the Contractor. Sump shall be excavated by the Contractor at such distances apart and of such depths, as the Engineer-in-charge may direct to allow the pumps to work. When and as the work progresses, other sumps shall be excavated by the Contractor from time to time. The sumps not in use shall be filled in by the Contractor to the satisfaction of the Engineer-in-charge. The contractor shall not claim anything extra for temporary bunds and sumps or their removal and refilling, nor shall such work be taken into measurements in any way.

1.1.19. Rate for Excavation:

The rates for excavation shall be included and cover without extra charge all the stipulations continued in every portion of these specifications, with regard to setting out, provision for the passage or traffic and for access to premises, arrangements for the continuance of drainage, khal-kuvas or such points water supply or lighting (If interrupted by the works) arrangements, for the efficient protection of the life and property, fencing, lighting, watching, shaping the trenches, maintenance of water pipes, gas pipes, telephone lines, electric lines drains, khal-kuvas and other work met with

in or about the excavation driving them dismantling them, rebuilding them as necessary, subsequent re-excavation, on account of rain, holiday or special occasion, filling necessary dewatering etc. complete.

- 1.1.20 The excavation shall be carried out in the strata met with as specified in the proper manner and with lifts mentioned therein.
- 1.2. EXCAVATION FOR PIPELINE TRENCHES IN HARD MURRUM, BOULDERS INCLUDING DEWATERING.
  - 1.2.1 All the items of excavation for trenches and manholes vent shaft, house connections, chambers and connecting sewers as described under 1.1 above shall also apply here.
  - 1.2.2 This shall included all kinds of disintegrated rock or shale or indurate clay tending to the formation of conglomerate interspersed with boulders up to having at least dimension of 300mm in any direction which do not need blasting and could be removed by a pick and bar and shovel with some difficulty.
- 1.3 EXCAVATION FOR PIPELINE TRENCHES IN LARGE BOULDERS AND SOFT ROCK WITHOUT BLASTING INCLUDING DEWATERING.
  - 1.3.1 All the items of excavation for trenches and foundation as described under 1.1 above shall also apply here.
  - 1.3.2 Excavation shall be in soft rock as lime stone, sand stone, laterite hard conglomerate or other soft of disintegrated rock, which may be quarried on spilt with crow bars, boulders which do not require blasting having diameter in any direction not more than 300mm and any rock which in dry state may be hard, requiring blasting but which when wet becomes soft and manageable by means other than blasting and excavation shall be decided by the Engineer-in-charge and his decision shall be final and binding on the contractor.
- 1.4 EXCAVATION FOR PIPELINE TRENCHES IN HARD ROCK INCLUDING DEWATERING AND CONTROLLED BLASTING IF REQUIRED AND OF CHIESELING.
  - 1.4.1 All the items of excavation for trenches and foundations under 1.1 above as applicable shall also apply here.
  - 1.4.2 Excavation shall be in any rock or boulders having diameter in any one direction of more than 300mm for which the use of mechanical plant or controlled blasting is required. The classifications of excavation shall be decided by the Engineer-in-charge and his decision shall be final and binding on the contractor.
  - 1.4.3 Controlled blasting shall be carried out only with the written permission of the Engineer-in-charge All statutory laws, regulations rules etc. Pertaining to the acquisition, transport, obtaining permission of

- respective departments, handling and use of explosives shall be strictly followed,
- 1.4.4 When controlled blasting is permitted by the Engineer-in-charge in writing the same shall be carried out by any method of blasting consistent with the safety and job requirements.
- 1.4.5 The magazine for the storage of explosives shall be built to the design and specifications of the explosive department concerned and located at the approved site. No unauthorized person shall be admitted into the Magazine which when not in use shall be kept securely locked. No matches or inflammable material shall be allowed in the magazine. The Magazine shall have an effective lighting conductor; the following shall be in the lobby of magazine.
- (a) A copy of relevant rules regarding safe storage both in English and Gujarati
  - (b) A statement of update stock in the magazine.
  - (c) A Certificate showing the last date of testing of the lighting conductor.
  - (d) A notice that smoking is strictly prohibited.
- 1.4.6 In addition to these, the contractor shall also observe the following instructions and any further additional instructions may be given by the Engineer-in-charge & shall be responsible for damage to property and any accident which may occur to workman or the public on account of any operations connected with the storage, handling and use of explosives and blasting.
- 1.4.7 All the materials, tool and requirement used for blasting operations shall be of approved type and approved by the Engineer-in-charge. The fuse to be used in wet locations shall be sufficiently water resistant as to be unaffected when immersed in water for 30 minutes. The rate of burning of the fuse shall be uniform and known to determine its length.
- 1.4.8 The blasting operation shall remain in charge of competent, experienced supervisory staff and workmen who are thoroughly acquainted with the details of handing explosives and blasting operations.
- 1.4.9 The blasting shall be carried out during the time fixed and approved by the Engineer-in-charge. The hour of blasting shall be made known to the people in the vicinity.
- 1.4.10 Red danger signals shall be displayed in all directions during the blasting operation. People except those who actually light the fire shall be prohibited from entering the area.  
The flags shall be planted at safe distance from the blasting area in all directions and all persons including workmen shall be excluded from the flagged area at least 10 minutes before the firing, a warning whistle being sounded for the purpose.
- 1.4.11 The charge holes shall be drilled in suitable places to depths approved by the Engineer-in-charge blasting should be as light as possible consistent with required breakage of materials.

- 1.4.12 when blasting is done with powder, the fuse cut to the required length shall be inserted into the hole and the powder dropped in. The powder shall be gently tamped with copper rod with rounded ends. The Explosive Powder shall then be covered with tamping materials which shall be tamped light but firmly.
  - 1.4.13 As the blasting will be only controlled one with light charges, dynamite etc. shall not be used.
  - 1.4.14 At a time not more than the number of charges approved by the Engineer-in-charge will be prepared and fired. The charges shall be fired after observing the instructions given above and the explosions counted. The man in charge shall satisfy himself that all the charges have been exploded before allowing the workmen to go back to work site.
  - 1.4.15 In case of misfire the following procedure shall be observed.
    - (a) Sufficient time shall be allowed to account for the delayed blast. The man in charge shall inspect all the charges and determine the missed charges.
    - (b) In the case of blasting powder missed charge, it shall be completely flooded with water. A new hole shall be drilled about 45 cm. from the old hole and fired. This should be repeated till the old charge is blasted.
  - 1.4.16 The main in charge shall at once report to the contractor's office and the Engineer-in-charge of all cases of misfire the cause of the same and the steps taken in connection there with.
  - 1.4.17 A careful and day to day account of the explosives shall be maintained by the contractor in an approved manner in a register which shall be open for inspection by the Engineer-in-charge at all times.
  - 1.4.18 The rate shall include all stipulations mentioned under 1.1 over and above these stipulations, the rate shall also include excavation by chiseling or controlled blasting as required for the work.
  - 1.4.19 The necessary permission of the concerned district authority shall be obtained by the contractor prior to the blasting operation and all safety and necessary arrangements shall be made as per his directions before the blasting operation is actually started. The rate shall be paid per Cu.M. and will be inclusive of necessary shoring, strutting, scaffolding, bailing out water, dewatering barricading etc. complete.
- 1.5 BEDDING AND REFILLING THE PIPE TRENCHES BY THE SAND AND EXCAVATED STUFF IN 15 CM TO 20 CM THICK LAYER, CONSOLIDATING UP TO POSSIBLE EXTENT AND DISPOSAL OF SURPLUS STUFF AS DIRECTED WITHIN THE PRESCRIBED LIMITS OF CORPORATION OR AS DIRECTED BY THE ENGINEER-IN-CHARGE.



1.5.1 After the sewer pipes have been laid and jointed and the manholes and vent shafts are constructed and as soon as the joints have been inspected and passed by the Engineer-in-charge and after all concrete work thoroughly set the trenches shall be fulfilled with the materials taken there from. In refilling the trenches the utmost care shall be exercised so as not to disturb, break or damage the jointed pipes. Over and around every pipes sand will be filled as per drawing no.-2. No lumps of rock earth or other material shall be put around the pipe or be thrown into the trenches until the same has been broken to specified size and pipes covered by the fine material above referred to. The selected sand shall be carefully placed next to the permanent work and well packed and well rammed in layers of 150 mm for a depth of at least 300 mm over the top of the pipe. The remaining of the excavation shall be filled in with the best and most suitable portions of the excavated material in layers of not more than 200 mm deep or as decided by the engineer in charge. Surplus soil shall be piled on top of the filling to the extent possible for expected subsidence. All road materials to from a compact neat surface. The contractor shall maintain all refilling and surfaces until completion of entire work. The contractor shall be responsible for claims arising from accidents due to subsidence or inadequate maintenance or improper refilling work. Where excavated material is not considered suitable for refilling by the Engineer-in-charge, the Contractor will be required to cart selected surplus excavated materials in place of unsuitable materials. The contractor may also be instructed to supply suitable granular or other hard filling material for use in refilling such imported filling material shall be paid for at the rates given in the Bill of quantities or as per S.O.R. of Rajkot Municipal Corporation.

When trench is excavated under or near any existing work likely to be affected by subsidence of the material in the trench, or where any permanent work will be constructed later of the trench. The contractor shall fill in the trench with M 100 concrete or take such other precaution means to prevent damage by subsidence as. The Engineer-in-charge may direct, Whether such work is shown in the drawing or not, whether it is billed in the quantities or not. Any extra work necessitated will be paid for according to the provisions of the conditions of Contract. Unless in the opinion of the Engineer-in-charge, it is necessitated by the contractor negligence, bad workmanship faulty materials or lack of reasonable foresight.

1.5.2 Subsidence in filling:  
Should any subsidence take place in the filling up of the road on or about any part of the work whatsoever up to the completion of contract works the contractor shall make good the same at his own cost. In case of failure of the contractor to attend to the work, the Engineer-in-charge without notice to the Contractors shall make good the same in any way and with any material that the (Engineer-in-charge) may consider proper at the cost of the contractor. The Engineer-in-charge may, if he anticipates the occurrence of any subsidence employ watchman to give him timely notice

of the necessity of making good the subsidence, and the cost of such watchman shall be charged to the contractor.

**2.0 PROVIDING SAND BEDDING AND ENCASING OF PIPE INCLUDING RAMING,WATERING, CONSOLIDATING ETC COMPLETE.**

The sand to be used for bedding and encasing shall be got approved from Engineer-in-charge before using the same for providing bedding on trench bed.

The providing of sand for bedding and encasing shall be done in required thick area as per instructed by Engineer-in-charge. It shall not contain dust, clay or other such harmful materials. If directed the sand shall be washed with water and screened before being used. The sand containing big clods shall be broken into small pieces and tree's roots. The tree's roots, meets, bit stones and other objectionable materials liable to decay shall not be used in the work. Sand brought from approved source shall only be used.

**3.0 REMOVING SURPLUS MATERIALS:**

After refilling all surplus excavated stuff shall have to be carted by the contractor within RMC limit including loading, transporting, unloading, spreading etc complete as directed by the Engineer-In-Charge.

Measurement: - Removal of surplus material shall be measured in Cu.m. of surplus material removed and rate will be paid per Cu.m.

**4.0 BREAKING OF ASPHALT SURFACE:-**

In this works, breaking of Asphalt surface is to be done as directed by Engineer-in-charge. For any damage to Gutter or Manhole due to breaking of asphalt surface, contractor is responsible for repairs. No extra payment will be paid for such work.

Payment will be made per square meter of work done.

**EXCAVATION OF ASPHALT PAVEMENT**

Under this item contractor shall demolish existing asphalt or WBM pavement met with during excavation for pipeline trenches. Only area of pavement intercepted in pipe laying shall be demolished. If excess area is demolished same shall be reinstated by the contractor. Work done to the extent of requirement for laying of drain and as per specifications shall measured in Sq.mt. and paid at the tender rate.

**C GENERAL MATERIAL SPECIFICATION**

## **1.0 CONCRETE:-**

Cement Concrete (plain or reinforced):

All cement concrete to be used in the work shall conform to the requirements of I.S. 456.

### **Materials:**

#### **1.2.1 Cement:-**

All cement for use on the works except otherwise stated shall be the standard Portland cement manufactured in India and shall conform to the IS:269, IS : 8112, IS:12269 or latest versions. It shall be of the make and quality approved by the Engineer. (For this work, approved makes are Ambuja, Sidhi, L&T, Ultratech, Sanghi, Kamal, Hathi or equivalent. Mini cement plant cement shall not be allowed).

The cement shall be stored in weather proof go down or cement store specially constructed for the purpose in such a manner as to prevent deterioration due to moisture of instruction of foreign matters.

The weather proof go down shall have a soil impervious floor raised 300mm above the general ground level so that the cement stored thereon shall not come in direct contact with sub soil moisture. The passage and the general construction shall be such that it offers full protection from weather effects. Large stocks of cement shall not be kept at the works but only sufficient quantities should be kept to maintain continuity of the work.

#### **1.2.2 Storage of Cement:**

No cement that has been stored for more than 90 days shall ordinarily be allowed to be used in the works Cement stored for longer period than 90 days shall be used only after approved by the Engineer-in-charge who shall ascertain its quality before giving such permission.

The Contractors shall offer every facility to the Engineer for inspection of cement. The cement go down shall be so arranged by the contractor that each consignment could be stacked separately and in such a manner so as to allow counting of bags in each row with ease.

The cement, used in any type of concrete shall always be measured by weight and one cubic meter shall be taken as weighing 1440kgs. (Table 30 of A.C.C. hand-book)

#### **1.2.3 Aggregates:**

All the aggregates shall conform to the latest IS : 383 The aggregates shall consist of naturally occurring sand and gravel or stones crushed or uncrushed or a combination thereof. They are classified broadly under two categories viz.(i) sand of fine aggregates and (ii) coarse aggregates, depending, upon their sizes. The fine aggregates, those which pass through Is sieve No.480 and the coarse aggregate are those which are retained on the IS sieve No.480.

#### 1.2.4 Storage of aggregate:

The fine and coarse aggregate shall be stored separately and in such a manner that segregation of the various sized particles shall not occur, the stock piles shall be formed on platform of weak concrete timber of similar approved hard standing and aggregate shall be kept clean and free from foreign substances. Storage piles of aggregate shall be arranged with proper drainage and protection from rainfall in order to prevent excessive changes in moisture content taking place during concreting.

The aggregate both fine and coarse shall be hard, strong, durable, clean, free from veins and adherent coatings. The use of flaky and elongated pieces of aggregates shall be prohibited.

The aggregates shall not contain deleterious materials such as iron pyrite, coal mica, shale or similar laminate material, clay, alkali, soft fragment sea shells, organic impurities etc in such quantity as to effect the strength of durability of concrete or the reinforcement embedded in such reinforced concrete.

1.2.5 The maximum quantities of deleterious materials that may be permitted shall conform to the following limits by weights.

Deleterious Substances	Fine P.C. by weight		Coarse aggregate P.C. by weight	
	Uncrushed	Crushed	Uncrushed	Crushed
1) Coal and lignite	1.00	1.00	1.00	1.00
2) Clay lumps	1.00	1.00	1.00	1.00
3) Soft fragments	---	---	---	---
4) Materials passing through 75 micro sieve	3.00	3.00	3.00	3.00
5) shale	1.00	---	---	---

The total of various deleterious materials in any sample shall in no case exceed 5 per cent. If the aggregate supplied is unclean, it shall be washed. If it is not properly graded, it shall be screened by hand or by mechanical means and the various sizes proportioned to get the required grading.

Storing of aggregates on dusty, muddy and grassy spots shall be avoided. They shall be stored on the works in such a manner as to prevent foreign matter and protected from exposure to dust. They shall be placed in stock piles in individual units of suitable sizes and in suitable layers to prevent segregation. They shall not be allowed to run down slopes.

#### 1.2.6 Sand or fine aggregates:

All fine aggregates shall consist of clean, hard strong durable uncoated siliceous gritty materials consisting of well graded particles obtained from rock, fragments. They shall be free from clay lumps, injurious amounts of dusts, mica shells, soft or flaky particles shale, alkali, organic matter, lead or other deleterious substances.

The sand shall be taken from source approved by the Engineer. The sand or fine aggregates shall conform to the latest IS No.383

If the Engineer considers it necessary, it shall be washed and or screened before use, all the expense of the contractors.

The sand shall have fineness modules of not less than 2.5 and not more than 3.0 and the grading shall conform as far as possible to the following analysis:

I. S. Sieve No.	Percent passing Natural sand or Crushed gravel.	Crushed Stone.
180	95 - 100	90 - 100
40	70 - 95	60 - 90
120	45 - 85	40 - 80
60	25 - 60	20 - 50
30	5 - 30	5 - 30
15	0 - 10	0 - 15

The specific gravity of sand shall not be less than 1.6. In no case shall fine aggregate be accepted containing more than 2 per cent by dry weight, not more than 2 ½ % by dry volume, not more than 5 percent by wet volume of clay, loam or silt, any sample of fine aggregate shows more than 5 per cent of clay, loam or silt, in one hour's settlement after shaking in an excess of water the lot represented by the sample shall be rejected.

The following two field tests are recommended for ascertaining the percentage of clay lumps and impervious organic material and the contractor shall carry out the same if the Engineer-in-charge deems necessary.

**(1) Test for determining silt in sand :**

Fill a calibrated tumbler with same to half its volume and add water there to until the fill a calibrated tumbler is three quarter full shake up the mixture vigorously and allow it to settle for about an hour. The volume of silt visible on top of the sand shall be measured. If the volume of the its standing over the sand exceeds 5 per cent of the total volume of sand same shall be rejected.

**(2) Colorimetric test for organic impurities :**

The sample of sand shall be mixed with equal volume of 3p.c. solution (about one ounce in a quarter of water) of caustic soda / sodium hydroxide taken in a plain glass an the mixture shall be allowed to stand for 24 hours. The liquid standing above the sand shall not be darker than lights straw (pale yellow) colour. If the colour is marked yellow of brown, then test would indicate presence of organic materials in excessive amount.

In case suitable sand is not available in adequate quantities within a reasonable and economical limit, the contractors may be allowed the use of crushed or pulverized

stone of gravel either along or mixed with natural sand in parts. The stone or gravel shall be clean, sharp and free from dust etc. and shall conform to the latest I.S. 383. In this case, approval of Engineer-In-Charge shall be obtained.

The percentage of crushed stone to be mixed with sand shall be such as to obtain the fineness modulus of the blended sand within the limits specified above, and or approved by the Engineer after Laboratory tests.

**1.2.7 Coarse Aggregates:**

All coarse aggregate used in concrete works shall consist of crushed rock gravel or other approved inert materials.

Broken or crushed rock from sound blue basalt or black trap zeolite shall be used in concrete as coarse aggregate. The particles of aggregate shall be clean hard, tough, and durable free from deleterious substance and shall contain no soft flat or elongated pieces. The coarse aggregate shall have specific gravity not less than 2.6 and the water absorption measured after being immersed for 24 hours in water shall not be more than 6 per cent by weight. The maximum percentage of deleterious materials in the coarse aggregate shall not exceed 5 per cent by weight in the aggregate when tested in conformity with IS No. 363

The nominal size of the coarse aggregate for reinforced concrete work shall be 10 to 20 mm. larger coarse aggregate up to 40mm size may be used if approved by the Engineer in plain concrete work. The maximum size of coarse aggregate shall be large as possible within the limits specified but in no case shall be greater than one quarter of the minimum thickness of the member, provided that the concrete can be placed in the form work without difficulty so as to surrounded to reinforcement thoroughly and to fill the corners of the form-work. The minimum size of coarse aggregate shall be as mentioned earlier such as to retain most of the material (90 per cent, 95 per cent maximum) on IS sieve No. 480.

Aggregating shall be screened and, if necessary blended to give the required grading when tested in the Laboratory at Contractor’s cost by means of standard mesh sieves, the grading shall fall within the following limits:

Sieve size.	Percentage retain by weight	
	Plain C.C.	R.C.C.
40 mm	-----	-----
25 mm	10 to 15	-----
20 mm	35 to 40	15 - 0
10 mm	37 to 80	100 - 80
No.480	98 to 100	100 - 95

The percentage given above are for guidance and the Engineer-in-charge reserves the right to modify the same to any other lower of higher value if considered necessary by him, according to the requirements of the work.

In the event of undesirable segregation occurring in coarse aggregating in two or more suitable fractions as directed.

The grading so specified shall be such as to give a dense, water tight concrete of specified proportion and strength and required consistency. The Engineer shall have the right and authority to carry out routine control tests and analyses of the broken rock at any stage of the work processing and / or concreting operations and the contractors shall give necessary facilities in respect of such testing. The sampling and testing shall be carried out, as per standard IS practice entirely at the cost of the contractors.

**1.2.8 Water:**

The water used for the preparation of concrete, for washing sand etc. and for curing shall be clean and free from objectionable quantities of silt, organic materials, acid, alkali, salts, oil and other deleterious impurities and it shall be obtained from the source approved by the engineer. Potable water shall be obtained from the source approved by the Engineer. Potable water shall generally be found fit for preparation of concrete. The quantity of water to be added for making concrete shall be properly measured and controlled.

**1.3 Water Cement Ratio:**

Suitable water cement ratio for the different mixes and use shall be determined in consultation with the Engineer and shall generally not be exceeding 0.5 (i.e. 50 percent by weight) The exact value being fixed after taking into account all relevant factors such as strength required, weather condition, water absorbed by material, workability and slump required consistent with the work requirements, methods of compaction etc.

**1.4 Concrete:**

All cement concrete whether used in R.C.C. work or plain concrete work shall be designated in grades by the strength at the age of 28 days) M 100, M 150, M 200 & M 250 where M refers to the mix and the number 100, 150,200 and 250 represent the specified 28 days works cube compressive strength of the mix under reference, expressed in Kg/sq cm.

The proportions of cement, aggregate water for ordinary cement concrete shall be as designated below and shall generally consist of quantities as given in the table below per bag of cement.

TABLE No.1:- Concrete mix proportion for ordinary concrete.

<b>Grades of Concrete</b>	<b>Total quantity of dry aggregates (Fine and coarse) by volume per 50kg. (Max. in liters).</b>	<b>Quantity of water per 50 kg. Of cement (Max. in liters)</b>
M-100	300	34
M-150	220	32
M-200	160	30
M-250	100	27



The proportion of fine aggregate to coarse for the various mixes listed above shall generally be 1:2 by volume but variation from 1:1 ½ to 1:3 depending upon the grading of the aggregates may be permitted by the Engineer. The quantity of fine and coarse aggregates, however, shall not in any case exceed the quantity given in the above table No.1.

The cement concrete shall be tested for compressive strength at the age of 28 days on 15 cm. Cubes in accordance with the latest IS : 516 and the strengths developed for all type of concrete shall not be less than those given in Table-2.

**TABLE –No.2:- Strength requirement of concrete.**

Grades of cubes Concrete	Minimum Compressive Strength of at 28 days in kg / cm <sup>2</sup>	
	Preliminary Test	Works Test
M-100	135	100
M-150	200	150
M-200	260	200
M-250	320	250

For quick results the contractors shall carry out compression tests on 15 cm cubes cast in accordance with relevant IS 516 at 7 days in addition to the normal 28 days compressive strength. The 7 day strength of the various concrete mixes shall not be less than the values given in the Table NO.3 below. However the 28 days compressive strength alone shall be the criterion for acceptance or rejection of the concrete unless the Engineer is satisfied of the relation between the 7 days compressive strength and the 28 days compressive strength, established by carrying out a number of tests, in which case, he may relax the test frequency of 28 days compressive strength specified hereinafter.

**TABLE –No.3:- Optional test requirement of Concrete**

Grades of Concrete	Minimum Compressive strength on 15cm. Cube at 7 days in Kg / cm <sup>2</sup>
M-100	70
M-150	100
M-200	135
M-250	170

All test strength specified above are exclusively for 15 cm size cubes and they shall be adequately modified to suit the requirement of 15cm dia and 30 cm long cylinder moulds wherever used in the case of cylinder the strength values obtained should be multiplied by 1.25 to obtain the equivalent cube strength.

### **1.5 Control and Testing of concrete.**

The following tests shall be carried out at site whenever required by the Engineer in accordance with IS 516

1. Works tests – 7 days and 28 days compressive strength
2. Consistency test.
3. Moisture contents in aggregates.
4. Unit Weight of concrete.

#### **(1) Works test:**

During concreting operations samples of concrete as placed in the work shall be taken every day and set of six cubes or cylinder shall be made there from for being tested for their compressive strength. The consistency (slump) test shall also made and the slump recorded.

All concrete cubes or cylinders shall be tested for compressive strength as specified under IS 456 and 516 at the approved material testing Laboratory generally as per specification under the latest IS 456 and IS 516. The above, specification cover concrete mixes of grade M-100 and above. Ordinarily it is not necessary to test the compressive strength of mix of grade M 100 as it is generally used for non structural purposes. However, where this mix (M 100) is used extensively on works ( i.e. more than 75 cu.m. of concrete is to be placed one time in any work) it shall be tested in the same manner as other grades of concrete used for structural purposes. The minimum strength of various grades of concrete both at the age of 7 days and 28 days are given in Table 2 and 3.

In the case of concrete of mix M 150 and above, the above, the Engineer-in-charge may not insist on the testing of concrete if the quantity of concrete to be laid on any particular day is less than 10 cum. if however the quantity exceeds 10 cum, test specimen must invariably, be taken and sent to the Laboratory for testing.

Specimen shall be made for every sample and three of them tested for 7 days strength as mentioned earlier the 28 day strength of concrete shall alone form the criterion for acceptance on rejection of the concrete. With this point in view, the concrete sample shall be tested both for 7 days strength as well as 28 days strength at the start of the work and this shall be continued until the Engineer is satisfied that proper relation between the 7 days compressive strength is established, in which case he may decide to relax frequency of testing the concrete cubes for the 28 days compressive strength.

If the average strength of the specimen tested at the time of 28 days is not less than the strength specified in Table – 2, the test shall be considered satisfactory subject to the condition that only one out of 3 consecutive tests may give a value less than specified strength but not less then 90 per cent of the specified strength. If the tests are unsatisfactory, the contractors shall take immediate steps to carry out remedial measures as may be directed by

the Engineer in respect of such works, entirely at the risk and cost of the contractor. Failure of a sample in test may entail partial or whole demolition of such work, heavy penalties, black listing of the contractors concerned and or such other similar steps. The results of the tests conducted at the approved material testing Laboratory shall be taken as final and binding on the contractors. In case of any dispute, the decision of the municipal commissioner shall be binding to the contractors.

A record showing the location of test specimen and daily progress of the work done shall be maintained by the Engineer-in-charge and shall be countersigned by the contractors or their representative. In case record maintained by the Engineer-in-charge is not signed by the contractor or their representative the record kept by the Engineer shall be considered as correct and binding on the contractor. In the case of any disputes, the decision of the Rajkot Municipal Corporation shall binding to the contractor. The contractor shall deliver the specimen for testing at the approved Laboratory at the own cost in their moulds. The contractors shall pay usual testing fees for the tests carried out in the Laboratory. These fees may vary as sanctioned by the competent authority.

**(2) Consistency slump test:**

The workability of concrete shall be checked at frequent intervals. The slump test shall be carried out in accordance with the standard methods given under I.S. specifications mentioned above. The slump shall be as small as practicable consistent with the efficient working and compacting of concrete. The slump shall not exceed 64 mm but the Engineer may under exceptional conditions, permit higher slump up to a limit of 150 mm.

The standard consistency test shall be applied very time at each mixer when test cubes are taken for the works of compressive strength test.

**(3) Moisture Contents in the aggregates:**

The moisture contents in the aggregates shall be determined in the field in accordance with the latest I.S. 2286 (Part – III) methods of test for aggregate for concrete.

**(4) Unit weight of concrete.**

It shall be determined by placing representative samples of concrete in a unit measures capacity and vibrating at extremely by shall vibratory or hand compacting to represent actual placing by conditions. The top of the concrete shall then be made truly flush with the top of the mould and the weight of concrete per cum. determined after curing and draying. The weight of dry concrete shall be between 2400-2625 kg / cum.

A complete record regarding various tests carried out at site and in the Laboratory shall be kept by the Engineer. The contractors shall provide at their own cost facilities for labour, material, and transport etc, required for the proper execution of the above tests. Any concrete, which does not comply with the above requirements, shall be liable for rejection by the Engineer.

### **1.6 Transporting Concrete:**

The concrete shall be transported in clean metal buckets, burrows, dumpers or trucks and the written approval of the Engineer must be obtained before any method involving the use of concrete pumps, placers, pipeline, chutes, or spouts may be used.

### **1.7 Placing Concrete:**

- (a) Unless otherwise approved, concrete shall be placed in a single operation to the full thickness of slabs, beams and similar members and shall be placed in horizontal layers not exceeding 600mm deep or 230 mm when manually compacted in walls, columns and similar members.
- (b) The contractor shall so organize his work that once concreting of a particular section of the work has started the operation shall be continued and each operation shall be completed prior to a stoppage for meal, etc. the contractor's attention is drawn to the requirements regarding the formation of construction joints.
- (c) Where concrete is to be placed directly against the surface of excavations all soft material and debris shall be removed from the contact surfaces which shall be made dry, clean and firm. If the contact surfaces have become softened due to delay in placing the concrete or any other cause, they shall again be excavated to firm material and trimmed as directed immediately before the concrete is placed. The contractor in such event shall receive no payment for the additional excavation and trimming or for any additional concrete required to replace the material so removed.
- (d) Concrete shall be well compacted between and around the steel reinforcement by approved means so as to ensure compact concrete with smooth surfaces, without air holes, flaws or voids. Great care shall be taken to prevent the displacement of the steel and form work before, during or after concreting. Whenever possible all reinforcing members shall be fixed in position before the concreting has been started and securely wired together to prevent movement. Reinforcing members which must be inserted during the concreting shall be placed with the greatest care to ensure their perfect location in the finished work.
- (e) Care shall be taken to prevent men engaged in placing concrete from introducing clay or other foreign matter into the concrete of form work by means of their body in any other way.

### **1.8 Compacting:**

Concrete shall be properly compacted by use of vibrators or by rodding and spreading as directed by the Engineer. Tamping as above shall be continued until all the entrained air is removed and the concrete has been compacted and completely fills the form. The sides of the form work shall be gently tapped by spades during concreting.

**1.9 Curing of Concrete:**

All concrete work shall be protected from directed rays of the sun. The exposed surface shall be kept wet for a minimum period of 10 days or for such longer periods as may be directed by the Engineer-In-Charge, Concrete laid shall not be disturbed and shall be suitably protected from any injury until completely set, particular care shall be taken at all corners and edges of the member. All horizontal concrete shall be constantly wet by ponding or in any clear manner approved by the Engineer till the time of next pouring regardless of time. Concrete surface shall be cured either by sprinkling or by spraying water or by adopting any other method to keep the area moist. Flat or fine vertical surfaces may be covered with dump gunny bags and watered frequently water used for cut for shall be clean and free from any excessive silt, colouring matter or other impurities which may stain the finished work. In order to ensure adequate quantities of water for curing, the contractors shall make necessary arrangements such as providing sufficient lengths of temporary pipe lines of suitable size, storage of water in tanks and / or sufficient nos. of Bhisties.

**1.10 Concreting through water:**

Concrete shall not be deposited under water without the prior consent in writing of the Engineer-In-Charge. In the event of permission being given the amount of cement in every batch shall be increased by twenty five per cent entirely at the expense of the contractor and he shall take every reasonable precaution to ensure that cement or fine aggregate is not washed out of any concrete so deposited by any flow of water.

**1.11 Finish of Concrete:**

On removal of the shuttering and after the approval of the Engineer-In-Charge, honeycombed surfaces shall be made good immediately by the method approved by the Engineer. Superficial water and air holes shall be filled in. Unless instructed to the contractor the faces of exposed concrete placed against shuttering shall be rubbed down with a carborandum stone immediately upon removal of the shuttering to remove fins or other irregularities. The face or concrete for which shuttering is not provided other than a slab, shall be smoothed with a wooden float to give finish equal to that of the rubbed down face where shuttering is provided. No cement wash master or paint may be applied to any concrete surface without the express instruction or permission of the Engineer.

**1.12 Sulphate resisting and rapid hardening cement concrete:**

Where sulphate resisting or rapid hardening Portland cement is specified or ordered by the Engineer in writing, extra cost will be paid over the price for a Portland cement concrete of similar grade.

**1.13 Permission for starting the concrete work:**

The surface where concrete or rock or form etc. on which concrete is to be placed, shall be got inspected and approved by the Engineer who shall then issue the permission for starting the work. Any concrete work done without such a permission shall be cut out and removed at the cost of contractors.

No concreting shall be started unless the surface of the foundation is first inspected and approved by the Engineer as stated above. If concreting is to be done on concrete previously laid, the surface of the old concrete shall be cleaned with wire brushed and all laitance removed to expose the original surface of metal and sand particles, etc. it shall then be covered with a 7 mm thick layer of cement mortar (1:2) before laying the fresh concrete.

**1.14 Defective concrete:**

The defective concrete shall be cut out and the work reconstructed with fresh concrete required quality in the presence of the Engineer. The concrete thus cut out shall not be reused under any circumstances. Should any concrete become permanently damaged due to creaking or broken or damage from whatever cause or should any concrete be found defective in quality due to honey combing or bad workmanship, it shall be removed forthwith and replaced by concrete of required quality at the cost of the contractors of the satisfaction of the Engineer.

**2.0 FORM WORK:**

**2.1 Material:**

All form work for concrete works shall be made either of planned and matched timber or MS plates. The timber for the form work shall be hard wood dry and well seasoned. It shall not be so dry as to absorb water from concrete nor shall it be so green as to shrink after erection. When steel plates are used for forms, the plates shall be free from wrinkles, dents, lumps or other imperfections. The timber or steel plates shall have sufficient thickness to withstand the construction loads and the pressure exerted by the wet concrete as well as vibration during placing of concrete.

Normally the thickness shall not be less than 38mm for timber and 18 gauges for M.S. plates. However, in case where the depth of concrete to be poured in the form work is small the thickness of timber planks may be reduced in consultation with the Engineer.

**2.2 Removal of form work:**

In no circumstances shall forms be struck off until the concrete reaches adequate strength as required or without obtaining permission of the Engineer. All form works shall be removed without such shock or vibration as would damage the concrete. Before the soffit and the struts are removed, the concrete surface shall be exposed where necessary in order to ascertain it has hardened sufficiently.

**2.3 Surface treatment and finish:**

When the form work is struck all the faces of concrete shall be smooth and sound, free from voids and air holes. Any roughness or irregularity on the exposed surfaces shall be immediately filled up while the concrete is still green with cement wash and or 1:1 ½ cement mortar properly trowel led and finished. Such patching of the concrete face shall be carried out with the permission of the Engineer. If the concrete is found honeycombed the honey

combed portion and whatever surrounding the Engineer shall be dismantled and fresh concrete of proper quality shall be reinstated at Contractor's cost.

### **3.0 REINFORCEMENT:**

The total reinforcement to be used on the work shall conform to the specification of the latest IS: 1139, IS: 1786, IS: 226, IS: 432 as the case may be in respect of physical properties, chemical requirements tolerance limits etc.

All steel reinforcement and wire, nails etc, required for the works shall be supplied by the contractors who shall make their own arrangements for the procurement of reinforcement bars from the open market.

### **4.0 BRICK MASONRY WORKS:**

#### **4.1 Materials:**

(1) Bricks: brick to be sound, well burnt, free from cracks, to ring when struck and not to crack or break when soaked in water or thrown on the ground on their flat face from a height of 60 cm, or when soaked in water in a saturated condition, regular in shape and uniform in size. They shall be of the best description obtainable in market and of the best quality and colour. They shall not absorb water more than 20 percent dry weight, when immersed in water for 24 hours. They shall have a crushing strength of not less than 35 kg / sq.cm.

(2) Sand: sand shall conform to the specifications detailed already for sand.

#### **4.2 Cement Mortar:**

All cement mortar to be used on this work shall be in proportion as specified and directed by the Engineer. The ingredients shall be in proportion as specified and directed by the Engineer. The ingredients shall be measured dry, by means of properly made gauge boxes on a covered platform and shall be thoroughly mixed dry before adding water to get the required consistency. Only such quantity of mortar shall be prepared at a time as can be used up immediately. Mortar after it has begun to set shall not be allowed to be raked up again, but shall be rejected and the contractor shall remove the same from the work site immediately.

#### **4.3 Workmanship:**

The work of brick shall be carried out in a workman like manner and in a perfect plumb, line and level as required. Brick shall be thoroughly cleaned well watered or soaked in water for at least 12 hours before being used on the work. No broken bricks shall be preserved throughout the work both laterally and transversely. All bed joints shall be horizontal in vertical walls, radial in arches and at right angle for the slopes in battered wells. In walling, the courses shall be kept perfectly horizontal and rise in plumb. The vertical joints shall break joints with the courses below and above. Use of bats shall be avoided as far as possible. The joints shall be close and regular and shall not exceed 12mm in thickness. The bond shall be English bond unless otherwise permitted by the Engineer. The contractors shall provide at their own expense all moulds, templates, centers, scaffolding etc. as may

be required for the proper execution of the work and nothing extra will be paid for the same including dewatering where necessary.

The mortar used should be stiff. The brick work shall be kept wet while the work is in progress for at least seven days after completion, to the entire satisfaction of the Engineer. On Sundays and holidays when the work is not in progress, the masonry shall be watered continuously by engaging Bhisties. Watering shall be done carefully so as not to wash out the mortar of the joints. The Engineer shall be at liberty to engage Labours at contractor's cost to water/curing. If contractors fail to do so, the work shall be pulled down and rebuilt at the risk and cost of the contractors.

The whole of the masonry work shall be carried up at one uniform level throughout but where breaks are unavoidable, the joint shall be made in good long steps raked so as to prevent cracks arising due to separation of old and new work. All junctions of walls shall be formed at the time the walls are being built and cross wells shall be carefully bonded into the main walls.

When the work is to be added to existing structure, the old work must be prepared to receive new work by roughening and grouting with a layer of rich mortar and both must be carefully bonded together.

During rains, the works to be carefully covered without extra charge so as to avoid fresh mortar being washed away.

#### **4.4 Cement plaster:**

Cement plaster shall be provided to brick masonry or rubble masonry wherever directed by the Engineer.

- (a) Materials:
  - (1) Cement: cement shall conform to the specifications detailed earlier.
  - (2) Sand: sand shall conform to the specifications detailed earlier.
- (b) Cement Mortar: All cement mortar to be used on this work shall be in proportion as specified in the drawings and as directed. The ingredients shall be measured dry, by volume of properly made gauge boxes, on a covered platform and shall be thoroughly mixed dry before adding water to get the required consistency. Only such quantity of mortar shall be prepared at a time as can be used up immediately. Mortar after it has begun to set shall not be allowed to raked up again, but shall be removed from the work immediately. Cement mortar shall be used within 30 minutes after it leaves the mixing Corporation or mill.
- (c) Workmanship:- All bricks shall be thoroughly wetted, joints and raked and well washed.

#### **4.5 Pointing:**

The whole of the exposed faces of the brick work, out stone work and stone paving when described as to be pointed are to have the joint raked out to a depth of 13 mm and pointed with cement and sand (unless otherwise described) in the proportion of one of cement to one of fine sand flush with the face of the work and out straight, parallel and of uniform width.



The exposed faces of the rubble-work are to be similarly pointed (when described as to be pointed) but the joints shall be raked out to a depth of 20mm and shall be raked out to a depth of 20mm and shall be irregular in direction. The above description of pointing shall apply generally so all classes except only as the pointing materials which may in certain cases or otherwise described in this specification.

**4.6 Protection of work from sun:**

All cement work pointing, plastering and concreting shall be protected from the sun and the surface kept moisture until in the opinion of the Engineer-in-charge it is thoroughly set.

**5.0 DEFINITION OF INCOMPLETE WORK:-**

A line or trench of pipeline (including the excavation thereof and all other accessories thereto) will be considered incomplete unless entirely laid, jointed and fully tested, encased wherever required the trench filled and consolidated and all other detail.

The contractor shall have no claim for incomplete work and no incomplete work will be measured up for payment to the contractors.

**5.1 Rates quoted in Bill of Quantities to cover everything necessary for complete Execution of work:**

The rates quoted will be held to cover everything necessary of the due and complete execution of the work according to the drawings and the several conditions and the stipulations of the contract, including specification, or the evident intent and meaning of all or either of them or according to customary usage and for the periodical and final inspection and test and proof of the work in every respect and for measuring, numbering or weighing the same including setting out and laying or fixing in position and the provision of all materials, power, tool rammers, beaters, labour, tackle platforms with impervious lapped joints for scaffolding ranging rods, straight edges, centering and boxes, wedges, moulds, templates, post straight rails, boning-staves, measuring rods, page boards, shores, barriers, fencing, lighting, pumping apparatus, temporary arrangements of passage of traffic, access to premises and continuance of drainage, water supply and lighting (if interrupted by the work) lard temporary sheds and buildings nahanis roofed in or otherwise haulage, painting, varnishing, polishing, establishments for efficient supervision and watching arrangements for the efficient protection of life and property and all requisite plant, implements and appliances every kind, except only such matter and things as it may be distinctly stated here in are to be supplied by the contractors. A rate for anyone description of work is to be held to include such items of other classes of and for these on separate specific charge will be admitted. The contractors shall keep every portion of the work clear of accumulation from time to time and shall leave every portion of the work clean, clear, perfect and at the conclusion of whole, providing at their own cost all such material implement appliances and labour as the Engineer may require to prove if it is to be so.

**6.0 CONTRACTOR TO OBSERVE ALL CONDITIONS:**

The contractors are particularly directed to observe from the Articles of Agreement and the specifications, what is to be included in their rates for the several portions of the work and also under what conditions payments are to be made.

**Signature of Contractor**

**A.E.  
R.M.C.**

**D.E.E.  
R.M.C.**

**C.E.(Drainage Project)  
R.M.C.**

## TECHNICAL SPECIFICATIONS

### **ITEM NO.1 :**

**Excavation for pipeline trenches with shoring, strutting and bailing out or pumping out water from trenches wherever necessary of required length, width and depth including excavation for socket and all safety measures and provisions such as site rails, fencing, lighting, watching including refilling the trenches and clearing the site etc as stipulated in the tender specification complete before starting work and after completion of work for the lift and strata as specified below including spreading the excavated stuff as directed with lead up to 90 Mtr.**

#### **1.1 0 to 1.5 mt depth.**

**1.1.1 ---do--- in all sorts of soil,soft murrum, hard murrum, boulders and macadam road**

**1.1.2 ---do--- In soft rock, Hard rock**

#### **1.2 1.51 to 3.00 mt depth.**

**1.2.1 ---do--- In soft rock ,Hard rock**

Excavation for pipe line trenches with shoring, strutting, bailing or pumping out watered from trenches whenever necessary of required length, width and depth including extra excavations for sockets and all safety measures and provisions such as site rails fencing, lighting, watching including refilling the trenches in layers including ramming and removing the excavated staff with 90m lead and clearing the site etc. as stipulated in the tender specification complete before starting work and after completion of work for all lifts and soil strata as specified.

- a) In all sorts of soil soft murmur, hard murrum, boulders, macadam and asphalt roads including breaking of lime and cement masonry and lime concrete.
- b) In soft rock, cement concrete, hard rock, and cutting of cement concrete and R.C.C. of any proportion, etc. with controlled blasting and or chiseling whichever is necessary and feasible as required by site conditions.
- c) In hard rock,

### **1.1 Clearing of sites :**

**1.1.1** The site at which the pipe line is to laid and the area required for setting out and other operations shall be cleared of all obstructions, loose stones, and rubbish of all kinds; stumps of trees, brushwood as well as all trees shall be removed as directed. The roots shall be entirely grubbed up.

**1.1.2** The products of the clearings to be stacked in such a place and in such a manner, As directed by the Engineer-in-charge.

**1.1.3** In site clearing, all trees not specially marked for preservation, bamboos jungle wood and brush wood shall be cut down and their roots grubbed up. All wood and materials from the clearing shall be the property of corporation and shall be arranged as directed by the Engineer-in-charge or his authorized agent. The materials found to be useful by

the Engineer-in-charge shall be conveyed and properly stacked as directed within the specified limit. Unless materials will be burnt or otherwise disposed off as directed.

1.1.4 All holes or hollows, whether originally existing or produced by digging up roots, shall be carefully filled up with earth, well rammed and leveled off, as may be directed shall not be paid for. The contractor shall get approval of design of shoring. The shoring shall be of sufficient strength to resist side pressure and ensure safety from slips and blows and to prevent damage to work and property and injury to persons. It shall be removed as directed after all the items of work for which it is required are completed.

1.1.5 Protection :

1.1.5.1 The foundation pits and trenches, etc shall be strongly fenced and red light Signals shall be kept at night in charge of watch-man to prevent accidents. Sufficient care and protective measure shall be taken to see that the excavation shall not affect or damage the adjoining structures. 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, the contractor at his own cost shall provide caution boards etc.

1.6 Classification of Strata :

1.6.1 The decision regarding classification of strata shall rest with the Engineer-in- Charge and his decision shall be final and binding to the contractor.

1.6.2 All the materials encountered in the excavation shall be classified as described in 2.0 of general specifications.

1.7 Dewatering :

1.7.1 Unless specially provided for as a separate item in the contract, the rate of excavation would include bailing or pumping out all water met with in excavation or which may accumulate in the excavation during the progress of the work either, by percolation, seepage, springs, rain or any other cause and diverting surface flow if any, by earthen bunds or by other means. The bunds shall be removed as soon as the work is completed.

1.7.2 Unless specially provided as a separate item of contract, pumping of water from foundation pit, trenches etc shall be carried out by the contractor at his won cost and he shall arrange for required numbers of dewatering pumping sets for the above work. He shall take precaution to prevent any damage to the foundation trenches, concrete or masonry or any adjacent structure. The excavation shall be kept free from water by the contractor (1) during inspection and measurement (2) When concrete and/or masonry work are in progress and till the construction work reaches above the natural water level and (3) till the Engineer – in – charge considers that the mortar is sufficiently set. The rate shall be paid for cum. of excavation.

1.8 Excavation in Rock :

1.8.1 Blasting with Gun Power:

Blasting operations shall be carried out with the prior permission and in the presence of the Engineer – in – charge or his authorized representative and during fixed time hours of the day. All safety precautions such as providing safety nylon netting etc. shall be carried out as per instructions of the Engineer – in – charge.

Red danger flags shall be prominently displayed and all the people, except those who have actually to light the fuse must be away to a safe distance, not less than 200 meters.

All fuses shall be cut to the length required before being inserted into the holes.

The number of charges to be fired and the actual number of shots heard shall be compared and the person responsible must satisfy himself by examination that all the charges have exploded before work people are permitted to approach the scene. The withdrawal of a charge which has not exploded shall under no circumstances be permitted, but the tamping and charge shall be flooded with water and the hole marked in a distinguishing manner. The next hole to be fired shall be at a distance of about 500mm from the old hole and fired in the usual way.

The contractor or any of his competent authorized person shall be in charge of the blasting operations and shall be held responsible for strictly observing the safety rules, particularly applicable to blasting operations, in addition to other safety rules.

In blasting rocks with dynamite, the following general principles shall be observed.

In general, the following diameter of drills shall be used for different depth of boreholes:

From 1 – 2 metres	25 mm diameter
From 2 – 3 metres	37 – 50 mm diameter
From 3 – 4.75 metres	50 – 60 mm diameter

The borehole should generally be not more than 1.3m deep and the distance apart should be from one and half to twice the depth.

Cracks and fissures in the rock to be blasted shall be carefully studied to ascertain the best portion for the boreholes. Charge shall always be placed in a round piece of rock, if possible not nearer than 30mm from the crack.

### **Rules for blasting with dynamite and other high explosives**

The person - in- charge must show that he is thoroughly acquainted with all blasting operations and that he understands the rules herewith laid down. He will be held responsible for any accident that may occur.

Boreholes must be of such sizes that the cartridge can easily pass down them. The position of all holes to be drilled must be marked out with white paint and the person – in – charge must take particular note of these positions.

The drilling operation being finished, the person – in – charge must make a second inspection and satisfy himself that the boreholes marked out by him have been drilled. The person – in – charge must prepare all charges necessary for boreholes.

Only ten holes may be loaded and fixed at one time and the charges should be fixed simultaneously as far as practicable. Boreholes must be thoroughly cleared before a cartridge is inserted.

The loading is to be done by the person – in – charge himself and the position of the charge holes carefully noted by him. Wooden tamping rods only to be used in charging holes (not pointed but cylindrical throughout, one cartridge at a time must be inserted and gently pressed with the tamping rod.

Immediately before firing blast, due warning must be given and the person – in – charge must see that all the labourers have retired to safety.

The safety fuse of the charged holes are to be lighted in the presence of the person – in – charge, who must see that the fuses of the holes charged have properly ignited. After the blast, the person – in – charge must carefully inspect the work and satisfy himself that all the charges have exploded.

#### 1.8.2 Misfires:

Misfires are a source of great danger, if it is suspected that part of the blast failed to fire or is delayed, allow sufficient time to elapse before entering the danger zone. When fuse and blasting caps are used, a safe time, at least of an hour should be allowed.

None of the drillers are to work near this hole until the two following separations have been done by the person – in – charge.

(a) The person – in – charge should very carefully extract the tamping with a wooden scrapper and withdraw the fuse with the primer and detonator attached, after which a fresh primer and detonator with fuse should be placed in this hole and fired or.

The hole may be cleared of 300mm of tamping and the direction then ascertained by placing a stick in the hole. Another hole may then be drilled 150mm away and parallel to it, the hole to be then charged and fired. The person – in – charge shall also at once report to the Engineer – in charge all cases of misfire, that cause of the same and what steps have been taken in connection herewith.

##### 1.8.2.1 Precautions against misfire:

The safety fuse should be cut in an oblique direction with a knife.

All saw dust must be cleared from the inside of the detonator this can be done by blowing down the detonator and tapping the open end. No instrument shall be inserted into the detonator for this purpose.

After inserting the fuse in the detonator, it shall be fixed by means of nippers.

If there is water present, or if the boreholes be damp, the junction of the fuse and detonator must be made water tight by means of grease, white or lead.

The detonator should be inserted into the cartridge, so that about one third of the copper tube is left exposed outside the explosives. The safety fuse outside the detonator, should be necessarily tied in position in the cartridge. Water proof fuse only to be used in the damp boreholes, or when water is present in the bore-holes.

If a misfire has been found to be due to defective fuse detonator or dynamite, the whole quantity or box from which the defective article was used shall be rejected.

Storage of materials for blasting shall be as per regulations/stipulations of the concerned authorities.

It shall be the contractor's responsibilities to arrange proper storage of explosives and obtain required permission from concerned authorities. No separate payment will be made for the above.

The refilling will generally refer to refilling of trenches up to ground level with excavated stuff.

Filling materials shall be from excavated stuff.

Excavated stuff to be used shall be cleared of all rubbish, large size stones, brick bats etc. Big clods shall be broken down to a size of 50 mm or less.

#### 1.9 Refilling :

After the pipes have been laid and jointed and the chambers are constructed and as soon as the joints have been inspected and passed by the Engineer-in-charge, the pipe line has been tested for water tightness, and after all concrete work thoroughly set the trenches shall be fulfilled with the materials taken there from. In refilling the trenches, the utmost care shall be exercised so as not to disturb, break or damage the jointed pipes. over and around every pipe, the finest selected material shall be put. No lumps of rock earth or other material around the pipe or be thrown into the trenches until the same has been broken to specified size and pipes covered by the fine material above referred to. The selected fine material shall be carefully placed next to the permanent work and well packed and well rammed in layers of 150mm for a depth of at least 300mm over the top of the pipe. The remaining of the excavation shall be filled in with the best and most suitable portions of the excavated material in layers of not more than 600 mm deep, each layer shall be thoroughly rammed before the next layer is placed. One man shall be employed for hand ramming for every 30m of refilling up to the level of 300mm over the top of the pipe. Surplus soil shall be piled on top of the filling to the extent possible for expected subsidence. All road materials to from a compact neat surface. The surface of the filled in trench shall be hand rolled by a hand roller weighing not less the ½ tones as directed by the Engineer-in-charge.

The contractor shall maintain all refilling and surfaces until reinstated. The contractor shall responsible for claims arising from accidents due to subsidence or inadequate maintenance or improperly refilling work.

The contractor shall be responsible for any settlement during the defects liability period including monsoon and the same shall be refilled with stuff brought from outside, if necessary.

Where excavated material is not considered suitable for refilling by the Engineer-in-charge, the Contractor will be required to cart selected surplus excavated materials in place of unsuitable materials. The contractor may also be instructed to supply suitable granular or other hard filling material for use in refilling. Such imported filling material shall be paid for at the rates given in the Bill of quantities.

No payment shall be made for carting away surplus material arising either because of rejection of excavated material for refilling or because of surplus material.

#### Measurement:

The contractor's shall be for the **unit of one cubic meter** of the quantity excavated limited to the dimensions and provisions specified in the specifications or as directed by the Engineer-in-charge. The extra excavation to provide for jointing pipes, shoring etc. will not be paid for. The rates shall include cleaning and clearing the trench site by cutting grass, shrubs and trees of girth (circumference) not

exceeding 10 feet and removing their obstructing roots in the trench cleaning the site, setting out works as per sanctioned plans, provide shoring, excavation and removal of all material from trenches, backfilling the trenches up to natural ground level and all other operations described above. The wood obtained during site clearance shall be the property of the department concerned.

The excavated quantity divided into two sub groups

#### **ITEM NO. 2**

**Providing, Supplying, Lowering, Laying, Jointing & Pressure Testing Ductile Iron pipe (K9) with internal cement mortar lining and external zinc coating with finishing layer of bitumen; manufactured, tested and duly marked in strict accordance with conforming to IS:8329/2000 (as per latest amendment); suitable for push-on jointing, along with one number rubber gasket for each length of pipe (EPDM Gasket as per IS:5382/1985), including all taxes, insurance, transportation, freight charges, inspection charges, loading, unloading to site of work inclusive of Lowering, laying and jointing in Position of DI pipe K-9 with CI/DI/MS special in proper position, grade and alignment as directed by Engineer including transportation to site of work, labour, giving hydraulic testing as per IS Code etc. complete.**

#### **DUCTILE IRON PIPES**

**Note: Wherever International Standards or Indian standards / specifications are mentioned, their equivalent or higher standards / specifications are also acceptable**

Supply and Delivery of **Ductile Iron Pipe as per IS:8329-2000 & IS 9523/2000 DI fittings** or its latest revision or amendments if any including jointing material as EPDM ring as per IS 5382-1985 and ISO: 4633-1996 or its latest revision or amendments if any.

#### **Standards**

The following standards, specifications and codes are part of this specification. In all cases, the latest revision of the including all applicable official amendments and revisions shall be referred to. In case of discrepancy between this specification and those referred to herein, this specification shall govern.

- 1) ISO: 10803-1997 Design method for ductile iron pipes
- 2) IS:8329-2000 Centrifugally Cast (spun) ductile iron pressure pipes for water, gas and sewage & IS 9523 for DI Fittings/Specials.
- 3) ISO:2531-1991 Ductile iron pipes, fittings and accessories for pressure pipelines.
- 4) ISO:4179-1985 Ductile iron pipes for pressure and non pressure-Centrifugal cement mortar lining – General requirements.
- 5) IS:8112 Specification for 53 Grade ordinary Portland cement.
- 6) BS:3416 Bitumen based coatings for cold application, suitable for use in contact with potable water.
- 7) ISO:8179-1995 Ductile iron pipes-External coating-Part-1 Metallic Zinc with



finishing layer.

- 8) IS:638 Sheet rubber jointing and rubber insertion jointing.
- 9) ISO:4633-1996 Rubber seals-Joint rings.
- 10) IS:5382-1985 Specification for Rubber sealing rings for gas mains, water mains and sewers.
- 11) AWWA C600 Installation of ductile iron water mains and their appurtenances.

**1.0 Internal Diameter:**

The nominal values of the internal diameters of pipe, expressed in millimeters are approximately equal to the number indicating their nominal sizes DN.

**2.0 Length:**

The working length of socket and spigot pipes shall be 5 m ,5.5 m, or 6 metres.

**3.0 Thickness:**

The wall thickness of pipe 'e' in mm shall be calculated as a function of the nominal diameter by the following equation with minimum of 5 mm

$$e = K(0.5 + 0.001 DN)$$

where : e = wall thickness in mm, DN = the nominal diameter, K = the whole number coefficient

**4.0 EPDM Rubber Gasket:**

Rubber Gasket shall be suitably for Push-on-Joint.

The spigot ends shall be suitably chamfered or rounded off to facilitate smooth entry of pipe in the socket fitted with the rubber gasket

Rubber Gasket shall confirm to IS 5382-1985 and ISO : 4633-1996 its latest revision or amendments if any

**5.0 Sampling Criteria:**

Sampling criteria for various tests, unless specified in IS 8329-2000, shall be as laid down in IS 11606. Mechanical test, Brinell Hardness test, Hydrostatic test etc are shall be as per IS 8329-2000

**6.0 Tolerances on External Diameter:**

The nominal external diameter (DE) of the spigot end of socket and spigot pipes and when measured circumferentially using a diameter tape shall confirm to the requirements specified as follow. The positive tolerance is +1 mm and applies to all thickness classes of pipes. The maximum negative tolerance of the external diameter are specified as follow:

DN	Nominal	Positive Tolerance	Negative Tolerance
80	98	+1	-2.2
100	118	+1	-2.8
125	144	+1	-2.9
150	170	+1	-3.0
200	222	+1	-3.0

250	274	+1	-3.1
300	326	+1	-3.3
350	378	+1	-3.4
400	429	+1	-3.5
450	480	+1	-3.6
500	532	+1	-3.8
600	635	+1	-4.0

#### 7.0 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 is given below:

Nominal Diameter in mm	Allowable Difference Between Minor Axis and DE in mm
80 to 300	1.0
350 to 600	1.75
700	2.0
750 to 800	2.4
900 to 1000	3.5

#### 8.0 Tolerance in thickness

The tolerance on wall thickness (e) and the flange thickness (b) of the pipes shall be as below:

Dimensions	Tolerance in mm
Wall thickness (e)	- (1.3 + 0.001 DN )1)
Flange thickness (b)	+ (2+0.05b) & - (2+0.05b)

#### 9.0 Coating

Pipe shall be delivered internally and externally coated.

**External Coating:** Pipe shall be metallic zinc coated and after that it shall be given a finishing layer of bituminous paint as per IS - 8329-2000 Zinc coating shall comply with IS:8329/EN 545/ ISO 8179. Only molten zinc spray coating shall be acceptable. The average mass of sprayed metal shall not be less than 130 g/sqm with a local minimum of 110 g/sqm. Bitumen overcoat shall be of normal thickness of 70 microns unless otherwise specified. It shall be a cold applied compound complying with the requirements of BS 3416 Type II suitable for tropical climates factory applied preferably through an automatic process.

Damaged areas of coating shall be repainted on site after removing any remaining loose coating and wire brushing any rusted areas of pipe.

**Internal lining:** Internally pipe shall be Portland Cement mortar lined (as per IS - 8329- 2000). The mortar shall contain by mass at least one part of cement to 3.5 part of sand. All pipes and fittings shall be internally lined with cement mortar using high speed centrifugal process in accordance with IWO 4179/IS 8329. Cement mortar lining shall be applied at the pipe manufacturing shop in conformity with the aforesaid standards. No admixtures in the mortar

shall be used without the approval of the Engineer. The sand to cement proportion of sand if justified by the sieve analysis. Pipe lining shall be inspected on site and any damage or defective areas shall be made good to the satisfaction of the Engineer. Lining shall be uniform in thickness all along the pipe. The minimum thickness of factory applied cement mortar lining shall be as per IS: 8329 Annex-B or ISO 4179. This is given below.

Nominal Pipe Size (mm)	Nominal lining thickness (mm)
Up to 300	3
350-600	5
700-1200	6
1400-2000	9

## 10.0 Joint

Jointing of DI pipes and fittings shall be push-on type

### Push-on-joints

The Contractor shall source the push-on-joint gaskets only from the pipe manufactures. In turn the pipe manufacturer shall supply at least 10% additional quantity of gaskets over and above the requirement to the Contractor at no extra cost. The gasket used for joints shall be suitable for natural and purified water conveyance. In jointing DI pipes and fittings, the Contractor shall take into account the manufacturer's recommendations as to the methods and equipments to be used in assembling the joints. In particular the Contractor shall ensure that the spigot end of the pipe to be jointed is smooth and has been properly chamfered, so that once the rubber ring is correctly positioned before the joint is made, does not get damaged by friction or sharp edges of the spigot Chamfer. The rubber rings and the recommend lubricant shall be obtained only through the pipe manufacturer.

Rubber ring bundles form every lot shall carry with them manufacturers test certificate for the following mechanical properties.

1. Hardness
2. Tensile strength
3. Compression set
4. Accelerated again test
5. Water absorption test
6. Stress relaxation test

Rubber rings shall be clearly labeled in bundles to indicate the type of ring, the type of joint, the size of the pipe with which they are to be used, the manufacturer's name and trade mark, the month and year of manufacture and the shelf life.

## 11.0 Testing of Pipe:

The main test among others to be conducted shall be as per IS:8329-2000 or with its latest revision/amendments.

**[a] Mechanical Tests**

Mechanical tests shall be carried out during manufacture of pipes as specified in the Standards. The frequency and sampling of tests for each batch of pipes shall be in accordance with IS 11606-1986. The test results so obtained for all the pipes and fittings of different sizes shall be submitted to Engineer. The method for tensile tests and the minimum tensile strength requirement for pipes and fittings shall be as per IS:8329/EN 545 for pipes and IS:9523/EN 545 for fittings.

**[b] Brinell Hardness Test**

For checking the Brinell hardness the test shall be carried out on the test ring or bars cut from the pipes used for the ring test and tensile test in accordance with IS:1500. The test shall comply with the requirements specified in IS:1500/ISO 6506.

**[c] Re-tests**

If any test 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 test results satisfy the specified requirements the lot shall be accepted. Should either of these additional test pieces fail to pass the test, the lot shall be liable for rejection.

**[d]** For hydrostatic test at works, the pipes and fittings shall be kept under test pressure as specified in the standard for a period of minimum 15 seconds during which the pipes shall be struck moderately with a 700 g hammer for conformation of satisfactory sound. They shall withstand the pressure test without showing any leakage, sweating or other defect of any kind. The hydrostatic test shall be conducted before surface coating and lining.

**12.0 Quality Assurance**

The manufacturer shall have a laid down **Quality Assurance Plan** for the manufacture of the products offered which shall be submitted along with the tenders and successful tendered shall have to get its approval from RMC. All the materials, pipe, specials, valves etc. shall have to be inspected through Inspecting TPI/PMC Agency whichever suggested by RMC and the charges for the TPI/PMC Shall have to be borne by the RMC .

**A) EXTERNAL COATING :**

1. Metallic Zinc with finishing layer of bituminous as per Annexure 'A' of IS: 9523/2000.
2. Zinc rich paint with finishing layer of bituminous as per Annexure 'A' of IS: 9523/2000.
3. Bituminous paint as per Annexure 'C' of IS: 9523/2000.

**B) INTERNAL LINING :**

1. Portland Cement (with or without additives) mortar as per Annexure – 'B' of IS: 9523/2000.
2. Cement Mortar with Coal coat as per Annexure 'B' of IS 9523/2000.
3. Bituminous paint as per Annexure 'C' of IS: 9523/2000.

**C) METALURGY & MICRO STRUCTURE :**

The metal used for manufacture of D.I. fittings as per IS : 9523-2000 shall conform to the appropriate grade as specified in IS : 1865-2005.

D.I. Fittings shall contain a Stub (as cast), minimum length -15mm x dia.- 10 mm., which at the time of Inspection can be cut at random to carry out Metallographic test to ascertain minimum 80% Graphite No dularity as per Clause – 9.1 of IS : 1865-2005, in the form - V or VI as per IS : 7754-2003.

**D) MANUFACTURING & VERIFICATION:**

**All the DI fittings and specials shall conform to IS: 9523/2000 and shall be manufactured at well equipped foundries.**

**Quality Assurance**

The manufacturer shall have a laid down **Quality Assurance Plan** for the manufacture of the products offered which shall be submitted along with the tenders and successful tendered shall have to get its approval from RMC before manufacturing clearance.

Measurement of pipe lines:

Payment for DI Pipe shall be made in running meter of pipe.

- (i) 90% payment of lowering, laying jointing and testing item of pipes shall be paid after lowering, laying and jointing pipes as per specifications.
- (ii) Remaining 10% payment shall be paid after satisfactory hydraulic test.

**Item No. 3**

**Providing, Supplying and Fixing of all type Ductile iron fitting (K12) like bends, tees, reducers or any other specials as per IS 9523-2000 (as per latest amendment) use with D.I. pipes manufactured as per IS: 8329/1994 (With external bitumen & zink coating & internal cement mortar lining) including all taxes, insurance, transportation, freight charges, inspection charges, loading, unloading to site of work. Weight shall be considered before Lining or Coating over fitting**

**1.1 General**

Specials, such as tees, Y-pieces, bends (single or composite), tapers, etc. shall necessarily be in steel and shall be manufactured from 6 to 10 mm thick steel plate as per standards and tested and laid in the same manner as the pipes. Small branches, single piece bends, etc. may be fabricated at site, care being taken to ensure that the fabricated fittings have at least the same strength as the pipeline to which they are to be jointed.

**1.2 Bends**

- (a) Bends shall be fabricated taking into account the vertical and horizontal angles for each case.
- (b) The bends shall have welded joints and the upstream and downstream ends of each bend shall have a straight piece of variable lengths as required.
- (c) Bends shall be designed with deflection angle of maximum 10 deg. between segments.
- (d) When the point of intersection of a horizontal angle coincides with that of a vertical angle, or when these points can be made to coincide, a single combined or compound bend shall be used, designed to accommodate both the angles. The combined bend should have a pipe angle equal to the developed angle, arrived at from appropriate formula.
- (e) All joints in bends shall be thermally stress relieved as specified.

- (f) Details of thrust collars anchor bolts, holding down straps, saddle plates should be furnished together with full specifications in Contractor's fabrication drawing.

### **1.3 Flanges**

Flanges shall be provided at the end of pipes or special where sluice valves, blank flanges, tapers, etc. have to be introduced. The flanges received from the manufacturers will have necessary bolt holes drilled. The Contractor shall assemble the flanges in the exact position by marginal cutting, if necessary, so as to get the desired position of the sluice valves, etc. either vertical or horizontal and shall then fully weld the flanges from both sides in such a way that no part of the welding protrudes beyond the face of the flanges. In case the welding protrudes beyond the flanges and if the Engineer orders that such protrusions shall be removed, the Contractor shall file or chip them off. If required and when ordered by the Engineer, the Contractor shall provide and weld gusset stiffeners, as directed on site. The drilling pattern shall be matching with the drilling pattern of flanges of valves.

### **1.4 Blank Flanges**

Blank flanges shall be provided at all ends left unattended for the temporary closure of work and also for commissioning a section of the pipeline or for testing the pipeline laid. For temporary closures, non-pressure blank flanges consisting of mild steel plates, tack welded at the pipe ends may be used. For pipes subjected to pressures, the blank flanges or domes suitably designed as per Engineer's requirements shall be provided.

### **1.5 Stiffener Rings**

The Contractor shall provide stiffener rings wherever required by design. The Contractor shall weld the same to the pipes with one circumferential run on each side. All fillet welds shall have a throat thickness of not less than 0.7 times the width of welding.

### **1.6 Field Hydraulic Test**

After erection at site and after the concrete anchor blocks have been constructed, the section of the pipeline shall be subjected to a hydraulic test as follows, to the test pressure as mentioned below:

1.6.1 The pressure test shall be conducted in as per IS- 5822-1986.

1.6.2 During the test, the pipe shall be struck sharp blows with 1 Kg hammer. Water shall not spout, ooze or sweat either through joints-welded or bolted or the body of the pipe. If any leakage noticed shall be repaired by the Contractor, which shall include coating and repairing of the damaged portion. Repairs and replacements and further testing including the cost of the plates and other raw materials shall be carried out by the Contractor at his own cost. If any leakages are observed during the defects liability period due to defective workmanship or material supplied by the Contractor, he shall repair the same to the entire satisfaction of the Employer, at his own cost. **Wt. of pipe specials shall be carried out before guniting and shall be paid on weight per Kg bases.**

### **1.7 Welding of MS Pipe Line / Specials & cutting of pipeline**

The item includes following operations:

- i) Carting of pipes from departmental store to site of work
- ii) Lowering and laying pipes and specials in trenches.
- iii) Welding of pipes and specials as per IS 5822: 1994

iv) Testing of welded joint as specified in the IS 5822: 1994 para 6.2. & Tensile test for minimum one joint out of forty joints.

v) Hydraulic testing of the pipes

M.S. pipe/specials shall be lowered, laid and jointed by welding including preparation of ends wherever required, grinding as per relevant IS code of welding, testing etc. complete with hydraulic testing complete as per IS: 5822-1994.

Mode of Measurement :

Payment will be made in Kg. basis.

Payment for Supplying and Fixing of all type Ductile iron fittings(K12) like , bends, tees, reducers or any other specials as under,

- (i) 90% payment of Supplying and Fixing of all type Ductile iron fittings(K12) like ,bends, tees, reducers or any other specials shall be paid after Supplying and Fixing as per specifications.
- (ii) Remaining 10% payment shall be paid after satisfactory hydraulic test.

#### **ITEM NO. 04**

**Providing , supplying, Lowering, Laying, Jointing in Position of IS 14846 Sluice valves, butterfly valves & Reflux valves of following class and diameter including all taxes, insurance, transportation, freight charges, octroi, inspection charges, loading, unloading, conveyance to departmental stores, stacking etc complete. (PN-1 Marked) with ISI mark**

*SCOPE :*

This specification covers the design requirements, features of construction, inspection, testing, painting, delivery, installation and commissioning of sluice valves with gaskets, hardware etc.

#### **CODES AND STANDARDS :**

The design and manufacture of the valves shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment will be installed. Nothing in this specification shall relieve the vendor of this responsibility. Valves shall conforming to **IS 14846 & ISI Marked only.**

#### **DESIGN REQUIREMENTS FOR SLUICE VALVES :**

Valve shall be provided with back seat arrangement. Renewable body and screwed wedge rings (riveted over and above) shall be provided.

Collared drain plugs of gunmetal shall be provided for all valves.

Valves shall be with non-rising spindle type and with indicator of valve opening-closing.

Valves shall be flanged and drilling shall conform to the standard as specified in data sheet.

Face to face dimension shall be as per IS 14846.

Gear operation when provided above 400 mm, the gear shall be packed enclosed (spur/worm) type. These gear boxes shall be sealed in such that there shall be no leakage of oil or grease even after long use.

Valves above 450 mm above shall be provided with a drain plug and air plug.

Valve of sizes 300 mm above shall be provided with machined shoe channel arrangement (with lining made of SS)

The face and seat rings shall be riveted over and above press fitted.

Valves shall be gear operated, manually hand wheel OR actuator operated.

Wherever specifically asked, valve shall be provided with actuators.

Appropriate bushing arrangement for replacement of packing without leakage for sizes above 300 mm and above shall be provided.

Stuffing box gland shall be of bolted type.

**CLEANING :**

Prior to factory inspection, all manufacturing waste such as metal chips, debris and all other foreign material shall be removed from the interior of the valve. All mill scale, rust, oil, grease, chalk and all other material shall be removed from the interior and exterior surfaces.

**PAINTING :**

Valves shall first be given two coats of zinc base primer after completely cleaning the surface and then it shall be coated with three coats of coal tar epoxy paint. The resulting coating shall be uniform and smooth and adhere perfectly to the surface.

**HAND WHEEL:**

A hand wheel shall be provided for normal operation.

**DIRECTION OF FLOW:**

Direction of flow shall coincide with the flow direction indicated by “arrow” casted on the valve body.

**TESTS AND INSPECTION:**

Valves shall be offered for visual inspection and dimension check.

Valves shall be tested as per IS 14846 with latest amendments.

The hydrostatic testing shall be witnessed by the authorized representative of client.

Sluice valve shall be tested with and/or without actuator.

**NAME PLATE :**

All valves shall have permanent name plates indicating the services for which they will be used and the design temperature and pressure rating.

The item shall be measured and paid per number of Sluice valves provided including cost of necessary jointing material and all taxes, duties and insurance charges etc. complete and payment will be made as per payment schedule.

Mode of Measurement :

Payment will be made in Nos. of valves

Payment for Providing , supplying, Lowering, Laying, Jointing in Position of IS 14846 Sluice valves, butterfly valves & Reflux valves

- (i) 90% payment of Providing , supplying lowering, laying jointing and testing item of Valves shall be paid after lowering, laying and jointing pipes as per specifications.
- (ii) Remaining 10% payment shall be paid after satisfactory hydraulic test.



**ITEM No.5**

**Providing, supplying, Lowering, Laying, Jointing in Position of CI Double Acting Air Valve with ISI mark IS-14845 & quality of following class and diameter including all taxes, insurance, transportation, freight charges, octroi, inspection charges, loading, unloading, conveyance to departmental stores, stacking etc. complete ( DS1 type & PN-1.0 ) as per figure 3A on Page 5 of IS 14845**

**GENERAL :**

- 1) The double acting air valves shall have two ball chambers, having one outlet of Large capacity for admission and release of built volume of air during emptying and filling of the main another having small outlet for escape of smaller quantities of entrapped air. This type of air valves shall be of flanged type with full conformation with IS : 1538.
- 2) The ball sealed orifice always remains open while air is exhausting and is immediately closed when rises in the chamber, lift the ball and seals the orifice. It shall also ensure that there are no recesses or pockets, sheltering, escaping air for the large orifice (low pressure) valve to drop into when the valve is open. Turbulent air at the time of filling of pipe shall not circulate in such cavities and cause the ball to blown into when the valve is open. Turbulent air at the time of filling of pipe shall not circulate in such cavities and causes the ball blown into the discharging air streams, blowing the valve shut prematurely.
- 3) The cone angle of the lower pressure chamber shall be such that even at the critical velocity of air escape at 300 m/sec. The total impact force on the ebonite covered ball is less than the suction force on the angular area between the ball and the cone. The design of the valve should be such as to allow maximum free air discharge at various pressure differentials. The tenderer shall submit with the tender full set of curves showing discharge of free air versus pressure differential for all sizes of valves offered by hi
- 4) Under no circumstances shall be large orifice ball blow shut prematurely.
- 5) The low pressure cover shall be massive and designed to withstand full operating thrust in working conditions.
- 6) The neoprene seat ring shall be held securely in place under the low pressure cover by a joint support ring to prevent it from sagging when the ball is not sealing the orifice.
- 7) The valve body, the orifice cover, cowl of the air valves shall be made of cast iron of grade 2 of IS : 210.
- 8) Where tenderer considers necessary a suitable drain shall be provided.

**JOINTING MATERIAL :**

- 1) Each valve shall be supplied with all necessary joint ring, nuts, bolts and washers for completing the joints such that it will ensure effective sealing of large orifice even at low pressures. The weights of floats of the same size and type shall not differ by more than 2%.

The timber, if used in the manufacture of floats shall be seasoned and those provided in large orifice shall be ebonite coated. The float provided in high pressure

chamber, if manufactured from seasoned wood, shall be coated with “ ethylene propylene Rubber “ (EPDM).

#### HIGH PRESSURE ORIFICE :

- 1) The high pressure orifice and the high pressure chamber shall be so designed that the orifice is effectively sealed in working condition by “EDPM” coated float.
- 2) The material of the orifice shall be gunmetal. The orifice shall be of size not less than 3 mm and tapering to 100 mm suitable to release accumulated air within the pipe. The profile of the orifice shall be carefully chosen to avoid damage to the float surface. The orifice shall be protected by a suitable plug of stainless steel.

#### VALVE FLANGES :

All valves flanges shall be designed to withstand the stresses to which they would be subjected under hydraulic tests. Flanges shall be machined flat. The flanges shall be drilled in accordance with IS: 1538 ( PART-I TO XXIII )-1976 (specification for C.I. fittings for pressure pipes for water etc.)

#### COATING :

- 1) The casting shall be such that it shall not impart any taste or smell to water. The coating shall be smooth, glossy and tenacious, sufficiently hard so as not to flow when exposed to a temperature of 77<sup>0</sup> C and not so brittle at a temperature of 15<sup>0</sup> C as to chip off when scratched lightly with the point of penknife.
- 2) Alternatively, two coats of black Japan conforming to type 8 of IS : 158-1969 ( OR latest edition ) shall be applied.

#### TESTING :

The air valves shall withstand 1.5 times the working pressure. The joints and air valve shall be waster tight. During test if the joints of air valve are found leaking or the air valve is found not functioning properly then the same shall be got rectified or replaced by the contractor to the satisfaction of Engineer-in-charge.

#### JOINTING MATERIAL :

The contractor shall have to provide all the jointing material like bolts, nuts, packing, white zinc etc. at his cost.

#### PAYMENT :

The item shall be measured and paid per number of air valve provided including cost of necessary jointing material cost of all jointing material and all taxes, duties and insurance charges etc. complete and payment will be made as per payment schedule.

#### Mode of Measurement :

Payment will be made in Nos. of valves

Payment for Providing , supplying, Lowering, Laying, Jointing in Position of C. I. Air valves of ISI marked

- (i) 90% payment of Providing , supplying lowering, laying jointing and testing item of Valves shall be paid after lowering, laying and jointing pipes as per specifications.
- (ii) Remaining 10% payment shall be paid after satisfactory hydraulic test.

**Item No.6****M.S.Specials Plain Ended and Flange Ended or any other type if required as directed by Engineer-in-charge**

The Specials of different diameter shall have to be prepared from steel as per instructions. The work should be carried out in such a way that there should be no marks of welding etc. in the Specials in the Plain Ended and Flange ended. The work should be with finishing, neat and clean. These Specials should be leak proof and shall have to be fixed on site as per instructions in a systematic manner.

Mode of Measurement :

Payment will be made in Kg. basis.

Payment for Supplying and Fixing of all type M S Special Plain / Flange Ended or any other specials as under,

- (i) 90% payment of Supplying and Fixing of all type M S Special Plain / Flange Ended or any other specials shall be paid after Supplying and Fixing as per specifications.
- (ii) Remaining 10% payment shall be paid after satisfactory hydraulic test

**ITEM NO. 7****Supplying, Cutting, Bending, Binding and Hooking and binding with wire for RCC work Tor steel TMT round bar including all cost.**

Details/dimensions of reinforcement for encasing pipes & thrust blocks shall be as per type design approved by the Engineer-in-charge shall be provided by the contractor at this own cost.

The reinforcement shall be of deformed steel bars of strength 415 Mpa complying with IS:1786 and in accordance with the requirements. The bars shall be free from oil, dirt, loose rust and scale.

Reinforcement for C.C. work for encasing pipes & thrust blocks also including work of cutting, bending, binding, and placing in position etc.

All reinforcement steel shall be of TMT bars confirming to IS: 1786 of Make TATA VIZAG, SAIL, ELECTROTHERM, GALLANT, NEELKANTH, or equivalent make approved by Engineer-in-charge and welded wire fabric to IS: 1566 for water retaining structure.

Reinforcement bars shall conform to IS-432, IS-226 or IS-1786 and welded wire fabrics to IS : 1566. Only TMT bars for reinforcement in RCC work shall be used which shall be clean, free from pitting, oil, grease, paint, loose mill scale, rust, dirty dust or any other such substance that will destroy or reduce bond.

The rate shall be paid for kg. bases.

## **Item No. 8**

### **Brick Masonry work with cement mortar 1:6 complete:**

#### **Materials:**

Water shall conform to M-1.

#### **Cement:**

Cement shall conform to M-3.

#### **Brick:**

The bricks shall be hard or machine moulded and made from suitable soils and burnt. They shall be free from cracks and flaws and nodules of free lime. They shall have smooth rectangular faces with sharp corners and shall be of uniform colors.

The bricks should not be broken when thrown on the ground from a height of 600 mm.

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

The size of the conventional bricks shall be as under:

(9" x 4.3/8" x 2,3/4") 225 x 110 x 75 mm

Only bricks of one standard size shall be used in one work. The following tolerances shall be permitted in the conventional size adopted in a particular work.

Length  $\pm 1/8"$  (3mm) width :  $\pm 1/16"$  (1.5mm)

Height:  $\pm 1/16"$  (1.5 mm)

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 percent by weight. Necessary tests for crushing strength and water absorption etc., shall be carried out as per IS: 3495 (Part I to IV) - latest edition.

#### **Workmanship:**

##### **i) Proportion:**

The proportion of the cement mortar shall be 1:6 (1-Cement, 6-Fine sand) by volume.

##### **Wetting of bricks:**

The bricks required for masonry 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.

##### **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; closer in such case shall be cut to required size and used near the ends of walls.

A layer of mortar shall be spread on full width for suitable length of the lower coarse. Each brick shall first be properly bedded and set frame by gently tapping with handle of trowel or wooden mallet. It's inside face shall be flushed with mortar before the next brick is laid and pressed against it. On completion of coarse the vertical joints shall be fully filled from the top with mortar.

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

The brick shall be laid with frog upwards. A set of tools comprising of wooden straight edges, mason's spirit level, square half meter rule, and pins, string and plumb shall be kept on 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 steeper than 45 degrees.

All fixtures, pipes, outlets of water, hold fasts of doors and windows etc. which are required to be built in wall shall be embedded in cement mortar.

**Joints:**

Bricks shall be so laid that all joints are quite flush with mortar. Thickness of joints shall not expose 12 mm. The face joints shall be raked out as directed by raking tools daily during the progress of work when the mortar is still green so as to provide key for plaster or pointing to be done.

The face of brick shall be cleaned the very day on which the work is laid and all mortar droppings removed.

**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.

**Mode of measurement & Payment:**

The measurement of this item shall be taken for the brick masonry fully completed in foundation up to plinth. The limiting dimensions not exceeding those shown on the plans or as directed shall be final. Battered tapered and curved position shall be measured net.

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

The testing of material is to be carried out at the cost of the contractor.

**Item No. 9**

**Cement Plaster 12 mm thick using cement mortar in proportion 1:3 with Neeru Finishing, curing etc. complete**

**Material:**

Water shall conform to M-1.

Cement Mortar shall conform to M-11

**Workmanship:**

12 mm thick cement plaster in single coat in CM 1:3 (1-cement : 3-sand) with a floating coat of neat cement slurry.

**Scaffolding:**

Wooden bullies, bamboos, planks, treatles and other scaffolding shall be sound. These shall be proper examined before erection and use. Stage scaffolding shall be provided for ceiling plaster which shall be independent of the walls.

This kind of Plaster is normally for interior side or as specified location by Consultant to be applied as above. NORMAL CEMENT PLASTER and the surface shall be rubbed smooth after coating it with a thick coat of pure Portland cement slurry while the base coat is still fresh. If Neeru plus cement finish is specified floating with neat cement will not be required.

**Mode of Measurement & Payment:**

The rate shall include the cost of all materials labour and scaffolding etc. involved in the operations described under workmanship.

All plaster shall be measured in square meter 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. Elowigns soffits shall be measured separately.

For jambs, soffits, sides, etc. for openings not exceeding 0.5 sq.mt. each in area for ends of joints, beams, posts girders, steps etc. not exceeding 0.5 sq.mt. each in area and for openings exceeding 0.5 sq.mt. and not exceeding 3.00 sq.mt. 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.mt. each and no addition shall be made for reverse, jambs, soffits, side etc. of these openings, for finish to plaster around ends of joints, beams, posts etc.
- b) Deductions for openings exceeding 0.5 sq.mt. but not exceeding 3.00 sq.mt. each shall be made as following and no addition shall be made for reverse, joints, soffits, sides, etc. of these openings.
  - i) When both faces of all walls are plastered with same plaster. Deductions shall be made for one face only.
  - ii)
    - For openings having door squares equal to or projecting beyond the thickness of wall. Full deduction for opening shall be made from each plastered face of the wall.
    - In case of openings of area above 3 dq.mt. each deduction shall be made for opening but Jambs, soffits and slits shall be measured.
    - The rate shall be for a unit of square meter.

**ITEM NO. 10**

**CC work 1:1.5:3 for Copping using aggregate of size 10-20 mm, centring, curing, finishing etc. complete (without reinforcement)**

&

**ITEM NO. 11**

**Providing and Laying casting in situ mass cement concrete in 1:2:4 Graded stone aggregate 10-20 mm, nominal size and curing complete including cost of formwork**

&

**ITEM NO. 12**

**CC work 1:3:6 using aggregate of size 10-20 mm, curing, finishing etc. complete (without reinforcement) (without centring)**

Details/dimensions of encasing pipes & thrust blocks shall be as per type design approved by the Engineer-in-charge shall be provided by the contractor at this own cost.

**MATERIALS:**

The specification of materials as given in IS Code is applicable here also.

**CC 1:1.5:3**

The proportion of concrete shall generally be 1 part of cement, 1.5 parts of sand and 3 parts of coarse aggregate by volume giving a strength of 200 kg/cm<sup>2</sup> at 28 days. Curing shall be done for 7 days.

**C. C. 1:2:4**

The proportion of concrete shall generally be 1 part of cement, 2 parts of sand and 4 parts of coarse aggregate by volume giving a strength of 150 kg/cm<sup>2</sup> at 28 days. Curing shall be done for 7 days.

Coarse aggregates shall be of black trap crushed chips graded from 10 mm to 20 mm size.

**MEASUREMENTS:**

The payment shall be made on cu.m. of completed work including all operations and final finishing.

**C.C. 1:3:6**

The proportion of concrete shall be 1 part of cement 3 parts of sand and 6 parts of coarse aggregate by volume. Size of coarse aggregate shall be graded from 40 mm to 50 mm size black trap metal. Curing shall be done for 7 days.

**MEASUREMENTS:**

The payment shall be made on cu.mt. of completed work including all operations and final finishing.

**ITEM NO. 13****Breaking of pavement surface.**

Breaking of existing Payment surfaces of roads with breakers or with cutting tools etc.  
Payment shall be made on Sq.mt bases.

**ITEM NO. 14****Removing the surplus earth after refilling the trenches as directed as per instruction of Engineer in charge with incl. spreading etc complete**

After Refilling the pipe / chamber trenches by the excavated stuff is 15cm thick layer, including ramming, watering and consolidating up to possible extent as specified in excavation & refilling item, the surplus stuff shall be disposed off as directed within the prescribed limits of Rajkot Municipal Corporations limits as directed by the engineering in charge.

After refilling surplus earth shall have to carted by the contractor with in RMC limit including loading transporting unloading spreading without any extra cost.

**ITEM NO. 15****1829 MM dia bore hole by horizontal Drilling push through method complete including cost of bore & pushing casing pipe (With Jointing) & pushing Carriage Sewage Pipe (With Jointing) excluding cost of casing pipe & Carriage Pipe****GENERAL: - RAILWAY/ROAD CROSSINGS**

Having Pipeline below road adopting Push through method / as per specifications & drawings approved & prescribed by road authorities, including cost of casing pipe all materials, tools & plants required for execution of these works the rate includes Casing pipes and laying pipeline inside, excavation, removal of surplus excavated stuff beyond the road boundary, clearing the site etc.. The carrier pipeline joints in the road boundary shall be 100% water tight. RMC shall make a proposal to road authorities, contractor shall follow up the approval process (Laying of carrier pipe will be paid in relevant item of lowering, laying & jointing pipe line)

In General following sequence shall be adopted in carrying out the job :

Pushing of the completed segments of the pipe shall be commenced as per the procedure described in above paras till the entire length of the pipe in the embankment is built up.

**GENERAL SPECIFICATIONS**

Permission for Highway & Railway crossing shall be procured by agency from competent authority of the concerned department. Necessary letter of recommendation shall be given by department.

At railways, public state highways, at such other crossings as are shown in the construction drawings issued by the company the pipeline shall be installed in MS casing of as recommended by railway authority/ state highway authority casing pipes conforming to the specifications given herein.



The casing pipes/box shall be installed in accordance with the details given in drawing and the casing, bushing and insulators, etc., shall be installed on the carrier pipe as detailed in drawings. Casing pipe size shall be **1700mm** carrier pipe to facilitate the insertion of the later without disturbing the casing pipe and to provide adequate drainage, Casing shall be installed with even bearing throughout its length and shall slope towards one end, as specified or desired by the engineer-in-charge. The ends of the casing shall be sealed to outside of carrier pipe in accordance with the details given in drawing.

Before installation, holes for installing vent pipes shall be cut and burrs if any shall be removed. The welding of both carrier pipe and casing pipe shall be done in accordance with the welding specifications, given herein. Before installing the casing pipe, it should be cleaned of all internal obstructions and during installation care should be taken to keep the inside clean.

The section of carrier pipe to be placed in any casing shall be closed at each end, hydrostatically tested preferably with dead weight tester for at least two hours. Only on successful completion of this test, shall the carried pipe section be inserted in the casing pipe. The installation of casing may open cut as circumstances may permit or require as directed by the engineer-in-charge.

The installation of casing in bended section of the carrier pipe shall be performed by metre bends of the casing pipe provided that the length of each metre cut out of casing pipe shall be such as to provide a clearance of at least 1-1/2" between the inside of the casing pipe and the outside of the coated carrier pipe.

Excavation for casing installation shall be immediately backfilled at the completion of the work with suitable solid matter and packed thoroughly to prevent seepage of water into the excavation.

#### **ROAD and RAILWAY CROSSINGS:-**

At road, and railway crossings the work shall be performed to the specifications of local authorities or such public bodies as may be in charge (S) of roads, railways and canals to be crossed. In case, however the minimum requirements of the governing agencies are less than those set out in the drawing or the specifications given herein, then the requirements given in the drawings and the specifications given for encased line shall be followed.

Whereas the casing pipe in the case of encased line to be laid normal by boring, tunnelling, engineer-in-charge may at his discretion permit open-cuts to be made for the installation of casing provided, however, that the TENDERER shall procure the necessary permit / license for the same from competent authority. At locations wherein the open cut methods are permitted, the TENDERER shall pass the carrier pipe through the casing located in the trench after the approval of the engineer-in-charge in writing and care shall be exercised to avoid damage to pipe coating and wrapping during this operation. The TENDERER shall produce a certificate in writing from concerned authorities for its satisfactory restoration and payment therefore.

At all crossings the carrier pipe shall be laid straight without bends so that if necessary the pipe at a later date may be replaced without cutting the casing. The carried pipe shall extend at least 2 meters beyond the end of casing pipe at either end.

At Road / railway crossings the TENDERER shall eliminate unnecessary bending of pipe to conform to the contour of ground by gradually deepening the ditch at such approaches as directed by the engineer-in-charge. Where the installation of the casing has been made by open cut TENDERER

shall install suitable temporary bridge work ensuring the safety of the traffic aids and safeguards for protection of the public safety, or he shall provide suitable diversions as desired by the engineer-in-charge.

At all Road / railway pipeline crossings shall be bored with horizontal boring machine. The method of carrying out a cased crossing by boring for various crossings on this pipeline route shall be jointly inspected by the representative of the COMPANY and TENDERER for each category of work prior to commencement of actual work.

Pipeline under railway track and irrigation canal an applicable portion of the right-of-way shall be encased in accordance with the specification. This item of work shall include, necessary clearing and grading required therefore, trenching to the depths and widths required, welding of casing and carrier pipes, testing, lowering in, installation of vent assemblies, end seals, insulator and all other fittings that may be required, backfilling, clean up, complete restoration to the original condition and further strengthening and protective works as may be required. The work shall be carried out in accordance with the drawings and as directed by the engineer-in-charge. For various operations mentioned above, the specifications pertaining to these operations shall apply in addition to the specifications given herein.

The TENDERER shall be permitted to use William Sons type Neoprene seals in place of concrete end seals for the crossings. The item shall be procured by the TENDERER himself as per the provisions under the appropriate head of work in case TENDERER so desires. The representative of the COMPANY may also be associated to determine the quality of the material and its delivery schedule from the open market. However, the particular work defined under the proper head shall not be delayed on account of non-availability of Neoprene end seals. In such case, concrete seals may be provided.

On both ends of pushing concrete supports are to be provided as per direction of engineer-in-charge.

**MODE OF PAYMENT:**

The payment shall be made on Running meter basis as shown in relevant schedule.

**GENERAL**

**01.00 QUALITY ASSURANCE & INSPECTION :**

**01.01 GENERAL REQUIREMENT OF QUALITY ASSURANCE**

- 01.01.01 All materials, components and equipment covered under the Technical specification for this Project shall be procured, manufactured, tested, erected and commissioned as per a comprehensive Quality Assurance Programme. It shall be the primary responsibility of the Contractor to draw up and implement such a programme which shall be duly approved by the Purchaser / their authorized Inspection Agency.
- 01.01.02 The detailed Quality Assurance Plans (QAP) for manufacturing & testing of equipment shall be prepared by the Contractor & submitted for approval by the Purchaser / Purchaser's Inspection Agency.
- 01.01.03 Quality Assurance Plan shall be submitted along with the tender.

## **01.02 INSPECTION:**

The All materials supplied under the scope shall be inspected jointly by Third party inspecting Agency /PMC appointed by RMC and Executive Engineer or his representative as per the technical specifications provided in the tender document. All testing facilities shall be provided by the manufacturer at its manufacturing premises without any extra charges. The Supplier on receipt of acceptance order. Shall intimate the third party inspecting Agency and concerned Executive Engineer carry out inspection as soon as material is ready. Inspection will be carried out normally within one weeks time and on receipt of such intimation the inspecting agency will inspect the materials as per the specification and on satisfying itself, will mark the inspection marks on all material and issued inspection note to supplier and concerned consignee

During third Party/PMC inspection if the material offered for inspection is rejected by third party inspection in that case the third party inspection agency will mark the rejection marking.

Railway / Road Crossing by pushing method including Providing, Lowering, Laying & Jointing M.S. pipe with suitable tools and plant including jointing of pipes by welding including carting of pipe, necessary excavation for pit construction, refilling the pit including cost of BB masonry in CM 1:6 including all cost of all equipment materials and labour required for pushing of pipes etc. comp. including providing leak proof joints. Item includes as shown in relevant Schedule. (Drawing as approved by concerned department).

## **GENERAL TECHNICAL SPECIFICATIONS SCOPE**

### **THE ITEMS INCLUDES FOLLOWING OPERATIONS:**

- A. The pipe shall be manufactured coated & lined from MS plate / H.R. Coils conforming to IS: 1916-1989 The MS plate / H.R. coils shall be of steel grade Fe – 410
- B. Fabricating specials such as bends, Tees, Tail pieces, reducers, enlargers, etc. as may be required with the same thickness as per pipes. Flange shall be with minimum thickness from 18 to 20 mm wherever flange specials are required.

### **STANDARDS**

The mild steel pipes to be manufactured supplied and delivered under the scope of this contract shall be manufactured in accordance and confirming to IS: 3589-2001 The MS pipes shall be with IS certification mark.

### **SCOPE OF ITEM**

The scope of item shall include all labours, material and machinery cost necessitated to be utilized for; Proper manufacturing of M.S. Pipes.

All test required to be undertaken at manufacturer's premises as per IS 3589-2001.

Transportation of the pipes either by the rail and / or by Road services with all the covers duly and appropriately insured.

Delivery of pipes with proper loading, unloading, stacking at site of work, or RMC store as indicated by Engineer-in-charge.

**M.S. Pipe with inside epoxy painting of thickness 200 micron as per IS.**

### **MARKING:**

The methods of marking all the pipes to be delivered under scope of contract shall ensure that all the information will remain legible even after transportation, storage in open space etc. In general the legible and marking upon the goods shall indicate the followings :

Manufacturer's brand name and/or trade mark.

Purchaser's mark as "RMC" be painted/stenciled.

Diameter and specified wall thickness.

Pipe designation (e.g. Fe-410) as per tender item

Any other important matter that the manufacturer deems fit to be inscribed.

**WORKMANSHIP:**

ALL PIPES SHALL BE WELL FINISHED AND WHEN VISUALLY INSPECTED SHALL BE FREE FROM DEFECTS SUCH AS CRACKS, SURFACE FLOWS, LAMINATIONS ETC.

Test Certificate:-

The contractor shall always provide manufacturer's test certificate in accordance with every batch/lot of goods so manufactured and supplied.

The contractor shall also produce in addition to manufacturer's test certificate as mentioned above test certificate from person/agency appointed by Engineer/ or Board for inspection.

The contractor will not start fabricating the pipes before the above test certificate from the approved laboratory are submitted to the department and approved by the department or consultant authorized by dept.

If the test report of any pipe is not satisfactory, the entire lot will be rejected.

Each pipe and special shall be inspected and tested in the factory and a special register of the pipe testing shall be maintain.

**DETAILED TECHNICAL SPECIFICATION MANUFACTURING**

The pipe shall be manufactured from MS plate / H.R. Coils confirming to IS: 2062/IS 10748-1995 is having IS mark. The pipes are to be fabricated as per terms and conditions as laid down in IS 3589-2001. The pipe shall be manufactured from Fe – 410 grade steel as per item of the tender.

1. wall thickness:  
The wall thickness of pipes shall be as specified in item having tolerance as per IS 3589-2001 but minus tolerance be limited to 5% only.
2. pipe ends:  
The pipe shall have beveled ends beveled to an angle of 30 + 5 measured from a line drawn perpendicular to the axis of the pipes. The roof face shall be 1.6 + 0.8 mm. The root face of the bevel may be prepared by hand finishing if required.
3. length of pipes:  
The random length pipes shall be in 4 to 7 meter for easy handling of the pipes. Larger length will be preferable.
4. Straightness of pipes:  
Finished pipes shall not deviate from straightness by more than 0.2% of the total length checking for straightness shall be carried out using as taut string or wire from end to end along the side of the pipe to measure, the greatest deviation.
5. testing of pipes:

The main tests among others to be conducted shall be as per IS:3589-2001 or with its latest revision/amendments.

6. sampling of pipes:  
The sampling of pipes shall be as in IS: 4711.
7. condition of supply:  
The pipes with epoxy painting of thickness 200 micron shall be as per specification.
8. other tolerances:  
As per IS: 3589-2001 with latest revision/amendment (Except for wall thickness).M.S. pipes shall be welded either longitudinally or spirally. Two circumstantial welds and one longitudinal weld permitted to make random length of welded tube as per specified above.

**PROTECTIONCOVER:**

Pipe

outside coated with best quality bituminous paint

**Epoxy painting:**

The inside Epoxy painting with required base and hardener shall be provided as per instruction of Engineer-in-charge/Consultants. The detailed specifications for epoxy painting are as under;

The inside lining shall consist of 1 coat of 50 micron of Zinc rich epoxy primer and three coats each of 50 micron of non toxic high build black paint.

The inside surface of the pipes and specials is to be provided with lining with anticorrosive paint before applying paint to the surface, the surface shall be made free from rust, mill scale, dust, grease, old paint and other loose particles. The surface shall be cleaned by sand/short blasting as per IS:1477/1971 (Part-I). Cleaning shall be followed by immediate application of Zinc rich primer. The primer shall be applied by spray or brush. The application of the primer shall be as per the recommendation of the manufacturer. After application of primer in 1 coat, 3 coats of high build black non toxic paint of reputed make like Asian, Burger, Shalimar Tar Product, Goodlass, Sigma, Goa paints etc. to be approved by Engineer-in-charge consultant shall have to be applied after 24 hours minimum. The technical specifications of primer and paint shall be as under;

**Epoxy Zinc Rich Primer (2 packs):** Types and purpose:

A two component heavy duty prefabricated primer based on Zinc Dust and Polyamide cured epoxy resins. This paint generally confirm to specification DGS-175, Type-A. The primer shall be non phenol.

**Conditions:**

The paint is supplied in two packs, fine Zinc dust mixed with epoxy resin as base and liquid hardener. They are to be mixed in following ratio.

	By Volume	By Weight
Base	1.5	4.0
Hardener	1.0	1.0

**Mixed Paint Properties:**

i)	Viscosity	20 + 30 % seconds by flow Cup No.4 @ 30o C
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ii)	Specific Gravity	1.70 + 3 %
iii)	Pot life of mixture	6-8 hours.
iv)	Zinc dust content on DFT basis	92 %
v)	Finish.	Smooth and Matt.
vi)	Drying time Surface Dry Hard Dry Over coating	5minutes Less than 1 Hour Minimum 24 Hours. Maximum No. limit.
vii)	Flash point	Above 23 o C
Viii)	D.F.T.	20-25 microns depending on blasting profile
ix)	Compatibility	Compatible with all systems of paints. Like Bituminous, conventional, chlororubber vinyl and epoxy paints.
X)	Toxicity	Non toxic

Application by:

Brush/Spray (Air and Airless)

Thinner : Epoxy thinner shall be used if required.Coverage:10 sq.m./liter at 25 microns.

High build black paint:

1)	Dry time	Surface dry not more than 4 hours Hard dry not more than 18 hours Film thickness per coat 75 micron
2)	Consistency	Thixotropic liquid
3)	Covering Capacity	5 Sq.m/litre.
4)	Color	Black/Brown/Black in alternate layer.

### Characteristics:

The paint shall be non phenol, non-toxic and shall not impart any test or odour or to the water to flow through the pipe. It shall afford a highly durable protective air tight coating to prevent corrosion or rusting of iron and steel against air moisture/water and shall be of sufficient elasticity to prevent racking, blistering or peeling. It shall retain its consistency at the ordinary atmospheric temperatures when packed in suitable containers. After application or drying, the paint shall not show any surface cracks due to drying, weathering action or expansion and contraction. Its resistance to water must be perfect. It shall also be resistant to weak acid and alkalis, natural salts and to dry heat up to 150 centigrade. It should have good brush ability.

The primer as well as paint shall have to be applied as per the manufacturer's specification. The paints shall be tested in the laboratory by the Owner at the cost of the contractor if found necessary. Each lot of primer and paint supplied shall be accompanied by the certified copies of the result of tests carried out by the manufacturer. The entire procedure of applying the paint as specified shall be rigidly inspected right from cleaning stage to application of final coat. If at any time it is found that the procedure of applying the paint is not as per standard laid down, all such painting work done shall be rejected.

The consumption of paint and primer shall be as manufacturer's specification. No deviation in consumption shall be allowed.

## **STACKING OF PIPES**

On receipt of the pipes shall be stacked on wooden/concrete sleeper to ensure that they do not come in contact with earth. The contractor shall take necessary precaution for safety of pipe so that no damage occurs during stacking.

## **INSPECTION**

Inspection of pipes & specials will be carried out by executive Engineer or his representative agency appointed by RMC All the expenditure of inspection shall be borne by the contractor.

## **MODE OF MEASUREMENT AND PAYMENT**

The measurement shall be taken in running meter of the pipes. The payment shall be made on Rmt basis. Item is including all taxes insurance, transportation, freight charges, octroi, Inspection charges, Loading, Unloading, carting to store, staking etc. comp.

Labour charges for lowering, laying and jointing M.S.pipe by pushing method with suitable tools and plant including jointing of pipes by welding incl. carting of pipes necessary excavation for pit constructing refilling the pit incl. Cost. Of B.B.Masonry in C.M. 1:6 including cost of all equipment's materials and labour required for pushing of pies etc. comp. Including providing leak proof joints etc. complete.

Before laying pipe in the pit for pushing the level at per "L" section and plans shall be got checked for Engineer-in-charge.

The pipe shall be laid in dry condition. The Pipes shall be lowered by means of tripod and chain pulley block, if however, wet condition are met with it will have to be made dry by dewatering of the cost of contractor.

Before the procure of the pushing or the pipes is commenced the pipes shall be placed in straight line, so that the complete line laid by pushing is in straight line. Divination will not be permitted.

The pipes shall be gently pushed and complete excavation inside the pipe shall be done simultaneously. The excavation shall be done in all sorts of soil & depth.

The excavated earth shall be removed and disposed off to any site within 5 km / RMC limit, distance as per instruction of Engineer-in-charge.

The each pipe shall be of such a length that can easily facilitate in pushing.

### **Jointing :**

After one pipe is pushed the second pipe will be lowered in the pit and welded with the pushed pipe. Before aligning assembling of and welding the pipes. The faces shall be cleaned by scrupling by care brushing or any other method approved by the Engineer-in-charge.

The procedure of jointing by welding and the materials required for the welding shall be as specified is item No.1.Closing of open end of M.S. pipe by providing B.B. masonry in C.M. 1:6. The work include closing of both the ends of M.S Pipe by providing B.B. Masonry in C.M. 1:6 This work shall be carried out after the completion of the work of providing pushing the M.S, pipe and laying of M.S. Pipes / RCC pipes. Before starting the work of closing the ends of M.S. pipe, It should be checked that no any living or dead animal remain.

Brickwork using common burnt clay building bricks having crushing strength not less than 35 Kg/ cm<sup>2</sup> in foundation and plinth in C.M. 1:6 (1 cement and 6fine sand) for foundation and plinth level.

The bricks to be used shall be oil defects. It shall be of uniform size and shape and shall sound ringing when struck with trowel. The bricks shall be soaked in water for at least 12 hours before they are used.

Cement mortar shall consist of end part of cement and size part of river sand of six parts of sand if necessary which shall be sharp clean and free from organic and foreign matters. The cement and sand shall first to be mixed dry on masonry platform or in iron sheet dray to have uniform colour then mixed by adding clear water slowly and gradually to have workable consistency.

Motor for one hour work only shall be mixed with work thoroughly by turning at least three times so that the mortar shall not be used.

**Mode of Measurement :**

The rate shall be per basis of Rmt. as shown in relevant schedule. The rate includes all the works and materials & labour as mentioned above or any other requirements such as excavation and dictating demolition of RCC thrust block if any refilling etc. for pushing and laying dia by pushing method.

Lowering and laying in position to correct line and level M.S.Pipe with/without any Inner or Outer Grating on pedestal or Chair upon Prepared formation or prepared bedding in trenches the rates include conveyance from store incl. Loading, unloading, stalling hoisting, marginal cutting, assembling and talk welding including welding in all positions with required number runs, for M.S.Pipe internally and/or externally including gauging wherever necessary fixing appurtenances and other accessories in connection with pipe laying work with hydraulic testing etc. comp.

**M.S. pipe shall be lowered, laid and jointed by welding including preparation of ends wherever required, grinding as per relevant IS code of welding, testing etc. complete with hydraulic testing complete as per IS: 5822-1994.**

**SPECIFICATIONS FOR WELDING:**

These specifications cover shop welding as well as site welding for requirement of M.S. pipe in particular length and M.S. specials. Following types of joints are considered for connecting the pipes or pipe and specials.

- i) Fillet weld with swaging of one end of pipe
- OR
- ii) But weld without swaging of one end of pipe.

**WELDING UNDER RAIN AND STRONG WIND:**

If welding is to be done during rain or strong wind, suitable protection shall be provided for the parts to be welded and the welder. Pre-heating of electrodes shall be done so as to remove any moisture. Where this is not practicable, no welding shall be done on piping under such conditions.

All the types of bends, scour teed, air valve tees, tail pieces of valves and water meters etc. shall be fabricated as per standard practice from M.S. pipe to be supplied by Contractor. The contractor shall have to provide M.S. pipe pieces and 18 to 20 mm thick flanges of required diameter for branch of tees, reducer, enlargers, etc. and paid on m. supply of M.S. pipe. Fillet or butt weld as may be required shall do joint. Holes of appropriate diameter shall be drilled in flanges of specials at appropriate spacing to facilitate jointing of sluice valves, water meter, air valves and other types of valves.



The following does are applicable for welding:

IS: 814 code for covered electrode for metal Arc welding for mild steel.

IS: 815 CLASSIFICATION AND CODING OF COVERED ELECTRODES FOR METAL Arc WELDING OF MILD STEEL AND LOW ALLOY HIGH TENSILTE STEEL.

IS: 1663 Part – 1 / part – II regarding method of tensile testing of steel sheets and stripes.

IS: 3600 codes of procedure for testing of fusion welding joints and weld metal in steel.

**ELECTRODES:**

The contractor shall use preferably Advani Orelikon overcord S.S. Greecon (Blue) or other electrodes as approved by Engineer-in-Charge depending upon the thickness of the plate and type of joint. They shall use standard current and Arc Voltage required for the machine in use as per manufacturer's directions. Welding electrode shall conform to test procedure of IS:814 and IS:815. The contractor shall submit manufacturer's test certificate for each batch of electrode use by him. Electrodes shall be stored unopened in original containers. Electrodes when used shall be free of rust, oil, grease and all other matter which could be harmful for the good quality of welding.

**QUALIFICATION OF WELDERS:**

Only such welders who are experienced and whose workmanship is satisfactory shall be employed for the work. Welders will be individually tested for the welding skill before they are allowed to work.

**WELDING PROCESS:**

All welds shall be made down – hand by manual or automatic shielded arc welding process. Welding shall be done so that there shall be through fusion and complete penetration. Sealing runs in the inside shall be done manually. The joints for seams and circular welding shall be square butt as per standard practice as per of IS:816 shall be accepted.

**END PREPARATION:**

Ends to be welded will be preferably made by machining. However preparation of ends may be made by flame cutting, provided all grooves and irregularities are ground off and all the oxidation is removed.

**CLEANING:**

The ends to be welded shall be properly cleaned. All paint, oil, grease, rust and oxide as well as earth, sand or any other material sticking which could be harmful to the welding should be removed. Ends shall be totally dry while welding. No dirt or debris will be permitted in the pipeline. Prior to alignment the inside of each joint shall be adequately scrapped by approved means to the satisfaction of the Engineer-in-charge.

**ALIGNMENT AND SPACING:**

Pipes to be welded shall be aligned and fitted with external line up clamp and spaced in a suitable manner, so as to hold ends during welding at a distance to ensure full penetration. Root opening shall not be more than as specified. Internal off set shall not exceed 1.5 mm. The pipe piece to be butt welded shall be coupled by means of pipe couplers or by yokes or bridge "c" clamps. Owner's inspector may check and approve the joint fit-up and alignment prior to the commencement of welding.

## **WELDING TECHNIQUE:**

### **ROOT PASS:**

#### **a) FOR BUTT JOINTS:**

The maximum electrode size shall be 3.15 mm ( 10 SWG) and the electrode holder shall be connected, having due regard for the polarity requirement of the electrode approved for the use for pipe in horizontal position .Upward technique shall be used with the recommended values of current.

The root pass of butt joints, regardless of the technique used, shall be such as to achieve full penetration. However, projection of weld metal in to pipe bore shall not exceed more than 5 mm. Root grooves and defective restart of the welding shall be care fully avoided. For pipes having diameter then 500 mm all circumferential joints shall be welded on both sides i.e. outside and inside.

At each interruption of welding and on completion of each run, craters, weld irregularities and slag shall remove by grinding or chiseling. After the welding is started and until the joint has been completed displacements, shocks, vibration or stresses shall be avoided in order to prevent cracks or breaks in the weld.

### **FOR FILLET WELDS:**

The maximum electrode size shall be 4 mm (8 SWG). On completion of the root pass, any visual defect or irregularity shall be ground off to avoid defects or irregularities in the next pass.

### **JOINT COMPLETION:**

Electrode size of more than 8 SWG ( 4 mm) shall not be allowed for filling of the weld upward

Technique shall generally be used for pipe in horizontal and vertical position welding. At each interruption of welding and after each run of welding is completed, chipping and slag removal shall be done. When the welding is completed, butt joints shall have a cover pass. It shall be slightly convex and fuse into the surface of the base metal in such a manner as to have a gradual notch free finish and good fusion at the joint edges. Welds shall have a regular appearance and shall be free from defects. Welder number shall be stamped alongside each weld whenever required by the Engineer-in-Charge / consulting engineer.

### **WELDING EQUIPMENT, TOOLS AND SUPPLIES:**

All welding machine, line up clamps, beveling machines, cutting torches and other equipment, tools and supplies used in connection with the welding work shall be kept in good working condition so as to produce sound welds. The welding machine shall have adequate controls for obtaining current adjustment for all pipe line welding requirements. Ground clamps shall be of such design as to be dependable and should not deflect the pipe and with as large a contact area as is practicable.

### **PREPARATION OF PIPE FACE FOR WELDING:**

Before aligning, assembling and welding pipe faces shall be cleaned by scrapping by wire brushes or by any other method approved by Engineer-in-Charge. The correctness of shape and bevel edge will be checked with templates and required corrections carried out before welding.

**WELDED JOINTS:**

As required in the welding work following points shall observe. The contractor shall use the standard electrode depending on thickness of the plate and type of joints. They shall also use standard current and arc voltage required for the machine in use as per the direction of the Engineer-in-Charge. Welding electrodes shall conform to IS 814 of Indian or equivalent foreign make of required quality approved by Engineer-in-Charge shall be used wherever.

**GAS CUTTING:**

Gas cutting if required for preparing in site distance pieces, straps etc. and cutting out holes in the pipe line shall have to be carried out by the contractor at his own cost. After cutting the edges shall be made smooth and even by using electrical or pneumatic grinder so as to remove all inequalities. Care shall be taken to see that the shape of the material cut does not defect in any way at the time of cutting.

**BLANK FLANGES:**

Blank flanges shall be provided at all ends left unattached for temporary closure of work and also for commissioning a section of pipeline for testing the line laid. For temporary closure non pressure blank flanges consisting of M.S. plate tack welded at the pipe ends may be used. The blank flanges or domes designed as per requirement shall be provided. Separate payment will not be made for the flanges or domes.

**STRAPS:**

Whenever pipe line is to be done from two faces and / or required to be done in broken stretches due to any difficulty met at site the final connection has to be done by introducing straps to cover the gap up to 30 cm length. Such straps shall be fabricated in field by cutting pipes splitting them longitudinally and tapping them over the ends connected in the form of collar. The collar shall be in two halves and shall have the inside diameter equal to the outside diameter of pipe to be connected. A minimum lap of 8 cm on either end of the pipe shall be kept and fillet welds shall be run for circumferential joint. The longitudinal joint of the collar shall be butt welded. The material for straps and labor for doing above work is included in the rate, and nothing extra shall be paid for material as well as labour. The joints shall be provided with Reinforced cement mortar coating outside and cement mortar lining inside.

**HYDRAULIC TEST:**

The final high pressure test on the completed sections over ground or in the trench shall be performed before back filling. The testing shall be carried out in strict compliance with the testing procedure that shall be specified by the Engineer-in Charge / consultant. The final hydro-static pressure test on the pipe line shall be performed with water. All arrangement required for testing shall be made by the contractor and after testing they shall be removed to the entire satisfaction of the contractor and after testing they shall be removed to the entire satisfaction of the Engineer-in-Charge. Water to be used for testing should be clean, arranged and supplied by the contractor. While the line is full, hydro-static pressure shall be applied at 1.5 times the internal design pressure and maintained on the line without significant loss. The testing shall be at least for 24 hours. Failure of the line disclosed by loss of pressure shall be located and reported by the contractor. Cost of required repairs shall be borne by the contractor. Before taking delivery and commencement he should inspect the pipes and if any defect is noticed at the time of taking over he should bring it to the Engineer-in-Charge.

**LOWERING:**

- 1) After the application and inspection of coating, the entire welded pipes shall be normally lowered into the finished trench next day after completion of the coating where ever required.
- 2) The trenches shall be of sufficient width, to enable lowering of pipe without difficulty. The trench bottom shall not be uneven.
- 3) If required 20 Cm thick bedding be provided using the selected excavated soil/murum without any extra cost. The bedding shall be watered, rammed, and well consolidated before laying of pipes.
- 4) Water present in the trench at the time of lowering shall be bailed out by the contractor without any extra cost.

**CONTRACTOR'S SCOPE:**

Cutting of pipes required for fabricated specials or for completing the gaps should be cut in such a way that the wastage shall be minimum.

**THE SCOPE FOR THE ITEM COVERS:**

Right of use for 10 meter width of private fields for laying pipe line, crop compensation for one session will be included in this right of use. If contractor fails to lay & joint pipe in one season and as a result of his failure if required of 2nd payment of crop compensation to field owner arises, then this second payment shall be made by contractor.

Right of use for obtaining excess to pipe line alignment, placing pipes, dumping excavated stuff and any other operation related to pipe line shall be obtained by the contractor at his cost. The contractor at his cost shall also pay Right of use crop compensation for such work. Owners shall not make any payment to the contractor, to the field owner for such Right of use.

Protection of existing works from damage and cost of repairs to the damages carried out to the existing structure, poles, sewer, pipe line, telephone, electricity cables, electric line, gas pipe line, irrigation pipe line etc.. are in the scope of contractor.

Cost of additional excavation required for jointing , clearing the site of all scrubs, bushes and trees and dewatering whenever necessary.

Cost of all materials like steel, cement, aggregate, bolts, nuts, washers, white lead, grace, rubber packing etc. necessary for pipe lowering, laying and jointing.

Labor for laying pipes in trenches to correct alignment at required depth with tools including cutting of pipes and specials if required for laying the pipes, including connecting pipes, to specials and appurtenances.

Cost of scaffolding, tools and plants, ropes etc.

Protection of existing works from damage and cost of repairs to the damages carried out to the exciting structures, poles, sewer, pipe line, telephone/electricity cables, electric lines. pipe line, etc.

Labour for making joints including welding with all materials for joints, tools as well as test for welds including testing of welded joint as per IS 5822 : 1994 para 6.2 etc.

Testing of pipes for leakage under water pressure, and flushing the pipes after testing. Water required for this hydraulic testing and construction work shall have to be arranged by the contractor at his own cost.

Re welding defective joints:

Providing temporary arrangements to keep the pipe clean and in position.

Labor for cutting pipes by gas cutting or any other method and laying and fixing the same. Labor for fabricating necessary specials such as bends, tees, reducers, enlarges, branch, flange etc. using M. S. Plates including drilling holes in flanges as may be required.

Carting surplus pipes, pieces, scrap etc. to stores at plant site, head work or sub head work sites.

Supply of any other material or labor not mentioned above but required to complete the work.

**METHOD OF MEASUREMENT OF PIPES:**

The measurement shall be recorded in running meter of pipe length laid along center line or axis of pipe line including tees, enlarges, reducers and bends correct up to 0.01M. length. No payment shall be made for overlaps etc. 30% payment of this item shall be withheld for satisfactory hydraulic testing.

The sanction from State (R&B) /National Highway Authority / GSPC / PGVCL / Telephone Department etc. Concern authority department for the purpose of road crossing will have to be obtained by the Tenderer. Agency shall have to do whole liaisoning work at his own level, however, RMC will recommend for the same wherever necessary. The charges occurred for obtaining such permission will have to be initially borne by the tenderer. However, RMC will reimburse only such relevant charges paid to such department(s), upon submission of necessary document i.e. Receipt etc. in original.

**ITEM NO. 16**

**Labour work only Pushing casing pipe (With Jointing) & pushing Carriage Sewage Pipe (With Jointing) For State Highway Crossing.**

**ITEM NO. 17**

**Providing and constructing "S1" type scraper manholes as per the type design in PCC-1:3:6, brick masonry in C.M. 1:4 and inside and outside plastering in C.M. 1:3, Benching- 1:2:4 necessary coping in C.C. 1:1:2, fixing H.D.P.E. Steps and fixing manhole frame and covers (But excluding supply of manhole frame and covers)**

**17.1 ---do--- Up to 2.50 Mt. Depth**

**17.2 ---do--- Extra Depth 2.51 Mt. To 9.00 Mt. Depth**

The said drainage manhole as per drainage type design is to be carried out in brick masonry in CM 1:4 and CC in foundation in 1:3:6 including bedding, benching in 1:2:4 and the inside plaster work in niru finishing in CM 1:3 as per drainage drawing is to be carried out whereas the outer plaster in CM 1:3 is to be done with necessary fixing of HDPE reinforced plastic steps of size 385 x 165 x 0.25 mm as per given type design is to be done. Precast RCC manhole frame and cover is to be done 1:1.5:3 by filling coping and fixing work. The work shall be such that there shall not be no leakage in the manhole, in which, the rate for excavation shall be paid separately which is not included the prescribed rate. The frame and cover shall be provided by RMC Store and same shall have to be transported from Store to Site at the cost of contractor and fixing work is to be carried out accordingly, for which, the rate for only fixing work shall be paid.

The rate for manhole shall be for one number in which, the rate for frame and cover shall be paid separately where for additional depth, the rate shall be paid on one running meter basis as shown in Schedule of this tender.

**THE MANHOLE AND DEPTH OF MANHOLES :-**

The manholes on the sewers shall be constructed in the form and of the dimensions shown in the Drawing. The depth of the manholes shall be measured from the top of cover to the invert level of the manhole.

The manholes shall be constructed at places shown on the drawings or whatever directed by the Engineer. Type designs for these manholes are shown on the drawings but the actual type and dimensions shall in each case be determined by the Engineer as the circumstances may require. (Refer drawing No. R.M.C.- DRN - PHASE-III - 01 to 09 )

**CONSTRUCTION OF BRICK MASONRY MANHOLES :**

The brick masonry shall be constructed as per the type design shown in the drawing enclosed. The various types of manholes to be adopted as per the requirement have been indicated in the L-section and sewer layout drawing in general. The manhole will be fitted with R.C.C. pre-cast medium or heavy duty manhole frame and cover as the case may be. The brick masonry manhole shall be plastered from inside and outside as shown in the drawing and as shown CM proportion and thickness.

**FLOORS AND 0.80 ID CHANNEL PIPES :**

The floor shall consist of cement concrete. Concrete of R.C. 0.80 ID channel pipes of the required size and curves shall be laid and bedded in cement on the concrete base to the same lines and fall as sewers unless otherwise directed. Both sides of the channel pipes shall be trenched up in concrete and rendered in cement mortar 20 mm thick and formed to a slope of not less than 1 in 12 to the channel.

**STEPS :**

Where the depth of the invert exceeds 0.90 M below the surface of the ground, HDPE reinforced steps of approved pattern shall be provided as per type design shown in manhole drawings.

**RATE OF MANHOLES :**

The rate for construction of manhole to be quoted in the bill of quantities shall include complete masonry, structure, concrete cap, plastering with cement from inside and outside, bottom concrete or channels including providing and fixing of HDPE reinforced steps and fixing of R.C.C. manhole frame & covers complete as per type design drawing and cutting the pipes flush with the inside plaster of the wall. The manholes will be paid per numbers up to the minimum depth shown in the type design and for depth beyond the specified minimum depth for a particular type of manhole, extra will be paid per running meter depth. The rates includes dewatering during all stages of construction.

The brick masonry will be paid per number excluding excavation but including masonry, bottom concrete, plastering, benching channel fixing of RCC frame and covers. (Refer R.M.C. DRG for H.C.1, H.C.2)

The rate for **Item No.17.1** shall be for a unit of one number whereas the rate for **Item No.17.2** shall be for a unit of running meter.

#### **ITEM NO 18**

**Removing of existing 1100 mm dia. GRP Pipeline incl. removal of specials, valves jointing material including stacking of removed material as directed (excluding excavation and refilling)**

The payment shall be made on Running meter basis.

#### **ITEM NO 19**

**Iron work as per drawing and instruction including all.**

MODE OF MEASUREMENT AND PAYMENT:

The rate shall be as per Kg basis.

#### **ITEM NO 20**

**Liasoning Fee of Providing Co-ordination Services for approval at Govt / Semi Govt Departments**

#### **ITEM NO 21**

**Hydro / Crain Rent to work on site**

The rate shall be as per 8 Hours/Day basis.

#### **ITEM NO 22**

**De-watering work for excavation of trench during Job work / repairing etc. with diesel engine Pump set (3 to 5 HP) with suction delivery pipe including proper disposal of water by Contractor, fuel transportation, adm. of pump set etc. all overheads (including all material, spare-parts etc. for dewatering) and temporary O&M, transportation etc. complete**

The rate shall be as per Hours basis.

#### **ITEM NO 23**

**Supply of Generator set on site including required fuel, transportation, power supply connection etc. for Electric Welding Machine where electricity is not available**

The rate shall be as per 12 Hours/Day basis.

**ITEM NO 24**

**Welding work at site using Electric welding machine or Gas welding machine including welding machine rent, transportation, welding material etc.complete**

The rate shall be as per 12 Hours/Day basis.

**ITEM NO 25**

**To Remove Existing Repairable Sluice Valve of Different Sizes & Fit the same by doing Excavating, Filling, Paver Dismantling, Site Cleaning with Traffic Regulation etc. complete including Transportation Excluding De-Watering Work. 300 mm , 900 mm and 1100 dia.**

The rate shall be as per No. basis.

**ITEM NO 26**

**To Remove Existing Repairable Sluice Valve and Air Valve of Different Sizes & Fit the same by doing Excavating, Filling, Paver Dismantling, Site Cleaning with Traffic Regulation etc. complete including Transportation Excluding De-Watering Work. 150 mm**

The rate shall be as per No. basis.

**ITEM NO 27**

**1100 mm Dia Mechanical Joint (Couplin) for joint of DI Pipe**

The rate shall be as per No. basis.

Signature of contractor.

**A.E.  
R.M.C.**

**D.E.E.  
R.M.C.**

**C.E.(Drainage Project)  
R.M.C.**



## **SPECIAL CONDITIONS:**

1. The contractor shall have to provide his own level instrument for this work .
2. Work is required to be carried out in residential area where all the services like water supply, sullage water pipeline, gas pipeline, telephone / electric cable are existing. Under the circumstances, prior to starting the work agency shall have to excavate the trenches manually for up to minimum **1.50 mt.** depth. During the course of execution, all the services shall have to be maintained by the agency and any damage to any services or property, the agency shall have to get it repair at their cost.
3. For excavation of trench, use of JCB machine will not be permitted directly on the top surface of the road. After excavation up to minimum 1.50 mt. depth from road surface or existing ground level, same shall have to be carried out manually or by using Breaker and after locating underground services like; water supply pipeline, gas pipeline, water connection lines, pipe gutters, telephone cables, electric cables etc., and thereafter upon taking the prior approval of the Engineer-In-Charge, the excavation can be carried out by using JCB machine.
4. Rajkot Municipal Corporation shall recommend to the competent authority to give Controlled Blasting License to the contractor for carrying out excavation in hard rock. In case of blasting license not permissible from the competent authority in some places then excavation is to be done by using wedges and hammers, chiseling, breakers, pneumatic tools, etc. Also in case where blasting license is permitted but even then if there is no possibility of carrying out the blasting for whatsoever reason, the excavation is to be done by using Wedges and hammers, chiseling, breakers, pneumatic tools etc. No extra payment shall be made for excavation to be carried out in any of the above mentioned both the situations.
5. Excavation in soft rock and hard rock shall have to be carried out only by Chiseling, Breaker (pneumatic tools) etc., as far as possible. If excavation is not possible in terms of above and if excavation is required to be carried out with the help of blasting then the same shall have to be carried out only after taking prior approval and necessary license for blasting from the competent authority.
6. In case of excavation not possible manually or by chiseling in certain place(s) as well as if blasting is also not possible due to various reasons i.e. to avoid damage to nearby water pipeline, pipe gutter, telephone cables / Duct, Raw houses / week buildings / narrow street etc., then the excavation by blasting will not be permitted. Under these circumstances, excavation shall have to be carried out only by Breaker (pneumatic tools) as per the instructions of the Engineer-In-Charge. No extra payment will be made for such type of excavation done by using Breaker. The rate for excavation shall be paid as per the rate of related item mentioned in Schedule-B.
7. The safety of the trenches is the prime important factor. Along the trenches on both the side, a hump of excavated stuff of minimum height 3 to 5 ft shall have to be provided till the work is got completed. However, where there is no defined road, in such area, the fencing/lighting etc., requires to be provided as per safety clause. Sign Board shall have to be provided at required locations, so that there will not be any fatal accident.
8. The quantity of various items mentioned in the schedule-B is liable to increase or decrease up to any extent. Under the circumstances, the contractor shall have to carry out the work accordingly without any rate escalation. Rajkot Municipal Corporation will not entertain any dispute in this regard.

9. In excavation, the decision regarding classification of strata shall rest with the Engineer-In-Charge and his decision in this regards shall be final and binding to the Contractor.
10. The rates are inclusive of dewatering, if required.
11. In case of any ambiguity found in specifications / drawings etc, the decision of engineer-in-charge shall be final and binding to the contractor.
12. **The clear cover on pipe shall be 1.50 mt.**
13. Rajkot Municipal Corporation shall recommend to the competent authority to give Controlled Blasting License to the contractor for carrying out excavation in hard rock. In case of blasting license not permissible from the competent authority in some places then excavation is to be done by using wedges and hammers, chiseling, breakers, pneumatic tools, etc. Also in case where blasting license is permitted but even then if there is no possibility of carrying out the blasting for whatsoever reason, the excavation is to be done by using Wedges and hammers, chiseling, breakers, pneumatic tools etc. No extra payment shall be made for excavation to be carried out in any of the above mentioned both the situations.
14. Excavation in soft rock and hard rock shall have to be carried out only by Chiseling, Breaker (pneumatic tools) etc., as far as possible. If excavation is not possible in terms of above and if excavation is required to be carried out with the help of blasting then the same shall have to be carried out only after taking prior approval and necessary license for blasting from the competent authority.
15. In case of excavation not possible manually or by chiseling in certain place(s) as well as if blasting is also not possible due to various reasons i.e. to avoid damage to nearby water pipeline, pipe gutter, telephone cables / Duct, Raw houses / week buildings / narrow street etc., then the excavation by blasting will not be permitted. Under these circumstances, excavation shall have to be carried out only by Breaker (pneumatic tools) as per the instructions of the Engineer-In- Charge. No extra payment will be made for such type of excavation done by using Breaker. The rate for excavation shall be paid as per the rate of related item mentioned in Schedule-B.
16. In case of any ambiguity found in specifications / drawings etc, the decision of engineer-in-charge shall be final and binding to the contractor.

**Signature of Contractor**

**A.E.  
R.M.C.**

**D.E.E.  
R.M.C.**

**C.E.(Drainage Project)  
R.M.C.**

**D. ADDITIONAL CONDITIONS:**

1. Regarding the width of excavation, as (a) it is difficult to carry out the vertical trench excavation, (b) possibility of sliding the soil, and (c) uneven excavation trench width in case of blasting. In this connection, for every 1.50 mt lift if there is less width up to 5 cm at the bottom then the top width of excavated trench, it shall be considered as per the specified trench width or actual trench width carried out at the ground level by the contractor whichever is less. If excavation is carried out more than the specified width then the payment will be made only for the specified width of excavation.
2. After entering into an agreement, the agency shall have to finalize the agency for supply of the material like pipes, valves, etc., and the name of manufacturer / supplier should immediately be informed to Rajkot Municipal Corporation so that Rajkot Municipal Corporation can also expedite the manufacturer / supplier for the material. If necessary, Rajkot Municipal Corporation will visit and inspect the factory. During the inspection, if Rajkot Municipal Corporation is not satisfied then the contractor shall have to procure the material from other manufacturer(s).
3. While the work in progress, there is possibility of change in drainage line routes according to the site conditions. Under these circumstances, the contractor shall have to carry out the work accordingly, for which, no extra payment shall be made in such situations. Over and above, the decision of Engineer-in-charge for change in drainage line routes shall be final and binding to the contractor.
4. The prices shall have to quoted firm and fix including all the taxes and duties without any statutory variation.
5. The contractor shall have to get registered under ESI (Employer's State Insurance) Act and obtain ESI Registration as per rules. Also, the agency shall have to give all the benefits to the workers as available under the ESI Act. The agency should follow all the rules and regulations of ESI Act as per prevailing norms.

**Signature of Contractor**

**A.E.  
R.M.C.**

**D.E.E.  
R.M.C.**

**C.E.(Drainage Project)  
R.M.C.**

**Note on Schedule:**

1. The bidder shall note that timely completion of this important work is of essence in meeting the overall schedule of completion of work under this sewerage project.
2. The bidder shall have to identify various risks involved in this work and shall accordingly frame the methodology for constricting the same.
3. The rates and prices shall be submitted in the formats given in the online Price Schedules. Rates and prices received in any other formats will be rejected and the Bids will be disqualified.
4. It will be entirely at the discretion of the Owner to accept or reject the bidder's proposal, without giving any reasons whatsoever.
5. In Price Schedule, bidder shall quote his percentage above/below for items listed in the schedule. Prices quoted in Schedule only will be considered for price evaluation & shall form a part of the Contract Agreement.
6. Only Price Schedule will be considered for financial evaluation of the bid with the successful bidder.
7. The bidder shall be deemed to have allowed in his price for provision, maintenance and final removal of all temporary works of whatsoever nature required for construction including temporary bunds, diverting water, pumping, dewatering etc. for the proper execution of works. The rates shall also be deemed to include any works and setting out that may be required to be carried out for laying out of all the works involved.
8. Where there is a discrepancy between the unit rates and the amount entered, in the price schedule the latter shall govern.
9. The Price Schedules are to be read in conjunction with the Conditions of Contract, the Specifications and other sections of these bid documents and these documents are to be taken as mutually explanatory of one another.
10. Prices quoted by the bidder shall be firm for the entire period of Contract without any escalation.
11. The bidder shall interpret the data furnished and carry out any additional survey work, or investigation work required at his own cost.
12. The prices quoted shall also include the cost of materials utilized for testing.
13. The bidder should acquaint himself with the site conditions including the access to Worksite. The successful bidder shall have to make suitable access to worksites at his own cost. These accesses will be used by the other Contractors working for RMC.
14. From each Running Account Bill, labour cess, Income Tax, Value Added Tax (VAT), Professional Tax, and other taxes prevailing from time to time will be deducted as per norms.
16. The contractor shall have to avail P F Code as per the prevailing Circular of Government for the employees on work. The process for preparation of bill will be taken up only after submission of the Challan for the amount of P.F. deposited every month for the employees on work, which will binding to the contractor. The required documents shall have to be submitted every month by the contractor to the competent authority.

17. The quoted rates should be inclusive of all taxes and duties.
18. The prices shall have to be quoted firm & fix including all the taxes & duties without any statutory variation. RMC will not consider any statutory variation as well as the price rise in the market and if any, those shall be on account of contractor
19. The work contract tax shall be borne by the agency.
20. The contractor shall have to borne all charges for testing and inspection purpose
21. For hydraulic test of pipe, water, power, labor etc. required for the necessary test shall be arranged by the contractor at his own cost.
22. The rates of excavation are inclusive of shoring, strutting, dewatering, refilling etc. complete and hence no any extra payment shall be made for the same.
23. During construction activity, proper care must be taken for labour safety and all the provisions of the labour laws must be followed by the contractor.
24. Testing of the materials like Bricks, Sand, Aggregate, Reinforcement, structural steel, etc. should have to be tested periodically as suggested by the Engineer-in-charge at government approved material testing laboratory and testing charges for the same has to be born by the contractor.
25. This office Circular bearing No.RMC/C/329 dated 22-12-2012 and Order No.RMC/C/132 dated 10-06-2013 are uploaded separately as a part of tender document. The Contractors quoting their rates shall have to read, implement, and submit the same duly signed along with the documents to be submitted during physical submission.
26. In reference to the above Circular and Order cited in Para above, the Contractors who have quoted their rates for this work will be called in person for verification of original documents. The date and time for verification of original documents will be as prescribed in the tender document.
27. In Every running bill 0.10% amount shall be retained as extra security deposit If Drawings of work done are not submitted. As Road Restraining is the responsibility of work contract agency, in Every running bill 0.50% amount shall be retained as extra security deposit for purpose of Corrections for road restraining in case of settlement of surfaces of refilled trenches. These shall be released after 1 Year.
28. The manufacturer shall have a laid down **Quality Assurance Plan** for the manufacture of the products offered which shall be submitted along with the tenders and successful tendered shall have to get its approval from RMC. All the materials, pipe, specials, valves etc. shall have to be inspected through Inspecting TPI/PMC Agency whichever suggested by RMC and the charges for the TPI/PMC Shall have to be borne by the RMC .
29. No extra item or extra width will be paid due to excavating method or type of machinery.

30. Appendix provided in tender is a sample format. The bidder shall furnish the details of concern tender duly signed by Chartered Accountant and Tenderer. List of on-going Works (i.e. Running Work details) must be attached. Ongoing work list shall include details name of work, total amount of awarded work, Work done amount till date, pending work today. In this Appendix, the details of experience and amount shall have to be mentioned in the respective column.
31. For any type of license regarding labour etc. has to be achieved by agency
32. The routes and levels shown in the maps are indicative and not final. There are possibilities of change in routes and levels at the time of execution of work and due to which the diameter of pipeline and depth of drainage line may increase or decrease. Under the circumstances, the contractor shall have to carry out the work accordingly at the approved rates without any extra cost. Rajkot Municipal Corporation will not entertain any dispute in this regard.
33. The contractor shall have to carry out the sub-soil strata investigation at his own cost.
34. If progress of work look slow, Extra Security Deposit may be recover from any running bill as decided by Engineer in charge up to maximum 5% amount of concern R.A. Bill amount.
35. Payment shall be only be done in case of complete section. Complete section - It is the length of laid Pipe part of the Work where sand bedding has been done and the same be backfilled as per tender norms be completed and the surface has been finished by proper compaction as per tender norms and / or as per instruction of engineer in-charge.
36. Where there are the areas having dense population or any other unsuitability, blasting may not be permitted.
37. Where there are the areas having narrow streets (3 to 4 Mtr. wide) big machinery may not enter.
38. Kachcha houses shall not be get damaged. Considering this manual labour work may be more feasible.
39. No extra item or extra width will be paid due to excavating method or type of machinery.
40. The tenders are advised to visit the project area and get acquainted with the local condition as the said area is residential area with numbers of underground utility services like water supply pipe line, sullage water pipe line, gas pipe line, telephone/electric cable, KHAL-KUVAS etc. which requires to be maintained during the progress of work. The safety of the work is prime important factor and all the tenderer should be very much vigilant for the same. Thus, there may be some locations where clear ROW or ROU may not be available due to certain reasons like TP Road open Issues, Permissions etc. If work of that much location is affected due to such reasons time limit may be extended considering that non-working period but in no case Price Escalation will be given for that extended period.  
  
Thus, it is to be clear that to work within utility services is a part of this work. If utilities are affected, it shall be the responsibility of tenderer to make same as it was as before. The expenditure and arrangement shall be bear by Tenderer.
41. Temporary drainage work like temporary diversion of gutter line, khal kuvas or bailing work of sub soil water, diversion of storm water way etc., is to be carried out by contractor without any extra claim. Cost towards shifting, repairing, replaced of utilities to be born by Tenderer.
42. In case of Extra Item, No on % age i.e. +ve % age Rate will be given but If there is Down % age i.e. -ve % age Rate that will be applied to that rate of that Extra Item.

43. Before procurement of Material the Quality Assurance Plan (QAP) shall be approved by RMC. QAP for approval shall be submitted in 3 Original copy duly signed and stamped by Manufacturer, Third Party Inspection Agency/ PMC and Tenderer. The draft QAP has been attached herewith.
44. The 'Vendor Form' provided in the tender document shall also have to be filled by the contractor and submitted along with all other required documents during the physical submission.
45. Any Financial document i.e. FDR, Demand Draft, Bank Guarantee etc., must be accompanied with the details like; Name and Address of Issuing Branch, Name and Address of Verifying Branch, Name & Designation of Contact Person, Contact Number, e-mail address, Fax Number etc.

Signature of contractor

**A.E.**  
**R.M.C.**

**D.E.E.**  
**R.M.C.**

**C.E.(Drainage Project)**  
**R.M.C.**

## **E EXECUTION OF WORKS**

Bidders shall keep in view the following constraints / site condition for bidding purpose.

1. Bidders shall note that timely completion of this important link is of essence in meeting the overall schedule of completion of work under this work.
2. The bidders shall have to identify various risks involved in this work and shall accordingly frame his methodology for construction the same.
3. It should be noted by the bidders that payment schedule to be approved the Owner will be exclusively govern by the actual progress of the work.
4. General soil type encountered is rocky. Once the monsoon breaks over the area which is generally end of June the site becomes water logged due to flat terrain condition. The nallahs which are practically dry may have substantial flows owing to rainfall. The contractor shall have to keep in view this condition for his planning purpose.
4. All the data, information etc, which are available, are given in the tender, similarly, the lengths of different trenches of pipeline and the profile indicted are based on the available topographic survey of the pipeline route. However, bidder should make his independent assessment of the pipeline route considering site conditions obtain and check all the data required from the sites and frame his bid accordingly.
5. Bidders shall take into account the change in alignments of the pipeline in both horizontal and vertical direction, along the entire route of pipeline. Pipe bends to suite the change in alignment a to be provided. Also anchor block / thrust block of suitable size are also to be provided considering the site situation.
6. The field hydraulic test pressure of the completed installation shall be as per relevant IS.
7. The makes for cement shall be Ambuja, Ultra Tech, Lotus, ACC, JK (Laxmi Brand), Sidhhi.
8. The Fe-415/Fe 500 HYSD-Reinforcement conforming IS:1786 steel shall be of make TATA VIZAG, SAIL, ELECTROTHERM, GALLANT or NEELKANTH.
9. Regarding water supply for hydro testing, it was clarified that necessary water / power / labour etc. required for the necessary test shall be arranged by the contractor at his own cost.
10. There may be some locations where clear ROW or ROU may not be available due to certain reasons like DP Road opening issues, permission from concerned authority etc. If work of such location(s) is/are affected due to such reasons, time limit may be extended considering that non-working period but in no case Price escalation will be given for that extended period. It is to be noted that, the work within utility services will be a part of this work. If utilities are affected, it shall be the responsibility of tenderer in full to rectify and correct the same. All arrangements in this regard is to be done by the tenderer as well as all such expenditure will have to be borne by the Tenderer.

Further, the pipeline work required to be carried out by crossing the existing compound wall of Pumping Station / STP site, the damage to the compound during the execution of



pipeline work will have to be rectified and corrected by the tenderer in whole, for which, no extra payment will be made by Rajkot Municipal Corporation.

11. The sanction from State/National Highway Authority /GSRDC/ GSPC / PGVCL / Telephone Department etc. Concern authority department for the purpose of road crossing will have to be obtained by the Tenderer. Agency shall have to do whole liaisoning work at his own level, however, RMC will recommend for the same wherever necessary. The charges occurred for obtaining such permission will have to be initially borne by the tenderer. However, RMC will reimburse only such relevant charges paid to such department(s), upon submission of necessary document i.e. Receipt etc. in original.

Signature of Contractor \_\_\_\_\_

### APPROVED VENDOR LIST

SR. NO.	PARTICULARS	DESCRIPTION
1.0	DI Pipes & Specials/Fittings	Electrosteel, Lenco–Khalasthi, Electrotherm, Jai Balaji industries Ltd., Jindal, Tata, Kejriwal casting Ltd., Kiswok industries Ltd., Kartar, Yuvraj, Jindal Steel & Power Ltd. and any other included in GWSSB PRESENT VENDOR LIST.
2.0	SLUICE VALVE/BUTTERFLY VALVE	ISI Marked 14846 only.
3.0	AIR VALVE	ISI Marked 14845 only.
4.0	MS PIPE SPECIALS	SAIL, WELSPUN, SAW, Jindal, ESSAR STEEL & MANUFACTURERS IN GWSSB PRESENT VENDOR LIST.

**Signature of contractor.**