GUJARAT ENERGY TRANSMISSION CORPORATION LIMITED
[Govt. of Gujarat Undertaking]
Circle Office, Post. Dabhan, Nadiad, Dist. Kheda, Gujarat, Pin- 387 230
E-mail: - setrnadiad.getco@gebmail.com

Corporate Identity No.U40100GJ1999SGCO36018

E-TENDER FOR THE WORK OF

"Providing & fixing Barbed Wire fencing for Various 66 KV & EHV S/S under Nadiad TR Circle."

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E - TENDER NOTICE

SE (TR) invites "On line Tenders" (e-tendering) for the mentioned in below table from registered Contractors in appropriate class with GETCO / Central / State Government / Railway/Semi. Govt. and who has executed civil works successfully as mentioned in Qualification requirement criteria given in the tender document. Bidders should fulfill the all the qualification criteria. Otherwise, their bids will not be considered & price bid will not be opened. All the bidders should have valid e-tender vender registration.

Tender Papers & Specifications may be downloaded from Web site as https://getcotender.nprocure.com (**For view, download and on-line submission)**.

All tender documents are to be upload (Notarized / self-attested copies of original – as specified in tender document) including scanned copy of duly attested Tender fee receipt, EMD receipt, Integrity Pact, attested tender documents with technical specification & other mentioned documents in qualification requirement through online only (mandatory) on (n) procure portal

NO PHYSICAL DOCUMENTS TO BE SUBMITTED BY BIDDER

1	Tender Notice No.:	**NTC/CIVIL/JUNE26/121**
2	Name of work	**"Providing & fixing Barbed Wire fencing for Various 66 KV & EHV S/S under Nadiad TR Circle."**
3	Tender Fee (non-refundable)	**₹ 2832.00 (Including GST @ 18%) (2400+432) Payment of Tender fee will be accepted through RTGS / NEFT mode only**
4	Estimated cost Including GST & WC	**₹ ₹ 50,25,045.93**
5	Earnest Money Deposit (EMD) amount	**₹ 50,250.00 Payment of EMD will be accepted through RTGS / NEFT mode only**
6	Time Limit	**11(Eleven) Calendar Months**
7	Required Class of Contractor	**Class D or Above**
8	Type of Tender (Works)	**Percentage Basis on FIRM PRICE**
9	On line (E-tendering) tender/ offer submission last date up to 16.00 hours only (This is mandatory)	**As per Tender Notice Schedule**
10	Date of opening of Preliminary & Technical stage (on-line Opening)	**As per Tender Notice Schedule**
11	Tentative Date of on – line opening of Price bid, (if possible),	**Shall be intimated separately**

IMPORTANT:

2 Quality Assurance

1. **All the online Annexures i.e. Annexure - 1 to 8 and price bid, other tender documents (refer Table-A) must be submitted/attached through online form only.**
2. Bidder has to upload scanned copies of original (Notarized / self-attested copies of original – as specified in tender document) documents with bid and **no physical documents to be submitted by bidder except Tender fee, EMD and Integrity pact**.
3. All such documents should be strictly submitted through online uploading. Otherwise the offer will not be considered and no any further communication in the matter will be entertained on or before due date of submission. **However, of anywhere in tender documents submission of other than this document or physical submission mentioned to be overlooked.**
4. Tender fees & EMD amount should be paid by **Online-payment mode only. Payment of Tender Fees & EMD by RTGS/NEFT shall be encouraged. After the payment through RTGS/NEFT bidder has to mail following details:**

Sr. No	Required Details
1	Name & Address of the bidder
2	Bidder GST No
3	Tender No with due date
4	Mode of Transfer
5	Ref. ID with Bank Details
6	Paid Amount
7	Payment against (**Tender Fee / EMD**)

To:

a. **setrnadiad.getco@gebmail.com**
b. **decivilnadcir.getco@gebmail.com**
c. **aotrnadiad@gebmail.com**

Bidder has to provide all above details on the same date of payment so that receipt can be generated.

- **GETCO Beneficiary Bank detail is as under:**

1	Name of Account Holder	Gujarat Energy Transmission Corporation Ltd.
2	Account No.	02900200000624
3	Name of Bank	Bank of Baroda
4	Address of Bank	Main Branch, Basudiwala Tarrace, Santram Road, Nadiad
5	IFSC Code	BARB0NADIAD
6	PAN No	AABCG4029R
7	TAN No	BRDG01028G
8	GST No	24AABCG4029R2ZC

The transection slip of payment made by RTGS/NEFT is to be uploaded in N-procure with tender documents

5. In case short submission of documents with bid and / or clarification if any required from the bidder, the required details / documents may be asked from bidder in physical form.
6. It shall be sole responsibility of the bidder that the uploaded scanned documents (in PDF form) remain legible and should not be password protected.
7. All the relevant scanned documents as per requirement of the tender are to be upload through online only on n-procure portal including Tender fee, EMD and Integrity Pact.
8. Tender will be evaluated on basis of Data / Details / Documents submitted by online form only.
9. It is mandatory for all the bidders to upload their tender documents by on line only (E-tendering) in scheduled time. **No documents shall be considered physically which are mentioned for on-line submission only.**
10. The bidders are required to fill up all the online annexure / forms (word file attached) and shall be uploaded invariably. This is intended for transparency and speedy evaluation of the bids. Instead

of simply confirming / attached in bid / refer physical offer, the Bidder shall fill in the particulars against appropriate place in respect of each line appearing in each online annexure. Wherever required, bidder shall invariably have to upload supporting authentic documents in the online bid. (In the absence of required details in the online annexure, the purchaser has every right to evaluate the bids accordingly and bidder cannot raise any objection against any point during evaluation.)

11. Bidders are requested to remain in touch with the web-site for any amendment / corrigendum or extension of due date etc

12. The Earnest Money Deposit and tender fee will be accepted through online payment mode NEFT/RTGS only and Tender Fee payment through NEFT/RTGS with different purchaser or agency shall not be accepted. Tender without EMD and tender fee shall be rejected. Two separate transection for Tender fee and EMD should be submitted.

13. The GETCO reserves the right to award the work to one or more bidders, considering their technical and financial capacity OR to reject any or all tenders or accept any tender without assigning any reason thereof.

Any technical questions, information and clarifications that may be required pertaining to this enquiry should be referred to: **The Superintending Engineer (TR), Gujarat Energy Transmission Corporation Limited, Circle Office, Opp. Collector office, P.O. Dabhan, Nadiad, Dist. Kheda, Gujarat, Pin – 387320.**
GETCO reserves the right to reject any OR all tenders without assigning any reasons thereof.

Yours faithfully,
Superintending Engineer
Nadiad

To view the PDF file please use “Acrobat Reader” software which can be downloaded from “Adobe” website.

GUJARAT ENERGY TRANSMISSION CORPORATION LIMITED
NADIAD Date:

I N T E G R I T Y P A C T

OUR ENEAVOUR

To create environment where Business Confidence is built through Best Business Practices and is fostered in an atmosphere of trust and respect between providers of goods and services and their users for the ultimate benefit of society the nation.

GETCO COMMITMENT	PARTY'S COMMITMENT
▪ To maintain the highest ethical standards in business and professional.	▪ Not to bring pressure / recommendations outside GETCO to influence its decision.
▪ Ensure maximum transparency to the Satisfaction of stakeholders.	▪ Not to use intimidation, threat, inducement or Pressure of any kind on GETCO or any of its employees under any circumstances.
▪ To ensure to fulfill the terms of agreement / contract and to consider objectively the viewpoint of parties.	▪ To be prompt and reasonable in fulfilling the contract, agreement, legal obligations.
▪ To ensure regular and timely release of payment on due dates for work done.	▪ To provide goods and / or services timely as per agreed quality and specifications at minimum cost of GETCO.
▪ To ensure that no improper demand is made by employees or by anyone on our behalf.	▪ To abide by the general discipline to be maintained in out dealings.
▪ To give maximum possible assistance to all the vendors / supplier / Service provider and other to enable them to complete the contract in time.	▪ To be true and honest in furnishing information including payment to agents / sub-agent.
▪ To provide all information to suppliers / contractors relating to contract / job which facilitate him to complete the contract / job successfully in time.	▪ Not to divulge any information, business details available during the course of business relationship to others without the written consent of GETCO.
▪ To ensure minimum hurdles to vendors / suppliers / contractors in complete of agreement / contract / work order.	▪ Not to enter into carter / syndicate / understanding whether formal / non-formal so as to influence the price.

_____
Seal & Signature
(GETCO Authorized Signatory)

Name:
Designation:

_____
Seal & Signature
(Party's Authorized Person)

PART.II
Technical Specification & Commercial Conditions

6 Quality Assurance

SECTION – A
INSTRUCTIONS TO THE BIDDERS

GUJARAT ENERGY TRANSMISSION CORPORATION LIMITED.
[Govt. of Gujarat Undertaking]
Transmission Circle Office, Post. Dabhan, Nadiad, Dist. Kheda, Gujarat, Pin- 387 320.
E-mail:- setrnadiad.getco@gebmail.com

(A) INSTRUCTIONS TO THE BIDDERS

(A1) SCOPE OF WORK :

(1) The site of proposed work is **within jurisdiction of NADIAD TRANSMISSION CIRCLE OF GETCO. The work is to be carried out in electrically charged SUB – STATIONS working at 11,000 OR 66,000 OR 132 KV OR 220 KV HIGHER VOLTAGE.** The works shall be carried out as per tenders specifications & detailed work order.

(2) Any activity not specifically mentioned in the tender but necessary in the opinion of engineer in charge of work must be carried out for successful completion of the job, on getting approval of competent authority of GETCO.

(3) Before taking up construction activity; the agency has to cut the trees which obstruct the working, of any diameter, bushes, vegetation, i.e. roots, plant, shrubs, grass etc including stacking and crediting to GETCO as directed with no extra cost.

(4) Site visit**:** The bidder is advised to visit the site and examine the site condition. Where in the work is proposed to be carried out and to get himself fully acquainted at his own responsibility for all information that may be necessary for quoting the tender bid and entering in to contract. All cost and liabilities arising out of the site visit shall be at bidder account.

(A2) Earnest money Deposit:

i.) Bidders are requested to pay an earnest money deposit (1 % of estimated cost) either by **Online-payment (NEFT/RTGS) only** for the amount as specified in the tender notice. Payment of EMD in any other form shall not be accepted.

ii.) The EMD shall be paid submitted / attached along with uploading of Technical bid only. In no case it shall be submitted with sealed cover or in other form like DD, Cheque, etc.

iii.) Tenders not accompanied by EMD shall be rejected.

iv.) If during the tender validity period, i.e. **180 days**, the tenderer withdraws their tender, the EMD shall be forfeited and the tenderer may be disqualified from tendering for further works of GETCO.

v.) The EMD will be returned promptly to the unsuccessful tenderer. The EMD will be returned to the successful tenderer after he furnishes the Security Deposit for performance and duly enters in to the contract. If he fails to furnish the SD or to execute the contract for the work offered to him, his EMD shall be forfeited and the tenderer may be disqualified from tendering for further works for GETCO.

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

1. All Nationalized Banks.

(B) Guarantees issued by following Banks will be accepted as SD /EMD **for the period up to March, 2025** Or the issuance of new Government Resolution on the same subject whichever is earlier. The validity cut – off date in GR is with respect to date of issue of Bank Guarantee is irrespective of date of termination of Bank Guarantee.

VII. "Contractor has to Tender/EMD Online-payment (NEFT/RTGS) RTGS from approved Bank list published

on GETCO's website only" as per circular from corporate office no. CE(P_/SE©/vendor List – Online/5967 Dated: 20-03-2024.

(A3) COMPLETION PERIOD:

"The time limit for the completion of the above work will be as mentioned above in table from the commencement of the work. The date of commencement will be given separately."

- One month additional will be considered for the rainy season if the scheduled execution period falls within the period from 1st July to 31st October. In case the duration of execution is not exactly falls for a period of 1st July to 31st October, the proportionate days shall be given based on the duration falls between period 1st July to 31st October. e.g.
  - if entire duration falls between 1st July to 31st October, 30 days allowable towards rainy days.
  - If the execution period falls short by four months, then the proportionate days shall be calculated based on following formula:
    Delay allowable on account of rainy period = 30 x N / 120
    Where N=Number of days falling between period 1st July and 31st October.
    Note: While applying this formula no extension of time limit shall be permitted on account of delay due to rain.
- 15 days additional will be considered where hard rock strata are available.
- Delay due to power supply will be considered in TLE only if the agency applies for power supply to DISCOM within 5 days from the date of issue of LOI. It is necessary for the bidders to apply within first 5 days from the date of LOI for temporary power connection considering 5 days required by Distribution company to provide the power connection as per their SOP, making thereby availability of power supply before commencement of work.

Any delay in making the application for temporary power connection beyond initial 5 days shall be on account of bidder.

(A3) SECURITY DEPOSIT:

As per prevailing rules of the Corporation, 5% of the contract value shall be paid as 'Security Deposit'. As per Government of Gujarat vide circular No. JNV.10212/520A dtd. 26.06.2012 & GERC audit report, contractor has to pay 100% SD upon placement of LOI within 10 days. Therefore, successful bidder shall have to enter contract agreements along with 100% of S.D. shall be paid at C. O. NADIAD within 10 days from receipt of letter of intent either

a) **In form of DD in favor of "Gujarat Energy Transmission Corporation Ltd." of any Nationalized Bank payable at Local Branch NADIAD**
   OR
b) **In form of Bank Guarantee of any Nationalized Bank as per the approved format (attached) of the Corporation valid for minimum period of time limit plus guarantee period of one year.**

The security deposit will be refunded only after the completion of 1 year guarantee period of work completed or finalization of final bill whichever is later.
If Security Deposit is not paid within 10 days of issue of LOI, EMD paid will be forfeited and Corporation will not deal with party for the period of two years.

(A4) OTHER INSTRUCTIONS:

1. Tenders must be submitted in the enclosed schedule of work & quantities. Those received in any other form will not be accepted. They should be accompanied by a covering letter in which

the bidder should give all information as called for in the specifications & any other point which he would like to be considered along with the tender.

2. The Schedule-B shall be filled up with the quoted % above or below & shall be submitted online only.
3. The bidders shall note that no deviations from the technical specifications or commercial conditions with this bid are acceptable & it will be presumed that the bidder agrees entirely with the specifications & general terms &conditions of the contract.
4. The Corporation reserves the right to accept any tender irrespective of whether it is lowest or not or to reject all the tenders without assigning any reasons thereof. Tenders departing from the technical Specification or the method of bidding in a radical manner may also be rejected.
5. On acceptance of the tender the name(s) of the accredited representative(s) of the tenderer who would be responsible for taking instructions from the Engineers of the Corporation shall be communicated to the **Superintending Engineer (TR), Gujarat Energy Transmission Corporation, Circle Office, Nadiad 387320..**
6. **Proof of payments of taxes made by the Contractor to the appropriate departments shall be produced to Gujarat Energy Transmission Corporation failing which appropriate amount shall be withheld on getting information / instruction from the concerned departments.**

6A: Goods and Service Tax (GST)

The rates are excluding GST at the rate of 9% CGST plus 9% SGST or 18% IGST under the GST law or as applicable to works contract service from time to time which will be paid extra on a given taxable goods and/or services.

The amount and % of GST should clearly be indicated separately. GST means all applicable tax under GST laws. (GST laws means IGST Act, GST(Compensation to the state for loss of revenue)Act, CGST act, UTGST Act and SGST act,2017 and all related ancillary legislations)

Further, the Company has a right to recover the amount of GST along with penal interest at the rate of 15% per annum if GST charged is not paid / short paid to the government or fail to upload the details or uploads inaccurate particulars on GSTIN portal by the Supplier / Contractor within the stipulated time limit.

In case, Govt. revises the rate of GST rate / Code during the tenure of the contract, the provision of GUVNL's statutory variation clause shall apply.

6A-2: STATUTORY VARIATION:

Any statutory increase or decrease in taxes and duties including GST and cess as applicable or in the event of introduction of New tax/cess or cessation of existing tax/cess subsequent to suppliers offer if it takes place within the original contractual completion date will be to company's account subject to the claim being supported by documentary evidence. However, if any decrease takes place after the contractual delivary date the advantage will have to be passed to the company.

6A-3: DEDUCTION OF TDS UNDER GST:

"As per provisions of GST Act, TDS under GST @ 2% (1% CGST & 1% SGST or 2% IGST as applicable) or at the applicable rate from time to time, will be deducted from the bill of suppliers/contractors at the time of credit or payment. TDS Certificates in the prescribed format will be issued as per the prescribed rules under GST."

6B Welfare Cess

- As per the Welfare Cess Act, the welfare cess @ 1% is applicable on supply and erection items for supply, erection, testing & commissioning of substation, transmission lines, EPC/Turnkey projects and civil works.
- Contractor shall get registered under Welfare Cess Act before commencement of work. Office of the Factory Inspector is authorized at present as a registering authority.

- The welfare cess@1% is considered in the price schedules so, the bidders are requested to quote accordingly.
- GETCO shall pay the welfare cess by way of reimbursing to contractors on production of documentary evidence of payment.
- The contracts for which supply or part supply of material are in the scope of GETCO, then contractors shall deposit welfare cess on estimated cost of supplied items to GETCO on progressive basis of utilization. As this part of welfare cess is on GETCO account, the same shall be reimbursed to the contractor on receipt of request letter along with documentary evidence of payment. For calculation of welfare cess on supply part, valuation as per MR shall be taken and informed to the contractor for payment. This will be over and above the A/T value.

The modality of payment/ reimbursement of welfare cess will be as under.

- On receipt of A/T, the contractor / bidder will get them registered under Welfare Cess Act and submit the documentary evidence to the concern office.
- Before release of payment of first R.A.Bill, the contractor has to submit the documentary evidence of registration. Only thereafter, the bill will be processed for payment.
- Before release of payment of subsequent R.A.Bills, the contractor has to submit the documentary evidence of payment of welfare cess of previous R.A.Bill.
- Before release of payment of final bill,the contractor has to submit documentary evidence of payment of welfare cess of previous R.A.Bill as well as of this final bill.
- If the R.A.Bill happens to be first and final bill, then before release of payment, contractor has to submit documentary evidence of registration under Welfare Cess Act and evidence of payment of welfare cess.
- The welfare cess shall be reimbursed to the contractor on submission of copy of documentary evidence of payment by observing due formalities.

6C: INPUT TAX CREDIT BENEFIT:

In the event of any statutory increase in the rate of Input Tax Credit and / or due to inclusion of any other additional item of their inputs / input services under the ambit of the Input Tax Credit provisions under the GST Act, subsequent to the date of submission of the offer, the same should be passed on to COMPANY and you should inform such changes to COMPANY from time to time.

6D: PENALTY FOR DELAY:

The time limit allowed for carrying out the work as entered in the tender shall strictly observed by the contractor and shall be reckoned on the 10th day of issuance of LOI. The work shall throughout the stipulated period of contract proceeds with due diligence (time being deemed to be essence of contract) and for delay, the contractor shall pay compensation @ 0.5% plus GST as applicable per week or part thereof on delayed portion subject to maximum 10% plus GST as applicable of the Total contract value of the civil works (End cost with GST & cess as applicable). For calculating the delayed portion, date of work completion mentioned in work completion certificate shall be considered.

In event of failure of the contractor to pay the amount of penalty as demanded, the Owner shall be entitled to deduct the amount of penalty for delay from the amounts payable to the Contractors. Under any bills raised under this contract or any other amount payable under any other contract with the GUVNL and its subsidiary companies i.e. GETCO, GUVNL, GSECL, MGVCL, DGVCL, PGVCL, UGVCL. It is permissible for the owner to adjust the amount of Penalty of delay against any bank Guarantee furnished by the contractor under this contract or any other contract with GUVNL and/or its subsidiary companies..

6E <u>INCOME TAX:</u>

Income tax at source at the prevailing rate will be deducted from bills in accordance with the provision of income tax laws and to that effect a certificate will be issued to the contractor.

7. The successful contractor will have to sign an agreement as per the Gujarat Energy Transmission Corporation rules on stamped paper & the necessary stamp duty charges shall be borne by the contractor.
8. The bidder shall visit the site and carefully study the work to be carried. The Corporation will not pay any extra or rate for any reason in case the contractor claims, after acceptance of contract, to have misjudged the site condition.
9. The percentage quoted shall include cost towards of all materials, & machinery including equipment, fixtures, labour, constructional equipment, fuel, scaffolding, staging, ramps, walkways, approach and haul road, temporary works, etc. bearing permanent or temporary nature necessary for the completion of the work in all respects, except for those items specifically mentioned to be furnished by the Corporation. The contractor must also arrange for the transport of materials & include all such costs in the rates quoted by him for finished work.
10. During the execution of the work if it is found that the work is not progressing as per the Scheduled Progress Program, approved by the Corporation & planned by the Contractor, due to the reasons attributable to the Contractor; suitable action shall be taken as per relevant clauses mentioned in General Conditions of Contract.
11. The contract or any part thereof shall not be subject to change without the written permission of the **Superintending Engineer (TR),** Gujarat Energy Transmission Circle, Circle Office, NADIAD or their authorized representatives.
12. Tender shall remain open for acceptance for a period of **180 days** from the date of Technical bid opening & during this period no bidder shall be allowed to withdraw their tender. Any such withdrawals, during the said period will entail forfeiture of the earnest money deposited with the tender. The GETCO will take further action as deemed fit like not to deal with bidder in GETCO works.
13. Further information required, if any, can be had from the office of the **Superintending Engineer (TR)**, Gujarat Energy Transmission Corporation, Circle Office, NADIAD. But it must be clearly understood that the tenders must be received complete in every respects by the due date & time
14. The notice inviting tender, general instructions to the contractors & all documents of this tender shall form part of the contract.
15. The works under this contract shall be completed in all respects within stipulated period from the date of commencement order issued by field office. However, interim mile stones to be jointly fixed after issue of LOI.
16. Bidders must quote firm price only, till completion of work under contract, & this is to be confirmed by bidder while submitting their offer. No escalation towards labor and material / fuel shall be paid in this execution of contract.
17. Contractor shall pay minimum wages to his laborers as per the Minimum Wages Act, 1948 & rules there under as applicable from time to time in pursuant to the State Government notification. The concerned contractor shall submit the details of the payment with due certificate of LWO/IRO of the Corporation
18. **Once the offer submitted will not be returned back for any reason thereof in any case.**
19. Each tender shall contain the name, residence & place of business of person or persons making the tender & shall be signed by the tenderer with their usual signature with seal of the company.
20. Tender by partnerships shall furnish the full names of all partners. It shall be signed with the partnership name by one of the members of the partnership or by an authorized representative followed by the name &designation of the person signing.
21. An attested copy of the constitution of the firm with the name of partners shall be furnished. Whenever, whether in submission of the tender or later in other matters, the signatures are made by one person on behalf of Directors or a firm or a corporation, an attested copy of the resolution of the partners or of law shall be supplied by the tenderer authorizing Witnesses & sureties shall be persons of status & probity, &their names, occupation & address shall be stated below their signatures. All signatures shall be dated.
22. Tenders by corporation shall be signed with the legal name of the corporation followed by the name of the state of incorporation & by the signature & designation of the president, secretary or other person authorized to bind it in the matter with rubber seal of the company.
23. The GETCO reserves the right to delete any item of Schedule-B for which contractor shall not have any right to claim on this account.

24. The Bidders shall study the Conditions of site & shall resort to dewatering, where necessary, by appropriate methods & maintain reasonably dry areas to work at and no extra claim will be entertaining on this account.

25. The Contractor shall prepare all required roads to execute various items of this Contract & arrange all transport of materials & all such costs shall be taken care of while quoting the rates. No extra payments shall be admissible towards such costs. On completion, this shall be cleared if asked by GETCO at no extra cost.

26. Gujarat Energy Transmission Corporation shall not entertain idle charges for any site conditions or any circumstances.

27. The Contractor shall take all requisite & necessary care to observe that no damage is occurred to the Existing structures, if any. For any damage to the Existing Structures of Gujarat Energy Transmission Corporation the Contractor shall be held responsible.

28. The submission of any bid connected with these document and specification shall constitute an agreement that bidder shall have no cause of action or claim against the GETCO for rejection of their bid. The owner shall always be at liberty to reject or accept split any bid or bids at their sole discretion and any action will not be called into question and the bidder shall have no claim in that regards against the owner.

29. By successful submission of bid shall be considered as fully acceptance of all conditions & specifications mentioned in this tender booklet to bidder.

30. Recoveries:

(I) In case of any damage to equipment/machinery or structure/building of GETCO or any public property due to negligence's of contractor or any other reasons attributed to contractor the decision of E.I.C. regarding the amount of recovery shall be final and binding.

(II) If the contractor fails to execute the proportionate work as per direction of E.I.C. within the time frame given for completion of part / whole of the work GETCO shall get the work done through any other contractor and the cost of execution of such work along with 15% overhead charges shall be recovered from contractor.

31. Notwithstanding anything contained to the contrary in the specification or tenders in subsequent exchange of correspondence, the conditions of contract shall be binding on the contractor and any change or variations expressed or implied, however made in the said conditions shall not be valid or operative unless expressly sanctioned by the Corporation. The contractor shall be deemed to have fully informed himself and to have special knowledge of the provisions of the conditions of contract herein contained.

32. Submissions of tender by a contractor implies that he has read the instructions and condition of contract herein contained and has made himself aware of the scopes and specifications of the work to be done.

33. These rules and directions shall form part of the contract.

34. Drawings: Drawings required for the works are available with the E.E. (Civil) of Circle Office **NADIAD/ Corporate Office, Vadodara.** They are indicative and for tender purpose only. Bidders shall have to execute the work as per construction drawings issued from time to time by GETCO.

35. Electricity Connection: The electric power shall be free of cost to the contractor, at site, will be made available at one mutually agreed points, free of cost (connection only) by Gujarat Energy Transmission Corporation. Further distribution will have to be carried out by the contractor as per requirements at their own cost.

36. Water shall be free of cost to the contractor. In no case, GETCO is bound to supply water if the ground water sources are not available at site within premises.

37. Tenders / bids received after scheduled time period: The tenders received after time and date specified in the tender notice, will not be accepted. Once the offer submitted by the contractor before due date of submission, the contractor will not be allowed to submit revised / additional / modified / other even before due date. However, if the issue and receipt of tender is extended by the Corporation due to any reason, the contractor may submit the revised offer before due date of submission, if they wish to submit.

38. The work shall be completed within the period stipulated in the contract. However, it may be noted that drawings shall be released progressively & site clearance arranged accordingly to the progress of work at site. Therefore, the contractor has to organize & coordinate the works to suit these. In the event of any delay due to the above or due to any other reason not attributable to

the contractor, reasonable extension in the completing the work may be given at the discretion & as decided by the Corporation but no compensation or idle charges will be paid to the contractor under any circumstances.

39. The price bid/proposals will be opened in the presence of the bidder's representatives who choose to attend at the date and time and venue to be notified by the GETCO, after conclusion of the Technical Evaluation and Post Qualification process.

40. GETCO will not issue any material required for the work. All the materials – tools & tackles, labour etc. will have to be arranged by the contractor.

41. ACCEPTANCE OR REJECTION OF BID

a) The GETCO reserves the right to accept any tender irrespective of whether it is lowest or not or to reject all the tenders without assigning any reasons thereof. Tenders departing from the stipulated technical specifications, commercial conditions or the method of bidding in a radical manner are liable to be rejected.

b) The bid is liable for rejection prima facie, if it is

c) Without payment of EMD / Tender Fee. Or Payment of EMD / Tender fee in any form other than D.D/ON LINE PAYMENT.

d) Not in prescribed form.

e) Not bearing signature of the bidder & seal of the company on all the documents accompanying the tender.

f) Not confirming to specifications or conditional tender.

g) Received after expiry of the due date & time.

h) Received by telex or telegram or fax.

i) Submitted by bidders who are listed under declaration of ineligibility for corrupt or fraudulent practices issued by GETCO, Govt. of Gujarat or its Public Sector under taking.

Tender not fulfilling all the above conditions and those specified in the documents attached or incomplete in any respect are liable to rejection.

SECTION- B
Qualification Requirement

Qualification Requirement

1. **Registration:** Bidder quoting for the bid shall have registration in appropriate class with GETCO/ Central/State Government/ Railway/Semi Govt. Organizations.

2. **Experience**: Bidder should have experience of similar work including RCC frame structure under single contract as main contractor for minimum of **50% value** of estimated cost of the tender with GETCO/ GEB / Central / State Government / Railway / Semi- Government / Public Sector Organization within last 5 years. Attested Photocopy copy of work orders executed from GETCO/ GEB / Central / State Government / Railway / Semi- Government / Public Sector Organization and satisfactory completion certificate from respective department should be submitted.

3. **Solvency:** Latest bank solvency certificate from any Nationalized/Scheduled Bank of a sum of minimum 20 % of the estimated cost shown in the tender. The solvency should be in the name of "**To Whomsoever it may concern**" or "**GUJARAT ENERGY TRANSMISSION CORPORATION LIMITED (GETCO)**".

4. **Provident Fund Code:** Separate provident fund code number towards firm registered with Regional P. F. Commissioner.

5. **Profit & Loss Account Statement:** The Bidder should submit certified Xerox audited copy of the Balance sheet with profit and loss account of last three Years along with Income Tax return photocopies.

6. **Nature of Firm :** Attested copy of **Partnership Deed with recent Form-G obtained from Registrar of firms for the current year, Power of Attorney**, if any, for signing the bid documents in case of partnership firm & **self-affidavit for proprietorship firm**. In case the Form-G is not available for current year Affidavit cum Undertaking of the firm declaring no change in Form-G is to be submitted. **However, this affidavit cum undertaking should be executed only by partnership firm.** The party shall be liable to give fresh affidavit cum undertaking, after completion of its one year. All such documents shall have to be **NOTARISED.**

7. **Goods & Service Tax (GST) Registration: The Bidder shall be registered under the GST Act and a certified copy of such registration under the GST act indicating the GSTIN shall have to be submitted along with the bid by the bidder.**

8. **I.T. PAN CARD:** The bidder should submit the attested photocopy of PAN Card of their fir & Income Tax Return & Balance sheet for last three years.

Note: All the required documents submitted / uploaded must be Self-attested by bidder.

Signature of Contractor

Superintending Engineer (TR)
GETCO, CO, NADIAD

CHECK LIST OF DOCUMENTS SUBMISSION

TABLE-A		
Mandatory to upload on-line only (Colour Scan pdf file)		
No.	**Particulars**	**Check Mark**
1	Scan of Tender Fee Amount / Online payment receipt	
2	Scan of EMD Amount / Online payment receipt	
3	Firm Registration document as Approved Contractor in Appropriate Class	
4	Duly Signed / attested Integrity Pact i.e on Pg. no.05 of tender booklet	
5	Work completion certificate in Form No.3A (Experience Certificate as main contractor) only as Per Qualification Requirement	
6	Bank Solvency Certificate	
7	Provident Fund Code Number registration Documents	
8	GST Registration Number Documents	
9	Income Tax Return, Profit Loss Accounts and Balance sheet of Last Three Financial Years	
10	Nature of Firm:	
	Partnership deed/Latest Form-G/ POA/Authorized Signatory Certificate for Partnership, Self-Affidavit Pg. 18	
	Self-Affidavit/POA/Authorized Signatory Certificate for Proprietorship Pg. 19	
11	PAN Number Registration Document	
12	Duly filled & signed of Annexure 1 to 8 on Pg. 170-178	
13	Scan of Self-attested copy of Tender document including technical specification i.e. signed on each pages (preferably digitally signed)	
14	Valid Electrical Contractor License or Consent on letter pad that whole electrification shall be executed by firm having valid Electrical Contractor License	
15	Declaration of Conflict On Interest on Pg. 179	
16	Declaration of Relationship with employee on Pg. 180	

(Applicable for Partnership firm only)

AFFIDAVIT CUM UNDERTAKING
(On Rs.300/- stamp paper duly notarized)

We, Shri _____ (names of all partners and POA holder) of M/s. _____ (name of partnership firm) having registered place of business at _____ do hereby solemnly state and affirm on Oath as under:

1. **That Form G up to last entry dated _____ has been submitted to GETCO by us.**

2. **That since this Form G is not of current year, it is affirmed that whatever entries specified by Registrar of Firms in this submitted Form G is true and correct and that, there is no any modification or change in any of the partners or other details. It is further affirmed that we are liable & bound to disclose to GETCO immediately, if there is any change and/or modification in partnership of this firm.**

3. **That if GETCO finds any undisclosed modification/amendment in partners or other details at any time, then they shall be entitled to take any legal action against us / partnership firm. GETCO shall be empowered to step-deal and /or black-list our firm for any contract, at such instances.**

4. **That whatever stated in aforesaid paras and contents therein are true and correct and shall be binding on all the partners of this partnership firm, which includes their heirs, representative, assignees, executors etc.**

Hence solemnly affirmed on this _____day of _____ months of 20_____at _____.

DEPONANTS
(name & sign of all partners / or POA Holders)

Dated:

Place:

For Proprietorship firm only

Self-Affidavit for proprietorship firm

(On Rs.300/- stamp paper duly notarized)

I the undersigned _____ hereby solemnly declare on oath that I am the sole proprietor of the firm _____ . The proprietorship concern is solely owned, managed and controlled by me.

The signature appearing in the contract agreement is signed by me and is true.

I hereby state that whatever is stated herein above is true and correct to the best of my knowledge and belief.

Hence solemnly affirmed on this _____ day of _____ of 202

Deponent

Place:

Date :

SECTION – C
GENERAL CONDITIONS OF CONTRACT

(C) GENERAL CONDITIONS OF CONTRACT

1. Definitions:

(a) The Contract means the documents forming the tender and acceptance thereof, together with the documents referred to therein or individual work order in the case of term contract, including these conditions, schedules and / or additional conditions attached to the form of tender or individual work, order, rate schedule, the specifications and the drawings and all these documents as applicable taken together shall be deemed to form the contract.

(b) The "Tender Document" means the form of tender, the applicable schedules and/or additional conditions and the specifications and/or drawings as issued to the contractors for the purpose preparing tender.

(c) The expression "works" or "work" when used in the conditions of contract shall, unless there be something in the subject or context repugnant to such construction means, the works or the work contracted to be executed under or in virtue of the contract whether original or altered.

(d) The "Contractor" means the individual or firm or company, whether incorporated or not, undertaking the works and shall include their or its legal personal representative, successors and permitted assignees.

(e) "Corporation" means the Gujarat Energy Transmission Corporation Ltd. and the "Accepting Officer" means the officer who is authorized to sign and signs the contract on behalf of the "Corporation."

(f) The letter "EE" means Executive Engineer who in the case of measurement and lump sum contract, direct the contractor and the letters "ACE" means "Add Superintending Engineer" and "CE " means "Superintending Engineer" who administers and in the case of the term contracts directs the contract.

(g) The "Engineer-in-charge" means all officers of the Corporation appointed by the Superintending Engineer to supervise the works or part of the works.

(h) "Approved" and "Directed" means the approval or direction of the Superintending Engineer to Supdt. Engineer or the person deputed by him for the particular purpose.

(i) "B.S." means the "British Standard" as issued by the British Standards institution. "A.S." means the American Standards as issued by the American Standard Institutions and "I.S." means the "Indian Standards" as issued by the Indian Standards Institutions. Wherever the above-mentioned abbreviations are preferred to, in the specifications and / or work orders, they mean the addition with all amendments current at the date of issue of tender documents of work orders.

In the case of measurement and terms of contracts "Specifications" means those contained in Gujarat Energy Transmission Corporation Ltd. schedule together with any amendments etc. embodied in the tender documents, "Drawings" refer to those accompanying the tender documents and/or any work orders referred therein.

(j) The "Contract Sum" means the sum accepted or the sum calculated in accordance with the prices accepted in the tender and/or the contract rate as payable to the contractor for the full and entire executing and completion of works.

(k) "The date of completion" is the date or dates of completion of the work or any part of the works set out or ascertained in accordance with the individual work orders and the tender documents or any subsequent agreed amendments thereto.

(l) GST/Cess means all applicable Tax/Cess under GST Laws. GST Laws means IGST Act, GST(Compensation to the State for Loss of Revenue) Act, CGST Act, UTGST Act and SGSCT Act, 2017and all related ancilliary legislations.

(m) 'Owner' shall mean the Gujarat Energy Transmission Corporation Ltd, Vadodara or any of its group companies i.e. GUVNL, GSECL, MGVCL, DGVCL, PGVCL UGVCL and shall include its legal representatives, successors and assigns

2. Security Deposit

The contractor shall, within 10 days of the issue of Letter of Intent, pay 5 % as Security Deposit along with Contract agreements; The Bank Guarantee from schedule bank in lieu of cash or government securities towards Security Deposit will be accepted providing amount of Security Deposit payable exceeds Rs. 1,00,000/- .All damages, costs, charges, expenses and other sums which may be or may become due or payable by the contractor to the Corporation under the terms of the contract may be deducted from the cash in the proceeds of sale of the Securities/Bank Guarantee to deposited (which the officer or person to whom the same may be endorsed as aforesaid is hereby authorized to sell / to encash for that purpose) or from the interest of any such securities of from any sums due or which may become due to the contractor by the Corporation or from the whole or the balance unpaid as aforesaid of the encash securities so deposited being repaid or transferred and returned as may be to contractor after the date on which the final bill is paid or after the expiry of the date up to which the contractor has to maintain the work in good order whichever is later.

"For Water Proofing Treatment:-
The contractor shall submit performance guarantee of the waterproofing item at the rate of 20% of cost of item of work order in the form of DD or in the form of BG of Schedule Bank / Nationalized Bank in favor of GETCO (A/c Agency) for a period of 5 years from actual date of completion of work on non-judicial stamp paper of appropriate value in approved format of GETCO. In the event of unsatisfactory performance of waterproofing work, the agency shall carry out necessary remedial/rectification works that may be necessary in the opinion of GETCO at no extra cost, failing which BG shall been cashed by GETCO. The BG shall be released only after satisfactory completion of performance period of 5 years."

"For Anti-termite Treatment:-
The contractor shall submit performance guarantee of the anti-termite treatment item at the rate of 20% of cost of item of work order in the form of DD or in the form of BG of Schedule Bank / Nationalised Bank in favour of GETCO (A/c Agency) for a period of 5 years from actual date of completion of work on non-judicial stamp paper of appropriate value in approved format of GETCO. In the event of unsatisfactory performance of anti-termite treatment work, the agency shall carry out necessary remedial/rectification works that may be necessary in the opinion of GETCO at no extra cost, failing which BG shall be encashed by GETCO. The BG shall be released only after satisfactory completion of performance period of 5 years."

3. Penalty for the delay

The time limit allowed for carrying out the work as entered in the tender shall strictly observed by the contractor and shall be given separately. The work shall throughout the stipulated period of contract proceeds with due diligence (time being deemed to be essence of contract) and for delay, the contractor shall pay compensation @ 0.5% plus GST as applicable per week or part thereof on delayed portion subject to maximum 10% plus GST as applicable of the Total contract value of the civil works (End cost with GST & cess as applicable). For calculating the delayed portion, date of work completion mentioned in work completion certificate shall be considered.

In event of failure of the contractor to pay the amount of penalty as demanded, the Owner shall be entitled to deduct the amount of penalty for delay from the amounts payable under any other contract with the GUVNL and its subsidiary companies i.e. GETCO, GUVNL, GSECL, MGVCL, DGVCL, PGVCL, UGVCL. It is permissible for the owner to adjust the amount of Penalty of delay against any bank Guarantee furnished by the contractor under this contract or any other contract with GUVNL and/or its subsidiary companies.

4. Action when whole of Security Deposit is forfeited

In any case in which under any clause or clauses of this contract the contractor shall have tendered himself to pay compensation amounting to the whole of their security deposit (whether paid one sum or deducted by installments) or in the case of abandonment for the work owing to serious illness or death of the contractor or any other cause, the Executive Engineer on behalf of the Corporation, shall have powers to adopt, (a) below and any of the following courses under (b) and (c) as he may deem best suited to the interest of the Corporation.

(a) To rescind the contract (for which rescission notice of 10 days) in writing to the contractor under the hand of the Executive Engineer shall be conclusive evidence and in that case the security deposit of the contractor shall stand forfeited and absolutely at the disposal of the Corporation.

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

(c) To order that the work of the contractor be measured up and to take such part thereof, as shall be unexecuted, out of his heads and to give it to another contractor to complete, in which case, any expenses, which may be incurred in excess of the sum, which would have been paid to the original contractor, if the whole work had been executed by him as to the amount of which excess expenses the certificate in writing of the Engineer-in-charge shall be final, conclusive and shall be borne and shall be paid by the original contractors and shall be deducted from any money due to him by the Corporation under the contract or otherwise from their security deposit of the proceeds sale thereof or a sufficient part thereof.

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

5. Notice for unsatisfactory progress

If the progress or a particular portion of the work is unsatisfactory the Executive Engineer whose decision shall be final, shall notwithstanding that the general progress of work is satisfactory; be entitled to take action under Clause 4(c) after giving the contractor 10 days notice in writing and the contractor will have no claim for compensation for any loss sustained by him owing to such actions.

6. Action in the case of Default by Contractor

If any case in which any of the powers conferred upon the Executive Engineer by Clauses 4 and 5 hereof, shall have exercised and the same shall not have been exercised, the non exercised thereof shall not constitute a waiver of any of the conditions hereof and such powers shall not withstanding be exercisable in any further case of default by the contractor for which, by any clauses hereof, he is declared liable to pay compensation amounting to the whole of his security deposit and liability of the contractor for past and future compensation shall remain unaffected in the event of the Ex. Engineer taking action under sub clause (a) or (c) of Clause 4 he may, if he so desires, take possessions of all or any tools, plants, materials, and stores in such upon the work or the site thereof belonging to the contractor, or procured by him and intended to be used for the execution of the work of any part thereof paying for allowing for the same in account at the contract rates, or in the case of a contract rates not being applicable to current market rates to be certified by the Executive Engineer whose certificate thereof shall be final. In the alternative, the Executive Engineer may by notice in writing to the contractor or his clerk of works, foremen or other authorized agent, require him to remove such tools, plants, materials or stores from the premises within a time to be specified in such requisition to decisions to the contractor failing to comply with any such requisition, the

decision of the Executive Engineer as to the expenses of any such removal and the amount of the proceed and expense of any such sale, be final and conclusive against the contractor.

If the Contractor shall neglect to execute the works with due diligence and expedition or shall refuse or neglect to comply with any reasonable order given to him, in writing by the Engineer in connection with the works or shall contravene the provisions of the Contract, the Owner may give notice in writing to the Contractor to make good the failure, neglect or contravention complained of. Should the Contractor fail to comply with the notice within thirty (30) days from the date of serving the notice, then and in such case the Owner shall be at liberty to employ other workmen and forthwith to execute such part of the works as the Contractor may have neglected to do or if the Owner shall think fit, without prejudice to any other right he may have under the Contract to take the work wholly or in part out of the Contractor's hands and re-contract with any other person or persons to complete the works or any part thereof and in that event the Owner shall have free use of all Contractor's equipment that may have been at the time on the Site in connection with the works without being responsible to the Contractor for fair wear and tear thereof and to the exclusion of any right of the Contractor over the same, and **If the sum thot the Contractor is entitled to be paid plus the costs incurred by the Owner in completing the works, exceeds the Contract Price or the entire works if entire works have been completed or the price for part of the works if part of the works have been completed. the Contractor shall be liable for such excess.**

If such excess is greater than the sums due to the Contractor, the Contractor shall pay the balance to the Owner and if such excess is less than the sums due to the Contractor, Owner shall pay the balance to the Contractor. For facilitating such payment. Owner shall encase the Bank Guarantees of Contractor available with Owner/s and retain such other payments due to the Contractor under the Contract in question or any other Contract that the Owner/s may have with the Contractor. Such payment of excess amount shall be independent of the liquidated damages for delay, which the Contractor shall have to pay if the completion of works is delayed.

7. Extension of Time Limit

If the contractor shall desire an extension of the time limit for completion of the work on the ground of his having been unavoidably hindered in it's execution or on any other ground, he shall apply in writing to the Executive Engineer and the Executive Engineer may, if in his opinion there are reasonable grounds for granting extension, recommend such extension as he may think necessary or proper. The decision of the competent authority in this regard shall be final and binding to the contractor. Any delay attributed to Corporation shall be compensated only by way of extending the limit.

8. Completion Certificate

On completion of the work the Contractor shall be furnished with Completion Certificate by the Executive Engineer of such completion but no such certificate shall be given nor shall be the work considered to be complete until works are taken over and/or duly tested and put to operative as the case may be, nor until the work shall have been measured by the Engineer-In-Charge or where the measurement have been taken by his subordinated until they have received the approval of the Executive Engineer the said measurement being binding and conclusive against the contractor.

9. Effect of the Certificate

No payment shall be made for any work estimated to cost less than Rs.1,000/- till after the whole of said work shall have been completed and certificate of completion given. But in the case of works estimated to cost more than Rs.1,000/- Contractor shall on submitting a monthly bill thereof, be entitled to receive payments. Proportionate to the part of the work then approved and passed by the Engineer-in-charge, whose certificate of such approval and a passing of the sum requiring bad, unsound, imperfect or unskillful work to be removed and taken away and reconstructed or rejected nor shall any such payment be considered as admission of the due performance of the contract or any part thereof in any respect of the accruing of the claim nor shall conclude, determine or effect in any way the powers of the Engineer-in-charge as to the final settlement and adjustment of the

accounts otherwise or in any other way, vary or affect the contract. The final bill shall be submitted by the contractor within one month of the date fixed for completion of work. Otherwise the certificate of Engineer-in-charge of the measurement and of total amount payable for the work shall be final and binding on all parties.

10. Payment to Contractors

The rates for several items of works estimated to cost more than Rs.1,000/- agreed to within shall be valid only when the item concerned is accepted, having been completed full, in accordance with the sanctioned specification. In case, where the items of the work, are not accepted, as so completed the Engineer-in-charge, may make payment on account of such items at such reduced rates, as he may consider reasonable in the preparation of final or running accounts bills.

10-A PAYMENT TERMS UNDER MSME ACT:

Bidders have to update their MSME detail on GETCO's website by following link https : / / getco.co. https://getco.co.in/msme/ (and intimate to concern bill submitting office with copy to this office).
(2) The payment will be made within 45 days from the ***date of acceptance or the "date of deemed acceptance of goods or services i.e. After submission of all required documents as per at Terms & time to time circular issued by GETCO's corporate Office as well as statutory requirement to process the Bill.

Date of acceptance means-

(a) The day of actual delivery of goods or the rendering of services: or

(b) Where any objection is made in writing by the buyer regarding acceptance of goods or services. the day on which such objection is removed by the supplier.

*** "**Date of deemed acceptance**" Means, where no objection is made in writing by the buyer regarding acceptance of goods or services within fifteen days to the delivery of the goods or the rendering of services, the day of the actual delivery of goods or the rendering or services.

11. Bills

The Bill shall be submitted by the contractor each month on or before the date fixed by the Engineer-in - charge, for all works, executed in the previous month and the Engineer-in-charge shall take or cause to be taken the requisite measurement for the purpose or having the same verified and the claim so far as it is admissible, shall be adjusted, if possible, within ten days from the presentation of the bills. If the contractor does not submit the bill, within the time fixed, as aforesaid, the Engineer-in-charge may depute a subordinate to measure up the said work in the presence of the contractor or his duly authorized agent, whose counter signature in the measurement shall be sufficient warrant and the Engineer-in-charge may prepare a bill from such list which shall be binding on the contractor in all respects. GETCO shall make effort for the payment of bills (RA & final bills) as early as possible, however no interest is payable on bill amount if there is delay in payment of GETCO for whatever reason.

12. Supply of Materials to Contractor

If the specification of the estimated work provides for use of any special description of material to be supplied from the Corporation's Stores or if it is required that the contractor shall use certain stores to be provided by the Engineer-in-charge (such material and stores and the prices to be charged thereof as here in after mentioned being so far as practicable for the convenience of contractor but not so as in any way to control, the meaning or effect of the contract specified in otherwise or from the security deposit or the proceeds of sale thereof if the deposit is held in Government Securities the same or a sufficient portion thereof, shall be sold for the purpose. All materials supplied to the contract shall remain the absolute property of Corporation and shall on no account be removed from the site of the work and shall at all-time be open to inspection by the used by him or for any wastage in or damage thereto. The contractor shall be responsible for the loss, destruction or deterioration of the materials, stores or articles supplied to him by the Corporation even if such loss, destruction or deterioration has occurred under any circumstances whatsoever beyond his control as if the materials, stores or articles so supplied were his property.

13. Works to be executed in accordance with specifications, drawings, orders etc.

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

14. Alteration in Specifications and Designs not to invalidate Contracts.

The Executive Engineer shall have powers to make any alteration, or addition to the original specification designs, and instructions that may appear to him to be necessary or advisable during the progress of the work and the contractor shall be bound to carry out the work in accordance with any instructions in this connection which may be given to him in writing, signed by the Engineer-in-charge and such alterations shall not invalidate the contract. Any additional work which the contractor may be directed to do in the manner above specified as part of the work shall be carried out by the contractor on the same conditions in all respect on which he agreed to do the main works, and at the same rates as are specified in the tender for the main work. Where, however, the works is to be executed according to the designs, drawing and specifications recommended by the contractor and accepted by the competent authority, the alteration above referred to shall be within the scope of such designs, drawings, and specifications appended to the tender.

15. Rates for works not entered in Estimate or Schedule of Rate of the District

If the additional and altered work includes any class of work for which no rate is specified in this contract, then such class of work shall be carried out the rates entered in the Schedule of Rates of the Division or at the rate mutually agreed upon between the Executive Engineer and the contractor, whichever are lower. If the additional or altered work for which no rate is entered in the Schedule of Rates of the Division is ordered to be carried out before the rates agreed upon then the contractor within seven days of date of receipt by him of the order to carry out the work inform the Executive Engineer for the rate which in his intension to charge for such class of work and if the Executive Engineer does not agree to this rate he shall be noticed in writing be at liberty to cancel his order to carry out such class of work and arrange to carry it out in such manner as he may consider advisable provided always that if the rates shall have been determined as lastly here in before mentioned then in such case he shall only be entitled to be paid in respect of the work carried out or expenditure incurred by him prior to the date of the determination of the rate as aforesaid according to such rate or rates as shall be fixed by the Executive Engineer. In the event of dispute, the decision of the Superintending Engineer of the Circle will be final.

16. Extension of Time Limit in consequence of Addition or Alteration.

The time limit for the work shall be extended in the proportion that the increase in its cost occasioned by alterations or additions bears to the cost of the original contract work and the certificate of the Engineer-in-charge as to such proportions shall be conclusive. No compensation shall be payable for Alternation in or Restriction of Work to be carried out. If at any time, after the execution of the contract documents the Engineer-in-charge shall, for any reason whatsoever, require the whole or any part of the work, as specified in the tender, to be stopped for any period or shall not require he whole or part of the work to be carried out at all or to be carried out by the contractor, he shall give notice in writing of the fact to the contractor who shall thereupon suspend or stop the work totally or partially as the case may be in any such case, except as provided here under the contractor shall have no claim to any payment or compensation what so ever on account of any profit or advantage which he might have derived from the execution, of the work in full but which he did not so derive in consequence of the full amount of work not having been carried out or on account of any loss that he may be put to on account of materials purchased or agree to be purchased or for unemployment of labour recruited by him. He shall not also have any; claim for compensation by reason of any alterations having been made in the original specification, drawings, designs and instructions which may involve any curtailment of the work as originally contemplated.

17. No claim to compensation on account of loss due to delay in supply of materials by Corporation.

The contractor shall not be entitled to claim any compensation from Corporation for the loss suffered by him on account of delay by Corporation in the supply of materials entered in Schedule-A where such delay is caused by: Difficulties relating to supply of railway wagons

I. Force Majeure

II. Act of God

III. Any other reasonable cause beyond the control of Corporation including Shortage of materials to be supplied by the Corporations & difficulties in time by reaching at the site of any materials equipment. In the case of such delay in the supply of materials, Corporation shall grant such extension of time for the completion of the works as shall appear to the Executive Engineer to be reasonable in accordance with circumstances of the case. The decision in the Executive Engineer as to the extension of time shall be accepted as final by the contractor.

18. Time Limit for Compensation Claims

Under no circumstances, whatsoever, shall the contractor be entitled to any compensation from Corporation on any account unless the contractor has claimed in writing to the Executive Engineer within one month of the cause thereof.

19. Action and Compensation payable in case of Bad Work

If at any time, before the security deposit is refunded to the contractor, it shall appear to the Executive Engineer or his subordinate in charge of the work that any work has been executed with unsound, imperfect or unskillful workmanship or with materials of inferior quality or that any materials or articles provided by him for the execution of the work are unsound or of a inferior quality to that contracted for or are otherwise not in accordance with the contract, it shall be lawful for Engineer-in-charge to intimate this fact in writing to the contractor and then no withstanding the fact that the work, materials or articles complained of, may have been inadvertently passed, certified and paid for, the contractor shall be bound forthwith to rectify or remove and reconstruct the work so specified in whole or any part, as the case may require or if so required shall remove the materials or articles so specified and provided other suitable materials or articles at his own charge and cost, and in the event of his failing to do so within a period to be specified by the Engineer-in-charge in the written intimation aforesaid the contractor shall be liable to pay compensation at the rate of one percent on the amount of the estimate for every day, not exceeding ten days during which the failure so continue and in the event of any such failure as aforesaid the Engineer-in-charge may rectify or remove and re-execute the work or remove and replace the materials or articles complained of, as the case may be, at the risk and expense in all respects of contractor should the Engineer-in-charge consider that any such inferior work or materials as described above may be accepted, or made use of, it shall be within his discretion to accept the same as such reduced rates as he may fix thereof. Provided that in the case of any work of which visible check is not possible, if the Engineer-in - charge or his subordinate in charge of the work feels that such work has been executed with unsound, imperfect or unskillful workmanship or with materials of inferior quality, he shall take sample tests at random, cost of which shall have to be borne by the contractor and if after taking such test, part of such work is found to be defective in any respect or to have been executed with materials of inferior quality, then the contractor shall be paid for the whole work such amount as may be fixed by the office of the Engineer-in-charge on the basis of the lowest quality of work found by him in such samples tests.

Explanation: I

Sample Test shall mean:

(i) In relation to poles fixed as line supports, the token of one pole out of every 100 poles after taking it out from its foundation for inspection.

(ii) In relation to any other work, such test as may be considered necessary, by the Engineer-in - charge or his subordinate in charge of the work.

Explanation: II
Cost of the sample test shall mean cost incurred for the purpose of taking Samples & test and for restoring tested work to its original condition.

20. Work to be opened to Inspection, Contractor or Responsible Agent to be present

All works under execution or in course of execution in pursuance of the contract shall at all times be open to the inspection and supervision of the Executive Engineer and his subordinate and contractor shall at all times, during the usual working hours and at all other times at which reasonable notice of the intension of the Executive Engineer or his subordinates to visit the works shall have been given to the contractor, during which period either he should be present to receive order and instruction, or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the contractor's duly authorized Agent shall be considered to have the same force and effect as if they had been given to the contractor himself.

21. Notice to be given before work is covered up.

The contractor shall give not less than 5 days notice in writing to the Executive Engineer or his subordinates in charge of the work, before covering up or otherwise placing beyond the reach of measurement of any work, in order that the same may be measured and correct dimensions thereof, taken before the same is so covered up or placed beyond the reach of measurement and shall not covered up or placed beyond the reach of measurement and work without the consent in writing of Executive Engineer or his subordinate in charge of work, If any work shall be covered up or placed beyond the reach without such notice having been given or consent obtained, the same shall be uncovered at the contractor's expense, and in default thereof, no payment or allowance shall be made for such work, or for the materials, with which the same, was executed.

22. Contractor's Liabilities

The Contractor shall supply, at his own cost, all materials (except such special materials, if any as may be supplied form the Corporation stored in accordance with the contract) plant, tools, appliances, implements, ladders, cordage, tackles, scaffolding and any temporary works which may be required for the proper execution of the work., in the original, altered or substituted form and whether included in the specification or other document forming part of the contract or referred to in these conditions or not and which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in-charge as to any matter on which under these conditions, he is entitled to be satisfied or which he is entitled to require together with carriage thereof to and from the work, the contractor shall also supply without charge, the requisite number of persons for setting out works, and counting, weighting and assisting in the measurement of, examinations at the time and from time to time of the work or materials, failing this, the same may be provided by the Engineer-in-charge at the expenses of the contractor and the expenses may be deducted from any money due to the contractor under the contract or from his security deposit or the proceeds of sale thereof or of a sufficient portion thereof the contractor shall provide all necessary fencing and light required to protect the public from accident and shall also be bound to bear expenses of defense of every suit, action or other legal proceedings of law that may be brought by any person for injury sustained. Owing to neglect of the above precautions and to pay any damage and costs which may be awarded in any such suit, action or proceedings to any such persons or which may with the consent of the contractor be paid in compromising any claim by any such person.

23. Contractor Liable for all Damages

Compensation for all damage done intentionally or unintentionally by contractor's laborer, whether in or beyond the limit of Corporation's property, shall be estimated by the Executive Engineer, or such other office, as he may appoint and the estimate of the Executive Engineer, subject to the decision of the Superintending Engineer, on appeal, shall be final and the contractor shall be bound to pay the amount of the assessed compensation demand, failing which, the same will be recovered from the contractor as damages or deducted by the Engineer in charge from any sums that may be due to or become due from Corporation to the contractor under this contract or otherwise. The contractor shall bear the expenses of defending any action or other legal proceedings that may be

brought by any person for injury sustained by him owing to neglect of precautions to prevent the spread of fire and he shall also pay any damage and costs that may be awarded by the court if in consequence.

24. Rescission of Contract and Forfeiture of Deposit.

The contractor shall not assign or sublet, without the written approval of the Engineer-in-charge and if the contractor assign or sublet his contract, or attempt to do so or become insolvent or commence any proceedings to be adjudicated as insolvent or make any composition with creditors, attempt to do so, the Engineer-in-charge may, by notice in writing rescind the contract. Also, if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise shall either directly or indirectly be given, promised or offered by the contractor or any of his servants, or agents, or any person to the employee of Corporation in any way relating to his office or employment or if nay such officers or persons shall become in any way directly or indirectly interested in the contract, the Executive Engineer may, by 10 day's notice in writing, rescind the contract. In the event of a contract being rescinded the Security Deposit of the contractor shall there upon stand forfeited and be absolutely at the disposal of Corporation and the same consequences shall ensure as it the contract has been rescinded under clause 4 thereof and in addition the contractor shall not be entitled to recover or be paid for any work thereof actually performed under the contract.

25. Compensation

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

26. Change in the constitution of firm to be notified

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

27. Works under direction of Superintending Engineer.

All works to be executed under the contract shall be executed under the direction and subject to the approval of the Superintending Engineer of the Circle, Engineer-in-charge for the time being who shall be entitled to direct at what point or points and in what manner they are to be commenced and from time to time carried on.

28. Decision of Superintending Engineer to be final.

Except where otherwise specified in contract and subject to the power delegated to him by Corporation under the Corporation's rule, then in force the decision of the Superintending Engineer of the Circle / EIC. for the time being shall be final, conclusive and binding on all of the specification, designs, drawings and instructions herein before mentioned and as to the quality of workmanship or material used on the or as to any other question, claim, right matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning, the works or the execution or failure to execute the same, whether arising during the progress of the work or after the completion or abandonment thereof.

29. Arbitration

'ALL QUESTIONS, DISPUTES OR DIFFERENCES, WHATSOEVER WHICH MAY AT AN TIME ARISE BETWEEN THE PARTIES TO THIS CONTRACT IN CONNECTION WITH THE CONTRACT OR ANY MATTER ARISING OUT OF OR IN RELATION THERE TO, SHALL BE REFERRED TO THE "GUJARAT PUBLIC WORKS CONTRACTS DISPUTES ARBITRATION TRIBUNAL" AS PER THE PROVISIONS OF THE GUJARAT PUBLIC WORKS CONTRACTS DISPUTES ARBITRATION TRIBUNAL ACT, 1992.

The reference to arbitration proceedings under this clause shall not:

a) Affect the right of the Engineer-in-charge to take possession of all or any tools, plants, materials and stores, in or upon the work or site thereof or belonging to the contractor or procured by him and intended to be used for the execution of the work or any part thereof.

b) Preclude the Engineer-in-charge from utilizing the materials purchased by the Contractor in any work or from removing such materials to other place, during the period the work is stopped or suspended in pursuance of notice given to the contractor under General Conditions.

c) Entitle the contractor to stop the progress of the work or carrying out the additional or altered work in accordance with the provision of General Conditions for the work where there is no specification.

d) Preclude the Corporation from getting the work done by another agency.

Neither party is entitled to bring a claim to arbitration latest by the thirty days after the expiration of the defects liability period.

The provisions of the Arbitration & conciliation Act, 1996, Gujarat Public Works Contract Disputes Arbitration Tribunal Act, 1992 and rules made there under shall apply to the arbitration proceeding under this clause.

30. Stores to be obtained from Corporation

The Contractor shall obtain from the Corporation Stores, such articles as are mentioned in Schedule 'A' which may be required for the work or any part of the work or in making up any articles required there fore or in connection therewith, unless he has obtained permission in writing from the Executive Engineer or obtained such stores and articles from elsewhere. The value of such stores and articles as may be supplied to the contractor by the Engineer-in-charge will be debited to the contractor in his account at the rate shown in the Schedule "A" attached the contractor and if they are not entered in said schedule they shall debited to him at cost price which for the purpose of this contract shall include cost of carriage and all other expenses whatsoever which may have to be incurred in obtaining delivery of the same at the stores aforesaid and further overhead charges 15% plus GST as applicable . The Contractor shall be responsible for the loss destruction or deterioration of the materials, stores or articles supplied to him by the Corporation, even if such loss destruction or deterioration has occurred under any circumstances whatsoever beyond his control as if the material, stores or articles so supplied were his property. The contractor shall be responsible for returning the residual materials after completion of the contract and if fails to return, the balance material supplied to him by the Corporation, the cost of the residual materials will be recovered form the contractor at the market rate or stock issue rate whichever be higher at the time of materials account plus 15% plus GST as applicable.

31.1 Lump Sum in Estimate

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

32. Lump Sum Tenders

Whenever lump sum tenders have been invited for building or other structures of the same type, design, the contractor shall submit his bill stated in Clause No.11 and the Engineer-in-charge not below the rank of Executive Engineer shall certify by general measurement or by other method considered suitable to him, the value of work done and the contractor shall be paid monthly a sum equal to 90% of the total value the work so certified, since the last payment, after deducting a part or whole of the secured advance if not already paid for the materials utilized on the works. An additional secured advance for any fresh materials brought on site will also be paid if certified by the officer not below the rank of Executive Engineer. After the work is completed final bill would be paid on the certification of officer not below the rank of Executive Engineer, that the work is done

according to drawing and specifications attached to the tender. If any additions and alteration have been carried out, detailed measurements in respect thereof shall be recorded and extra payment or deductions are regulated as per item rates quoted by the contractor while submitting the tender and if there are any items in the additions and alterations for which the contractor has not quoted a rate, the payment shall be as per Clause 15 above.

33. Action where no specifications.

In the case of any class of work for which there is no such specifications as is mentioned in clause 1. such work shall be carried out in accordance with the divisional specifications and in there event of there being no divisional specifications, the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-charge / consultant of the Corporation etc.

1. **Wages to be paid and time of payment etc. by the Contractor: -**

   a) The contractor shall pay minimum wages as fixed under Minimum Wages Act whichever is higher. The wages of every contract labour employed by him under this contract shall be paid by him before the expiry of 7th day of the last day of the month in respect of which the wages are payable (i.e. wages of a month have to be paid by him in the first week of the next month). The payment shall be disbursed in presence of Management Representative during the working hours in factory premises and the contractor shall get the entries certified in the register of wages by the Representative of the Corporation. Any default will result in cancellation of contract forthwith or else the contractor shall be punishable to the extend of Rs.100/- fine per each day.

   b) The contractor shall give his telephone number and address to the Corporation so that in case of labour trouble etc., the contractor can be contacted. The contractor shall arrange to have his office outside the factory premises and the contractor keep himself present throughout the working hours.

Labour Laws :-

a) Persons below the age of 18 years shall not be employed for the work.
b) Female worker shall be employed according to latest labour laws
c) Contractor shall maintain a valid labour license under the Contract Labour (Regulation and Abolition Act) for employing necessary manpower to be required by him. In the absence of such license the contractor shall be liable to be terminated without assigning any reason thereof.
d) The contractor shall at his own expense comply with all labour laws and keep the Corporation indemnified in respect thereof. Some of the major liabilities under various labour and industrial laws which the contractor shall comply with are as under :

i. Payment of contribution of wages of employer's contributions towards Provident Fund, Family Pension Scheme, Deposit Linked Insurance Scheme, Administrative Charges etc. at the rates made applicable from time to time by Government of Gujarat / Government of India or other Statutory Authorities.
ii. Payment of deposit in respect of each contract labour of the rate of RS.30/- with the office of the Commissioner of Labour as per the Contract Labour Act (Regulation & Abolition).
iii. License Fee as prescribed under the contract Labour Act (Regulation and Abolition) and Rules framed there under depending upon the number of workmen employed by the contractor.
iv. Paid leave facility and wages as per the provision of the Factories Act at the rate of one day for every 20 days of working.
v. Identity cards as prescribed under the factories Act with photo affixed thereto, the same for identification.
vi. Payment of retrenchment compensation, notice pay and other liabilities as per Industrial Disputes Act. Any payment to the contractor's employees arising out of any claim of disputes under the Industrial Disputes Act – 1947 or any other laws.
vii. Provision of compensation in the case of accidental injury.

viii. Payment of crèche if the female labour employed is more than 30 numbers

ix. Maternity leave as per the provision of the Maternity Benefit Act.

The above are some of the major liabilities of the contractor in addition to other liabilities prescribed under the various Labour Las in force from time to time from Statutory Authorities like State Government / Government of India which the contractor shall have to comply with.

2. Provident Fund and Family Pension Scheme

The contractor shall submit along with his bill (month wise) a statement regarding deductions against employees provident fund and family pension scheme in respect of each concerned employees' Provident Fund and Family Pension scheme at the rate of 12 % (or at the rates made applicable by the Government from time to time) of the wages. Contractor's contribution and his workers contribution towards provident fund and family pension scheme shall be deposited by the contractor with regional Provident Fund Commissioner, Ahmedabad.

3. Deposit Linked Insurance Scheme:-

The contractor shall have to deposit ½ % of the wages in-respect of employees who is a member of the Provident Fund as the contribution to the Deposit Linked Insurance Scheme with Regional Fund Commissioner, Ahmedabad.

4. Administrative Charges:-

Administrative charges for maintaining Provident Fund Account shall be deposited by the contractor with Regional Provident Fund Commissioner, Ahmedabad at the rates applicable.

5. Paid Leave Facility

Paid leave facility at the rate of one day for every 20 days worked by the contract laborer shall be provided by the contractor to his workers. He shall maintain Leave records/ Leave Cards for individual laborer which shall be duly verified and approved/ certified by the authorized officer of the Corporation.

6. Workmen's Compensation Fund and Employers Liability Insurance:-

The contractor shall cover all his employees under Workmen's Compensation Fund and under the Liability Insurance. The contractor shall employ adequate number of experienced staff at site for daily supervision and for maintenance of various registers and records required under the law and contract. No payment for supervision shall be admissible.

7. Contractor to Indemnify to the Corporation

The contractor shall indemnify and keep indemnified the Corporation and every officer and employees of the Corporation and also Engineer-In-Charge and his staff against all actions, proceedings, claims, demands, costs and expenses whatsoever arising out of or in connection with the matters referred in above clauses and elsewhere and against all actions, proceedings, claims, demands, costs and expenses which may be made against the Corporation by any workman/ employee of the contractor or any sub contractor and / or from any liability may arise to any workman / employees of the contractor or any sub contractor under any laws, rules or regulation having the force of law including but not limited to claims against the owner under workman's compensation Act, 1923. The employee's Provident Act 1952, and / or the contract Labour (Abolition and Regulation) Act 1979. The Corporation shall not be liable for or in respect of or in consequence of any accident or injury to any workmen or other person in the employment of the contractor or his sub-contractors, and the contractor shall indemnify and keep indemnified the Corporation against all such damage and compensation and against all claims, demands, proceedings costs, charges and expenses whatsoever in respect thereof or in relation thereto.

8. Workmen's Compensation And Employer's Liability Insurance:-

Insurance shall be affected for all the contractor's for all the contractor's employees engaged in the performance of this contract. If any of the work is sublet to the sub-contractor, the contractor shall require that he or his sub-contractor to provide workmen's compensation and employer's

liability insurance for the latter's employees unless such employees recovered under the contractor's insurance.

9. The Corporation reserves the right to terminate this rate contract at any time during it tendency without giving notice of termination or any reasons thereof.

10. The Corporation will be entitled to deduct directly form the bills, to be paid to the Subcontractor and Labourers any sum or sums payable by contractor and which sum/sums the Corporation is required to pay as a principal employer on account of contractor's default in respect of all liabilities referred to in above clauses.

11. Nothing in the contract document stated shall any wise constitute any workmen/ employees of the contractor or any sub-contractor as or to be workmen/employee of the power, or place obligation or liability in respect of any such workmen/ employee upon the Corporation.

NOTE: -The Prevailing Act at the time of execution of work over and above act specified herein shall be binding to the contractor

35. No Claim for Variation in Quantities of Work

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

36. No Claim for Compensation for Delay in staring work

No compensation shall be allowed for any delay caused into starting of work on account of acquisition of land and in the case of clearance for works or any delay in according sanction to estimates**.**

37. No Claim for Compensation for delay in execution of work

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

38. Entering upon or commencing any portion of work

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

39. Method of Payment

Payment to contractors shall be made by direct RTGS to contractor's bank account. Generally, payment may take 30 to 60 days after passing of bills depending on availability of fund.

40. Acceptance of conditions on tendering for work.

Submission to tender or acceptance of work order shall imply acceptance of these conditions of tender by contractor.

41. Employment of Scarcity Labour

If government declares a state of scarcity or famine to exist in any village situated within 20kms of the work, the piece worker / contractor shall employ upon such part of the work as are suitable for unskilled labour; any person certified to him by the Executive Engineer or by any person to whom Executive Engineer may have delegated this duty in writing to be in need of relief and shall be bound to pay such person wage not below the minimum, which

Government may have fixed in this behalf from time to time. Any implementation of this clause shall be decided by the Superintending engineer / Engineer-in-Charge whose decision shall be final and binding on the piece worker/contractor.

42 Employment of Technical Persons

The contractor who are registered under class 'A', 'B' and 'C' or such contractors who executes the works of Rs.5 lakhs and above shall employ the technically qualified personnel possessing minimum a Diploma of reconciled Technical institution, for executing the work of the Corporation.

Date:
(Signature of Contractor)
Address:
Seal:

Superintending Engineer (TR)
GETCO, CO NADIAD.

GENERAL CONDITIONS OF CONTRACT

1.0 Contactor to inform himself fully:

The contractor shall be deemed to have carefully examined the work & site conditions, the general conditions, the special conditions, specifications, schedules, drawings shall be deemed to have visited the site of the works & to
have fully informed himself regarding the local conditions. Copy of Appendix V attached with tender shall have to be filled up before quoting the rate, for confirmation of site visit. If there shall have any doubts as to the meaning of any portion of these general conditions or special conditions of the scope of work of the specifications or any other matter concerning the contract, he shall in good time before submitting his tender, send for the particulars thereof & submit them to the Engineer in writing in order that such doubt may be removed.

2.0 Data to be furnished by Contractor:

Prior to the commencement of work the contractor shall submit a bar chart showing detailed programme for completing the work within time limit to the S. E. for approval within a week of the date of LOI. No change in the approved plan & layout shall be carried out without specific written approval of the Executive Engineer in charge.

3.0 Errors, Omissions & Discrepancies:

In all cases of errors, omissions, doubts or discrepancies in the dimensions, or discrepancies in the drawings & items of work on specifications, reference shall be made to the Executive Engineer whose elucidation & elaboration shall be considered as authoritative. The contractor shall be held responsible for any error that may occur in the work thorough lack of such reference.

4.0

1. Temporary structures may be erected by the contractor for storage sheds, offices, and residential etc. for non-commercial use on land, handed over to him at his own expense & with the permission of the Corporation. In any circumstances for constructing temporary structures contractor's use, Corporation free supply of materials shall not be made. If it is found that Corporation's free supply material are used for the works other than approved drawings, it will be recovered at penalized rate.
2. The contractor shall preserve all existing vegetation such as trees on or adjacent, to the works site which, do not interfere with the construction as determined by the Corporation.
3. The contractor shall take all possible precautions in felling trees authorized for removal to avoid any unnecessary damage to vegetation & trees not to be felled & to structures or to workmen, & shall be responsible for any damage if it occurs in such operations.
4. All produce from cutting of trees grass etc. shall be the property of Corporation & shall be stacked at the directed places. No claim shall be made for such tree felling / cutting &stacking of trees/produce or grass etc. by the contractor.
5. The land shall as herein before mentioned be handed over to Corporation / Owner of Land immediately after the completion of the work under this contract. Also no land shall be held by the contractor longer than the Corporation shall deem fit & necessary & the contractor shall, on due notice by the Corporation, vacate & return the land which the Engineer In Charge may certify as no longer required by the contractor for purposes of the work.

5.0 Start of Work:

The contractor shall not enter upon or commence any portion of the work except with the written permission of the authority of the Corporation, failing which the contractor shall have no claim to ask for measurement of or payment for work & shall be responsible for any claims or damages that may arise due to such unauthorized commencement or entry. No compensation shall be allowed for any delay caused in starting the work on account of any delay in clearance of the work site.

6.0 Work to execute to the satisfaction of the Corporation's Engineers:

The contractor shall proceed with the work with diligence & expedition & the whole of the work herein specified as well as the mode of execution shall be under the supervision & the direction & shall be carried on to the entire satisfaction of the Corporation's site Engineers, who shall have full powers to order the contractor to alter, enlarge or diminish the form, dimensions, positions, or quantities of any of the work or to make use of materials & workmanship of different descriptions & qualities from this herein specified. In the case of any class of work for which there are no Technical Specifications, these shall be carried out in accordance with the latest IS Codes & in the event of being no relevant IS Code, the works shall be carried out in accordance with the directions & instructions of the Corporation's Engineers at site.

7.0 Workmanship etc.:

The work shall be executed in thoroughly substantial manner with workmanship of best quality & strictly in accordance with the specifications & with the drawings, or with such other drawings or written instructions as may from time to time be furnished to the contractor, in accordance with terms of this contract & shall be completed in every respect with workmanship implied & necessary according to the fair interpretation & meaning of the same & should there be any discrepancy between the drawings & specifications or any difference or dispute as to the dimensions to be worked out or the mode of doing periodical quantity of the work to be executed or with respect to any subject arising out of this contract, the decision of the Corporation's authorized Engineers shall be final & binding on all parties.

8.0 Samples of descriptive Data:

Samples of descriptive data requiring approval shall be submitted by the Contractor to the Corporation's Engineers in good time before the use of such material to permit its inspection & testing & there-by the approval. The samples shall be properly marked to show the name of material, manufacture place or origin & the place where it is intended to be used etc. Failure of any samples to pass specified tests requirements. It shall be sufficient cause for the refusal to consider any further samples from that source.

9.0 Baselines & Grades:

The Corporation near to the site of work shall furnish one permanent Bench Mark. Semi-permanent baselines & cross lines shall be established at sufficiently spaced intervals with benchmarks by the Contractor at his own cost & risk. The contractor shall provide at his expense, all the required pillars, equipments, materials, & labour for the establishment of the grade lines & bench marks, for that the Contractor shall be responsible for their further maintenance during the execution of the actual work till the complete period of construction. The contractor shall be responsible for the proper execution of work to such lines & levels & grades as may be specified in the drawings, established, or indicated by the Corporation's Engineers. All the survey work, if required, shall be checked by the Corporation's engineers. However this shall not absolve the contractor for the correctness of survey/ temporary or permanent Benchmarks.

10.0 Contactor not to dispose off soil etc.:

The contractor shall not sell or otherwise dispose off or remove except for the purpose of this contract the sand, ballast, earth, rock or other substances or materials that may be obtained from any execution made for the purpose of this contract or produce upon the site at the time of delivery of the possession of the land but also such substances materials & produce shall be the property of the Corporation & shall be disposed off in the manner & place as directed by the Corporation's Engineers.

11.0 Gold, silver, Minerals, Oil Relics, etc. found on the Site:

All gold silver, oil relics, or other minerals, of any description & all precious stones, coins, treasures relic, antiquities, & other similar things that shall be found in or upon the site shall be the property of the Corporation. The contractor shall return the gathered things as above to the authorized representative of the Corporation.

12.0 Fencing, lighting & ventilation:

The contractor shall be responsible for the proper lighting, fencing, guarding & taking of all the necessary safety measures for all works comprised in the contract & or the proper provision of temporary roadways, footways, guards fences, caution notices etc. as far as the same may be rendered necessary by reasons for the work for the accommodation & protection of workmen foot passenger or other traffic & of the Corporation & occupiers of adjacent villages, property of the public & shall remain responsible for any accidents that may occur on account of his failure & timely precautions. All the works & approaches shall be adequately illuminated with electric lights to the satisfaction of the Corporation's Engineers. The power & lighting connections, wiring equipment shall be subject to the inspection & passing by Electrical Inspector to GOG authorized under the Indian Electricity Act. Any additions alterations or omissions shall be got approved from the Corporation's Engineers got certified from the Electrical Inspector. Work spots such as faces of excavation of borrow pits; filling area etc. shall be adequately illuminated with floodlights to the satisfaction of the Corporation's Engineers.

13.0 Explosive procurement & storage:

Explosives, petrol, oils, fuels, &other inflammable materials shall be stored strictly in accordance with the rules of the Explosive Department.

The contractor shall at his own expense construct & maintain proper magazines which are required for the storage of explosive & arrange for storage facilities for oils, petrol, fuels etc. for use in connection with the work. The contractor shall at his own cost obtain the necessary license for the storage & use of explosives, oils, petrol, diesel etc. The Corporation shall not take any responsibility whatsoever in connection with the storage or use of explosives on the site, any accident occurs in the connection at site or nearby village or vicinity. All operations of the contractor in which or for which explosives are employed shall be at the risk of the contractor & upon his own responsibility.

14.0 Liability for accidents to persons:

14.0.1 The contractor or subcontractor shall indemnity the Corporation against any claims which may be made under the workman's compensation Act, 1923, or any statutory modification or other wise for or in respect of any damages or compensation payable in consequence of any accident or injury caused, by fault of contractor or subcontractor &sustained by any workmen or other person on the employment of the contractor or subcontractor. In every case in which by virtue of the provisions of subsection (1) of section 12 of the workman's Compensation Act, 1923, the Corporation is obliged to pay compensation to a workman employed by the contactor or subcontractor in execution of the work, the Corporation will recover from the contractor the amount of compensation so paid, and without prejudice to the rights of the Corporation under subsection 12 of the said Act, such amount will be paid back to the Corporation in 30 days, failing which the Corporation will be at liberty to recover such amount of any part thereof by deducting it from the dues by the Corporation to the contractor under this contract or otherwise. The Corporation shall not be bound to contract any claim made against either of them under section 12, subsection (1) of the said Act, except on written request from the contractor & upon his giving to the Corporation full security for all costs for which the Corporation might become liable in consequence for entertaining such claims.

14.0.2 The contractor and/or subcontractor named in the contract shall indemnity the Corporation against all claims based upon injury or death to any person in the employment of the contractor or sub contactor, or to the third parties under paragraph (a) 2 or condition no.47 to the extent of any sums recovered under the insurance policy.

14.0.3 On occurrence of the accident which result on the death of workman employed by the contractor or subcontractor, which is so serious as to be likely to result in the death of any workman, the contractor shall within 24 hours of happening of such event intimate in writing to the Engineers of the Corporation the fact of such accidents. The contractor or subcontractor shall indemnity the Corporation against all loss or damage sustained, by the Corporation resulting directly or indirectly from his failure to give intimation in the manner aforesaid including penalties or fine if any, payable by Corporation as a consequence of Corporation's failure, to give notice under workman's compensation Act or otherwise to confirm to the provisions of the said Act in regard to such accident.

Liability for damage to woks & materials:

14.0.4 The contractor shall during, the progress of the work, properly protect the works & the existing Ash Disposal pipelines & materials placed at his disposal or acquired for him by the Corporation, & shall remain answerable & liable for all accidents, damages. Loss etc. & shall be made good in the most complete & substantial manner by & at the sole cost of the contractor & to the reasonable satisfaction of the Corporation's Engineers. If the contractor fails to make good such losses, damages within the specified time given by the Corporation, the Corporation shall be at liberty to recover the amount towards such expenses fixed by the Corporation's Engineers & shall be recovered from the amount due under this contract to the contractor.

14.0.5 Further the contractor shall, at all times, protect & preserve all materials, machinery, equipments, Ash Disposal pipelines, allied structures such as spillway chambers, ADP, haul road and ramps etc., materials &so acquired by himself or Corporation for the execution of the work. All reasonable requests of the Corporation's Engineers to enclose or especially protect any of the above shall be expeditiously complied with at no extra cost.

14.0.6 If the Engineer considers that the work, asked for in the aforesaid Para, is not sufficiently & satisfactorily protected by the contractor, on requests made for, the Corporation shall be entitled to arrange for such protection at his unfettered discretion & recover the cost thereof from the contractor.

14.0.7 Until the work shall be or deemed to be taken, over as aforesaid, the contractor shall also be liable for &shall be deemed to have indemnified the Corporation in respect of all damage or injury to any person or any property of the Corporation or of others in villages near by, occasioned by the negligence of the contractor or his workmen, or his subcontractor, or by defective /ill methods of working.

14.0.8 Materials, tools, machinery brought on the site of work: All materials, tools & tackles, machinery etc. of the contractor brought to & delivered upon the site for the work shall be the time of their being so brought shall be deemed to be the property of the Corporation in it's possession to be used for the purpose of the work & for that purpose only & shall not on any account be removed or taken away by the contractor or any other person without the permission of the Corporation's Engineers in charge, but the contractor shall be fully responsible for & loss, destruction thereof or damage thereto. The Corporation may have a lien on such materials, tools, tackles, machinery for any sum or sums which may at any time prior to the completion of the works be or owing to the Corporation by the contractor, under in respect of & dispose of any such materials, tools. Tackles, machinery in such a manner as the Corporation may think fit & to apply the proceeds in or towards the satisfaction of such sum or sums due or owing as aforesaid but subject to such lien & power of sale & disposal such surplus materials, tools, tackles, machinery shall belong to the contractor & may be removed & disposed off by him as he may think fit.

15.0 Access to site & work on site:

The Engineer or his authorized representative may if he considers fit from time to time enter upon any lands which may be in the possession of the contractor under this contract, for the purpose of executing any work not included in this contract & may execute by other contractors at his opinion & the contractor shall in accordance with the requirements of the Engineer, afford all reasonable facilities for execution of the works including occupation of lands by structure or other wise for any other contractor employed by the Corporation & his

workmen or for the execution on or near site of the works not included in the contract. The contractor shall not be entitled for any extra claims on such executions.

16.0 Inspection of Works:

The Corporation's Engineers or their authorized representatives shall have at all times power to inspect the works, wherever in progress, either on site, on the contractor's premises in connection with this contract. Further, the contractor shall not allow any person other than Corporation's Engineers or their authorized representatives to the work sites. The contractor shall, during working hours, maintain supervisors of sufficient training & experience to supervise the work as a whole. All orders & directions given to such supervisors or other staff shall be deemed to have been given to the contractor. Further the Corporation may by due notice, desire a high ranking member of the supervisor staff of the contractor to be present on any specified inspection & the contractor shall comply with such directions.

17.0 Action & compensation payable in case of Bad Work:

If at any time before the refund of Security Deposit to the Contractor it appears to Gujarat Energy Transmission Corporation's Executive Engineers or subordinate and / or any authorized officer of the Corporation that the work has been executed with unsound, imperfect or unskilled workmanship or with materials of inferior quality or any materials or articles provided by him are unsound or of quality inferior to that contracted as specified in the Technical Specifications or otherwise not in accordance with the contract, it shall be lawful for the Gujarat Electricity Corporation to intimate that the works , materials, articles which may have been inadvertently passed, certified & paid to the Contractor. The Contractor shall be bound to rectify or remove & reconstruct the said work so specified at his own charge & cost & in the event of being failure to do so within specified period by the Corporation, the Contractor shall be liable to pay compensation at the rate of 1% per day on the amount of the estimate for the specified work. For the period up to 10 days this shall be attended by the Contractor else the Corporation shall get these rectifications at the risk & expense in all respects of the Contractor. Any levy of GST on such compensation payable to GETCO shall be on contractor's account.

18.0 Cleaning up:

18.0.1 The contractor shall at all-time keep the construction areas & his labour colony & storage areas free from accumulation of waste, or rejected materials.

18.0.2 Prior to the completion of the work the contractor shall remove all rubbish from & about the premises, & tools, tackles, machinery, left out materials consumable, rejected materials, scaffolding etc. which are not the part of the permanent work/structure. The premises will be left fully satisfactorily to the Corporation's Engineers/representatives; thereafter only the completion certificate will be issued.

19.0 Contractor's inventory of equipments & machinery:

The contractor shall prepare & maintain an inventory of all machinery, equipments, temporary rolling stock, and plant purchased or hired for the use of this contract's execution.

19.1 Progress Schedule:

Contractor shall furnish a Construction Schedule on receipt of LOI or Work Order whichever is earlier, in quadruplicate, indicating the date of start, the monthly progress expected to be achieved & anticipated completion of each major items of the work under this contract & procurement of equipments, machinery & other materials. The schedule should be such as is practicable of achievement the whole work in the time limit & of the particular items on due date specified in the contract & shall have the approval of the Corporation's Engineers. Detailed schedules for each working season showing the progress month by month to be achieved is to be submitted to the Corporation. The Corporation is empowered to ask for more detailed progress schedule week by week for any item or for all items & the contractor shall comply when asked for.

19.2:The Corporation shall have, at all times the right without in any way violating this contract, or forming grounds for claim to alter the order of the works or any part thereof & the contractor shall after receiving such direction proceed in the order directed. The contractor shall revise the progress schedule accordingly & submit to the Corporation in four copies.

19.3: The contractor shall furnish sufficient machinery, equipment, labourers & materials shall work for such hours & shifts as may be necessary to maintain/achieve the progress of the scheduled, after getting written permission of Engineer In Charge.

19.4 The progress schedules shall be in the form of bar charts, statements &/or reports as may be necessary & directed by the Corporation's representatives.

19.5.1 Unsatisfactory Progress: In the case of unsatisfactory progress by the contractor not proceeding as per the Scheduled Programme approved by the Corporation, suitable actions shall be taken in accordance with Clauses No. 3 & 4 of the booklet prescribed by the Corporation for ``Tender & Contract for Works''.

Recoveries:

Recoveries due from the contractor, up to the end of the month previous to the one in which the bill is prepared shall be made from bills approved for payment every month or at other periods when the bills are prepared, for the enlisted, but not limited to, in the order of priorities & extents. (a) Penalty, if Leviable,

Expenditure, in full, incurred by the Corporation on contractor's behalf in labour, machinery, equipment etc.,

(c) Charges for services such as water & power supply, etc. in full,

(d) Hire charges for Corporation's or Government machinery if any,

(e) Other recoveries not specifically mentioned but recoverable.

(f) GST as applicable on recoveries due from the contractor enlisted as above.

20.0 Date of completion:

The contractor shall complete the whole work & hand over to the Corporation on or before the date specified in the work order. Provided always that if in the opinion of the Corporation the completion of the works shall be delayed by any change of original design or by the order of the Corporation, of any altered, modified substituted or additional works or materials omitted or by strikes, lock outs or stoppages of labour, or revolution, riots, civil or political disturbance or by the contractor not being given possession of the site or by the Corporation taking possession of & using the site or part thereof or the works or part thereof or any part of the work or delayed supply of material by the Corporation or by the not receiving any orders, drawings, instructions or directions in time or by the suspensions if the works or by fire, flood exceptionally bad weather tempest , storm or by from unforeseen circumstances(& whether the same shall be due to any act or omission of the Corporation or it's representatives) the Corporation may in the unfettered discretion thinks fit either forthwith or at a later time & from time to time not withstanding that the prescribed or extended time for completion has expired or work have been completed, extend the date for the completion of the works to such a date as deemed fit as practical & acceptable.

21.0 Subletting of contract

There will be generally no objection on the component parts if the work, being given over to responsible subcontractors but Corporation shall under no circumstances recognize these subcontractors & the responsibility of executing the work in the accordance with the conditions of contract will entirely rest on the main contractor. However written consent of EIC shall be obtained before subletting. The main contractor will therefore always have the very responsible member, preferably a technical hand present on the works with power to sign all work orders issued on the site of work & to take requisite actions in the interest of efficient execution of work.

22.0 Other contracts for the suspension stoppage or curtailments of work:

If during the tendency of the contract the Engineer shall for any reason (which shall be unquestioned) whatsoever require the whole or any part of the work as specified in the

contract to be suspended for any period or shall not require the whole or any part of the work as specified in the contract to be carried out at all by the contractor, he shall give notice in writing of the fact to the contractor who shall thereupon suspend or stop the work totally or partially as the case may be. In any case except as provided hereunder, the contractor shall have no claim to any payment or compensation whatsoever on account of any profit or advantage which he might have derived from the execution of the work in full but he did not so derive in consequence of the full amount of the work not having being carried out, or on account of any loss that he may be put on account of materials purchased or agreed to be purchased or for unemployment of labour recruited by him. He shall not also have any claim for compensation but reason of any alterations having been made in the original specifications, drawings, designs & instructions that may involve any curtailment of the work as originally contemplated. Where however, materials have already been purchased or agreed to be purchased by the contractor, before receipt of the aforesaid notice, the contractor shall be paid for such materials at the rate determined by the Corporation, provided they would have been useful for the work curtailed or stopped are not in excess of requirements are of approved quality & cannot be used on other contract works or otherwise by the contractor &/or shall be compensated for the loss if any, that he may put to, on respect of materials agreed to be purchased by him, the amount of such compensation to be determined by the Corporation, whose decision shall be final. The Corporation may order the contractor to suspend any work on account of bad weather; rain or storm & such other adverse climate conditions & the contractor shall comply with the same. The contractor shall not be entitled to any compensation for such suspensions of work.

23.0 Other contractors:

Apart from this work, the other works connected with this work will be simultaneously going on either departmentally or through any other contractors. The contractors shall co-operate with others to their fullest extent & shall allow each other every facility & coordination for the execution of their works simultaneously & satisfactorily, during their action of machinery or execution of any other co-ordination works, the contractor will have to co-operate as directed buy the Corporation's Engineers in the charge of the works. In such cases the contractor shall not be entitled for any compensation on account of reduction or stoppage of labour force/machinery/equipments etc. In the matter of dumps, haul, roads, drainage, diversion & the like, each contractor shall take into considerations the needs & the requirements of the other contractors if any working in the vicinity. Further no contractor shall take or cause to be taken any stops or action that may cause disruption, discontent or disturbance to the work, labour arrangements etc. to other contractors. Any action, by any contractor, which the Corporation in the unquestioned discretion may consider as infringement of the above code, would be considered as a breach of the contract conditions & the Corporation may take such action as may deem fit against the contractor & the action taken shall be considered as final & binding.

24.0 Speed of work:

The contractor shall at all times maintain the speed of work to confirm to the latest operative progress schedule but the Corporation may at any time with sufficient notice in writing direct the contractor to slow down or to accelerate any part or the whole work for any reason (which shall not be questioned whatsoever) & the contractor shall comply with such orders of the Corporation. The compliance of such orders shall not entitle the contractor to any claim or compensation.

25.0 Contract document & matters to be treated as confidential:

All documents, correspondence, decision & other matters concerning the contract shall be considered as of confident & restricted nature by the contractor & he shall not divulge or allow access there to any unauthorized persons of any kind.

26.0 Access to the contractor's book:

Whenever it is considered necessary by the Corporation to ascertain the actual cost for execution of any particular item of work, the Corporation may do so by directing the contractor to produce the original invoices.

27.0 Interest on money due to the contractor:

The contractor shall not be entitled to receive the interest on the payment due to him upon measurements or otherwise or on any balance payable to the contractor. Also, contractor shall not be allowed to relate it with the progress of work at site in any case.

28.0 Measurements to be provisional & subject to correction:

Every measurement for running payment on account of work done shall be subject to adjustment or final measurements. In case there is disagreement between such intermediate & final measurements, the latter shall prevail.

29.0 R. A Bills:

The contractor shall submit his R/A bill every month, which shall be processed in reasonable time after checking and recording the MB. The contractor shall be responsible to submit R/A bills well in time and shall depute his representative for joint checking of the measurements; so that the bills can be processed in time. The contractor shall take due care in this regard, failing to which consequences will be up to him.

30.0 Breach on part of Corporation not to annul contract:

No breach or non-observance on the part of the Corporation of any the agreements contained
herein, shall annul this contract of discharge the contractor from the observance & performance
thereof, or of any part thereof, but on application by the contractor & in the unfettered discretion of the Corporation an extension of time may be given to the contractor in respect of such breach or non-observance by the Corporation.

31.0 Labour conditions:

31.1 The contactor shall comply with the labour laws laid as may be current & shall furnish the returns & information as may be specified from time to time.

31.2 The contractor shall as far as possible obtain his requirements of labour, skilled & unskilled from the local areas.

31.3 The contractor shall pay wages as per the latest circulars applicable at the times for the minimum wages to be paid to unskilled, semiskilled & skilled labour prescribed by the Govt. of Gujarat.

31.4 The Corporation shall have the authority to remove from the work site any person, who may be considered unfit or undesirable & no responsibility shall be accepted by the Corporation for any delay or extra expense caused towards the completion of the work by such removal.

31.5 If Govt. declares a state of scarcity or famine to exist in any village situated within 10 Km. of the work site then the piece worker or contractor shall employ upon such parts of work, as are suitable for unskilled labour any person certified by the Corporation or by any person to whom the Corporation has authorized, & shall pay the minimum wages as fixed by the Govt. of Gujarat in this behalf. Any dispute that may arise in the implementation of the clause the decision of the Supdt. Engineer (civil) shall be final & binding.

31.6 The contractor shall provide reasonable facilities to the labour employed by him. The usual facilities are weather proof shelter for rest & meal, supply of whole some drinking water, facilities for obtaining food, reasonable washing & sanitary facilities, special facilities for women workers, suitable residential accommodation, general sanitation & health measures etc.

31.7 The implementation of any & all provisions of this clause in no way entitles the contractor to claim in this contract.

32. Local Laws:

31.1 All local laws in force at the time entering into the contract & those enacted there after shall be binding on the contractor & he shall abide by the same.

All import duties, sales tax & other local taxes shall be borne by the contractor & they shall be deemed to have covered by this quoted rate.

33. Performa returns:

The contractor shall maintain proforma, charts & details regarding machinery, equipments, materials labour, personnel & other matters as may be specified by the Corporation time to time.

34. Maintenance:

The contractor shall maintain the works under contract for a period of one year from actual date of completion and during this period all maintenance expenditure incurred shall be borne by the contractor.

35. Insurance:

The contractor shall procure, or arrange for the Subcontractor to procure insurance coverage in amounts approved by the Corporation & sufficient to protect against the following risks arising out of the work. Accidents & professional & non-professional sickness of all labourers & personnel engaged in the work as required by Law pursuant to Workmen's Compensation Act, 1923 or Revised version thereof. Injury or death to third parties including without limitation injury or death caused by any of the construction aids or vehicles or rented machinery, equipments used by the contractor or subcontractor whether at the site or elsewhere. Damage to contractors tools machinery construction equipments form works, scaffolding materials etc. due to floods, earthquake or any such cause. Damage to the existing permanent structures of the Corporation & nearby villages, equipments of the Corporation or of the co-contractors working in the area for other works.

All the above conditions referred for the insurance cover, shall be in effect from the date of commencement of the work until the Corporation has accepted the work. In the policies covering the insurances referred to above, the Corporation, contractor & the subcontractor shall be as co-ensured where possible.

The cost of insurance shall be borne by the contractor.

36. Liens:

Final payment to the contractor shall not be made until the contractor shall deliver to the Corporation receipts in full in lieu thereof, & in either case, an affidavit that so far he has knowledge or information the releases & materials for which in lien could be filed. If any lien remains unsatisfied after all the payments are made, the contractor shall refund to the Corporation all money that the latter may be compelled to pay in discharging such a lien, including all costs & a reasonable attorney.

37 RIGHTS OF THE OWNER:

Whenever any claim or claims for payment of a sum of money arises out of or under the contract against the contractor, the Owner shall be entitled to withhold and also have lien to retain such sum or sums in whole or in part from the security, if any, deposited by the contractor and for the purpose aforesaid, the Owner shall be entitled to encash and withhold the amount of Performance Bank Guarantee or other security, if any, furnished as the case may be. The Owner shall also heave o lien over the same pending finalization or adjudication of any such claim. In the event of the security is insufficient to cover the claimed amount or amounts, the Owner shall be entitled to withhold and have lien to retain to the extent of the such claimed amount or amounts referred to above, from any sum or sums found payable or which at any time-thereafter may become payable to the Contractor under the same contract or any other contract with the Owner or GUVNL or its subsidiary companies pending finalization or adjudication of any such claim.

Lien in respect of Claims in other Contracts:

a.) Any sum of money due and payable, to the Contractor (including the security deposit) under the contract may be withheld or retained by way of lien by the Owner against any of its claim in respect of payment of a sum of money arising out of or under any other contract made by the contractor with the owner or GUVNL or any of its subsidiary companies.

b.) It is an agreed that the sum of money so withheld or retained under this clause by the Owner will be kept withheld or retained as such by the owner till its claim arising out of the same contract or any other contract is either mutually settled or determined by the arbitrator or competent court, as the case may be, and the Contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this clause and as moy be duly notified to the contractor."

38 Relationship with employee:

Every bidder, at the time of submission of bid. Give a declaration as under

"If any bidder company/firm, the interest (i.e. Shareholding in Company and share in partnership firm)of any empyee of the tendering company or his/her relative as defined in Section 2(77) of the Company's act 2013 is 10% or more, the tendering Company will not deal with such Company/Firm at all.

Tendered therefore, must specifically disclose this fact in his technical bid. Non-disclosure of such facts would immediately disqualify the tenderer for further dealing with the tendering company.

39 <u>Conflict of Interest among Bidders/ Agents</u>

A bidder shall not have conflict of interest with other bidders for particular quoted item. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. The bidder found to have a conflict of interest shall be disqualified. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process for particular quoted item, if:

a) they have proprietor/ partner(s)/ Director(s) in common; or
b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; or
c) they have the same legal representative/ agent for purposes of this bid; or
d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another bidder; or
e) bidder participates in more than one bid in this bidding process. Participation by a bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ assemblies from one bidding manufacturer in more than one bid.
f) in cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent/ dealer. There can be only one bid from the following:
    1. The principal manufacturer directly or through one Indian agent on his behalf; and
    2. Indian/ foreign agent on behalf of only one principal.
g) a Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid;

h) in case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/ management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business.

i) Bidder shall not act in contravention/ violation to the provisions of competition act, as amended from time to time.

Every bidder should, at the time of submission of bid, give a declaration, that bidder shall not have conflict of interest with other bidders, as above.

40 Use of Call before you dig (CBUD) App

All the excavators/excavating agencies engaged by "GETCO(Gujarat Energy Transmission Corporation Limited) must self-register "Call Before you Dig (CBUD) app as excavator

All digging agencies/Contractors must be mandated to do any type of digging/excavation only after prior intimation through CBUD Mobile app.

Date:
(Signature of Contractor)
Address:
Seal:

Superintending Engineer (TR)
GETCO, CO NADIAD.

SECTION –D
TECHNICAL SPECIFICATIONS:

GUJARAT ENERGY TRANSMISSION CORPORATION LTD

STANDARD FIELD QUALITY PLAN (REVISED-R1)

FOR CIVIL WORKS OF GETCO PROJECTS

Sr. No.	Component/Operation & Description of Test	Sampling Plan With Basis	Ref. Document for Acceptance	Testing Agency	Specific Guideline	Approving Authority
1	**MATERIAL**					
A	**CEMENT (FROM APPROVED LIST ONLY)**					
(i) (ii) (iii)	Fineness Compressive Strength Initial & final setting time	As per mix Design requirement	IS: 456,IS: 269 IS: 8112,IS: 12269 IS: 1489	Govt. Approved Lab	The tests for cement Coarse aggregates & Fine aggregate shall be conducted during Mix design for Concrete. Mix design shall be subject to approval by GETCO	B-3
B	**COARSE AGGREGATES (FOR CONCRETE)**					
(I) (ii) (iii) (iv) (v) (vi) (vii) (viii) (ix)	Determination of Particle size (Sieve Analysis) Flakiness Index Crushing Value Specific Gravity Bulk Density Absorption Value Moisture Content Soundness of Aggregate Presence of deleterious materials.	As per mix Design requirement	IS: 383,IS: 2386 IS: 456	Govt. Approved Lab	In case of change of source of coarse& Fine aggregates, mix Design should be revised.	B-3
C	**COARSE AGGREGATES (FOR ROAD AND YARD)**					
(i) (ii) (iii) (iv) (v) (vi) (vii)	Particle Size Distribution Elongation Index Flakiness Index Deleterious Material Specific Gravity Water Absorption Impact Value	As per relevant IS	IS ; 2386, IS : 383	Govt. Approved Lab	To be approved by GETCO	B-3

(viii) (ix) (x) (xi) (xii) (xiii)	Los Angeles Abrasion Value Aggregate Crushing Value 10% Fines value Soundness Alkali Aggregate Reactivity Petrography					
D	**FINE AGGREGATE**					
(I) (ii) (iii) (iv) (v) (vi) (vii)	Gradation /Determination of Particle size Specific Gravity and density. Moisture content Absorption Value Bulking Silt Content Test Presence of deleterious materials	As per mix Design requirement	IS: 383,IS: 2386,IS: 456	Govt. Approved Lab	In case of change of source of coarse& Fine aggregates, mix Design should be revised.	B-3
E	**BURNT CLAY BRICKS**					
(i) (ii) (iii) (iv)	Dimensional tolerance Compressive Strength Water Absorption Efflorescence	As per relevant IS	GETCO Specs. IS: 3495) (Part I to Iv)	Govt. Approved Lab	To be approved by GETCO	B-3
F	**FLY ASH LIME BRICKS**					
(i) (ii) (iii) (iv) (v)	Dimension Water absorption Drying Shrinkage Compressive Strength Efflorescence	As per relevant IS	GETCO Specs. IS: 3495 and IS : 12894	Govt. Approved Lab	To be approved by GETCO	B-3
G	**SOLID CC BLOCKS**					
(i) (ii) (iii) (iv)	Dimension Block Density Compressive strength Water absorption	As per relevant IS	GETCO Specs. IS: 2185 Part 1	Govt. Approved Lab	To be approved by GETCO	B-3

(v)	Dry Shrinkage					
H	**BELLA STONE**					
(i) (ii)	Water absorption Compressive Strength	As per relevant IS	GETCO Specs. IS: 2386 Part 3	Govt. Approved Lab	To be approved by GETCO	B-3
I	**PRECAST CC PAVER BLOCKS**					
(i) (ii) (iii) (iv) (v) (vi)	Shape and Dimension Compressive Strength Flexural Strength Abrasion Resistance Split Tensile Strength Water absorption	As per relevant IS	GETCO Specs. IS: 15658	Govt. Approved Lab	To be approved by GETCO	B-3
J	**SOIL TO BE USED FOR BACK FILLING**					
(i) (ii) (iii) (iv) (v) (vi) (vii)	Grain Size Analysis Atterberg's limit Classification of Soil Free Swell Index Swelling Pressure Proctor Test SO_3 (Sulphate) Content	As per relevant IS	IS :2720	Govt. Approved Lab	To be approved by GETCO	B-3
K	**WATER**					
(i) (II)	Cleanliness (Visual Check) Chemical and physical properties of water for checking its suitability for construction proposes.	Random One sample per Source	IS: 456,IS: 3025 and Specification. The Water used for mixing concrete shall be fresh, clean and free from oil, acids and alkalis, organic materials, or other deleterious materials IS: 456,IS: 3025 and GETCO Specification	Contractor / GETCO Govt. Approved Lab	Each source to be Approved by GETCO	C
L	**REINFORCEMENT STEEL(FROM APPROVED LIST ONLY)**					

(i) (ii) (iii) (iv) (v) (vi)	Identification & size Chemical Analysis Test Tensile Test Yield stress\proof stress Percentage Elongation Bend/Re-bend Test Reverse Bend Test for HYSDWire	Random One sample per Heat One sample per Each size One sample per Each size One sample per Each size One sample per Each size	IS: 432,IS: 1139, IS: 1786 &GETCO Specification	Contractor should produce manufacturer's test Certificate. i.e. from approved Manufacturer. Govt. Approved Lab	Approved by GETCO.	B-3
M	**STRUCTURAL STEEL**					
(i) (ii) (iii) (iv) (v) (vi) (vii) (viii)	Chemical Composition Tensile Strength Yield Strength Percentage Elongation Bend Test Impact Test Y Groove Crackability Test Dimensions	One sample per Heat One sample per Each size One sample per Each size One sample per Each size One sample per Each size One sample per Each size One sample per Each size Random	IS :2062, IS :228, IS : 1608, IS : 1599, IS : 1757, IS : 10842	Govt. Approved Lab	Approved by GETCO.	B-3
N	**FOUNDATION BOLTS**					
(i) (ii) (iii) (iv) (v) (vi) (vii)	Identification & size Chemical Analysis Test Tensile Test Yield stress/Proof Stress Percentage Elongation Bend / Rebend Weight/Thickness/Uniformity of Galvanizing	Random One sample per Each One sample per Each One sample per Each One sample per Each One sample per Each One sample per Each	IS : 209, IS : 2016, IS :2062, IS : 2633, IS :12427,& GETCO Specification	Govt. Approved Lab	Approved by GETCO.	B-1
O	**PVC WATER STOPS**					
(i) (ii) (iii) (iv)	Tensile strength Elongation Hardness Water absorption,percentage by mass	One sample per Each One sample per Each One sample per Each One sample per Each	IS : 15058, IS :8543 (Part4 / Sec 1), IS : 13360 (Part 5 / Sec 1), IS ; 9766 & GETCO Specification	Contractor should Produce manufacturer's test Certificate. i.e from approved Manufacturer.	Approved by GETCO.	B-3

(v) (vi) (vii)	Cold bend temperature at which sample does not crack Accelerated extraction test: (a) Tensile strength (b) Elongation Stability in effect of alkalis test : (a) weight increase at 7 days, % by mass (b) weight decrease by mass at 7 days, % by mass (c) Change in hardness at 7 days (d) Weight increase at 28 days (e) Weight decrease at 28 days **(f)** Dimension change	One sample per Each One sample per Each One sample per Each				
P	**Bought out item (shown as annexure – II)** Check the bought out items are as per Technical specification / IS codes before use. Approval of all bought out items.	Check all the items	GETCO Specification	Joint inspection By GETCO. And Contractor	Approval by GETCO.	**A**
2	**WORKS**					
	GANTRY/EQUIPMENT FOUNDATION/CABLE TRENCH					
A	**BEFORE EXCAVATION**					
(i) (ii)	Checking of pegs location as Per line and alignment Checking of pit making as perDrawing & RL	100% on each Location 100% on each Location	IS: 4091,IS: 3764 &GETCO approved Drawing/ specification	Contractor	Approved by GETCO.	C
B	**EXCAVATION**					
(i) (ii) (iii)	Dimensional conformity Verticality/slopes & Square ness of each pit Verification of classification of foundation wherever applicable.	Each location Each location Each location	IS: 4091,IS: 3764 &GETCO approved Drawing/ Specification.	Contractor Contractor Joint inspection By GETCO. And Contractor	Approval by GETCO. (1) Foundations will not be placed on filled up soil (2) Minimum depth Of foundation will be 750 mm in Virgin soil.	B-3
C	**ANTITERMITE TREAMENT**					

(i) (ii) (iii) (iv)	Check for material to be used Check for proportion Depth and c/c distance of holes Check for pouring of required quantity of liquid in holes	100% Random Random Random	IS : 6313 & GETCO Specification	Joint inspection By GETCO. And Contractor	Approval by GETCO.	B-3
D	**P.C.C. PADDING**	For all locations	IS:456,GETCO Approved foundation Drawing & specification	Joint inspection By GETCO. And Contractor	Approval by GETCO.	C
E	**SHUTTERING (**Form work)					
	Check for materials, breakageOr damage Check for plumb, alignment Parallelism,squareness and equidistance from stubDimensional check. Check for level & height Check for rigidity of frame/tightness Cleaning and oiling Diagonal bracing if required as per drawings/site conditions. Checking of joints to avoid undue loss of cement slurry	**100%**	IS: 456,GETCO Specification/ Approved drawings.	Joint inspection By GETCO. And Contractor	Approved by GETCO.	C
F	**PLACEMENT OF REINFORCEMENT STEEL.**					
(i) (ii) (iii) (iv)	Check the steel bars for rust,cracks,surface flaws,laminate etc. (Visual check) Check as per the bar bendingSchedule before placement ofConcrete. Check cutting tolerance for bars as per check List/drawings. Check whether all bent bars and lap lengths are as per approved bar bending schedule. Check whether all joints & crossing of bars are tied	**100%**	IS: 456,GETCO Specification/ approved drawings.	Joint inspection By GETCO. And Contractor	Approved by GETCO.	B-3

	properly with right gauge & annealed wire as per specification.					
(v)	Check for proper cover distance spacing of bars,spacers, & chairs after the reinforcement cage has been put inside the formwork.					
(vi)	Check whether lapping of bars are tied properly with right gauge and annealed wire as per specification.					
G	**PILE FOUNDATION** (Additional Tests)					
(i)	Check of centre line of pile group	Each pile group	IS:2911 &GETCO Approved pile Foundation Drawings/ Specification.	Joint inspection by GETCO and Contractor	Checklist to be prepared And signed jointly	B-3
(ii)	Check pile location	Each pile				
(iii)	Temporary casing tube & permanent line also check Thickness of liner material (if applicable)	Each pile				
(iv)	Bentonite slurry (if applicable)	Each pile	GETCO Approved pile foundation Drawings/pecification			
(v)	Pile depth, level, size and alignment	Each pile				
(vi)	Chipping of pile head	Each pile				
(vii)	Pile load testing	As per GETCO GBOQ/Specifica-Tion IS: 2911				
(viii)	Anchor bolts if applicable					
(ix)	Level, centre to centre distanceOf bolts.	100% on each Location				
(x)	Visual check for galvanizing	100% on each Location				
H	**SETTING OF TEMPLATE**					
(i)	Identification	Each foundation	GETCO Approved specifications	Joint inspection by GETCO. and Contractor	Approval by GETCO	C
(ii)	Check for orientation of template to match with drawing	Each foundation				
(iii)	Check for line and level of template	Each foundation				
(iv)	Check for center line of foundation and template	Each foundation				
(v)	Check for diagonal dimensions	Each foundation				

(vi)	Check for diameter and distance of holes	Each foundation				
I	**PLACEMENT OF FOUNDATION BOLTS**					
(i)	Identification (Diameter and length)	Each foundation	GETCO Approved specifications	Joint inspection by GETCO and Contractor	Approval by GETCO	C
(ii)	Check the foundation bolts for rust, cracks, surface flaws, laminate etc. (Visual check)	Each foundation				
(iii)	Check for height of bolts above concrete level as per drawing	Each foundation				
(iv)	Check for bolt to bolt distance as per drawing	Each foundation				
(v)	Check for verticality of bolts	Each foundation				
(vi)	Check for Fixity of bolts	Each foundation				
J	**PLACEMENT OF WATER STOP**					
(i)	Check the water stops for blisters, pinholes, cracks, and embedded foreign matters (Visual Check)	Random	GETCO Approved specifications	Joint inspection by GETCO and Contractor	Approval by GETCO	B-3
(ii)	Check for width and thickness	Random				
(iii)	Line and level	100%				
(iv)	Fixity during concreting	100%				
K	**CONCRETING**					
a	**APPROVAL OF MIX DESIGN**.	For each grade of Concrete.	IS: 456 &GETCO Approved specifications	Contractor	Approval by GETCO	B-3
b	Batching, mixing & placing of concrete and compacting	Random	IS: 456 &GETCO Approved drawings And specifications	Contractor	Approval by GETCO	B-3
	Placing concrete, and compacting	Random				
c	**CONCRETE TESTING**					
	Slump test	Random	IS:456,IS:516,IS: 1199 And GETCO Specifications	Contractor	Results to be recorded and signed Jointly	B-3
	Check for quantities for cement, fine aggregate, coarse aggregate and water while batching	Random				
d	**CONCRETE CUBE TESTING**					

	Compressive Strength	Sample (Consisting of minimum 6 cubes-3 cubes for 7days and 3 cubes for 28 days test) 1-5 Cmt : 1 6-15 Cmt : 2 16-30 Cmt : 3 31-50 Cmt : 4 Above 50 Cmt : 4+1 additional for each additional 50 Cmt	Is:1199,IS:456, IS:516	Govt. Approved lab	To be witnessed for important structure (slab)& Approved by GETCO	B-3
L	**BACKFILLING**					
	Check for thickness of Layer & watering Visual check for correction/ramming Compaction test (Percentage ofMax dry density	100%	GETCO Specifications.	Govt. Approved lab	To be witnessed & Approved by GETCO	C
M	**BRICK-WORK**					
	Mortar mix/proportion Plumb & Alignment Joints	Random Random Random	IS:2250, GETCO Specification	Joint inspection by GETCO and Contractor	Approval by GETCO	C
N	**PLASTERING**					
	Plastering thickness and evenness Mortar mix proportion	Random Random	GETCO Specification GETCO Specification	Joint inspection by GETCO and Contractor	Approved by GETCO	**C**
O	**FLOORING**					
(i) (ii) (iii) (iv)	Thickness of flooring material (Kotah stone/Vitrified tiles/glazed tiles) Mortar mix proportion Line and level Joints	Random Random 100% 100%	GETCO Specification	Joint inspection by GETCO and Contractor	Approved by GETCO	**B-3**
P	**WATERPROOFING**					
(i) (ii) (iii) (iv) (v) (vi)	Check for material to be used Cleaning of terrace Proportion of mortar Level Joints Pond Test	100% 100% Random 100% 100% 100%	GETCO Specification,.	Joint inspection By GETCO. And Contractor	Approval by GETCO	**B-3**
Q	**CURING FOR CONCRETE, MASONRY,PLASTERING**	100% on all locations	IS 5613 &GETCO Specification,.	Contractor.	Approval by GETCO	**C**

	ETC.					
R	**ALLUMINIUM DOORS/WINDOWS**					
(i)	Check for size of different members	Random	IS : 733, IS: 1285, IS : 1868, & GETCO Specification	Joint inspection By GETCO. and Contractor and test report from Manufacturer	Approval by GETCO	B-2
(ii)	Check for weight of different members	Random				
(iii)	Check for anodizing	Random				
(iv)	Check for joints of various members	Random				
(v)	Check for thickness of glass	Random				
(vi)	Fixing (line, level, plumb)	100%				
(vii)	Gap between frame and wall	100%				
S	**FALSE CEILING**					
(i)	Type of false ceiling	Random	GETCO Specification	Joint inspection By GETCO. And Contractor	Approval by GETCO	B-2
(ii)	Thickness of false ceiling panel	Random				
(iii)	Check for size and weight of different members of false ceiling skeleton	Random				
(iv)	Fixing with wall	Random				
(v)	Line and level	Random				
(vi)	Check for hangers	Random				
(vii)	Cutouts for lighting fixtures	Random				
T	**GI PIPE FOR WATER SUPPLY**					
(i)	**Check for weight as per diameter of pipe**	Random	IS : 1239 & GETCO Specification	Joint inspection By GETCO. And Contractor	Approval by GETCO	**B-3**
(ii)	**Depth of excavation for pipe line**	Random				
(iii)	**Laying of pipe line as per layout given**	Random				
(iv)	**Fixing of pipe with clamps on walls**	100%				
(v)	**Watertight ness of joints**	100%				
U	**SITE SURFACING**					
(i)	Check for layers of 200mm	100%	GETCO Specification	Contractor and Govt. approved Laboratory	Approval by GETCO	**B-3**
(ii)	Check for watering	100%				
(iii)	Check for rolling	100%				

(iv)	Check for density (% Compaction)	100%				
V	**ROAD WORK**					
(i) (ii) (iii) (iv) (v) (vi) (vii)	Visual check for material Stacking of material Preparing the land for road Spreading of metal in required thickness Camber Rolling Watering	One sample 100% Random Random Random Random Random	IS383 & 2386 GETCO Specs. GETCO Specification	Contractor	Approval by GETCO	B-3
W	**YARD QUARRY DUST/METAL SPREADING**					
(i) (ii) (iii) (iv) (v)	Visual check of material Stacking of material Preparing the land upto required level Spreading of material of required thickness Compaction	One sample 100% Random Random Random	IS383 & 2386 GETCO Specs.	Contractor	Approval by GETCO	B-3
X	FALSE FLOORING					
(i) (ii) (iii) (iv) (v) (vi) (vii)	Type of false flooring Thickness of false flooring panel Check for size and weight of different members of false flooring skeleton Fixing with floor Line and level Check for studs Cutouts for panel to be supported on MS channel	Random Random Random Random Random Random Random	GETCO Specification	Joint inspection By GETCO. And Contractor	Approval by GETCO	B-2
Y	PERIPHERAL/ROAD SIDE DRAIN					
(i)	Alignment as per lay out	100% on each Location	As per approved drawings	contractor	Approval by GETCO	**C**
(ii)	Invert level as per outlet points	100% on each Location	As per approved drawings	contractor	Approval by GETCO	**C**
(iii)	Concrete and masonry as per FQP		As per approved drawings	contractor	Approval by GETCO	**C**

57 Quality Assurance

: GENERAL GUIDELINES FOR IMPLEMENTATION:

1. Details of categories of check codes A, B & C including accepting and deviation dispositioning authorities are indicated at annexure-I

2. GETCO specification shall mean GETCO technical specification, approved drawings data sheets and Law provisions applicable for the specific contract.

3. Acceptance criteria and permissible limits shall be as per relevant Indian Standards and/ or prevalent code of practice / GETCO specifications.

4. It is clarified that the tests indicated at column 2 of this FQP i.e. Against column "component operation & Description of test ", are only generally required to be conducted. However, GETCO reserves the right to carry-out any additional tests at any stage if the situation so warrants.

5. SE (TR) of circle shall approve testing laboratory before accepting the test results from the lab.

6. SE (TR) of circle shall approve the sources for cement, coarse aggregate, fine aggregate & water before actual utilization.

7. All the testing & measuring equipments used by the contractor for testing are required to be calibrated. A Copy of valid calibration report shall be retained by GETCO based on the joint inspection.

8. Classification of foundations shall be approved by GETCO based on the joint inspection report & Soil investigation reports.

9. Zone-IV fine aggregate shall be used for nominal mix. Reinforced cement concreting work.
Zone-IV fine aggregate shall be avoided for design mix reinforced cement concreting work unless tests have been done to ascertain the suitability of proposed with the prior approval GETCO sit.

10. Bricks should be free from cracks, flaws and modules of free lime. They should have smooth rectangular faces with sharp corners and should be uniform in colour.

11. Cement
In case of cement is in the scope of the contractor, the same shall be procured from sources approved by GETCO site and got tested on sample basis for specified acceptance tests as specified in the FQP at a reputed third party lab approved by GETCO site.
The samples of cement for site testing shall be taken within three week of the delivery and all the tests shall be commenced within one week of sampling. If the cement remains in store for a period of more than Six months. All the site tests are required to repeated before usage.
The source and grade of cement shall be as per approved design mix.

12. Reinforcement steel & structural steel used in cable trenches & foundations
In case supply of steel is in the scope of the contractor, the same shall be procured from the main producers i.e. SAIL, TISCO, IISCO or RashtriyaIspat Nigam or the rerollers approved by main producers.

The results of testing of cement and reinforcement steel referred in 12.1 and 13.1 above shall be got approved from GETCO site before cement and reinforcement steel are put to use. However, in exceptional cases due to exigencies of work, GETCO site may authorize the contractor to use cement and reinforcement steel even before the test results are received. However, in all such cases, if the test results subsequently received are found to be not complying with the specified acceptance criteria, the contractor shall have to dismantle and recast all such foundations cast with such non-conforming materials at his own cost. Confirmation to this effect shall be obtained from the contractor by the project authorities beforehand in all such cases.

13. The contractor shall submit welding procedure specification (WPS) including the type of electrode used for approval of GETCO site before staring the welding work. The welder with proper certificate shall be deployed

14. Approval/acceptance of individual test results by GETCO in the course of execution of contract will neither relieve the contractor from his contractual obligations and responsibilities, nor does it limit the owner's right under the contract.

15. In case, requirement of special items like super sulphate cement, corrosive resistant reinforcement Steel (CRS) etc. arise due to site conditions, the specific approval of GETCO may be obtained before using the same and all the tests as per relevant standards shall be carried out.

16. All the materials shall be stored by the contractor in a manner affording convenient access for identification and inspection at all the times. Storage of material shall be in accordance with IS: 4032 (latest edition).

ANNEXURE-I

GUJARAT ENERGY TRANSMISSION CORPORATION LIMITED

Accepting and deviation dispositioning authorities for different Categories of checks as envisaged in field quality plan

Category	type of Check	100%Checking/ witnessing by	counter check/ surveillance check by	Accepting Authority, if Test results Are within Permissible Limit	Deviation Dispositioning Authority
A	Critical	EE (civil) of circle with Contractor's Engineer	SE(TR) Plus EE(C)	SE(TR) Plus EE(C)	CE, Corporate Office
B-1	Major	D E (Quality Deptt)	E E (Quality Deptt)	EE (Quality Deptt)	CE (Quality Deptt)
B-2	Major	EE (civil) of circle with Contractor's Engineer	SE (Civil)	SE (Civil) plus EE (C)	CE, Corporate Office
B-3	Major	DE(C)	EE(C)	EE(C)	SE(TR) Plus EE(C)
C	Minor	JE(C)	DE(C)	DE(C)	EE(C) Plus DE(C)

ANNEXURE-II

BOUGHT OUT ITEMS

Check the following bought out items for their specifications / IS codes before use

1. Cement.
2. Murrum or yellow earth for filling in yard or plinth.
3. Bricks/Block.
4. Reinforcement.
5. Structural steel.
6. Foundation bolts.
7. Fine aggregate.
8. Coarse aggregate for all type of concrete, WBM road and metal spreading in yard.
9. PVC water pipe line with fixtures.
10. PVC drainage pipe line with fixture.
11. PVC rain water pipe with fixture.
12. PVC casing pipe for bore well.
13. 4 mm thick flat copper cable for submersible pump
14. Teak wood for frame and shutter.
15. Aluminium door, window and ventilator.
16. FRP door.
17. Steel cup board shutter.
18. False ceiling material.
19. Glazed tiles.
20. Kotah stone and marble strips.
21. Vitrified tiles.
22. Granite or Marbo granite tiles.
23. Metallic hardener topping.
24. Paver concrete block.
25. Prestressed concrete cover for cable trench.
26. Oil bound distemper.
27. Acid/Alkali resistant paint.
28. Apex or equivalent exterior paint.
29. Epoxy paint for flooring in GIS room.
30. Rolling shutter.
31. Chain link fencing panel and angle.
32. Wash basin.
33. Orissa pan/European pan.
34. Glass mirror.
35. Marble year plate.
36. Towel rod for bath room.
37. Sliding gate.
38. RCC Hume pipe.(pressure/Non pressure).
39. Submersible pump for bore well.
40. Substation Sign boards.
41. Acrylic name plates.
42. MS cover for cable trench in control room/GIS room.
43. Ear thing strips.
44. Grout materials for foundation/flooring.

(D) TECHNICAL SPECIFICATIONS:

(E1) General Conditions :

1. The contractors shall at their own expense make all necessary provisions for housing, water supply, and sanitary arrangements for their employees as well as for works and shall pay direct to the authorities concerned, all rates and taxes.
2. The contractor shall make their own arrangements for the necessary approach, road, for transport of their materials and be responsible for the compensation on account of damage to crop etc. & shall till completion of work.
3. All the royalty charges, Octroi and other duties & all taxes will be paid by the contractor and no extra be claimed on this account.
4. Godowns or sheds hired or constructed for storing of controlled materials and more particularly of cement shall be such as would prevent the materials from getting damaged in any way.
5. It will be absolutely incumbent on the contractors to have on the site of work only such of the materials as have been duly passed by the Engineer-in-charge. Materials that have been rejected must on no account be allowed to remain on the site, and in spite written order to do so, any such rejected material is on the site beyond a period of 48 hours notice, the Engineer-in-charge shall have the right to remove it, at the risk and cost of the contractors and even to destroy it.
6. It must be distinctly understood that conditions of contract and of claims in respect of extra work, will not be allowed unless the works to which they relate is clearly without the spirit and meaning of the specifications or unless such works are ordered in writing by the Engineer-in-charge and claimed for in specified manner.
7. On completion of the work, the site shall be cleared by the contractor within the stipulated period, and ground brought to original state and they shall not be entitled for any extra claim on this account.
8. General Specifications of the relevant Indian standard specification shall also apply.
9. Damage to work clause:

The works whether fully constructed or not and all materials, machinery plant tools, temporary buildings and other things connected there shall be at the risk and in the sole charge of the contractor, until the works have been delivered, completed to the satisfaction of the Engineer-in – charge and certificate from him to the effect is obtained. Until such delivery, the contractor shall at their own cost, take all the precautions reasonably necessary, to keep all the aforesaid works, materials, machinery, plant tools. Temporary buildings and other things connected with the works, free from any loss or damage and in the event of the same or any part thereof being lost or damaged, shall forthwith within the possible speed, reinstate and made good such loss or damage at contractor's own cost.

10. Any components or part of the work shall not be given to any sub-contractor without approval of the competent authority of the Corporation. The whole responsibility of the execution of the work, as per the terms and conditions of the contract, will entirely rest of the main contractor. The main contractor shall always keep his responsible representative, preferably a technical hand, on work site with powers to sign M.R.s. and take necessary decision and implement the instructions issued in the interest of efficient execution of the works.
11. The Engineer-in-charge will fix the hours of work, and no work shall be executed beyond that period, during night time or in absence of the Engineer-in-charge of his authorized agent. The box measures shall be filled only in the presence of the engineer-in-charge or his authorized agent.
12. Contractor will be asked to present the sample of materials, and the approved samples will be preserved at the site of work, and no charge in the approved sample will be allowed, without the written permission of the Engineer-in-charge.
13. In any work is not executed according to the specifications, and the directions of the Engineer-in - charge, the same will be rejected, and the contractor has re execute the same without any financial implication to the Corporation.
14. Contractor will have to communicate the name of his authorized agent, who shall be present on the works, and shall be authorized to sign the material requisitions, receive instruction given verbally or on the order book, on behalf of the contractor.
15. The contractor will have to sign the conditions of contract, and execute the agreements, send the list of previous works executed, solvency certificate and pay up the security deposits, falling to that, the tender will be rejected and earnest money deposited will be forfeited. The value of the stamp paper and stamp duty charges shall be borne by the contractor.

16. Tenderer must return the form of tender, with the specifications and the schedule of quantities, and rates and other schedules only signed on each page. Any tender not bearing signature of the tenderer on all the documents accompanying the tender is liable to be rejected.
17. Before submitting his tender, unit rates, which shall be for the finished work complete, including charges involved in testing, maintenance for a period of 12 months, the tenderer shall closely examine the specifications and carefully study the drawings and all documents, which form a part of the contract, to be entered into by the accepted tenderer.
18. The Tenderer must visit the site of works and see for himself the site conditions regarding water, labour conditions rates approach road during all seasons and all other matters affecting the works before submitting the tender.
19. The submission of tender by a contractor implies that, he has read these instructions, the conditions of contract etc. and has made himself aware of the scope and specifications of the work to be done, and of conditions and rates at which stores will be issued to him, and local conditions and other factors bearing on the executions of the work. The Corporation will not therefore, after acceptance contractor's rate, pay any extra charge for lead or for any other reason. In case the contractor is found later on, to have misjudged the site conditions.
20. The tender document shall be written legibly and free from erasure, over writing or conversions of figures. Correction where unavoidable, shall be made by crossing out, initialing, dating and rewriting.
21. The Corporation or its officers, who accept tender, shall have the right of rejecting all or any of the tenders, and will not be found to accept the lowest offer not to assign any reasons whatever, for the rejection of any tender or all tenders.
22. The tender notice to tenderers shall from a part of the contract.
23. The entire work is to be completed, within the stipulated time limit from the date of issue of letter for commencement of the work by field office. The contractor will not be eligible for any extra for the idle period of works, or waiting period that may be required to suit other consideration, and no claims for compensations on account of such, will be considered. However in case of delay due to circumstances beyond the control of contractors, either in date of commencement or due to, waiting during construction, extension in time may be considered for completion of works, without any penalty to the Corporation.
24. The contractor shall keep full time qualified Civil Engineers at the site, who shall be fully authorized to receive and comply with such instructions, as given by the Executive engineer. The name of such Engineer with his qualifications and experience shall be intimated by the contractor.
The Executive Engineer shall have the right to demand the removal of any technical personnel, skilled or unskilled workmen, who in his opinion are considered to cause bad workmanship in the execution of works or to cause indiscipline.
25. The department reserves the right to make any change in the design and the plans of the works and the contractor shall be bound to carry out them at the rates tendered. No claim or compensation will be allowed on this account.
26. Bills shall be submitted by the contractor monthly on or before the date fixed by the Executive Engineer, for all works executed in the previous months.
27. Should this tender be accepted I /We hereby agree to abide by and fulfill all the terms and provisions of the "Tender & contract for works" as applicable, and in default thereof to forfeit and pay to the Corporation the sums of money due.
28. The contractor shall keep instruction book on site, for taking site instruction from time to time. This book shall be made available on site whenever asked for.
29. The contractor shall pay wage to the workers, as per minimum wages act as declared by the Government time to time.
30. The contractor shall follow all labour laws of Govt.
31. Contractor shall arrange for testing of material to be used in the work or finished product, if desired by the Executive Engineer. The provision shall be made in the unit rate quoted for this.
32. The full value of the "Earnest Money Deposit" paid herewith, shall be forfeited to the Corporation, if the contractor fails to deposit the full amount of specified security deposit, within stipulated time.

(E2) Use of Materials:

I. The contractor shall have to use the best quality of materials in the work, as per the specifications and relevant I.S. codes. In case Corporation desires to carry out any field test/laboratory test for any materials required for the work, the contractor shall arrange for the same at his own cost. Further, for any finished works such as masonry, plastering, cube testing for all important concreting work etc., if any testing is required same shall be arranged by the contractor at his own cost. The

contractor shall have to maintain the regular records for such testing and shall submit along with each R.A. bills.

II. No collection of materials shall be made before it is go t approved from the Engineer-in-charge.

III. Materials, if and when rejected by the Engineer-in-charge shall be immediately removed from site of work.

IV. All installations pertaining to water supply and fixtures thereof as well as drainage lines and sanitary fittings shall be deemed to be completed only after giving satisfactory tests by the contractor.

V. Approval to the samples of various materials given by the EIC shall not absolve the contractor from the responsibility of replacing defective material brought on site or materials used in the work found defective at a later date. The contractor shall have no claim to any payment or compensation whatsoever on account of any such material being rejected by E.I.C.

VI. Approval to any of the executed item for the work does not in any way relieve the contractor of his responsibility for the correctness, soundness and strength of the structure as per the drawing and specification.

VIII. "Contractor has to bring the cement, reinforcement steel, structural steel from approved brand list published on GETCO's website only" as per circular from corporate office no. CE(P_/SE©/vendor List – Online/5967 Dated: 20-03-2024.

Special condition for use of cement in work:

1). The rate in Schedule-B is inclusive of cement cost. Contractor has to purchase fresh 43-53 grade cement confirming to as per IS: 8112 and of approved brand by G. E. T.C.O.

2). Contractor has to construct pucca go-down at site of work so that cement bags can be properly preserved to avoid damage due to any kind of water.

3). Contractor has to bring sufficient of cement bags and at no time less than 200 (two hundred.) bags to maintain progress of work .The work should not suffer for want of cement.

4). Cement should give the required strength.

5). To bring sufficient and timely cement at site is full responsibility of contractor Nothing extra will be paid on account of any reason to maintain progress of work and to complete the work in schedule time.

6). Contractor has to submit material account for consumption of cement used with every bill. In case of not submitting the same, bill will not be passed. Party has to submit the copy of cement/purchase bill along with each RA Bill/Final Bill.

7). No negative variation will be allowed for consumption in cement then prescribed as per booklet of technical specification of Corporation/mix design and nothing will be paid extra for over consumption.

8). Contractor is fully responsible for safety of cement at site; nothing will be paid extra on account of safety.

9). If Corporation's authorized representative wants to check cement stock at site, contractor has to allow for the same at any time.

10). Contractor has to maintain day-to-day cement consumption / balance account at site.

11). As far as possible contractor has to maintain supply of cement of only approved brand and grade throughout the work.

12). Minimum cement consumption considered for cement concrete having grade of M-15/M-20/M-25/ M-30 is 300 Kgs/320-Kgs/370Kgs/396Kgs respectively. Contractor has to use minimum cement as above. Contractor should not use less than the prescribed quality of cement even in the case of mix design recommends lower quantity.

13). Contractor will be allowed to carry out work only after physical verification of cement brought at site.

(E3) CEMENT CONSUMPTION SCHEDULE:

The proportion of cement with coarse aggregate and the fine aggregate for cement concrete works & with sand in case of cement mortar will be in accordance with the under mentioned schedule showing the consumption of cement in bags. The Engineer-in-charge will adjust the proportion of cement irrespective of the mix mentioned in the description of the items, to ensure the consumption of the cement as per prescribed schedule. The tendered rate will be considered to have been based on the consumption of cement in this schedule and nothing extra will be paid on this account.

a. If the quantity of cement shown as utilized in the work, is observed to be less than permitted as below then work will be accepted at reduce rate at the discretion of EIC, if deemed fit.

Table showing the cement required to be consumed in civil work items.

Sr. No. Item Description	Unit	Cement to be consumed in Bags
1. Masonry Works		
B.B. Masonry in C.M. 1:6.	1 CMT	1.4
U.C.R. Masonry in C.M. 1:6	1 CMT	1.7
U.C.R. with pointing in C.M. 1: 2	1 CMT	2.0
115 mm thick B. B. Partition in C.M. 1:4	1 SMT	0.2
–do- but with both sides plaster in C.M. 1:3;12 mm thick.	1 SMT	0.46
2. Cement Concrete works without finishing	1 SMT	0.46
C.C. 1:1 ½ : 3	1 CMT	8.12
C. C. 1 : 2 : 4	1 CMT	6.27
C.C. 1 : 3 : 6	1 CMT	4.42
C.C. 1 : 4 : 8	1 CMT	3.00
C.C. 1 : 5 : 10	1 CMT	2.47
3. Flooring		
25 mm thick I.P.S. in C.C. 1:2:4	1SMT	025
–do- 40 mm thick	1SMT	0.35
–do- 50 mm thick	1 SMT	0.45
–do- 75 mm thick	1SMT	0.60
–do- 100 mm thick	1SMT	0.75
Cement for fixing marble Mosaic Tiles	1SMT	0.13
–do- White glazed tiles with 12 mm thick coating cement plaster for leveling.	1SMT	0.25
Terrazzo floor finishing 20 mm thick with mm thick back coating cement plaster.	1SMT	0.25
Kotah stone flooring	1SMT	0.20
4. Bedding Below Flooring		
110 mm thick C. C. 1 : 4 : 8	1 SMT	0.35
– do – C. C. 1 : 5 : 10	1SMT	0.28
5. Plastering & Pointing		
12 mm thick C.P. in C.M. 1 : 3	1SMT	0.13
20 mm thick C.P. in C.M. 1:3	1SMT	0.19
20 mm thick sand faced in two layers.	1SMT	0.20
Cement Pointing 1 : 1	1SMT	0.07
6. Ground Sink 750 x 750 mm with dwarf wall 115 mm thick 40 mm IPS with 110mm. thick 1: 5: 10 bedding,	1NO	0.75
7. RCC water tank 1000 liter. (1.2x1.2x0.9M with free Corporation)	1NO	0.75
– do – size (2x2x0.9 M with free Corporation) (3000 Liters)	1NO	13.0
8. Kitchen Platform with 75 mm thick slab with 2 partitions with 12 mm smooth plaster.		
Size 2000 x 675 mm	1NO	1.50
Size 3000 x 675 mm	1NO	2.50

9. 75 mm quarter round vata in C.M. 1:2.	100RMT	4.0
100 mm – do –	100RMT	5.0
150 mm – do –	100RMT	7.0
10. Fixing W.C. Pan	1 No.	0.50
11. Gully trap with chamber or 300x300mm.	1NO	0.75
Nahni trap	1NO	0.05
12 50mm thick RCC shelf in C.C. 1:1 ½ : 3	1 SMT	0.60
13 - do - precast cover 300 mm, wide 50 mm thick with smooth finishing on all sides.	1SMT	0.60
14 Manhole chambers with 230 mm, thick masonry in C.M. 1:6 and depth up to av. 1000 mm incl. cement plaster in C.M. 1:3 inside, top and outside up to 150 mm depth.		
Size 900 x 450 mm	1NO	2.5
Size 600 x 450 mm	1NO	2.0
Size 600 x 600 mm	1NO	2.25
Size 900 x 900 mm	1NO	3.70
Size 450 x 450 mm	1NO	1.25
Size 300 x 300 mm with 110 mm partition wall.	1NO	0.75
15 RCC hume pipe with filling joints in C.M. 1:1 and bed concrete 1:4:8 below joints 150 mm. thick		
750 mm Dia	1RMT	0.45
650 mm Dia	1RMT	0.35
450 mm Dia	1RMT	0.24
300 mm Dia	1RMT	0.16
225 mm Dia	1RMT	0.12
150 mm Dia	1RMT	0.08
16. Porcelain Pipes (S.W.G. Pipes)		
100 mm Dia	1RMT	0.06
150 mm Dia.	1RMT	0.08
17 150 mm Dia half round gutter in C.C. 1:3:6	1 RMT	0.15
18 2500 mm Dia x 300 mm deep of hollow masonry in C.M. 1:6 with C.C. 1:4:8 bedding & RCC slab cover, for soak pit.	1NO	21.00

Note: (1) Consumption figures mentioned against each item is for theoretical consumption. This consumption may very + 5 %.

(2) In the case of plaster to masonry walls, an extra quantity of 1 Cft to mortar for every 100 sq. ft. of area may be allowed at the discretion of EIC.

General: Please refer latest edition of relevant Indian Standard Specification of Code i.e. B.I.S. General relevant I.S. of B.I.S. shall prevail for all items including materials, measurements etc. The Item wise detailed specifications are intended for full description of items covered by Schedule “B”. The specifications are not however intended to cover every detail and the works shall be executed according to the spirit of the specifications below and the best prevailing P.W.D. practice. The clarification to any clause in detailed specifications shall be sought from the latest edition of relevant I.S. specification and codes. Where these specifications are at variance with the specification laid down in the I.S. Books stated above, the former will be applicable. As regarded matters not covered by any of the above specification, the decision of the Executive Engineer-in-charge shall be treated as final and shall be binding upon the contractor. The contractor is expected to get clarified any doubt about specification, etc. before tendering by discussing with Executive Engineer.

(E4) TECHNICAL SPECIFICATIONS OF VARIOUS ITEMS:

Tolerance:

Single pile 50mm in alignment group of piles – 75mm

Concrete :

* Grade M-30 or M-25 as specified. Aggregate size – 20mm down.

* Designed water cement ratio shall be maintained.

* Minimum cement content shall not be less than 370 kg. Per cu.mt. for M-25 & 396 kg. For M-30 cement concrete and slump of concrete should not be less than 150mm.

Concrete Placing:

The concreting shall be done by tremie with minimum diameter 200mm of pipe – when concreting is carried out under water, casing/liner should be installed to the full depth of the bore hole or 2m into non-collapsible stratum, so that fragments of ground can not drop from the sides of the hole into concrete, as it is placed. This Shall be done strictly as per the directive of GETCO Engineer-in-Charge.

The hopper and tremie shall be a closed system embedded in the placed concrete by 1.50m concrete so that water can not pass. The pile should be concreted wholly by tremie only and uninterrupted.

The quantity of concrete used shall be compared with calculated quantity at various depths, as per drawing to have check against fall of debris, or side caving.

Reinforcement:

Reinforcement cage shall be prepared as per design & drawing, with cover blocks and shall be placed centrally, so that sides of pile bore are not disturbed.

The length of cage shall be determined as per the actual depth of bore including socketing length of pile into rock if any.

Sufficient care shall be taken to avoid any lifting or tilting of reinforcement cage, at the time of concreting.

Boring operation:

Boring operation shall be done by rotary or percussion type drilling rigs using direct mud/bentonite circulation or reverse circulation methods to bring the cuttings out.

Pile bore log shall be maintained and shall be compared with soil investigation report and design & drawing.

The size of cutting tool should not be less than the pile diameter by more than 75mm.

Proper cleaning of pile bore after lowering the reinforcement and before concreting shall be done. On completion of bore as per required depth as per design, the bottom of the bore shall be flushed to remove debris till clear water comes out.

When liner is used and the pile bore is filled with water or drilling mud, the bottom part may be concreted using tremie so that the liner is effectively sealed against ingress of ground water.

For execution of piling work relevant latest IS Code of materials and working method shall be followed.

A. CONCRETE
I PROPORTION :
The Proportion of fine, coarse aggregates and cement shall be as specified in item of tender where nominal mix is to be used. Proportion of martial shall be carried out such that the proportion of materials is readily verifiable. Material must be measured in boxes of steel or wooden, approved by EIC. Box to be used for

which aggregate, its size etc. shall be clearly marked on box. No ramming of boxes will be permitted. Slight variation in proportion for technical requirement will have to be carried out without any extra cost. Boxes shall be filled in presence of authorized agent of Corporation and work shall be carried out during working hours fixed by Corporation or approved by Engineer-in-charge.

Where strength of concrete is specified instead of nominal mix, contractor will have design mix for the specified strength as provided in IS code for design mix. Proportion shall be used on weight of ingredients of concrete using specified size of the coarse aggregate in item. If ordered, contractor will have to get economical design from Gujarat Engineering Research Institute or other approved institution.

Where permitted, in case of small works, proportional of weight basis can be converted to volumetric for use at site with maintaining same quality of aggregates as used in designing the mix. Design mix shall be got approved and minimum cement if specified shall have to be used. Any charge in source of aggregate will require redesigning of the concrete mix. The engineer shall have right to inspect the source of materials used and contractor will have to arrange for testing of material, if ordered, without any extra cost.

II MATERIALS :

Coarse aggregate & fine aggregate i.e. black Trap metal, Grit, sand etc. shall confirm to IS 353 for aggregate form natural source. Aggregates shall be strong, hard, durable, free from foreign materials and adherence. If found necessary, contractor shall have to arrange testing of aggregate according to IS 2386 & IS 576.

Coarse aggregate shall be of specified size in the item viz 40 mm, 20 mm, 10 mm etc. Where gradation is to be done in mix design, it shall be properly graded. Coarse aggregates shall be free from mica, shale etc. The pieces shall be angular in shape having granular or crystalline surface, triangular, flaky & laminated should not be used. If ordered by Engineer-in-charge, aggregates shall have to be screened or washed. Samples of coarse aggregates to be used shall be got approved and source of approved quality material shall not be changed without prior approval.

Sand shall be clean river sand of quality approved as per IS confirming to gradation zones. Sand shall have fineness modulus of not less than 2.2 or more than 3.2.

When sufficient quantity of aggregates are to be collected. they shall be stacked separately in piles to avoid inter mixing. Mixing or earth, organic materials and other foreign materials shall be avoided. Rakers shall be used for lifting of coarse aggregates. Coarse aggregate having specific gravity of less then 2.6 shall not be used.

Cement shall be ordinary Portland cement unless otherwise specifically specified. One bag of cement is considered 50 kg. of cement. If cement is to be procured by contractor from outside, certified report that cement confirms to the provision of I.S. shall be furnished if demanded. If necessary, testing will have to be carried out, in approved laboratory without any extra cost. For compressive strength and initial setting time test as per I.S.456.

Water to be used for mixing and curing shall be potable water free injurious and deleterious materials confirming to IS 3025, proper storing facility at site shall be provided by contractor and see that water do not get contaminated – The suitability of water for making concrete shall be ascertained. Water shall confirm to the test as given in I.S.3025.

(III) MIXING

Ingredients i.e. cement, sand and coarse aggregates shall be measured by weigh batcher or volumetric boxes as specified or approved. Boxes for each component shall be prepared for such quantity that will be required for one bag of cement.

All ingredients shall be mixed in mechanical mixer. Ingredients shall be first mixed dry for 1 minute and than required quantity of water is added as per design and mixed for minimum 1 ½ minutes till concrete is uniform. Entire concrete in the mixing drum shall be discharged in pre operation before raw materials for second batch is feed into the drum.

Concrete which can be laid before initial setting time of cement shall be prepared. Party set or tempered concrete shall not be used. Mixer machine, weigh batcher etc. shall be cleared after completion of work. Mechanical mixture shall comply to I.S.1791.

For checking consistency and workability of concrete, slump test shall be carried out as per IS 1199 if desired by Engineer-in-charge.

(IV) LAYING

Before laying of concrete, shuttering and reinforcement shall be got checked. Where inserts are to be provided, they shall be fixed properly at places shown. Concrete shall be laid on cleaned surface. Concrete shall be laid such that ingredients do not get separated and on segregation of concrete is caused. Concrete shall be consolidated properly with vibrators or other approved method according to the requirement of

jobs. Joints in concrete shall be left as shown or as directed by Engineer-in-charge. Where concrete is to be place from height, necessary chute shall be provided.

(V) CURING

Concrete work shall be cured for minimum period of 15 days. Horizontal surface shall be cured by ponding and vertical surface shall be kept wet by tying gunny cloth or gunny bags and keeping them wet by spraying or sprinkling water. Where structure is at higher-level contractor shall arrange for pumping arrangement for water. Watertight sump may be prepared on site or storing of water for curing and other uses.

Curing is important for gaining strength of cement structure. Hence full proof arrangement is required to be made. If curing is found sufficient, the same shall be arranged by department as risk and cost of contractor and charges as per rules shall be recovered from contractor's bills.

(IV) FINISHING

Concrete work where specified in item as exposed surface shall be plastered 12mm thick in CM 1:3 as per specifications of plastering item. Any finishing required to make surface in level of flush to adjoining surface shall be made by contractor with mortar specified portion of concrete.

Cement required to plastering of finishing shall be drawn separately. In plastering of slab bottom, chhajas etc. wherever patta, groove, bend etc. are shown same shall be executed in this item without any extra cost. Where slopes is to be given for drainage and is not provided properly will have to be done without any extra cost. Edges of beam, pillars, etc. where chamfering is shown or instructed shall be done without extra cost.

If concrete surface is found honey combed and same is rejected by Executive Engineer, it shall have to be dismantled and recast by contractor without any extra cost at his risk and cost.

(**VII**) **SHUTTERING** :

The form work shall be rigid, sufficiently strong and well anchored to bear the load which it has to take without any distortion. It shall be backed sufficient so as not to budge of twist. Form work shall be of steel plates or plywood. Where exposed surface is desired, plywood shuttering will have to be provided. All surface coming in contact with concrete shall be applied with shuttering oil after cleaning properly. Props supporting from work shall rest on pucca platform. Adjustment of height shall be done with wooden wedges. Spacing of props shall be as instructed by Engineer-in - charge of work.

Form work shall be got checked form the Executive Engineer or his authorized agent and on clearance only, further work should be done. Necessary opening, in form work, for providing hooks, kada or other inserts will have to be made by contractor, as instructed, without any extra cost. Removal of from work shall be carried out slowly and at the specified period as under. In case it is ordered to contractor to keep for more period, considering quality of cement or other factors, same will have to be done by contractor. Minimum period of de-shuttering shall be as under.

1. Vertical surface 24 hours.
2. Slab up to 4.5M span 8 days

More than 4.5M span 14 days

3. Beam soffits (bottom) 20 days

Removal of shuttering shall be done only on getting clearance from Ex. Engr. in change of work.

Various IS. specifications for scaffolding materials and code of practice shall be followed.

(VIII) MEASUREMENT & PAYMENTS :

Unless otherwise specified separately, item of concrete work shall be inclusive of shuttering work required for the same with scaffolding, ladders etc., No separate payment should be made for keeping holes, pockets, keeping inserts in position etc.

Payment of concrete work shall be made on Cu. Mt. basis. No deduction will be made for reinforcements, opening of less than 1/20 Sq. Mt. in area where measurement is in sq.m. and 1/150 cu.m. where concrete is to be measured in CU. M.

Rate quoted for the item shall be inclusive of all materials, ingredients, labour, mixer & other machinery, scaffolding, laying in position and fixing of all inserts curing other requirements for the complete execution of item.

B. WATER SUPPLY

G.I. piping

G.I. pipe be used for water supply shall be of class 'c' confirming to I.S. Specifications. It shall be fixed with suitable clamps, for concealing with necessary groove in wall and finishing with C.M. When pipe is to be laid underground necessary excavation shall be done to level required. Pipe shall be given 3 coats of coal tar. For joining pipes specials of approved quality (extra thick) shall be used. If item provide painting

of pipe same shall be painted with approved brand quality and tint enamel paint. All specials shall be provided as instructed.
Skilled plumber shall be employed on job. Pipes shall be laid as per detailed drawings or as directed on site. Generally shortest route shall be followed. At connection of pipe with special, joint shall be made water tight with hemp rope and zinc white or Teflon tape.
On completion of laying of pope and before sealing of concealed pipe and underground pipe, leak proof test shall be given.
All the piping work shall be measured in running meter and rate quoted shall be inclusive of all special required and all operations required for cutting, threading, joining, excavation, making groove in wall, sealing grout, backfilling, providing clamps with screws, painting etc. complete.

C. WOOD WORK GENERAL FOR DOORS WINDOWS, CUP BOARD etc.

The timber shall be of best quality Bulsar teak or equivalent teak approved by Executive Engineer. Decision of Executive Engineer in this connection will be final. If desired by Executive Engineer, contractor shall have to arrange testing of wood samples selected by department at random, in the laboratory as instructed by department. Sample of wood approved shall be preserved and contractor shall procure wood of the approved quality only. The source of wood shall be informed to the Engineer-in-charge.
The timber to be used for wood work shall be well seasoned, closed grains, uniform texture, free from knots, rots, soft, cracks, mend, spongy spots etc. The size of frame and all members shall be final size after planning and finishing. Undersized wooden members shall not be accepted. Wood of inferior quality, undersize shall be liable to rejection.
When frames or other members are ready they shall be got checked from Engineer-in-charge and got approved for quality and workmanship. Primer coat of paint shall be applied only after clearance by Engineer-in-charge. If the wooden members are found warped, shrunk or with bad workmanship within guarantee period, the same shall have to be replaced by contractor without any extra cost and to the satisfaction of engineer-in-charge.
Before fixing, the frame of door it shall be provided with six nos. M.S. flat 37mm x 6mm and 300 mm long hold fasts fixed to the frame, with screws as directed. Hold fast shall be with split end and bent at right angle to hold fast. Holes shall be provided at other end of hold fast for fixing of screws. Sample of holdfast shall be got approved from Engineer-in-charge. Windows and cupboard shall be provided with 4 Nos. or 2 Nos. of hold fast according to the size of frame and as instructed by Engineer-in-charge in addition to horns projecting minimum 75 mm on both sides of top & bottom members. The side of frame to be embedded in the wall or in touch with wall or floor, shall be applied uniform thick coat of coal tar.
The frame shall be rebated on one side (or both sides) 12 mm deep and of full thickness of shutter and to have a return bead on the other to be chamfered or rounded as directed by Engineer-in-charge. Wherever M.S. Bars of 16 mm diameter are specified in frame as grill in windows or ventilator, they shall be provided at 100 m c/c and shall be locked in frame for minimum 40mm deep. if M.S. flat is to be provided the flat of size 50 x 10 mm, 1 or 2 Nos. as specified, they shall be provided.

Shutters

The thickness of shutter and members of shutter frame shall be as per details given in drawing or supplied at site. Size specified shall be after planning & finishing without painting. Where single plank is specified single plank shall be used. The joint shall be tongue and groove joint. Shutter shall be single or double shutter as per drawing and details given or as directed at site. For paneled doors the panel to be raised feather tongued into style and rails with beaded edges on both sides. Thickness of styles & rails shall be 37 mm and that of panel shall be 30 mm.
The arrangement of panels shall be as directed by the Engineer-in-charge and his decision will be final. The shutter styles, top, bottom, lock and frieze rods to be molded on both sides. The sample of shutter shall be got approved before taking work on full scale. Size of bottom, top & lock rail and ledges shall be as instructed by Engineer-in-charge.

Joints :

All jointing shall be brought on all faces and finished off by hand with sand paper with slightly rounded edges.
The joints shall be pinned with hard wood pins and put together with fevicol. Joining shall be by means of mortise and tennon or dovetailed joints as approved. Any joinery work, which shall split, fracture, shrink or shows flap or other defects shall be removed and replaced with sound material at the contractor's expenses.

Fixtures and fastening :

Oxidized iron, brass or aluminum fixtures as specified in item shall be provided in best workmanship, maintain level and line with approved quality and size screws. Screw shall be never hammered but driven

with screwdriver. The fixture to be used shall be got approved first and approved samples of all fixtures shall be kept on site easily available for inspection.

1. For main door.

1. 300 mm long 16 mm dia aldrop 1 No.
2. 300 mm long flat latch. 1 No.
3. 100 mm long but hinges or 150 mm long or suitable parliamentary hinges. 3 Pairs.
4. 150 mm long tower bolts. 2 Nos.
5. 100 mm long handles (150 mm long). 2 Nos.
6. Door catchers 2 Nos.
7. Magic eye. 1 Nos.

2. Internal door.

1. 250 mm long 16 mm dia aldrop 1 No.
2. 250 mm long flat latch. 1 No.
3. 100 mm butt or 150 mm hinges or suitable Parliamentary hinges. 3 Pairs.
4. 100 mm long tower bolts. 2 Nos.
5. 100 mm long handles 150 mm long. 2 Nos.
6. Door catchers 2 Nos.

For bath & door 16 mm dia 250 mm long aldrop and one handle on both sides shall be provided.

3. Windows

1. 75 mm long butt hinges or parliamentary hinges 2 to 3 pair as per size.
2. 100 mm tower bolts 4 Nos.
3. 100 mm handles. 2 Nos.
4. 150 mm hook eye or stopper of approved quality. 2 Nos.

4. Ventilator.

1. 75 mm butt hinges. 1 Pair
2. 100 mm tower bolts. 1 Nos.
3. 150 mm long hook eye. 2 Nos.

5. Cup Board

1. 75 mm long butt hinges 2 Pairs.
2. 100 mm handles 2 Nos.
3. 100 mm tower bolt. 2 Nos.
4. Pivot. 2 Nos.
5. Ball catcher. 1 No.

The Nos. of fixtures shown above is for general arrangement but in case some change is felt necessary on site it shall be made by Executive Engineer on site and shall be binding to the contractor.

Glazing :

For all glazing of doors, windows, ventilators and cup Boards all glasses shall be of best quality free from bubbles, smoke wanes, air hole, specks and other defect. Sheet glass, ground for clear as approved and instructed shall be of 3 mm thickness. The glasses shall be fixed with wire nails and putty of best quality or wooden bead of required size to flush with style or sash bar etc. The putty and the wooden battens should be finished with 3 coats of oil paints matching with other paint of doors, windows and ventilators. At the time of handing over the glazing work shall be intact. Any damage shall have to be replaced by the contractor without any extra cost.

Erection :

All doors, windows, ventilators, cupboards shall be erected in line, level and in one plane to the elevation shown in the drawing or directed by Engineer in charge at site.

Painting :

All doors, windows, ventilators, cup board shall be given 3 coats of approved quality, brand and shade of oil paint. Each coat of paint shall be allowed to dry thoroughly before next coat is applied. The work shall not show any brush marks, ridges or drops of paint and no puddles in the corner of panels or molding etc., shall be left.

Measurement :

For payment purpose of doors, windows, ventilators and cup board, measurement will be paid outside to outside of the frame in square meter basis.

D. GRILL/FABRICATION/RAILING

General

All workmanship and finish shall be of first class quality, in all respects and shall confirm to the best accepted standards of practice. Finish surface should not have any defect. The greatest accuracy shall be observed to see that all parts properly fit with each other on erection.

Before cutting & fabrication work is taken up, it is necessary, to see that if any twisting, bending etc. is there, the same is removed and made straight or in plane. The process to be adopted shall be such that original material is not injured.

Members shall be fabricated on site or in workshop, as approved, by Engineer in charge. Allowance for camber shall be made in case of truss etc. similarly in tension member and compression members. IS standards shall be followed. Based on design and/or detailed drawings, cutting schedule with no, of members shall be prepared and got approved from competent authority. Shearing machine or gas cutting may be adopted as approved.

All holes to be drilled shall be marked on members and drilled after proper checking. If necessary, a template shall be made for this. All holes shall be perpendicular to the face of the member and 1/6" larger than the nominal size of rivet or bolt. All holes shall be so drilled and reamed that more than 85% of continuous holes in any group in same plane shall not show any offset greater than 1/32" between adjacent thickness of metal. Burns, resulting from reaming or drilling, shall be removed with a tool making 1/16" bored.

All welding shall be done with electric arc method. Welding electrodes shall be heavily coated type designed for all position. The size, type and manufacturer of electrodes shall be subject to approval of Engineer. Electrodes and welding work shall be as per I. S. standards. All the cutting and needed surface shall be properly grinded with electric grinder. Fabricated members shall be joined either by welding or by rivets or nut & bolt arrangement as specified or shown on drawing or instructed. One assembled shall be got approved for alignment, riveting, welding etc. For bolted joints necessary washers shall be provided as shown in the drawing or as instructed on site.

Fabricated structure shall be given one shop coat of red oxide. Erection of the structure shall be done by approved method. Care shall be taken during erection so that no accident occurs. All the workers shall be provided with safety belts, helmets etc, during working.

Care shall be taken to see that no damage is done to the members during transportation of fabricated/assembled structure. Contractor shall provide necessary derricks, gantry, scaffolding and staging, inflammable etc. for erection work, No. gas cutting shall be allowed for the widening of holes when it is not matching. It shall be drilled.

After erection of structure one more coat of red oxide and 2 coats of approved oil painting should be provided to the structure. Paint to be applied shall be got approved for brand, quality, tint etc.

If desired test shall have to be carried out for welded joints. IS 816 shall be followed for general construction in mild steel. Bolts shall be confirm to IS 1363 & IS 1364. Electrodes shall confirm to IS 814.

(E5) GENERAL TECHNICAL SPECIFICATIONS FOR BUILDING WORKS:

GENERAL:

1. In the specifications " as directed "/"approved" shall be taken to mean " as directed "/"approved by the Engineer-in-Charge.
2. Wherever a reference to any Indian Standard appears in the specifications, it shall be taken to mean as a reference to the latest edition of the same in force on the date of agreement.
3. In " Mode of Measurement" in the specifications wherever a dispute arises in the absence of specific mention of a particular point of aspect, the provisions on these particular points, or aspects in the relevant Indian Standards shall be referred to.
4. . All measurements and computations, unless otherwise specified, shall be carried out nearest to the following limits :

(i) Length, width and depth (height) 0.01 meter
(ii) Areas 0.01 Sq.Mt.
(iii) Cubic Contents 0.01 Cu.Mt.

In recording dimensions of work, the sequence of length, width and height (depth) or thickness shall be followed.

5. "The distance which constitutes lead shall be determined along the shortest practical route and note necessarily the route actually taken. The decision of the Engineer-in-charge in this regard shall be taken as final.
6. Where no lead is specific, it shall mean " all leads ".
7. Lift shall be measured from plinth level.
8. Up to " floor two level" means actual height of floor (Maxi. 4 .M) up to 3 Mt. above plinth level.
9. Definite particulars covered in the items of work, though not mentioned or elucidated in it specifications shall be deemed to be included therein.
10. Reference to specifications of materials as made in the detailed specification of the items of works is in the form of a designation containing the number of the specification of the material and prefix "M" e.g. 'M-5'.
11. Approval to the samples of various materials given by the Engineer-in-charge shall not absolve the contractor from the responsibility of replacing defective material brought on site or materials used in the work found defective at a later date. The contractor shall have no claim to any payment or compensation whatsoever on account of any such materials being rejected by the Engineer-in-charge.
12. The contract rate of the item of work shall be for the work completed in all aspects.
13. No collection of materials shall be made before it is got approved from the Engineer-in-charge.
14. Collection of approved materials shall be done at site of work in a systematic manner. Materials shall be stored in such a manner as to prevent damage, deterioration or intrusion of foreign matter and to ensure the preservation of their quality and fitness for the work.
15. Materials, if and when rejected by the Engineer-in-charge, shall be immediately removed from the site of work. .
16. No materials shall be stored prior to, during and after execution of a structure in such a way as to cause or lead to damage or overloading of the various components of the structure.
17. All works shall be carried-out in a workmanlike manner as per the best techniques for the particular item.
18. All tools, templates, machinery and equipment for correct execution of the work as well as for checking lines, levels, alignment of the works during execution shall kept in sufficient numbers and in good working condition on the site of the work.
19. The mode, procedure and manner of execution shall be such that it does not cause damage or over-loading of the various components of the structure during execution or after completion of the structure.
20. Special modes of construction not adopted in general Engineering practice if proposed to be adopted by the Contractor, shall be considered only if the contractor provides satisfactory evidence that such special mode of construction is safe, sound and helps in speedy construction and completion of work to the required strength and quality. Acceptance of the same by the Engineer-in-Charge shall not, however absolve the contractor of the responsibility of any adverse effects and consequences of adopting the same in the course of execution of completion of the work, 21. All installations pertaining to water supply and fixtures there of as well as drainage lines and sanitary fittings shall be deemed to be completed only after giving satisfactory tests by the contractor
22. The contractor shall be responsible for observing the rules and regulations imposed under the "Minor Minerals Act", and such other laws and rules prescribed by Government form to time.

23. All necessary safety measures and precautions (including those laid down in the various relevant Indian Standards) shall be taken to ensure to ensure the safety of men materials and machinery on the works as also of the work itself.
* 24. The testing charges of all materials shall be borne by the Contractor
25. Approval to any of the executed items for the work does not in any relieve the contractor of his responsibility for the correctness, soundness and strength of the structure as per the drawings and specifications

(E6) SPECIFICATIONS OF MATERIALS:

M-1. Water

1.1 Water shall not be salty brackish and shall be clean, reasonably clear and free objectionable quantities of silt and traces of oil bad injurious alkalis, salts, organic matter and other deleterious material which will either weaken the mortar of concrete or cause efflorescence or attack the steel in R.C.C. Container for transport, storage and handling of water shall be clean. Water shall conform to the standard specified in I.S.456-1978.

1.2 If required by the Engineer-in-Charge it shall be tested by comparison with distilled water. Comparison shall be made by means of standard cement tests for soundness time of setting and mortar strength as specified in I.S. 269-1976 Any indication of unsoundness, charge in time of setting by 30 minutes or more or decrease of more than 10 per cent in strength, of mortar prepared with water sample when compared with the results obtained with mortar prepared with distilled water shall be sufficient cause for rejection of water under test.

1.3 Water for curing mortar, concrete or masonry should not be too acidic or too alkaline . It shall be free of elements which significantly affect the hydration reaction or otherwise interfere with the hardening of mortar or concrete during curing or those which produce objectionable stains or other unsightly deposits on concrete or mortar surfaces

1.4 Hard and bitter water shall not be used for curing.

1.5 Potable water will generally found suitable for curing mortar or concrete.

M-2 Lime

2.1 Lime shall be hydraulic lime as per I.S. 712-1973 Necessary tests shall be carried out as per IS .6932 (Parts I to X) 1973

2.2 The following field tests for Times are to be carried out:

(1) A very rough idea can be formed about the type of lime by its visual examination i.e. fat lime bears pure white colour, lime in form of porous lumps of dirty white colour indicates quick lime, and solid lumps are the unburnt limestone.

(2) Acid tests for determining the carbonate content in lime Excessive amount of impurities and rough determination of class of lime.

2.3 Storage shall comply with I.S. 712-1973. The slaked lime, if stored, shall be kept in a weatherproof and damp-proof shed with impervious floor and sides to protect it against rain, moisture, weather and extraneous materials mixing with it: All lime that has been damaged in any way shall be rejected and all rejected materials shall be removed from site of work.

2.4 Field testing shall be done according to I.S. 1624-1974 to show the acceptability of materials.

M-3 Cement

3.1 Cement shall be ordinary Portland slag cement as per I.S.269-1976 or Portland slag cement as per I.S. 455-1976

M-4 White Cement

4.1 The white cement shall conform to I.S 8042-E-19.78.,

M-5 Coloured Cement

5.1 Coloured cement shall be with white of grey Portland cement as specified in the item of the work.

5.2 The pigments used for coloured cement shall be of approved quality and shall not exceed 10% of cement used in the mix. The mixture of pigment and cement shall be properly ground to have a uniform colour and shade. The pigments shall have such properties as to provide for durability under exposure to sunlight and weather.

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

M-6 Sand

6.1 Sand shall be natural sand, clean, well graded, hard strong, durable and gritty particles free from injurious amounts of dust, clay kankar nodules, soft or flaky particles shale, alkali salts organic matter, loam, mica or other deleterious substances and shall be got approved from the Engineer-in-Charge. The

sand shall not contain more contain more than 8 percent of silt as determined by field test. If necessary the sand shall be washed to make it clean.

6.2. Coarse Sand :The fineness modulus of coarse sand shall not be less than 2.5-and shall not exceed 3.0, The sieve analysis of coarse shall be as under :

I.S Designation	Sieve Passing sieve	Percentage by weight Designation	I.S. Sieve percentage weight passing sieve
4.75mm	100	600 Micron	30-100
2.36mm	90 to 100	300 Micron	5-70
1.18mm	70-100	150 Micron	0-50

6.3. Fine Sand :

The fineness modulus shall not exceed 1.0. The sieve analysis of fine sand shall be as under :

I.S Designation	Sieve Passing sieve	Percentage by weight Designation	I.S. Sieve percentage by weight passing sieve
4.75mm	100	600 Micron	40-85
2.36mm	100	300 Micron	5-50
1.18mm	75-100	150 Micron	0-10

M-7 Stone Dust

7.1. This shall be obtained from crushing hard black trap or equivalent. It shall not contain more than 8%, of silt as determined by field test with measuring cylinder. The method of determining silt contents by fields test is given as under

7.2. A sample of stone dust to be tested shall be placed without drying in 200 mm. measuring cylinder. The quantity of the sample shall be such that it fills the cylinder up to 100mm. Mark .The clean water shall be added up to 150 mm. mark. The mixture shall be stirred vigorously and the content allowed to settle for 3 hours.

7.3. The height of silt visible as settled layer above the stone dust shall be expressed as percentage of the height of the stone dust below. The stone dust containing more than 8% silt shall be washed so as to bring the content within the allowable limit. The fineness nodules of stone dust shall not be less than 1,80.

M-8. Stone Grit

8.1. Grit shall consist of crushed or broken stone and be hard, strong, dense, durable, clean of proper gradation and free from skin or coating likely to prevent proper adhesion of mortar. Grit shall generally be cubical in shape and as far as possible flakey elongated pieces shall be avoided. It shall generally comply whit the provisions of I.S. 383-1970. Unless special stone of particular quarries is mentioned grit shall be obtained from the best black trap or equivalent hard stone as approved by the Engineer-in-Charge. The grit shall have no deleterious with cement.

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

I.S Designation	Sieve Passing sieve	Percentage by weight Designation	I.S. Sieve percentage by weight passing sieve
1250mm	100 %	4.75mm	0-20 %
10.00mm	85-100 %	2.36mm	0-25%

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

8.4 The necessary tests for grit shall be carried out as per the requirements of I.S.2386- (parts-l of VIII) 1963, as per instructions of the Engineer-in-Charge. The necessity of test will be decided by the . Engineer-in-Charge.

M-10. Lime Mortar

10.1. Lime : Lime shall conform to specification M-2 Water : Water shall conform to specification M-1 Sand: Sand shall conform to specification M-6

10.2. Proportion of Mix :

10.2.1. motor shall consist of such proportions of slaked lime and sand as may be specified in item. The slaked lime and sand shall be measured by volume.

10.3 Preparation of mortar :

10.3.1. Lime mortar shall be prepared by wet process as per I.S.1625-1971.Power driven mill shall e used for preparation of lime mortar. The slaked lime shall be placed in the mill in an even layer and ground for 180 revolutions with a sufficient water. Water shall be added as required during grinding (care being taken . not to add more water) that will bring the mixed material to a consistency of stiff paste. Thoroughly wetted sand shall then be added evenly and the mixture ground for another 180 revolutions.

10.4. Storage :

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

10.5 Use :

10.5.1. All mortar shall be used as soon as possible after grinding. It should be used on the day on which it prepared, But in no case mortar made earlier than 36 hours shall be permitted for use.

M-11 Cement Mortar

11.1 Water shall conform to specification M-1 Cement : Cement shall conform to specifications M-3 Sand : Sand shall conform to M-6

11:2 Proportion of Mix

11.2.1. Cement and sand shall be mixed to specified proportion, sand being measured by measuring boxes, the proportion of cement will be by volume on the basis of 50 Kg/Bag of cement being equal to 0.0342 Cu.m. The mortar may be hand mixed of machine mixed as directed.

11.3. Proportion of Mortar :

11.3.1. In hand mixed mortar, cement and sand in the specified proportions shall be thoroughly mixed dry on a clean impervious platform by turning over at least 3 times or more till a homogeneous mixture of uniform colour is obtained. Mixing platform shall be so arranged, that no deleterious extraneous material shall get mixed with mortar or mortar shall flow out. While mixing, the water shall be gradually added and thoroughly mixed to from a stiff plastic mass of uniform colour so that each particle of sand shall be completely covered with a film of wet cement. The water cement ratio shall be adopted as directed.

The mortar so prepared shall be used within 30 minutes of adding water. Only such quantity of mortar shall be prepared as can be used within 30 minutes.

M-12 Stone Coarse Aggregate For Nominal Mix Concrete

12.1 coarse aggregate shall be of machine crushed stone of black trap or equivalent and be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar.

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

TABLE

IS. Sieve	Percentage passing for single			IS. Sieve	Percentage passing for single		
Designation	Sized aggregates of Nominal size 40mm	20mm	16mm	Designation	Sized aggregates of Nominal size 40mm	20mm	16mm
80mm	-			12.5mm	0.5		0.20
63mm	100			10 mm		0.5	0.5
40mm	85-100	100		4.75mm			
20mm	0.2	85-100	100	2.35 mm			
16mm		85-100					

Note : This percentage may be varied some what by the Engineer-in-Charge when considered necessary for obtaining better density and strength of concrete.

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

M-13 Black Trap or Equivalent Hard Stone Coarse

13.1. Aggregate For Design Mix Concrete Coarse aggregate shall be of machine crushed stone of black trap or equivalent hard stone and be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar,

13.2. The aggregates shall generally-be cubical in shape. Unless special stones of particular quarries are mentioned, aggregates shall be machine crushed from the best, black trap or equivalent hard stones as approved, Aggregate shall have no deleterious with cement.

13.3. The necessary tests indicated in IS. 383-1970 and IS.456-1978 shall have to be carried out to ensure the acceptability of the material. If aggregate is covered with dust it shall be washed with water to make it clean.

M-15 Brick

15.1 The brick shall be shall be machine moulded and made from suitable fly ash, cement, lime, gypsum, etc. They shall be free from cracks and nodules of free lime. They shall have smooth rectangular faces with sharp corners and shall be of uniform colour. The bricks shall be moulded with the frog of 100mm x 40 mm and 10mm to 20mm deep on one of its flat sides. The bricks shall not break when thrown on the ground from a height of 600mm.

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

15.3 The size of the conventional bricks shall be 225 x 110 x 75mm.

15.4. Only bricks of one standard size shall be used on one work. The following tolerance shall be permitted in the conventional size adopted in a particular work. Length +3.0mm, Width + 1.50mm, Height +1.50mm.

15.5 The crushing strength of the brick shall not be less than 35.0 Kg / Sq cm. The average water absorption shall not be less than 20 per cent by weight. Necessary test for crushing strength and water absorption shall be carried out as per IS 3495 : (Part I to Part IV) 1976.

M-16 Stone

16.1 The stone shall be of the specified variety such as Granite/Trap Stone/-Quartzite Or any other type of good hard stones. The stones shall be only from the approved quarry and shall be hard sound, durable and free from defects like cavities, cracks, sand holes, flaws injurious veins, patches of loose or soft materials etc., and weathered portions and other structural defects or imperfections tending to affect their soundness and strength. The stone with round surface shall not be used The percentage of water absorption shall not be more than 5% of day weight. When tested in accordance with I.S. 1124-1974.Theminimumcrushingstregth of stone shall be 200 Kg/Sq. Cm. unless otherwise, specified 16.2 The samples of the stone to be used shall be got approved before the work is started 16.3 The Khanki facing stone shall be dressed by chisel as specified in the item for khanki facing in required shape and size. The face of the stone shall be so dressed that the bushing on the exposed face shall not project by more than 40 mm. from the general wall surface and on face to be plastered it shall not project by more than 19 mm. nor shall it have depressions more than 10 mm. from the average wall surface.

M-17 Laterite Stone

17.1 Laterite stone shall be obtained from the approved quarry. It shall be compacted in texture, sound, durable and free from soft patch. It shall have minimum crushing strength of 100Kg/Sq.Cm.in its-dry condition. It shall not absorb water more than 20% of its own weight,whenimmersedfor24hoursinwater. After quarrying, the stone shall be allowed to weather for some time before using in work.

17.2 The stone shall be dressed into regular rectangular blocks so that all faces are free from waviness and unevenness, and the edges true and square.

17.3 Those types of stone in which white clay occurs should not be used. Special corner stones shall be provided where so directed.

M-21. Mild Steel Binding Wire

21.1. The mild steel wire shall be of 1.63 mm. or 1.22 mm. (16 to 18 gauge) diameter and shall conform to l.S. 280-1972.

21.2. The use of black wire will be permitted for binding reinforcement bars. It shall be free from rust, oil paint, grease, loose mill scale or any other undesirable coating which may prevent adhesion of cement mortar.

M-22. Structural Steel

22.1. All structural Steel shall conform to I.S. 226-1985. The steel shall be free from the defects mentioned in I.S. 226-1975 and shall have a smooth finish. The material shall be free from loose mill scale, rust pits or other defects affecting the strength and durability. River bars shall conform to I.S. 1148-1973. When the steel is supplied by the Contractor test certificate of the manufacturers shall be obtained according to I.S. 226-1975 and other relevant Indian. Standards.

M-26 Shuttering

26.1: The shuttering shall be plywood sheet. The shuttering shall be supported on battens and beams and tubular steel supports properly cross braced together so as to make the centering rigid.

26.2. The form work shall be sufficiently strong and shall have camber, so that it assumes correct shape after deposition of the concrete and shall be able to resist forces caused by vibration of live load of men working over it and other incidental loads associated with it. The shuttering shall have smooth and even surface and its joints shall permit leakage of cement grout.

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

26.4. The props shall consist to tubular steel support shall be placed as per design requirement. These shall rest squarely on steel sole plates and minimum bearing area of 0-10 sq m. laid on sufficiently hard base.

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

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

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

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

26.9. The shuttering for beams and slabs shall have camber of 4 mm. per metre

26.10. (1in250) or as directed by the Engineer-in-Charge so as to offset the subsequent deflection. For cantilevers, the camber at free end shall be 1/50 of the projected length or as directed by the Engineer-in-Charge.

M-29 Teak wood

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

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

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

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

29.5. First class teak wood

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

29.6. Second Class Teak Wood :

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

M- 31. Aluminum doors, windows ventilators

31.1. Aluminum alloy used in the manufacture of extruded window sections shall conform to I.S. designation HEA-WP of I.S. 733-1975 and also to I.S. Designation WVG-WP of I.S. 1285-1975.Thesection shall be as specified in the drawing and design. The fabrication shall be done as directed.

31.2. The hinges shall be cast or extruded aluminum hinges of same type as in window but of larger size. The hinges shall normally be of 50 mm. projecting type. Non-projecting type of hinges may also be used if directed. The handles of door shall be of specified design. A suitable lock for the door operable either from outside or inside shall be provided. In double shutter door, the first closing shutter shall have concealed aluminum alloy bolt at top and bottom.

M-32. Rolling Shutters

32.1. The rolling shutters shall conform to I.S.6248-1979. Rolling shutters shall be supplied of specified type with accessories. The size of the rolling shutters shall be specified in the drawings. The shutters shall be specified in the drawings. The shutters shall be constructed with interlocking lath sections formed from cold rolled steel strips not less than 0.9 mm. thick and 80 mm. wide for shutters up to 3.5 m. width not less than 1.25 mm. thick and 80 mm. wide for shutters 3.5 m. in width and above, unless otherwise specified.

32.2. Guide channels shall be of mild steel deep channel section and of rolled pressed or built-up (fabricated) joint less construction. The thickness of sheet used shall not be jess than 3.15 mm.

32.3. Hood covers shall be made of M.S. Sheets not less than 0.90 mm. thick. For shutters having width 3.5 Meter and above, the thickness of M.S. sheet for the hood cover shall be not less than 1,25 mm.

32.4. The spring shall be of best quality and shall be manufactured from tested high tensile spring steel wire or strip of adequate strength to balance the shutters in all position.

The spring pipe shaft etc. shall be supported on strong M.S. or malleable C.I. brackets. The brackets shall be fixed on or under the lintel as specified with rawl plugs and screws bolts etc.

32.5. The rolling shutters shall be of self rolling up to 8 Sq. m. clear area without ball bearing and up to 12 Sq.m. clear area with ball bearing. If the rolling shutters are of larger, then gear operated type shutters shall be used.

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

32.7. The Shutters shall be completed with door suspension shafts, looking arrangements, pulling hooks, handles and other accessories.

M-33. Collapsible Steel Gate

33.1. The collapsible steel gate shall be in one or two leaves and size as per approved drawings or as specified. The gate shall be fabricated from best quality mild steel channels, flats, etc. Either steel pulleys or ball bearings shall be provided in every double channel. Unless otherwise specified the particulars of collapsible gate shall be as under :

(a) Pickets : These shall be of 20mm MS channels of heavy sections unless otherwise shown on drawings. The distance centre to centre of pickets shall be 12 cms. with an opening of 10 cms.

(b) Pivoted MS flats shall be 20 mm x 6 mm.

(c) Top and bottom guides shall be from tee or flat iron of approved size.

(d) The fittings like stoppers, fixing hold fasts, locking cleats, brass handles and cast iron rollers shall be of approved design and size.

M- 37. Plywood

37.1. The plywood for general purpose shall conform I.S.303-17-1975

Plywood is made by cementing together than boards or sheets of wood into panels. There are always an odd number of layers, 3,5,7,9, ply etc. The plies are placed so that grain of each layer is at right angles to the grain in the adjacent layer.

37.2. The Superintending advantages of plywood over a single board of the same thickness is the more uniform strength of the plywood, along the length and width of the plywood and greater resistance to cracking and splitting with change in moisture content.

37.3. Usually synthetic resins are used of gluing, phenol resins are usually cured in a hot press which compresses and simultaneously heats the plies between hot plates which maintainatemperatureof90degree C to 140 degree C and a pressure of 11 to 14 Kg/Sq. Cm. on the wood. The time of heating may be. anything from 2 to 60 minutes depending upon thickness.

37.4. When water glue are used the wood absorbs so much water that the finished plywood must be dried carefully. When synthetic resigns are used as adhesive the finished plywood must be exposed to an atmosphere of controlled humidity until the proper amount of moisture has been absorbed.

37.5. According to I.S: 303-1975 the plywood for general purpose shall be of the grades namely BWR, WWR and CWR, depending upon the adhesives used for bonding the veneers, and it will be further classified into six types namely AA, AB, AC, BB, BC and CC based on the quality of the two faces each face being of three kinds namely A, Band C After pressing, the finished plywood should be reconditioned

to a moisture content not less than 8 percent and not more than 16 percent. Thickness of plywood Boards :

TABLE

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

M-38. Glass

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

38.2. Sheet Glass

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

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

38.2.3. Sheet glass shall be patent flattened glass of best quality and for glazing and framing purposes shall conform to I.S. : 1761-1960. Sheet glass of the specified colours shall be used, if so shown, on detailed drawings or so specified. For important buildings and for panes with any dimension over 900 mm. plate glass of specified thickness shall be used.

38.3. Plate Glass :

38.4. 38.3.1. When plate glass is specified it shall be " polished patent plate glass " of best quality It shall have both the surface ground, flat and parallel and polished to obtain clear undisturbed vision and reflection. The plate glass shall be of the thickness mentioned in the item or as shown in the detailed drawing or as specified. In absence of any specified thickness, the thickness of plate glass to be-supplied shall be 6 mm. and a tolerance of 0.20 mm. shall be admissible.

38.4. Obscured Glass :

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

38.5. Wired Glass :

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

M-40. Particle board

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

(1) **M-43. Fixtures and fastenings**

43.1. General :

43.1.1. The fixtures and fastenings, that is butt hinges tee and strap hinges sliding door bolts, tower bolts, door latch, bath-room latch, handles, door stoppers, casement window fasteners, casement stays, and ventilators catch shelf be made of the metal as specified in the item or its specification.

43.1.2. They shall be of iron, brass, aluminum chromium plated iron, chromium plated brass, copper oxidized iron, copper oxidized brass or anodized aluminum as specified.

43.1.3. The fixtures shall be heavy medium or light type. The fixtures and fastenings shall be smooth finished and shall be such as will ensue ease of operations.

43.1.4. The samples of fixtures and fastenings shall be got approved as regards, quality and shape before providing them in position

43.1.5. Brass and anodized aluminum fixtures and fastenings shall be bright finished.

43.2. Holdfasts :

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

43.3. Butt hinges :

43.3.1. Railway standard heavy type butt hinges shall be used when so specified.

43.3.2. Tee and strap hinges shall be manufactured from M.S. Sheet

43.4. Siding door bolts (Aldrops) :

43.4.1. The aldrops as specified in the item shall be used and shall be got approved.

43.5. Tower bolts (Barrel Type) :

43.5.1. Tower bolts as specified in the item shall be used and shall be got approved.

43.6. Door Latch :

43.6.1. The size of door latch shall be taken as the length of latch.

43.7. Bathroom Latch :

43.7.1. Bathroom latch shall be similar to tower bolt.

43.8. Handle:

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

43.9. Door Catch :

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

43.10. Door Stoppers :

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

43.11. Wooden Door Stop with hinges :

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

43.12. Casement Window Fastener :

43.12.1. Casement window fastener for single leaf window shutter shall be left or right handed as directed.

43.13.Casement stays (Straight Fed Stay) :

43.13.1. The stays shall be made from a channel section having three holes at appropriate position so that the window can be opened either fully or partially as directed. Size of the stay shall be 250 mm. to 300 mm. as directed.

43.14. Ventilator Catch :

43.14.1. The pattern and shape of the catch shall be as approved.

43.15. Pivot:

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

M-44. Paints :

44.1. (A) Oil paints :

44.1.1. Oil paints shall be of the specified colour and as approved. The ready mixed paints shall only be used. However, if ready mixed paint of specified shade or tint is not available white ready mixed paint with approved strainer will be allowed. In such a case, the contractor shall ensure that the shade of the paint so allowed shall be uniform.

44.1.2. All the paints shall meet with the following general requirements

(i) Paint shall not show excessive setting in a freshly opened full can and shall easily be re dispersed with a paddle to a smooth homogeneous state. The paint shall show no curdling, livering, caking or colour separation and shall be free from lumps and skins.

(ii) The paint as received shall brush easily, possess good levelling properties and show no running or sagging tendencies.

(iii) The paint shall not skin within 48 hours in a three quarters filled closed container.

(iv) The paint shall dry to a smooth uniform finish free from roughness, grit unevenness and other imperfections.

44.1.3. Ready mixed paint shall be used exactly as received from the manufacturers and generally according to their instructions and without any admixtures whatsoever.

44.2. (B) Enamel paints :

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

M-46. Marble chips for marble mosaic terrazzo

46.1. The marble chips shall be of approved quality and shades. It shall be hard, sound, dense and homogeneous in texture with crystalline and coarse grains. It shall be uniform in colour and free from stains cracks, decay and weathering.

46.2. The size of various colours of marble chips ranging from the smallest up to 20 mm shall be used where the thickness of top wearing layer is 6 mm. size. The marble chips of approved quality and colours only as per grading as decided by the Engineer-in-charge shall be used for marble mosaic tiles or works.

46.3. The marble chips shall be machine crushed. They shall be free from foreign matter, dust etc. except as above, the chips shall conform to I S.2114-1962.

M-47. Flooring Tiles.

47.1. (A) Plain Cement tiles ;

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

47.1.2. The tiles shall be manufactured from a mixture of cement and natural aggregates by pressure process. During manufacture the tiles shall be subjected to pressure ofnotlessthan140Kg/Sq.Cm.The proportion of cement to aggregate in the backing of the tiles shall be not less than 1 :3 by weight. The wearing face, through the tiles are of plain cement, shall be provided with stone chips of 1to2mm.size.The proportions of cement to aggregate in the wearing layer of the tiles shall be three parts of cement to one parts chips by weight. The minimum thickness of wearing layer shall be 3 mm. The colour and texture of wearing layer shall be uniform throughout its face and thickness. On removal from mould, the tiles shall be kept in moist condition continuously at least for seven days and subsequently, if necessary, for such long period as would ensure their conformity to requirements of I.S. 1237-1980 regarding strength resistance to wear and water absorption.

47.1.3 The wearing face of the tiles shall be plane, free from projections, depressions and cracks and shall be reasonably parallel to the back face of the tile. All angles shall be right angle and all edges shall be sharp and true.

47.1.4. The size of tiles generally be square shape 24.85 Cm x24.85 Cm. or 25 Cm x 25 Cm. The thickness of tiles shall be 20 mm.

47.1.5. Tolerance of length and breadth shall be plus of minus one millimeter. Tolerance on thickness shall be plus 5 m.m.

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

47.2.(B) Plain Coloured Tiles:

47.2.1. The tiles shall have the same specification as for plain cement tiles as per (A) above except that they shall have a plain wearing surface wherein pigments are used. They shallconformtiI.S.1237-1980.

47.2.2. The pigments used for colouring cement shall not exceed 10 percent by weight of cement used in the mix. The pigments, synthetic or otherwise, used for colouring tiles shall have permanent colour and shall not contain materials detrimental to concrete.

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

47.3. (C) Marble mosaic tiles :

47.3.1. These tiles have same specification as per plain cement tiles except the requirements as stated below:

47.3.2. The marble mosaic tiles shall conform to I.S. 1237-1980. The wearing face of the tiles shall be mechanically ground and filled. The wearing face of tiles shall be free from projections, depressions, and cracks and shall be reasonably parallel to the back face of the tiles.

All angles shall be right angles and all edges shall be sharp and true.

47.3.3. Chips used in the tiles be from smallest unto 20 mm. size. The minimum thickness of wearing layer of tiles shall be 6 mm. For pattern of chips to be used on the wearing face, a few samples with or without their full size photographs as directed shall be approved by the Engineer-in-Charge, for approval.

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

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

47.4. (D) Chequered Tiles :

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

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

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

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

47.5. (E) Chequered Tiles For Stair Cases :

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

(1) The length of a tile including note shall be 300 mm.

(2) The minimum thickness shall be 28 mm.

(3) The nosing shall have also the same wearing layer as at the top.

(4) The nosing edge shall be rounded.

(5) The front portion of the tile for a minimum length of 75 mm. from and including the nosing shall have grooves running parallel to nosing and at centers not exceeding 25 mm. Beyond that the tiles shall have normal chequer pattern.

M-49. Polished Kotah Stones

49.1. Polished Kotah stone shall have the same specification as per rough Kotah stone except as mentioned below :

49.2. The stones shall have machine polished surface. When brought on site, the stones shall be single polished or double polished depending upon its use. The stones for paving shall generally be single polished. The stones to be used for dado, skirting, sink, veneering, sills, steps, etc. where machine polishing after the stones are fixed in situ is not possible shall be double polished.

M-55. White glazed tiles

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

55.2 The tiles shall be nominal size of 150 mm. x 150 mm. unless otherwise, specified. The maximum variation the stated sizes, other than the thickness of tile shall be plus or minus 1.5 mm. The thickness of tile shall be 6 mm. Except as above the tiles shall conform to I.S. 1977-1970.

M-56. Galvanized iron pipes and fittings

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

M-57. Bib cock and stop cock

57.1 A bib cock is a draw off tap with a horizontal inlet and free outlet. A stop cock is a valve with a suitable means of connection for insertion in a pipe line for controlling or stopping the flow.

57.2. They shall be of screw down type and or brass chromium plated and of diameter as specified in the description of the item. They shall conform to I.S. 781-1977 and they shall best Indian make. They shall be polished bright.

57.3. The minimum finished weight of bib cock and stop cock shall be as given below :

Diameter	Bib cock	Stop cock	Diameter	Bib cock	Stop cock
8mm	0.25kg	0.25 kg	15mm	0.40kg	0.40 kg
10mm	0.30 kg	0.35 kg	20mm	0.75kg	0.75 kg

M-58. Gun metal wheel valve

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

M-59. White glazed porcelain wash basin

59.1. Wash basin shall be of white porcelain first quality best Indian make and it shall conformtoI.S.2556.(Part-IV) -1972 and I.S.771-1979. The size of the wash basin shall be as specified in the item. Wash basin shall be of one piece construction with continued over flow arrangements. All internal angles shall be designed so as to facilitate cleaning. Wash basin shall have single tap hole or two holes as specified. Each basin shall have a circular waste hole which is either rebated or beveled internally with 65mm. diameter at top and 10 mm. depth to suit the waste fitting. The necessary stud slot to receive the bracket on the underside of the basin shall be provided Basin shall have an internal soap holder recess which shall fully drain into the bowl.-

59.2. White glazed pedestal of inequality and color as that to the basin shall be provided where specified in the item. It shall be completely recessed at the back for reception of supply and wash pipe. It shall be capable of supporting the basin rigidly and adequately and shall be so designed as to make the height from the floor to top of the rim of basin 750 mm. to 800 mm. as directed.

M-60. European type water closet / with low level flushing.

60.1 The European type water closet shall be white / coloured glazed porcelain first quality and shall be of wash down type conforming to IS 2556 – 1973 and IS 771 – 1979.

60.2 'S' trap shall be provided as required with water seal not less than 50mm. The solid plastic seat and cover shall be of the best Indian make conforming to IS 2548 – 1980. They shall be made of moulded synthetic materials which shall be tough and hard with high resistance to solvents and shall be free from blisters and other surface defects and shall have chromium plated brass hinges and rubber buffer of suitable size.

M-61. Orissa type water closet

61.1 The specification of Orissa type white / coloured glazed water closet of first quality shall conform to IS 256 (Part III) 1981 and relevant specification of Indian type water closet except that pan will be with the integral squatting pan of size 580 mm x 440 mm with raised footrest.

M-62. Indian type water closet

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

M-62. A. Foot Rests

62.A. 1. A pair of whit glazed earthen ware rectangular foot to minimum size 250 mm. x 130 mm. x 20 mm. shall be provided with the water closet.

M-64. Glazed earthen-ware Lipped type flat back urinal/corner type urinal

64.1. The lipped type urinal shall be flat back or corner type as specified in the item and shall conform to I.S.771-1979. It shall be of best Indian make and. size as specified and approved by the Engineer-in-Charge. The flat back of corner type urinal must be of 1st quality free from any defects, cracks etc.

M-67. Flush cock.

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

M-68. Cast iron pipes and fittings.

68.1. All soil, water, vent and anti-siphonage pipes and fitting shall conform to I.S.1729-1964.Thepipesshall have spigot and socket ends with head on spigot end. The pipes and fitting shall be true to shape, smooth, cylindrical, their inner and outer surfaces being as nearly as practicable concentric. They shall be sound and nicely cast and shall be free from cracks, laps, pinholes or the imperfection and shall be neatly dressed and carefully fettled.

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

68.3. The sand of cast iron pipes shall be of the diameter as specified in the description and shall be in lengths of 1.5 M., 1.8 M. including socket ends of the pipe unless shorter lengths are either specified or required at junctions etc. The pipes and fittings shall be supplied without ears unless specified or directed otherwise.

68.4. Tolerances :

68.4.1. The Standard weights and thickness of pipes shall be as shown in the following table.

A tolerance up to minus 10 per cent may however be allowed against these standard weights.

Sr. No.	Nominal dia. of bore	Thickness	Overall 1,5 m. long	Weight of pipe 1.8 m. long	excluding ears 2.m. long
1	75mm	5mm	12.38kg	16.52kg	18.37kg
2	100mm	5mm	18.14kg	21.67 kg	24.15kg

68.4.2. A tolerance up to minus 15 percent in thickness and 20 mm. length will be allowed. For fittings tolerance in lengths shall-be plus 25 mm. and minus 10 mm.

68.4.3. The thickness of fittings and their socket and spigot dimensions shall conform to the thickness and dimensions specified for the corresponding sizes of straight pipes. The tolerance in weights and thickness shall be the same as for straight pipes.

M-**69. Nahni Trap**

69.1. Nahni trap shall be of cast iron and shall be sound and free from porosity or other defects which affect serviceability. The thickness of the base metal shall not be less than 6.5mm.Thesurfaceshallbesmoothand free form craze, chips and other flaws or any other kind of defects which affect serviceability. The size of Nahni trap shall be specified and shall be of self cleaning design.

69.2. The Nahni trap shall be of quality approved by the Engineer-in-Charge and shall generally conform to the relevant Indian Standards. , ,

69.3. The Nahni trap provide shall be with deep seal, minimum 50 mm. except at places where trap with deep seal cannot be accommodated. The cover shall be cast iron perforated cover shall be provided on the trap of appropriate size.

M-70. Gully Trap

70.1. Gully trap shall conform to I.S.651 -1980. If shall be sound, free from defects such as fire cracks or hair. cracks. The glaze of the traps shall be free from crazing. They shall give a sharp clear note when struck with light hammer. There shall be no broken blisters.

70.2. The size of the gully trap shall be as specified in the item.

70.3. Each gully trap shall have one C.I. grating of square size corresponding to the dimensions, of inlet of gully trap. It will also have a water tight C.I. cover with frame inside dimensions 300mm.x300mm. the cover with frame inside dimensions 300 mm. x 300 mm. the cover and weighing not less than 4.53 Kg. and the frame not less than 2.72 Kg. The grating cover and frame shall be of sound and good casting and shall have truly square machined seating faces.

M 71. Glazed Stone Ware pipe And Fittings

71.1. The pipes and fittings shall be of best quality as approved by the Engineer – in - Charge. The pipe shall be of best quality manufactured from stone-ware of fire clay, salt glazed thoroughly burnt through the whole thickness, of a close even texture, free from air blows, fire blisters, cracks and other imperfections, which affect the serviceability. The inner and outer surfaces shall be smooth and perfectly glazed. The pipe shall be capable to withstand pressures or 1.5 M. lead without showing sign of leakage. The thickness of the wall shall not be less than 1/12th of the internal dia. The depth of socket shall not be less than 38 mm. The socket shall be sufficiently large to allow a joint of 6 mm. around the pipe.

The pipes shall generally conform to relevant I.S.651-1980.

M-78 Barbed Wire

78.1: The barbed wire shall be of galvanized steel and it shall generally conform to I.S.278-1978. The barbed wire shall be of type-l whose nominal diameter for line wire shall be 2.5 mm. and point wire 2.24 mm. The nominal distance between two barbs shall be 75 mm. unless otherwise specified in the item. The barbed wire shell be formed by twisting together two line wires. One containing the barbs. The size of the line and point wires and barb spacing shall be as specified above. The permissible deviation from the nominal diameter of the line wire and point wire shall not exceed + 0.08 mm.

78.2. The barbs shall carry four points and shall be formed by twisting two point wires, each two turns, lightly round one line wire, making altogether four complete turns. The barbs shall have a length of not less than 13 mm. and not more than 18 mm. The point shall be sharp and cut at an angle not greaterthan35degree of the axis of the wire forming the barbs.

78.3. The line and point wires shall be circular in section, free from scale and other defects and shall be uniformly galvanized. The line wire shall be in continuous length and shall not contain any welds other than those in the rod before it is drawn. The distance between two successive splices shall not be less than 15 metres.78.4. The lengths per 100 Kg. of barbed wire I.S. type I shall be as under: Nominal 1000 metre Minimum 934 Metre Maximum 1066 Metre

(E7) :DETAIL SPECIFICATION FOR WORK ITEMS:-

Excavation for foundation in trenches in ordinary, dense, hard soil, sand, clay, soft murrum up to 1.50 Mt. depth including strutting, shoring wherever necessary and throwing away the extra stuff within any lead and outside of Substation premises and its dressing etc. complete as directed by E. I. C.

1.0. General

1.1. Any soil which generally require close application of picks or jumpers or scarifiers to loosen it, stiff clay, gravel and stone, etc. or organic soil, gravel silt, sand, turf, loam, clay, peat, etc. fall under this category.

2.0. Clearing the site

2.1. The site on which the structure is to be built shall be cleared, and all obstructions loose stone, materials, and rubbish of all kind, bush wood and trees shall be removal as directed. The materials so obtained shall be property of the Government and shall be conveyed and stacked as directed up to any. lead. The roots of the trees coming in the sides shall be cut and coated with a hot asphalt.

2.2. The rate of side clearance is deemed to be included in the rate of earth work for which no extra will be paid.

3.0. Setting out

After clearing the site the centre lines will be given, by the Engineer-in-Charge. The contractor shall assume full responsibility for alignment, elevation and dimension of each and all parts of the work. Contractor shall supply labours materials, etc., required for setting out the reference marks and bench marks and shall maintain them as long as required and directed.

4.0. Excavation

The excavation in foundation shall be carried out in true line and level and shall have the width and depth as shown in the drawings or as directed. The contractor shall do the necessary shoring and shutting or providing necessary slopes to a safe angle, at his own cost. The payment for such precautionary measures shall be paid separately if not specified. The bottom of the excavated area shall be leveled both longitudinally and transferal as directed by removing and watering as required. No earth filling will be allowed for brining it to level. If by mistake or any excavation is made deeper or wider than that shown on the plan or directed. The extra depth or width shall be made up with concrete of same proportion as specified for the foundation concrete at the cost of the contractor The excavation up to 1.5 m depth shall be measured under this item.

5.0. Disposal of the excavated stuff

5.1. The excavated stuff of the selected type shall be used in filling the trenches and plinth or leveling the ground in layers including ramming and watering etc.

5.2. The balance of the excavated quantity shall be removed by the contractor from the site of work to a place as directed with lead up to all lead and lift.

6.0. Mode of measurements & payment

6.1. The measurement of excavation in trenches for foundation shall be made according to the sections of trenches shown on the drawing or as per sections given by the Engineer-in- Charge. No payment shall be made for surplus excavation made in excess of above requirements or due to stopping and sloping back as found necessary on account of conditions of soil and requirements of safety.

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

Excavation for foundation in trenches in ordinary, dense, hard soil, sand, clay, soft murrum up to 1.50 Mt. to 3.0 mt. depth including strutting, shoring wherever necessary and throwing away the extra stuff within any lead and outside of Substation premises and its dressing etc.and its dressing etc. complete as directed by E. I. C.

1.0 Workmanship

1.1 The relevant specification of item no. 1 shall be followed except that the excavation work shall be carried out with 1.5Mt to 3.0Mt lift in ordinary soil, sand, clay, soft murrum.

2.0. Mode of measurements & payment

2.1 The relevant specification of item no. 1 shall be followed.

2.2 The excavation work from 1.5Mt to 3.0Mt shall be measured under this item.

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

Excavation for foundation in trenches in ordinary, dense, hard soil, sand, clay, soft murrum up to 3.00 Mt. to 5.0 mt. depth including strutting, shoring wherever necessary and throwing away the extra stuff within any lead and outside of Substation premises and its dressing etc. and its dressing etc. complete as directed by E. I. C.

1.0 Workmanship

1.1 The relevant specification of item no. 1 shall be followed except that the excavation work shall be carried out with 3.0Mt to 5.0Mt lift in ordinary soil, sand, clay, soft murrum.

2.0. Mode of measurements & payment

2.1 The relevant specification of item no. 1 shall be followed.

2.2 The excavation work from 3.0Mt to 5.0Mt shall be measured under this item.

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

Filling available excavated earth (Excluding rock) in trenches, plinth sides of foundation etc. in layers not exceeding 20 CM in depth, consolidating each deposited layers by ramming and watering.

1.0 Workmanship

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

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

1.3 The plinth shall be similarly filled with earth in layers not exceeding 20 cms. adequately watered and consolidated by ramming with iron or wooden rammers. When filling reaches finished level the surface shall be flooded with water for at least 24 hours and allowed to dry and then rammed and consolidated.

1.4 The finished level of filling shall be kept to shape intended to be given to floor.

1.5 In case of large heavy duty flooring like factory flooring, the consolidation may be done by power rollers, where so specified. The extent of consolidation required shall also be as specified.

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

2.0 Mode of Measurements & Payment

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

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

Filling in foundation and plinth with murrum or selected soil in layers of 20 CM thickness including watering, ramming and consolidation etc. complete (Yellow earth should be brought by contractor from out side) Note : 25 % of the successive bill amount shall be retained till lapse of one full scale monsoon and rectifications of subsistence if any to the design ground level)

1.0. Materials

1.1. Murrum shall be clean, of good binding quality, and of approved quality obtained from approved pots / quarries of disintegrated rocks which contain silicon materials and natural mixture of clay of calcareous origin. The size of murrum shall not be more than 20mm.

2.0 Workmanship

The relevant specifications of item No. 4 shall be followed except that murrum or selected soil shall be filled in foundation and plinth in 20 cms. Layers including consolidating, ramming, watering, dressing, etc. complete.

3.0. Mode of Measurements & Payment

3.1. The relevant specifications of item No. 4 shall be followed.

3.2. The rate includes cost of collecting, carting murrum / or selected earth of approved quality with all lead and labour required for filling the same in trenches and plinth under floors.

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

Filling in plinth with sand under floors including watering, ramming consolidating and dressing etc. complete.

1.0. Materials

1.1. Sand shall conform to M6.

2.0 Workmanship

The relevant specifications of item No. 4 shall be followed except that sand shall be filled in under floors, including watering, ramming, consolidating and dressing etc. complete.

3.0. Mode of Measurements & Payment

3.1. The relevant specifications of item No. 4 shall be followed.

3.2. The rate includes cost of collecting, carting sand with all lead and labour for filling the same in plinth under floors.

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

Providing and applying anti termite treatment, as per IS 6313 (part II & Part III 2001) for building works in pre construction & Post construction stages, using chemicals conforming to relevant IS in water emulsion and effective when applied uniformly over the area to treated. The chemical to be used is chloro-pyriphos 20 % EC or its equivalent. The treatment is to be carried out as per the procedure mentioned below and treated plinth surface area is to be taken for measurement.

a) For pre-construction treatment: For plinth filling and periphery holes inside plinth to be drilled and 300mm centre to centre each having depth 1.5 mtr and for inside plinth the holes are to be treated with diluted chemical solution 1.5 ltr. Per hole in the ratio of 1:20 per periphery, i.e. outside plinth the ditch is to be treated with diluted solution 2.25 ltr. per Rmt. in the ratio 1:20. The entire surface area is to be treated with diluted solution of dose 2.25 ltr. per smt over and above as a plinth surface treatment.

Specification for the item shall be as per item description and relevant IS code.

"For Anti-termite Treatment:-

The contractor shall submit performance guarantee of the anti-termite treatment item at the rate of 20% of cost of item of work order in the form of DD or in the form of BG of Schedule Bank / Nationalised Bank in favour of GETCO (A/c Agency) for a period of 5 years from actual date of completion of work on non-judicial stamp paper of appropriate value in approved format of GETCO. In the event of unsatisfactory performance of anti-termite treatment work, the agency shall carry out necessary remedial/rectification works that may be necessary in the opinion of GETCO at no extra cost, failing which BG shall be encashed by GETCO. The BG shall be released only after satisfactory completion of performance period of 5 years."

Measurement will be paid in square meter basis.

Brick work using common fly ash / concrete blocks/ building bricks having crushing strength not less 35 kg. / sq. cm. in foundation and plinth in cement mortar 1:6 (1 -Cement : 6 - Fine sand)

1.0. Materials

Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Cement mortar shall conform to M-11. Brick shall conform to M-15.

2.0 Workmanship

2.1. Proportion : The proportion of the cement mortar shall be 1:6 (1 Cement : 6 fine sand) by volume.

2.2 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.

2.3.1 Laying : Bricks shall be laid in English bond unless directed otherwise. Half or cut bricks shall not be used except when necessary to complete to bond, closers in such case shall be cut to the required size and used near the ends of walls.

2.3.2 A layer of mortar shall be spread on full width for suitable length of the lower course. Each brick shall first be properly bedded and set home by gently tapping with the handle of trowel or wooden mallet. It side face shall be flushed with mortar before the next brick is laid and pressed against it. On completion of course, the vertical joint shall be fully filled from the top with mortar.

2.3.3 The wall 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 course shall generally be directly one over the other. The thickness of the brick course shall be kept uniform.
2.3.4 The bricks shall be laid with frog upwards. A set of tools comprising of wooden straight edges, mason's spirit level, square half meter rub, and pins, string and plumb shall be kept on the site of the work for frequent checking during the progress of work.
2.3.5 Both the faces of the walls of thickness greater than 23 cms. shall be kept in proper place. All the connected brickwork 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.
2.3.6 All fixtures, pipes, outlets of water, holdfasts of doors and windows, etc. which are required to be built in wall shall be embedded in the cement mortar.

2.4 Joints

2.4.1 Bricks shall be so laid that all joints are quite flush with mortar. Thickness of the joint shall not exceed 12mm. The face joints shall be raked out as directed by raking tool daily during the progress of work, when the mortar is still green so as to provide key for plaster or pointing to be done.
2.4.2 The face of the brick shall be cleaned the very day on which the brick work is laid and all mortar dropping removed.

2.5 Curing

2.5.1 Green work shall be protected from the rain suitable. Masonry work shall be kept moist on all the faces for a period of seven days. The top of the masonry work shall be kept well wetted at the close of the day.

2.6 Preparation of the foundation bed

2.6.1 If the foundation is to be laid directly on the excavated bed, the bed shall be leveled, cleaned of all the loose materials, cleaned and wetted before starting masonry. If masonry is to be laid on concrete footing, the top of the concrete shall be cleaned and moistened. The contractor shall obtain the engineer's approval for the foundation bed, before foundation masonry is started. When pucca flooring is to be provided flush with the top to plinth, the inside plinth offset shall be kept lower than the outside plinth top by the thickness of the flooring.

3.0 Mode of measurement

3.1 The measurements 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 portion shall be measured net.
3.2 No deduction shall be made from the quantity of brick work, nor any extra payment made for embedding in masonry or making holes in respect of following items.

(1) End of joints, beams, posts, girders, rafters, purlins, trusses, corbel, steps, etc. where cross section area does not exceed 500 sq cm.
(2) Opening not exceeding 1000 sq cm.
(3) Wall plates and bed plates, bearing of slabs, and the like whose thickness does not exceed 10 cm and the bearing does not extended to the full thickness of the wall.
(4) Drainage holes and recesses fro cement concrete blocks to embed hold fasts for doors, windows, etc.
(5) Iron fixtures, pipes up to 300mm dia, hold fasts and doors and windows built into masonry and pipes, etc. for concealed wiring.
(6) Forming chases of section not exceeding 350 sq. cm. in masonry.

3.3 Apertures for fire places shall not be deducted nor shall extra labour required to make splaying of jambs, throttling and making arches over the apertures be paid for separately.
3.4 The rate shall be for a unit of one cubic meter.

Brick work using common fly ash building bricks having crushing strength not less 35 kg. / sq. cm. for super structure above plinth level up to floor two level (i.e. 4.0 m above plinth level and parapet above the same) in cement mortar 1:6 (1 -Cement : 6 - Fine sand)

The specification of item no. 8 shall be applicable to this item but for brick masonry for super structure above plinth level up to floor two level i.e. 4.0m above plinth level and parapet above the same.

The rate shall for a unit of one cubic metre.

Half brick masonry in fly ash / concrete blocks building bricks having crushing strength not less than 35 kg/sq.cm. in cement mortar 1:3 (1 - Cement : 3 - Coarse sand) with 2 Nos. of 6 mm mild steel round bars after every three courses embedded in cement mortar above plinth level up to floor two level.

1.0 Materials

Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Cement mortar shall conform to M-11. Brick shall conform to M-15. M.S. reinforcement shall conform to M-18.

2.0 Workmanship

2.1 Relevant specification of bricks, wetting and laying of bricks, joints, curing, scaffolding etc. shall conform to Item no. except the following :

2.2 Cement mortar used in masonry work shall be in proportion of one part of cement and three parts of sand by volume and shall conform to M-11, and this work is for half brick thickness for partition walls.

2.3 The hoop iron i.e. two nos. of 6mm dia MS round bars shall be provided at every third course. The ends of reinforcement shall be full embedded in main walls on both sides as directed. Reinforcement shall be placed on top of the bottom-most course. Laps shall be of 15 cms. of mild steel bars of hoop iron.

2.4 The joints in the course where reinforcement is placed shall admit of mortar cover to the reinforcement.

3.0 Mode of measurements and payment

3.1 The rate shall be for half brick masonry work including providing specified reinforcement, the limiting dimension not exceeding those in plan or as directed. The length shall be measured nearest to one cm.

3.2 Any work done extra over specified dimensions shall be ignored.

3.3 The rate shall be for a unit of one sq. meter.

Providing & laying M-15 grade of concrete with minimum cement content 300 kg/M^3 and keeping maximum free water cement ratio as 0.60, for plain structure foundation using 12 mm to 20 mm size black trap machine crushed metal including necessary centering for all sides as required, mixing the concrete in mixer machine, ramming with vibrator, including keeping pockets for foundation bolts & finishing the exposed honey combed surface if any, curing, etc., complete as per drawing & specification, and as directed by E. I. C. (Finishing by Plaster & Reinforcement if any will be paid separately)

M-15 grade of concrete using machine cut black trap of size 12 to 20mm shall be laid using minimum cement content of 300 Kg / Cmt. and free water cement ratio of 0.55. Sample of ingredients to be used shall be got approved.

The general specification of concrete shall be applicable for this item. Rate quoted shall be of all materials, labour, tools, tackles, shuttering, scaffolding, curing, etc. as per item. Concreting work, involved in this item, is for the foundation work for various equipments and machinery.

Payment shall be made on actual cu. M. of concrete work done as per detailed drawing furnished by department.

The pockets to be grouted shall be properly cleaned. Dust and other foreign materials shall be removed. If required, it shall be cleaned by Air blower. If surface is not rough, roughening shall be done, if necessary and instructed by Engineer – in – Charge for bonding purpose. Existing surface shall be applied with thick paste of cement mortar. No separate payment will be admissible for this.

Payment shall be made for actual quantity of concrete work done for grouting.

Providing & Laying controlled cement concrete M-200 curing complete excluding the cost of form work and reinforcement for reinforced concrete work in

a) Foundation, footings, Bases of columns etc. and Mass concrete,

b) Slabs, Landings, shelves, Balconies, Lintels, Beams, Girders and cantilever up to floor two level,

c) Columns pillars posts and struts up to floor two level.

1.0 Materials

Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Grit shall conform to M-8. Graded stone aggregate 20mm nominal size shall conform to M-12.

2.0 General

2.1 The concrete mix shall be designed by preliminary tests, the proportioning of cement and aggregates shall be done by weight and necessary precautions shall be taken in the production to ensure that the required work cube strength is attained and maintained. The controlled concrete shall be in grade of M-200 with prefix controlled added to it. The letter 'M' refers to mix and numbers specify 28 days works cube compressive strength of 150mm cubes of the mix expressed in Kg/ Cm^2

2.2 The proportion of cement, sand and coarse aggregates shall be determined by weight. The weigh batching machine shall be used for maintaining proper control over the proportion of aggregates as per mix design.

The strength requirements of different grades of concrete shall be as under :

Grade of concrete	Compressive strength of 15 cms. cubes in Kg / Cm^2 at 28 days, conducted in accordance with IS 516 – 1959.	
	Preliminary test (min)	Work test (min)
M-150	200	150
M-200	260	200
M-250	320	250
M-300	380	300
M-350	440	350
M-400	500	400

In all cases, the 28 days compressive strength specified in above table be the criteria for acceptance or rejection of the concrete. Where the strength of a concrete mix as indicated by tests, lies in between the strength of any two grades specified in the above table, such concrete shall be classified in for all purposes as concrete belonging to the lower of the two grades between which its strength lies.

2.3 Admixture may be used in concrete only with approval of Engineer – in – Charge based upon the evidence that with the passage of time neither the compressive strength of concrete is reduced nor are other requisite qualities of concrete and steel impaired by the use of such admixture.

3.0 Workmanship

3.1 The proportions for ingredients chosen shall be such that concrete has adequate workability for conditions prevailing on the work in question and can be properly compacted with means available except where it can be shown to the satisfaction of the Engineer – in – Charge, that the supply of properly graded aggregate of uniform quality can be maintained till the completion of work. Grading of aggregate shall be controlled by obtaining the coarse aggregates, in different sizes and being in them in the right proportions as required. Aggregate of different sizes shall be stocked in separate stock piles. The required quantity of material shall be stock piled several hours, preferably a day before use. The grading of coarse and fine aggregate shall be checked as frequently as possible, the frequency for a given job being determined by the Engineer – in – Charge to ensure that the suppliers are maintaining the uniform grading as approved for samples used in the preliminary tests.

3.2 In proportioning concrete, the quantity of both cement and aggregate shall be determined by weight. Where the weight of cement is determined by accepting the maker's weight per bag a reasonable number of bags shall be weighed separately to check the net weight. Where the cement is weighed from bulk stocks at site and not by bags, it shall be weighed separately from the aggregates. Water shall either be measured by volume in calibrated tanks or weighed. All measuring equipments shall be maintained in clean, and serviceable condition. Their accuracy shall be periodically checked.

3.3 It is most important to keep the specified water cement ratio constant and at its correct value. To this end, moisture content in both fine and coarse aggregates shall be determined by the Engineer – in – Charge, according to the weather conditions. The amount of mixing water shall then be adjusted to compensate for variations in the moisture content. For the determination of moisture content in the aggregates, IS 2389 (Part III) shall be referred to. Suitable adjustments shall also be made in the weights of coarse aggregates due to variation in the moisture content. Minimum quantity of cement to be used in concrete shall not be less than 320 Kg / Cmt.

3.4 Mixing

3.4.1 For all work, concrete shall be mixed in a mechanical mixer which along with other accessories shall be kept in first class working condition and so maintained throughout the construction. Measured quantity of aggregate, sand, cement required for each batch shall be poured into the drum of the mechanical mixer while it is continuously running. After about half a minute of dry mixing measured quantity of water required

for each batch of concrete mix shall be added gradually and mixing continued for another one and half a minute. Mixing shall be continued till materials are uniformly distributed and uniform colour of the entire mass is obtained and each individual particle of the coarse aggregate shows complete coating of mortar containing its proportionate amount of cement. In no case shall the mixing be done for less than two minutes after all ingredients have been put into the mixer.

3.4.2 Mixers which have been out of use for more than 30 minutes shall be thoroughly cleaned before putting in a new batch. Unless otherwise agreed to by the Engineer – in – Charge the first batch of concrete from the mixture shall contain only two thirds of normal quantity of coarse aggregate. Mixing plant shall be thoroughly cleaned before changing from one type of cement to another.

3.5 Consistency

3.5.1 The degree of consistency which shall depend upon the nature of the work and methods of vibration of concrete shall be determined by regular slump tests in accordance with IS 1199 – 1959. The slump of 10 mm to 25 mm shall be adopted when vibrators are used and 80 mm when vibrators are not used.

3.6 Inspection

3.6.1 Contractor shall give the Engineer – in – Charge due notice before placing any concrete in the forms to permit him to inspect and accept the false work and forms as to their strength, alignment and general fitness but such inspection shall not reliever the contractor of his responsibility for the safety of men, machinery, materials and for results obtained. Immediately before concreting, all forms shall be thoroughly cleaned.

3.6.2 Centering design and its erection shall be got approved from the Engineer – in – Charge. One carpenter with helper shall invariably be kept present throughout the period of concreting. Movement of labour and other persons shall be totally prohibited for reinforcement laid in position. For access to different parts, suitable mobile platforms shall be provided so that steel reinforcement in position is not disturbed. For ensuring proper cover, mortar blocks of suitable size shall be cast and tied to the reinforcement. Timber, kapachi or metal pieces shall not be used for this purpose.

3.7 Transporting and laying

3.7.1 The method of transporting and placing concrete shall be as approved. Concrete shall be so transported and placed that no contamination, segregation or loss of its constituent material takes place. All form work shall be cleaned and made free from standing water, dust, snow or ice immediately before placing of concrete. No concrete shall be placed in any part of the structure until the approval of Engineer – in – Charge has been obtained.

3.7.2 Concreting shall proceed continuously over the area between construction joints. Fresh concrete shall not be placed against concrete which has been in position for more than 30 minutes unless a proper construction joint is formed. Concrete shall be compacted in its final position within 30 minutes of its discharge from the mixer. Except where otherwise agreed to by the Engineer – in – Charge concrete shall be deposited in horizontal layers to a compacted depth of not more than 0.45 metre when internal vibrators are used and not exceeding 0.30 metre in all other cases.

3.7.3 Unless otherwise agreed to by the Engineer – in – Charge, concrete shall not be dropped into place from a height exceeding 2 metres. When trucking or chutes are used they shall be kept close and used in such a way as to avoid segregation. When concreting has to be resumed on a surface which has hardened, it shall be roughened, swept clean, thoroughly wetted and covered with a 13mm thick layer of mortar composed of cement and sand in same ratio as in the concrete mix itself. This 13 mm layer of mortar shall be freshly mixed and placed immediately before placing of new concrete. When concrete has not fully hardened, all laitance shall be removed by scrubbing the wet surface with wire or bristle brushes, care being taken to avoid dislodgement of any particles of coarse aggregate. The surface shall then be thoroughly wetted, all free water removed and then coated with neat cement grout. The first layer of concrete to be placed on this surface shall not exceed 150mm in thickness and shall be well rammed against old work, particular attention being given to corners and close spots.

3.7.4 All concrete shall be compacted to produce a dense homogeneous mass with the assistance of vibrators, unless, otherwise permitted by the Engineer – in – Charge for exceptional cases, such as concreting under water, where vibrators can not be used. Sufficient vibrators in serviceable condition shall be kept at site so that spare equipment is always available in the event of breakdowns.

Concrete shall be judged to be compacted when the mortar fills the spaces between the coarse aggregate and begins to cream up to form an ever surface. Compaction shall be completed before the initial setting starts i.e. within 30 minutes of addition of water to dry mixture. During compaction, it shall be observed that needle vibrators are not applied on reinforcement which is likely to destroy the bond between concrete and reinforcement.

3.8 Curing

Immediately after compaction, concrete shall be protected from weather, including rain, running water, shocks, vibration, traffic, rapid temperature changes, frost and drying out process. It shall be covered with wet sacking, Hessian or other similar absorbent material approved, soon after the initial set and shall be kept continuously wet for a period of not less than 14 days from the date of placement. Masonary work over foundation concrete may be started after 48 hours of its laying but curing of concrete shall be continued for a minimum period of 14 days.

3.9 Sampling and testing of concrete

3.9.1 Samples from fresh concrete shall be taken as per IS 1199 – 1959 and cubes shall be made, cured and tested at 7 days or 28 days as per requirements in accordance with IS 516 – 1959. A random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested i.e. the sampling should be spread over the entire period of concreting and cover all mixing units. The minimum frequency of sampling of concrete of each grade shall be in accordance with following:

Quantity of concrete in the work	No. of samples	Quantity of concrete in the work	No. of samples
1 – 5 Cmt.	1	31 - 50 Cmt.	4
6 – 15 Cmt.	2	51 and above	4 + one additional for each additional 50 m. or part thereof.
16 – 30 Cmt.	3		

NOTE : At least one sample shall be taken from each shift. Ten test specimens shall be made from each sample, five for testing at 7 days and the remaining five at 28 days. The samples of concrete shall be taken on each day of concreting as per above frequency. The number of specimens may be suitably increased as deemed necessary by the Engineer – in – Charge when procedure of tests given above reveals a poor quality of concrete and in other special cases.

3.9.2 The average strength of the group of cubes cast for each day shall not be less than the specified cube strength of 150 Kg / Cm^2 at 28 days. 20 % of the cubes cast for each day may have value less than the specified strength provided the lowest value is not less than 85% of the specified strength. If the concrete made in accordance with the proportions given for a particular grade, does not yield the specified strength, such concrete shall be classified as belonging to the appropriate lower grade. Concrete made in accordance with the proportions given for a particular grade shall not, however, be placed in a higher grade on the ground that the test strength are higher than the minimum specified.

4.0 Stripping

4.0.1 The Engineer – in – Charge shall be informed in advance by the contractor of his intention to strike the form work. While fixing the time for removal of form work, due consideration shall be given to local conditions, character of the structure, the weather and other condition that influence the setting of concrete and of the materials used in the mix. In normal circumstances (generally where temperatures are above 20° C and where ordinary concrete is used, forms may be struck after expiry of periods specified in item for respective item of form work.

4.0.2 All form work shall be removed without causing any shock or vibration as would damage the concrete. Before the soffit and struts are removed, the concrete surface shall be exposed, where necessary in order to ascertain that the concrete has sufficiently hardened. Centering shall be gradually and uniformly lowered in such a manner as to permit the concrete to take stress due to its own weight uniformly and gradually. Where internal metal ties are permitted, they or their removable parts shall be extracted without causing any damage to the concrete and remaining holes filled with mortar. No permanently embedded metal part shall have less than 25 mm cover to the finished concrete surface. Where it is intended to re-use the form work, it shall be cleaned and made good to the satisfaction of the Engineer – in – Charge. After removal of form work and shuttering, the Executive Engineer shall inspect the work and satisfy by random checks that concrete produced is of good quality.

4.0.3 Immediately after the removal of forms, all exposed bolts etc., passing through the cement concrete member and used for shuttering or any other purpose shall be cut inside the cement concrete member to a depth of at least 25 mm below the surface of the concrete and the resulting holes be filled by cement mortar. All line caused by form joint, all cavities produced by the removal of form ties and all other holes and depressions, honeycomb spots, broken edges or corners and other defects shall be thoroughly cleaned, saturated with water and carefully pointed and rendered true with mortar of cement and fine aggregate mixed in proportions used in the grade of concrete that is being finished and of as dry

consistency as is possible to use. Considerable pressure shall be applied in filling and pointing to ensure thorough filling in all voids. Surfaces which are pointed shall be kept moist for a period of 24 hours.
If rock pockets / honeycombs in the opinion of the Engineer – in – Charge are of such and extent or character as to effect the strength of the structure materially or to endanger the life of the steel reinforcement, he may declare the concrete defective and require the removal and replacement of the portions of the structure effected.

4.1 Mode of measurement and payment

4.1.1 Controlled concrete RCC fro work as specified shall be measured under this item. The rate excluded the cost of form work.
4.1.2 The consolidated cubical contents of concrete work as specified in item shall be measured. The concrete laid in excess of section shown on drawings or as directed shall not be measured. No deduction shall be made for –
(a) Ends of dis-similar materials such as joists, beams, posts, girders, rafters, purlin trusses, corbels and steps, etc. up to 500 Sq. Cm. in section.
(b) Opening up to 0.1 Sq. M.
4.1.3 The rate includes cost of all materials, labour, tools, and plant required for mixing, placing in position, vibrating and compacting, finishing as directed, curing and all other incidental expenses for producing concrete of specified strength.
4.3 The rate shall be for a unit of one cubic metre.

Providing and laying Thermo Mechanically Treated (TMT bars) steel reinforcement conforming to grade Fe 415 IS : 1786 for RCC work including cutting, bending, hooking and binding the reinforcement with approved quality of binging wire etc., completed as per design

All reinforcement TMT bar specified in item shall confirm to relevant IS standard 1786 for thermo mechanical Tested bars, Wherever tested brands to be used, certificate for the same from manufacture shall be submitted. If it is instructed by Executive Engineer, contractor shall have to arrange for testing of bars at the laboratory or institution, suggested by GETCO at his cost.
If the bars are to be supplied by GETCO at specified rate, in schedule “A” the same shall be collected and carted to the site of use.
Bars shall be bent as per bar bending schedule supplied with drawing. If bar bending schedule is not supplied contractor shall prepare it and get it approved at the site before cutting for fabrication. Bars shall be clean, free form rust, dust, mud etc. if coils are there, they shall be first straightened. Bars shall be cut according to the cutting length specified/approved by department. Bars shall be bent gradually. Bars having crack or spits shall be rejected. Bars shall be bent cold, unless otherwise specified in case of higher diameter bars. If bar is bend wrongly, it should be straightened and recent such that it do not injure the materials.
Laps and splices shall be got approved. They shall be staggered and shall be at location shown/approved. Lapping shall be avoided when full length bars are available. All laps, hooks, bends etc. shall be provided as per IS standards. Reinforcement bars shall be place in position as per drawing or details given. It shall be tied with annealed black wire/G.I. wire of 18 gauge. Blocks, spacers, chairs etc., shall be provided as per IS. 2502 at places instructed.
Bars shall be provided with clear cover as shown in drawing or as instructed on site. Cover shall be provided with cement mortar cover block prepared of specified thickness with binding wire embedded to fix cover in position and tie with the reinforcement so that it may not get disturbed. Minimum clear cover shall be less than 13 mm or diameter of bars for slabs. For beam and columns depending on size it shall be 20mm to 25mm. Cover shall be provided depending on structure, weather condition, location of structure etc., as per ISI.
After the reinforcement is tied and checked by contractor himself it shall be got checked by GETCO’s authorized representative and okayed for pouring of concrete. Quantity of reinforcement bars in M.T. embedded in concrete shall be paid. Weight shall be computed on cutting length approved or given multiplied by standard weight of particular diameter of bars as per IS standards. Work shall to be carried out at all levels. “Rate quoted shall inclusive of wastages, cost of binding wire etc., No separate payment will be made for binding wire. However laps, dowels etc., shall be paid as per drawing or as approved in site.

For the purpose of payment, the bar shall be measured correct up to 100 mm length and weight payable worked out at the rate specified below :

1	6 mm x 0.22 Kg / Rmt.	8	20mm x 2.47 Kg / Rmt.
2	8 mm x 0.39 Kg / Rmt.	9	22mm x 2.98 Kg / Rmt.
3	10 mm x 0.62 Kg / Rmt.	10	25mm x 3.85 Kg / Rmt.
4	12 mm x 0.89 Kg / Rmt.	11	28mm x 4.83 Kg / Rmt.
5	14mm x 1.21 Kg / Rmt.	12	32mm x 6.31 Kg / Rmt.
6	16 mm x 1.58 Kg / Rmt.	13	36mm x 7.99 Kg / Rmt.
7	18 mm x 3.00 Kg / Rmt.	14	40mm x 9.86 Kg / Rmt.

Providing 15 mm. thick cement plaster in single coat in C. M. (1:3) on fair side brick / concrete wall for interior plastering of floor two level including finishing the surfaces with smooth cement finishing, necessary drip moulding, scaffolding, curing with three coats of the white wash or colour wash as directed by E. I. C.

1.0 Materials

1.1 Water M-1. The cement mortar of proportion 1:3 shall conform to M-13.

2.0 Workmanship

2.1 Scaffolding : Wooden ballies, bamboos, planks, trestles and other scaffolding shall be sound. These shall be properly examined before erection and use. Stage scaffolding shall be provided for ceiling plaster which shall be independent of the walls.

2.2 Preparation of back ground :

2.2.1 The surface shall be cleaned of all dust, loose mortar droppings, traces, of algae, efflorescence and other foreign matter by water or by brushing. Smooth surface shall be roughened by wire brushing if it is not hard and by racking if it is hard. In case of concrete surface, if a chemical retardant has been applied to the hard and by racking if it is hard. In case of concrete surface, if a chemical retardant has been applied to the form work, the surface shall be roughened by wire brushing and all the resulting dust and loose particles cleaned off and care shall be taken that none of the retardant is left on the surface. Trimming of projections on brick / concrete surface where necessary shall be carried out to get an even surface.

2.2.2 Raking of joints in case of masonry where necessary shall be allowed to dry out for sufficient period before carrying out the plaster work.

2.2.3 The work shall not be soaked but only damped evenly before applying the plaster. If the surface becomes dry such area shall be moistened again.

2.2.4 For external plaster, the plastering operation shall be started from top floor and carried downwards. For internal plaster, the plastering operations may be started wherever the building frame and cladding work are ready and the temporary supporting ceiling resting on the wall of the floor have been removed. Ceiling plaster shall be completed before starting plaster to walls.

2.3 Applications of plaster :

2.3.1 The plaster about 15 x 15 cms. shall be first applied horizontally and vertically at not more than 2 metre intervals over the entire surface to serve as gauge. The surfaces of these gauges shall be truly in plane of the finished plastered surface. The mortar shall then be applied in uniform surface slightly more than the specified thickness, then brought to a true surface by working a wooden straight edge reaching across the gauges with small upward and sideways movement at a time. Finally, the surface shall be finished off true with a trowel or wooden float according as a smooth or a sandy granular texture is required. Excessive trowelling or overworking the float according as a smooth or a sandy granular texture is required. Excessive trowelling or overworking the float shall be avoided. All corners, arises, angles and junctions be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chamfering corners, arises, junctions etc. shall be carried out with proper templates to the size required.

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

2.3.3 In suspending the work at the end of the day, the plaster shall be left out clean to the line both horizontally and vertically. When recommencing the plaster, the edges of the old work shall be scraped clean and wetted with cement putty before plaster is applied to the adjacent areas to enable the two to properly join together. Plastering work shall be closed at the end of the day on the body of the wall and nearer than 15cms to any corners or arises. Horizontal joints in plaster work shall not also occur on parapet

tops and copings as these invariably lead to leakage. No portion of the surface shall be left out initially to be packed up later on.

2.3.4 Each coat shall be kept damp continuously till the next coat is applied or for a minimum period of 7 days. Moistening shall commence as soon as plaster is hardened sufficiently. Soaking of walls shall be avoided and only as much water as can be readily absorbed shall be used, excessive evaporation on the sunny or windward side of building in hot air or dry weather shall be prevented by hanging matting or gunny bags on the outside of the plaster and keeping them wet.

3.0 Mode of measurement & payment:

3.1 The rate shall include the cost of all materials, labour and scaffolding etc. involved in the operations described under workmanship.

3.2 All plastering shall be measured in square metres unless, otherwise specified. Length, breadth or height shall be measured correct to a centimeter.

3.3 Thickness of the plaster shall be exclusive of the thickness of the key i.e. grooves or open joints in brick work, stone work etc. or space between laths. Thickness of plaster shall be average thickness with minimum 10mm at any point on this surface.

3.4 This item includes plastering up to floor two level.

3.5 The measurement of wall plastering shall be taken between the walls or partition (dimensions before plastering being taken) for length and from the top of floor or skirting to ceiling for height. Depth of cover of cornices if any shall be deducted.

3.6 Soffits of stairs shall be measured as plastering on ceilings. Flowing soffits shall be measured separately.

3.7 For jambs, soffits, sills, etc. for openings not exceeding 0.5 Sq. Mt. each in area for ends of joists, beams, posts, girders, 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 deduction 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 reveals jambs, soffits, sills etc. of these opening for finish to plaster around ends of joints, beams, posts etc.

(b) Deduction for openings exceeding 0.5 sq.mt. but not exceeding 3 sq.mt. each shall be made as follows and no addition shall be made for reveals, jambs, soffits, sills etc. of these openings.

(i) When both faces of all wall are plastered with same plaster, deduction shall be made for one face only.

(ii) When two faces of wall are plastered with different types of plasters or if one face is plastered and the other pointed, deductions shall be made from the plaster or pointing on the side of frame for door, window etc. on which width of reveals is less than that on the other side but no deductions shall be made on the other side. Where with of reveals on both faces of all equal, deductions of 50 % of area of opening on each face shall be made from area of plaster and / or pointing as the case may be.

3.8 For opening having door frames equal to projecting beyond the thickness of wall, full deduction for opening shall be made from each plastered face of the wall.

3.9 In case of openings of area above 3 sq.mt. each, deduction shall be made for opening but jambs, soffits & sills shall be measured.

3.10 The rate shall be for unit of one sq.mtr.

Providing 20 mm thick smooth cement plaster finished in two coats, first base coat of 12 mm thick in C. M. (1:3) and second coat of 8 mm thick in C. M. (1:2) including providing drip moulding, making grooves in plaster, curing, scaffolding etc., completed as directed by E. I. C.

1.0. Materials

1.1. Water shall conform to M-1. Cement mortar shall conform to M-11.

2.0. Workmanship

2.1. The work shall be carried out in the coats. The backing coat (base coat) shall be 12 mm. thick in C.M.

1:3. The relevant specifications of item No. 14 shall be followed except that the thickness of back coat shall be 12 mm. average. Before the first coat hardens its surface shall be beaten up by edges of wooden tappers and close dents shall be made on the surface. The subsequent coat shall be applied after this coat has been allowed to set for 3 to 5 days, depending upon the weather conditions. The surface shall not be allowed to dry during this period.

2.2. The second coat shall be completed to 8 mm. thickness in C.M. 1:1 as described above, including raising sand facing by bushing. The sample of sand face shall be got approved before the work is started. The whole work shall be carried out uniformly as per sample approved.

2.3. Curing:

The curing shall be started overnight after finishing of plaster. The plaster shall be kept wet for a period of 7 days. During this period, it shall be protected from all damages.

3.0. Mode of measurement & payment

3.1. The relevant specifications of item No. 17.58 shall be followed except that the sand face plaster on outside up to 10 m. above ground level shall be measured under this item.

3.2. The rate shall be for a unit of One sq. metre.]

Providing 20 mm thick SAND FACED CEMENT PLASTER on wall up to height 10 mtrs. above ground level finished in two coats, 1st base coat of 12 mm thick in C. M. (1:3) and 2nd coat of 8 mm. thick in C. M. (1:1) including making grooves in plaster curing, scaffolding etc., complete as directed by E. I. C. with three coats of water proofing cement paint on wall surface, including watering as directed by E. I. C.

1.0. Materials

1.1. Water shall conform to M-1. Cement mortar shall conform to M-11.

2.0. Workmanship

2.1. The work shall be carried out in the coats. The backing coat (base coat) shall be 12 mm. thick in C.M. 1:3. The relevant specifications of item No. 14 shall be followed except that the thickness of back coat shall be 12 mm. average. Before the first coat hardens its surface shall be beaten up by edges of wooden tappers and close dents shall be made on the surface. The subsequent coat shall be applied after this coat has been allowed to set for 3 to 5 days, depending upon the weather conditions. The surface shall not be allowed to dry during this period.

2.2. The second coat shall be completed to 8 mm. thickness in C.M. 1:1 as described above, including raising sand facing by bushing. The sample of sand face shall be got approved before the work is started. The whole work shall be carried out uniformly as per sample approved.

2.3. Curing:

The curing shall be started overnight after finishing of plaster. The plaster shall be kept wet for a period of 7 days. During this period, it shall be protected from all damages.

3.0. Mode of measurement & payment

3.1. The relevant specifications of item No. 17.58 shall be followed except that the sand face plaster on outside up to 10 m. above ground level shall be measured under this item.

3.2. The rate shall be for a unit of One sq. metre.]

Providing 100 mm quarter round water proofing cement vata in C. M. (1:1) at junction of walls & slab in parapets, weather sheds, cantilevers including finishing the top with smooth cement finishing using water proofing compound, curing scaffolding etc., complete as directed by E. I. C.

1.0. Materials

1.1. Water shall conform to M-1. Cement mortar shall conform to M-11.

2.0. Workmanship

2.1. The work of cement vata of 10 cms. x 10 cms. size shall be earned out at junctions of parapets and terraces as directed. The vata shall be finished in quarter round shape. The work shall be earned out in the best workman like manner. The inner portion of rain water pipe shall be rounded off properly during constructing the vata. The work shall be cured for 7 days.

3.0. Mode of measurements and payment

3.1. The work shall be measured for finished item in running metre.

3.2. The rate shall be for a One running metre.

Providing & applying 3 coats of oil bound distemper and with one coat of primer of approved shade & make including scaffolding touching with putty, smoothening the surfaces etc., completed as directed by E. I. C.

1.0. Materials

1.1. Oil bound washable distemper and primer shall be of approved brand and manufacture. The distemper shall be of required colour and shade and the same shall conform to I.S. : 428- 1969.

2.0. Workmanship

2.1. Scaffolding

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

2.2. Preparation of surface :

2.2.1. The undecorated surface to be distempered shall be thoroughly brushed from dust, dirt, grease, mortar dropping and other foreign matter and sand papered smooth. New plaster surface shall be allowed to dry for at least 2 months before applications of distemper.

2.2.2. All unnecessary nails shall be removed. Pitting in plaster shall be made good with plaster again with a fine grade sand paper and made smooth. A coat of distemper shall be applied over the patches. The surface shall be allowed to dry thoroughly before the regular coat of distemper is allowed. The surface affected ay moulds, moss, fungi, algae lichens, efflorescence etc. shall be treated in accordance with I.S; 2395 (Part01) 1966. Before applying distempering, any unevenness shall be made good by applying putty made of plaster of pairs mixed with water on entire surface including filling up the undulation and then sand papering the same after it is dry.

2.3. Priming coat :

2.3.1. A priming coat of distemper primer of approved manufacture and shade shall be applied over the papered surface in case of new work on undecorated surface. If the distemper priming is done after the wail completely, the distemper primer shall be applied.

2.3.2. Application of primer shall be done as under : The primer shall be applied with a brush on the clean dry and smooth surface. Horizontal strokes shall be given first and vertical strokes shall be applied immediately afterwards. This entire operation will constitute on coat. The surface shall be finished as uniformly as possible leaving no brush marks. It shall be allowed to dry for at least 48 hours before oil bound distemper or paint is applied.

2.3.3. Oil bound distemper is not recommended to be applied within six months of the completion of wall plaster.

2.4. Preparation of oil bound distemper :

2.4.1. The distemper shall be diluted with water or any other prescribed thinner in a manner recommended by the manufacturer only. Sufficient quantity of distemper required for a days work shall be prepared.

2.5. Application of Distemper coat :

2.5.1. For undecorated surfaces, after the primer coat is dried for at least 48 hours, the surface shall be lightly sand papered to make it smooth for receiving the distemper, taking care not to rub but priming coat. All loose particles shall be dusted of after rubbing. Minimum tow coats of distemper shall be applied with brushes in horizontal strokes followed immediately by vertical strokes which together shall constitute one coat. The subsequent coats shall be applied after a time interval of at least 24 hours between consecutive coats to permit proper drying of the proceeding coat. The finished surface shall be even and inform without patches, brush marks, distemper drops etc.

2.5.2. Sufficient quantity of distemper shall be mixed to finish one room at a time. The application of a coat in each room shall be finished in one operation and no work shall be striated in any room which cannot be completed on the same day.

2.5.3. 15 cm. double bristled distemper brush shall be used. After day's work brushes shall be thoroughly washed in hot water with soap solution and hung down to dry. Old brushes which are dirty and caked with distemper shall not be used on the work.

2.6. Protective measurements : The surfaces of doors, windows, floors, articles of furniture etc. and such other parts of the buildings as are not to be distempered shall be protected form being splashed upon. Such surface's shall be cleaned of distemper splashes if any.

3.0. Mode of measurements and payment

3.1. Priming coat of distemper primer, scraping of surface spoiled by trunk soots, removal of oil and grease spots, treatment for infraction of effloresces., mould. moss, fungi, algae and lichen and patch repairs to plaster shall be included in this item for which nothing extra shall be paid.

3.2. All the work shall be measured net in the decimal system as in place subject to the following limits unless otherwise stated hereinafter :

(a) Dimensions shall be measured to the nearest 0.01 m.

(b) Area in individual items shall be worked out to the nearest 0.01 sq. m. All work 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 reveals, jambs, soffits, sills etc. of these openings not for finish around ends of joints, beams, posts etc.
3.3. Deductions of opening exceeding 0.5 sq.m. but not exceeding 3 sq. m. each shall be made as follows and net addition shall be made for reveals, jambs, soffits etc. of these openings
(a) When both the faces of wall are provided, with same finish, deductions shall be made for one face only.
(b) When each face of wall is provided with different finish, deduction shall be made for that side of frame for doors, windows etc. on which width of reveals is less than that of the other side but no deduction shall-be made on the other side. Where the width of reveals on the both the faces of wall are equal, deduction of 50% of area of opening on each face shall be made from area of finish.
(c) When only one face of wall is treated and the other face is not treated, full deductions shall be made if the width of the reveal on treated side is less than that on untreated side but if the width of the reveal is equal or more than that on untreated side neither deductions nor additions to be made for reveals, jambs, soffits, sills etc.
3.4. In case of opening of area exceeding 3 sq. m. each deduction shall be made for openings but jambs, sills and soffits shall be measured.
3.5. No deductions shall be made for attachments such as casings, conduits, pipes, electric wiring and the like.
3.6. Item includes removing nails, making good holes, patches with materials similar in composition of distemper.
3.7. The rate includes cost of all materials, labours, scaffolding, protective measures etc. involved in all the operations described above. This shall also include conveyance, delivery, handing, unloading, storing work etc.
The rate shall be for a unit of one sq. metre.

Providing & applying 3 coats of ACID / ALKALI resisting paint of approved shade & make to wall, ceiling including filling putty smoothing the surfaces scaffolding etc., complete as directed by E. I. C.

Acid/Alkali resisting painting of approved brand and tint be got approved before, collecting. Surface shall be cleaned as described in item of distempering. One coat of primer shall be applied to the surface, after same is made even with putty application.
Primer shall be of same manufacture and suitable for Acid. Alkali resisting paint. Acid & Alkali resisting paint shall be applied in 2 to 3 coats as per item, with either brush or with spray painting. Uniform painting on surface shall be done & got approved. manufacturers instructions regarding use of paint be followed.

Providing & applying 2 coats of APEX or its equivalent ACRYLIC EXTERIOR paint on exiting plastered surface or approved makes & shade including finishing & thinning as per manufacturer's instruction. A gap of 6 hrs. should be given between 2 subsequent coats. The work should be carried out strictly as per manufacturer's specifications and requirement etc., complete as directed by E. I. C.

Specification of item no. 7 shall be followed for preparing of surface to receive the painting work. Surface shall be applied with smoothing coat of paint, putty, before application of paint Surface of shall be applied first coat of APOCOLITE APEX or its equiv. ACRYLIC EXTERIOR paint after putty has dried and surface is smoothes by applying fine sand paper. Second coat of paint shall be after first coat had dried. Surface shall be rolled with 3 layer to get uniformity Sample of painting work shall be first prepared and got approved before taking further work. Manufacturers instructions shall be followed while applying the paint.

Providing & fixing steel rolling shutter 18 Gauge of approved make & made 30 mm wide M. S. Laths interlock together through their entire length and jointed together at the end by end locks mounted on specially designed pipe shaft with bracket plates guide channel and arrangement for inside and outside locking with push pull operation complete including the cost of hood cover and spring etc., complete with both sides one coat of red oxide and three coats of oil cover painting of approved colour & tint with drum & cover in perfect working condition etc., complete as directed. (THE MEASUREMENT SHALL BE PAID FOR WALL OPENING PLUS DRUM ONLY)

Rolling shutter shall be of interlocking scroll rolled from 18 gauge, steel metal. The scrolls are to be held in place by markable iron locks, which are riveted to alternate latches, wind lock on slots shall be included.

The bottom bar shall be of two angles back to back. Steel guide shall be of angle-framed, screwed to the metal frame at opening. The hood shall of 18 gauge-selected steel suitably reinforced to prevent sag. The guaranteed deflection of shaft and hood shall be stated in the tender. This shall be set on inside of wall; above high point of opening, as shown on drawing. Rolling shutter shall be manually operated and for big shutter, if chain pulley arrangement of electrically operated is specified; the same shall be designed and installed by contractor. The rolling shutter shall be applied one coat of red oxide as shop coat and 2 coats of aluminum paint after erection. Contractor shall give satisfactory operation of shutter trial and has to maintain the shutter during guarantee period.
Pull & push operations shall be constructed with curve slab from steel metal of 18 gauge with dimension 65mm between centers inter lock and bridge depth of 16mm. These curve slab shall slide into one another, fitted with alternatively inter lock. They shall coil at the head of the opening with the weight of shutter at all positions, tempered steel. Shutter when coiled up, shall be housed in a box of 18 gauge steel metal. They shall be opened from outside and locking arrangement shall be provided at the bottom of the shutter on both ends.
The rate quoted shall be inclusive of complete supply of shutter with hood, drives etc., scaffolding, fixing in position, painting, labour, tools, equipments, pull & push arrangements.
Measurement shall be taken for clear area plus drum area provided on top and paid as per unit rate quoted for item.

Providing and fixing aluminium anodised sliding windows having standard section using extruded section fabricated by standard. Manufacturers with 20 Microns colour anodising as per drawing windows shall be of 4 mm thick. Triveni 'HB4' plain glass glazing rubber gasket and necessary hardware, handles cum locking arrangement etc. complete unit shall be fabricated from aluminum section conforming to HE9WP designated to IS - 1285 / 1980 for its chemical and mechanical properties. Anodised shall be conforming to IS - 1868 / 1968. All joints shall be mechanically joint having secured with specially design M. S. Zink plated heat arrangement. The frame section shall be 61.85 mm. X 31.75 mm. weighing 0.695 Kg per mtr. Minimum of section no 8687 Jindal Aluminium Ltd. make or its equivalent and section for shutter shall be of 50 mm X 20 mm size weighing 0.571 Kg per mtr. minimum of section no. 8305 of Jindal Aluminium Ltd. make or its equivalent. No welding process shall be allowed in the unit.

The aluminium section to be utilized shall confirm to IS 1285/1980 and IS 1869/1968 for the material grade and anodizing respectively. The frame section shall be 61.85mm x31.75mm weighing 0.695kg per mtr. Minimum of section no 8687 Jindal Aluminum Ltd make or its equivalent and section for shutter shall be of 50 mm x 20 mm size weighing o.571kg per Mtr. minimum of section No 8305 of Jindal aluminium Ltd make or its equivalent. Necessary additional / special sections shall be used to facilitate locking arrangement, handle stay if necessary. As directed by EIC. Payment shall be made on Smt. Basis. No additional payment shall be made for fixture or addition /special section. Gold Colour anodizing is to be provided. The same shall be got approved from EIC.

ITEM : -- DO --- as above, but for ventilator.

The material grade and anodizing shall confirm to IS mentioned in Item No 57. The frame section size shall be 50mm x 25mm and the section shall be 1.5 mm. The ventilation shall be adjustable louvered type with glass fins of 125mm size. The description of item 57 is confirming this item in terms of material only.

Supply & Fixing to doors & windows, ventilator, cup-boards following fixtures & fastenings of approved quality with wooden or metal screws, nuts & bolts as directed or as per the drawing & specifications etc., complete as directed by E. I. C.

Supplying & fixing to doors, windows, ventilators, cupboards fixtures & fastenings of approved quality with wooden or metal screws, nuts & bolts as directed or as per drawings.
Oxidized iron

Sample of oxidized iron fixtures proposed to the used shall be got approved and approved sample shall be displayed on Board, of work site for comparison. Aldrop shall be with plate handle covering the rod and riveted. All fixtures shall confirm to relevant IS Standards.
All G. I., Iron, C. P. brass, C. P. & aluminum fixtures shall be got approved and approved sample kept on site. Only approved brand and quality fixtures shall be used in the work.
Ten-takora khataka lock with latch of approved quality & make shall be provided & fixed.
All the fixtures & fastenings are to be fixed with required size & no, of nuts & bolts, screws etc. All Aldrop shall be with nuts & bolts arrangements for fixing.
Rate quote for fixtures and fastenings are inclusive of supplying & fixing with nuts, bolts etc., screws of approved quality, make, brand and size.

Providing & fixing M. S. Grill of approved quality & design weighing 25 to 30 KG / SMt. as per drawing & as directed with necessary grill door (IF REQUIRED) including welding or bolted fixtures and fastening, M. S. Flat hold fasts, 300 mm. long 16 mm. dia. Aldrop & 300 mm. long tower bolt necessary handles etc., with 3 coats of oil painting of approved shade & tint with one coat of red oxide primer including grouted hold fast in C. C. (1:2:4) etc., complete as directed by E. I. C.

General specification of fabrication shall be applicable. Grill shall be prepared of approved design supplied by Board. Fabricated grill shall be in one plane, line & level with all members. If any members, is found destroyed, it shall have to be changed. All fixtures & fastenings shall be bolted unless otherwise instructed welded. Tower bolt, aldrop etc shall be of approved quality. Bolts, nuts shall be "GKW" brand or its equivalent confirming to I.S. standard. All structure shall be given one coat of red oxide primer and 3 coats of oil painting. Holdfast shall be grouted in c. c. 1:2:4.
Rate quoted shall be inclusive of erection at site. Actual weight arrived at with standard sectional wt. of members, shall be paid. No. payment shall be made for weight due to welding.

Providing fabricating & erecting in position GI Angle, channels girders etc., for purlins rafters, columns etc., including welding the section as per instruction & drawing making holes etc. complete. (ALL MATERIALS SHALL BE BROUGHT BY THE CONTRACTOR)

General specification of fabrication shall be applicable. Cutting schedule of the various members shall be prepared as per drawing and got approved.
The rate quoted shall be for supplying steel, confirming I. S. Standards, fabricating erecting.
Payment will be made by computing the weight of various structural section on the basis of standard weight as per I. S. and weight of bolts and nuts if provided. No Payment shall be considered for the weight due to riveting or welding.

Providing & laying 40 mm. thick I. P. S. Flooring in C. C. (1:2:4) including finishing the floor with smooth cement slurry, marking diagonal lines, curing etc., complete as directed by E. I. C.

1.0 Materials
Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Stone aggregate 20mm nominal size shall conform to M-12.
Cement concrete 1:2:4 proportion measured by volume shall conform to relevant specification or ordinary grade 1:2:4 concrete.
2.0 Workmanship
2.1 The cement concrete flooring of 40 mm thick (average) is to be laid as per the site condition. The concrete shall be mixed in a mechanical mixer at the work. Hand mixed however, may be allowed for smaller quantities of the work and in case of failure of machines or as permitted by the Engineer – in – Charge. It shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. However, in such cases 10 % more cement than otherwise required shall have to be used without any extra cost. The mechanical mixing shall be done for period of ½ to 2 minutes. The quantity of the water shall be just sufficient to produce a dense concrete of required workability. The flooring of specified thickness shall be laid in accordance with the approved pattern or as directed. Finishing operation shall start shortly after the cessation of beating and shall be spread over a period of one to six hours depending upon the temperature and atmospheric condition. The surface shall be left for some time till moisture disappears from it. Fresh quantity of cement shall be mixed

with water to form a thick slurry to spread over the surface while the concrete is still green. Use of dry cement or cement and sand mixture sprinkled on this surface to stiffen the concrete or absorb excessive moisture shall not be permitted. The cement slurry shall then be properly pressed twice by means of iron floats, once when the slurry is applied and the second time when cement starts setting and finished smooth. The surface shall be marked with string or BRC fabric jail to make the surface non-slippery as and when directed. The junction of the floors with wall plaster, dado or skirting shall be rounded off where so required up to 25 mm radius. Flooring in lavatories and bathrooms shall be laid after fixing of water closet and squatting pans and floor traps which shall be plugged while laying the floors and opened after the floors are completed. Any damage done water supply or sanitary fittings during the execution of the work shall be made good.

2.2 After the final set, the concrete shall be kept continuously wet, if required by ponding for a period of not less than 7 days from the date of placement.

2.3 The form work shall be provided, if necessary as directed by the Engineer – in – Charge. Concreting shall be done as per alternate bay method with necessary centering either by mastic or cement mortars as directed.

3.0 Mode of measurement and payment

3.1 The rate shall include the cost of all materials and labour involved in all the operations described above. No deduction shall be made or extra paid for any opening up to 0.1 Sq. Mt. In area in the floor, nothing extra shall be paid for laying the floor at different level in the same room or the courtyard.

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

Providing & laying 25 mm. thick POLISHED KOTAH STONE HAND DRESSED on all sides of approved quality of 600 mm X 600 mm size in floor & dado in (1:1.5) lime mortar bedding & setting the stone in cement slurry filling the joints with cement, curing, machine mirror polishing etc., complete as directed. (CONCRETE BEDDING SHALL BE PAID SEPERATELY). This item includes providing and fixing of marble patti of 600 X 25 X 25 mm thick size between the joints of the Kotah Stone flooring in line and level as per the instruction of the EIC.

1.0. Materials

1.1. Water shall conform to M-1. Lime mortar shall conform to M-10. Cement mortar shall conform to M-11. Polished kota stone shall conform to M-49.

2.0. Workmanship

2.1. Each slab shall be cut to the required size and shape and fine chisel dressed at all the edges. The sides trust dressed shall have a full contract if a straight edge is laid along. The sides shall be table rubbed with coarse sand before paving. All angles and edges of the slabs shall be true square and free from chippings and giving a plane surface. The thickness shall be 25 mm. (Average) as specified in the item but not less than 20 mm. at any place of the slab.

2.2. Bedding for the Kota stone slabs shall be of cement mortar 1:6 (1 cement : 6 coarse sand) or .M. 1:1.5. of average thickness 20 mm. given in the description of the item. Sub grade shall be cleaned, wetted and mopped. Mortar of the specified mix and thickness shall then be spread on an area sufficient to receive one kota stone slab. The slab shall be washed clean before laying. It shall be laid on top, pressed, tapped gently to bring it in level with the other slabs. If shall then be lifted and laid aside. Top surface of the mortar shall then be corrected by adding fresh mortar at hollows or depressions. The mortar shall then be allowed to harden bit. Over this surface, cement slurry of honey-like consistency shall be applied. The slab shall then be gently placed in position and tapped with wooden mallet till it is properly padded in level with and close to the adjoining slab. The joint shall be as fine as possible. The slabs fixed in the floor adjoining, the walls shall enter not less than 10 mm. under the plaster, skirting or dado. The junction between the wall and door shall be finished neatly. The finished surface shall be true to levels and slopes as directed.

2.3 The floor shall be kept wet for a minimum period of 7 days so that bedding and joints set properly.

2.4 Polishing shall be normally commenced after 14 days of laying the stone slab. First polishing shall be done with carborundum stones of 120 grade grit fitted in the heavy machine and then second polishing shall be done with carborundum stone of 220 to 350 grade grit fitted in heavy machine. Water shall be properly used during polishing. The stone shall then be washed clean with water. When directed by the Engineer-in-charge, wax polish of approved quality shall be applied on the surface with the help of soft cloth over a clean and dry surface. Then the polishing machine fitted with bobs shall be run over it.

2.5. The holes required for Nahni traps, pipes and any other fittings shall be made without any extra cost.

3.0. Mode of Measurement & payment

3.1. The rate shall include the cost of all materials and labour involved in all the operations described above. The kota stone flooring shall be measured in square metres correct to two places decimal, length and breadth shall be measured correct to a centimeter and between the finished face of skirting dado or wall plaster and no deduction shall be made nor extra paid for any opening in floor of areas up to 0.1 sq. mt.

3.2. The rate shall be for a unit of one sq. metre.

ITEM : --- DO --- as above item No. but for 1600 mm X 350 mm wide for steps, riser, dado, pillar laid on 10 mm thick C. M. (1:3) etc., complete etc., complete.

1.0. Materials

1.1. Water shall conform to M-1. Lime mortar shall conform to M-10. Cement mortar shall conform to M-11. Polished kota stone shall conform to M-49.

2.0. Workmanship

2.1 The relevant specification of item no. 28 shall be followed except that the Kotah stone shall be fixed for riser of steps, dado or skirting in cement mortar 1:3 and shall be done manually instead of machine polishing.

3.0. Mode of Measurement & payment

3.1 The riser of steps, skirting or dado shall be measured in sq. meter. Length shall be measured along the finished faces of the riser, skirting or dado. Height shall be measured from finished level of treads or floor to top. Lining of the pillars shall be measured under this item.

3.2. The rate shall be for a unit of one sq. metre.

Providing & fixing white / coloured glazed tiles of Spartek / Kajaria / Nittco / JOHNSON or its equivalent make in flooring, skirting & dado including fixing the same in cement mortar bedding (1:2) & 12 mm. thick back coating of cement plaster in C. M. (1:3) for base, filling the joints with white / colour cement neatly.

1.0. **Materials**

Water shall conform to M-1. Cement mortar shall conform to M-11. White / coloured glazed tiles shall conform to M-55

2.0. Workmanship

2.1. **Preparation of Surface**:

In case of brick masonry wall, the joints shall be raked out to a depth of least 15 mm. while the masonry is being laid. In case of concrete wall the surface shall be chiselled and roughed with wire brushes. The surface shall be cleaned and wetted thoroughly before commencing the laying work.

2.2. Laying :

2.2.1. The wall surface shall be covered with 10 mm. thick plaster of cement mortar 1:3 mix and allowed to harden. The plaster shall be roughened with wire brushes both way. The back of tiles shall be floated with grey cement slurry set and edges with white cement slurry in bedding mortar. The tiles shall be gently tapped in position on after the other keeping the joints as thin as possible. Top of skirting or dado shall be truly horizontal and the joints vertical or as per required pattern.

2.2.2. Risers of steps, skirting and dado shall rest on top of treads or flooring. Where full size tiles can not be fixed, They shall be cut to the required size and the edges be smoothened,

2.2.3. The joints shall be cleaned and flush pointed with white cement. The surface shall be kept wet for seven days. After curing the surface shall be washed clean.

3.0. Mode of measurements and payment

3.1. The rate shall include the cost of all materials and labour required for various operations described above. Risers of steps, skirting and dado shall be measured in square metres. Length and height shall be measured along the finished face of the skirting or dado including curves, where special such as covers, internal and external angles, etc., used. The length and height shall be measured correct to the centimeter except in case of risers and skirting where height shall be measured correct to 3 mm.

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

Providing, supplying, fabricating & erecting chain link fencing panel of size 2400 X 2000 mm. made from 75 X 75 mm & 10 Gauge G. I. Chain links & GI 50 X 50 X 6 mm. angle including fixing the chain link in angle frame by means of 40 X 3 mm. GI Flat welded to angle frame drilling to holes in angle frame & flat with hot deep galvanizing as per IS-2633 / 72 and 209 of 1966 or latest amendment including making necessary arrangement of gate 0.75 X 2.0 in it with locking arrangement and fixing the same with angle post in line level & plumb by means of 10 mm. dia. bolts frame & flat & nuts, etc., complete as per drawing & as directed by E. I. C. (ALL THESE MATERIALS LIKE GI FLAT, CHAINLINK FENCING, GI ANGLES, BOLTS, NUTS, WILL HAVE TO BE SUPPLIED BY THE CONTRACTOR)

Necessary GI Angle GI Flat, chain link jali, bolts, nuts and washers shall be procured by contractor. Fabrication work shall be carried out as per general specifications of fabrication work. Chain link fencing panels shall be prepared as described in the item. All corners shall be at right angle and fame in one plane. One frame shall be prepared & got approved. Chain link shall be got approved before collecting. It shall be properly galvanized.
Frame work shall be hot dip galvanized as per IS 2633 /72 and 209 of 1966 or latest amendment and as directed. Fabrication work shall be as per drawing and as directed on site.
Payment shall be made on number of panels prepared and erection of the same as above and rate shall be inclusive of all labour, materials tools, plant etc., required fabricated. Surplus panel if any is to be credited to store or stack at place shown, shall be done without any extra cost.

Providing, supplying, fabricating & fixing 50 X 50 X 6 mm. GI Angle for vertical support 2.75 Mt. long including providing & 50 X 6 mm. GI Flat / Pieces, 150 mm. long welded at top & bottom of support with 18 mm. dia. slotted holes in flats, as directed by E. I. C. with hot dip galvanizing as per IS-2633 / 72 and 209 of 1966 or latest amendment & grouting the same in pillar in line & level etc., complete. (THE ITEM RATE INCLUDES COST OF SUPPLY OF MATERIALS, FABRICATION & ERECTION AT SITE).

GI Angle 50 x 50 6mm shall be fabricated as per detailed drawing supplied and as described in the item. General specification of fabrication shall be followed. Necessary holes for providing barbed wire on top shall be provided. Angle shall be fabricated as per drawing. Angle shall be erected in line & level at the center to center distance given on the drawing or as directed at site. Angle shall be welded with holdfasts, anchor at bottom to have fixing with concrete work done at base. MS flats / pieces 150mm long shall be welded at top & bottom on two sides as shown in the drawing with 18mm dia slotted holes to receive the bolts required for fixing chain link fencing panel.
Frame work shall be hot dip galvanized as per IS 2633 /72 and 209 of 1966 or latest amendment and as directed. Fabrication work shall be as per drawing and as directed on site.
Rate quoted shall be for supply and fabrication of GI Angle 50 x 50 x6mm with GI flat 5- x6mm necessary bolts, nuts, washers, cutting bending, welding, erection in line & level & plumb, got dip galvanizing, etc. complete. Payment shall be made on number basis.

Providing water proofing treatment in Terrace of different levels preparing roof surface for laying brick bat on cement mortar (1:4) with special water proofing composed in necessary gradient for easy flow of rain water, brick bat coba is finally covered by join less cement plaster in cement mortar (1:3) added with special water proofing compound and top smooth finished with trowel with false chequered making of 3000 mm size. The treatment is carried along the vertical surface of the parapet and other joining wall up to height of about 300 mm in a shape of quarter round vatah. The average thickness of the water proofing treatment is about 140 mm. Minimum thickness at rain water outlet points being 75 mm including curing etc. complete as per specification and instruction including water proofing test for minimum 3 days etc., complete as directed by E. I. C. Contractor should give guarantee for water proofing for 5 years. All the material including cement should be brought by the contractor at his own cost.

The work is carried out using brick bats of assorted sizes with cement mortar 1:4 ratio and special water proofing compound. The work is to be carried out as per good practice and as per item description. The complete drawing of terrace area specified ridges, valleys, gradient and its exact location shall be prepared in advance. The same shall has to be got approved by EIC. The work is to be carried out so as to facilitate

complete draining of rain water. Necessary basins shall be constructed at the mouth of spout or rain water pipes.

The contractor shall have to give the pond test by filling 8" depth of water on the treated surface by blocking the spout for 7 days.

"For Water Proofing Treatment:-

The contractor shall submit performance guarantee of the waterproofing item at the rate of 20% of cost of item of work order in the form of BG or in the form of DD of Schedule Bank / Nationalised Bank in favour of GETCO (A/c Agency) for a period of 5 years from actual date of completion of work on non-judicial stamp paper of appropriate value in approved format of GETCO. In the event of unsatisfactory performance of waterproofing work, the agency shall carry out necessary remedial/rectification works that may be necessary in the opinion of GETCO at no extra cost, failing which BG shall be encashed by GETCO. The BG /DD amount shall be released only after satisfactory completion of performance period of 5 years."

Providing, laying and jointing in true line and level UPVC pipe (SCH-40) for cold water including fittings make PRINCE / SUPREME / ASTRAL / FINOLEX or equivalent as approved by Engineer in charge. Pipe shall be fixed on the wall with the help of clamp at every two-meter c/c or shall be concealed as directed including necessary fittings, fastening, fixtures, excavation and back filling. The rates includes testing of pipe and jointing and fixing the same with adhesive solvent, including cost of all materials.

a) 15 mm dia pipe
b) 25 mm dia pipe
c) 40 mm dia pipe

1.1 The pipe material and specials like bend shoe cowl coupler etc shall confirm to grade and quality specified in relevant IS code. The spout pipe shall be fixed at level, suitable to drain complete rainwater. The vertical pipes shall be truly in plumb, shall be fixed to walls by means of G.I. clamps of approved quality with G.I. studs, saddles etc. complete leak proof test shall be given before payment is realized.
1.2 P. V. C. pipes shall be fixed on wall with wooden plugs and suitable clamps.
1.3 The pipes and sockets shall be accurately cut. The ends of the pipes and fittings should be absolutely free from dirt and dust. The outside surface of the pipes and the inside of the fittings shall then be roughened with emery paper, and then solvent cement joint. Since solvent cement is aggressive to P.V.C., care must be taken to avoid applying excessive cement to the inside of pipe sockets as any surplus cement cannot be wiped off after jointing. Empty solvent cement tins, brushes, rags, or paper impregnated with cement should not be buried in the trenches. They should be gathered, not left scattered about, as they can prove to be a hazard to animals, which may chew them.
1.4 If manufacturer recommends its own methods of jointing, the same shall be adopted after necessary approval from the Engineer - in – Charge.
1.5 Payment shall be given in running length of the pipe irrespective of specials used.

General specifications of water supply piping shall be followed. Rate shall be quoted for the diameter specified with all specials required for completing pipe work as per drawing or as directed.

Testing of joints :

After laying and jointing, the pipes and fittings shall be inspected under working conditions of pressure and flow. Any joints found leaking shall be redone, and all leaking pipes removed and replaced without extra cost.

The pipes and fittings after they are laid shall be tested to hydraulic pressure of 6 Kg/sq. cm. The pipe shall be slowly and carefully charged with water allowing all air to escape and avoiding all shock and water hammer. The draw off takes and stop cock shall then be closed and specified hydraulic pressure shall be applied gradually. The pressure gauge must be accurate. The pipes and fittings shall be tested in sections as the work laying proceeds, keeping the joints exposed for inspection during the testing.

Providing & Fixing approved best quality I. S. S. approved full way G.M. Wheel valve.
a) 15 mm. dia. Valve
b) 25 mm. dia. Valve
c) 40 mm. dia. Valve
1.0. Materials **:** The gun metal check or not return full way wheel valve or specified dial, shall conform to I.S. : 778-1964. The non-return valve shall be of tested quality.

2.0. Workmanship
2.1. The gun metal check or non return valve shall be fully cleared of all foreign matter before fixing. The fixing of shall be done by means of bolts nuts and 3 mm. rubber insertions with flags of spigot and socketed tail pieces, drilled to the same specifications as in *case* of socket and spigot flanges in case of flanged pipes. The joining shall be done leak proof.
3.0. Mode of measurements and payment
3.1. The rate includes all labours, materials, tools and plant etc. required for satisfactory completion of this item.
32. The rate shall be for a unit of One number.

Providing & Fixing 25 mm. dia. half turn brass C. P. Flush cock with one union of approved quality prince or its equivalent I. S. I. approved quality including fixing the same in pipe line as directed by E. I. C.

1.0. Materials : Chromium plated brass half turn flush cock shall conform to M-67.
2.0. Workmanship
The hall turn flush cock of specified diameter shall be fixed as directed. The flush cock shall be fixed in G.I. pipe line With necessary fittings. The joints shall be made leak proof by using spun yarn and white zinc. The fixing work shall be carried out as per relevant specifications of item No. 35.
3.0. Mode of measurements and payment
3.1. The rate includes cost of all materials and lobour required for satisfactory completion of this item including fittings.
3.2. The rate shall be for a unit of One number**.**

Providing & Fixing 15 mm. dia. brass C. P. Screw down bib cock of approved quality having 250 to 300 grams weight etc., complete as directed by E. I. C.

1.0. Materials :
15 mm. dia. brass screw down with bright polished finished shall conform to I.S, 781-1977. The bib cock shall be best Indian make and quality.
2.0. Workmanship.
2.1. The screw down bib cock 15 mm. as specified above shall be fixed as directed. The threaded portion shall be smeared with white or red lead and around with a few turns of fine spun yarn round the screwed end of the pipe. The bib cock shall be then screwed and fixed to water tight position.
3.0. Mode of measurements and payment
3.1. The rate includes cost of all labour, materials, tools and plant etc. required for satisfactory completion of this item.
3.2. The rate shall be for a unit of One Number.

Providing & Fixing readymade 1000 LITRE capacity P. V. C. water tight storage tank made from linear low density polyethylene & low density polyethylene LDPE product confirming to I. S. : 10146 - 1982 with cover including providing & fixing one 20 mm. dia. float valve ball-cock, one 20 mm. dia. G. I. Waste pipe with plug one 25 mm. dia. G. I. Over flow pipe of length up to 0.30 mt. including making all connection for inlet / outlet supply with necessary fittings for outlet / inlet etc., complete as directed by E. I. C.

P.V.C. Polythene readymade water tank (equivalent to Sintex make 'Sintex' brand and not the 'Reno" brand) internally white coated shall be approved make and as per I.S. 10146. Quality of tank proposed to be provided shall be got approved Technical literature of tank shall be submitted for approval. Tank of capacity specified shall be installed at places shown with 20mm dia float valve with polythene ball and

brass handle and fixing arrangements, 20mm dia G.I. “C” class waste pipe with G.I. plug, 25mm G.I. “C” class overflow pipe with all necessary fittings of heavy type for inlet/outlet connection.
Tank shall be installed on terrace or other places shown. Rate shall be inclusive of providing tank at place of use, installing at terrace or place shown with all fittings specified above, and giving test with filling of water. Payment shall be made for tank provided and installed of capacity specified in the tender, with all necessary fitting specified above. On number basis.

Providing and fixing FINOLEX brand or equivalent rigid P. V. C. Pipe for rain water (4.0 Kgf/cm2) including necessary fittings like bend shoe, cowl etc., & fixing the pipes to the wall in plump by means of G. I. Clamps of 18 gauge sheet with 1 meter distance and joining pipe with approved solution etc., complete as directed by E. I. C.
a) 110 mm. dia. O. D., P. V. C. Pipe
b) 140 mm. dia. O. D., P. V. C. Pipe

1.1 The pipe material and specials like bend shoe cowl coupler etc shall confirm to grade and quality specified in relevant IS code. The spout pipe shall be fixed at level, suitable to drain complete rainwater. The vertical pipes shall be truly in plumb, shall be fixed to walls by means of G.I. clamps of approved quality with G.I. studs, saddles etc. complete leak proof test shall be given before payment is realized.
1.2 P. V. C. pipes shall be fixed on wall with wooden plugs and suitable clamps.
1.3 The pipes and sockets shall be accurately cut. The ends of the pipes and fittings should be absolutely free from dirt and dust. The outside surface of the pipes and the inside of the fittings shall then be roughened with emery paper, and then solvent cement joint. Since solvent cement is aggressive to P.V.C., care must be taken to avoid applying excessive cement to the inside of pipe sockets as any surplus cement cannot be wiped off after jointing. Empty solvent cement tins, brushes, rags, or paper impregnated with cement should not be buried in the trenches. They should be gathered, not left scattered about, as they can prove to be a hazard to animals, which may chew them.
1.4 If manufacturer recommends its own methods of jointing, the same shall be adopted after necessary approval from the Engineer - in – Charge.
1.5 Payment shall be given in running length of the pipe irrespective of specials used.

Providing & fixing (HEAVY DUTY) C. I. Soil pipe for drainage line including necessary fittings like bend, tee, Y bend, plug bend etc., fixed with wall by means of clamps and nails filling the joints with cement as directed by E. I. C.
a) 75 mm. dia. pipe
b) 100 mm. dia. pipe

1.0. Materials :
1.1 The specified dia C.I. spigot and socket soil or waste pipe shall conform to M-68.
2.0. Workmanship
2.1 The fixing of C.I. spigot and socket soil waste and ventilating pipe shall be carried out as per relevant specifications of item 35 except the C.I. spigot and socket shall be fixed. The joints shall be fixed with cement mortar 1:2 (1 cement : 2 sand) and spun yarn. The pipes without ears shall be fixed to wall with M. S. clamps. The pipes with ears shall be secured with 40mm before steel or iron barrel distance pieces or bobils and stout galvanized iron nails 10 cms. long driven into hard wood plugs fixed in walls. Access doors to fittings shall be provided with 3mm rubber insertion packing and secured without screws to make air and water tight.
2.2 All soil pipes shall be carried up above the roof and shall have a wire balloon guard or a cowl.
2.3 The ventilating pipe or shaft shall be carried out to a height of at least one metre above the outer covering of the roof of the building or in the case of windows in a gable wall or a dormer windows, it shall be carried up to the ridge of the roof or at least two metres above the top of the windows. In case of flat roof to which access for use is provided, it shall be carried out up to a height of at least one metre above the parapet or two metres measured vertically from the top of any windows or opening which may exist up to a horizontal distance of five metres from the vent pipe into such building and in no case shall be carried out to a height less than three metres.
2.4 Where ventilating pipe are carried in pipe shafts, the shafts shall be of a minimum size of one metre. If the shafts are also used to give light and air to rooms, the ventilating pipes must be carried out to a horizontal distance at roof level not less than five metres from the site of shaft.

2.5 The sand cast iron pipes above the parapet shall be fixed with M.S. clamps and stays. The clamps shall be made from 1.5 mm thick M. S. flat or 3 mm width band to the required shape and size to fit tightly on the sockets when tightened with screw bolts. It shall be formed of two semi-circular pieces with flanged ends on both sides, with holes to fit in the screw bolts and nut 40mm dia M. S. bars. One end of the stay shall be bent to from a hook to be fixed with clamps by means of bolts and the other end shall be bent for embedding in wall in cement concrete block of size 200mm x 100 mm x 100 mm in 1:2:4 mix. The concrete shall be finished to match the surrounding surfaces.
2.6 The connection between the main pipe and branch pipes shall be made by using branches and bends with access doors for cleaning.
2.7 The waste from lavatories, kitchens, basins, sinks, baths, and other floor traps shall be separately connected to respective stacks of upper floors. The waste stack of lavatories shall be connected directly to manhole while waste stack of other shall be separately discharged over gulley trap.

3.0. Mode of measurements and payment

3.1 The length of pipe shall be measured included all fittings along its length in running metres correct to a centimeter. No allowance shall be made for the portion of pipe length entered in the sockets of the adjacent pipe or fittings.
3.2 The rate includes all labour, and materials, tools and plant etc. required for satisfactory completion of this item.
3.3. The rate shall be for a unit of one running metre.

Providing & fixing S. W. G. Pipe for sanitary connection (SEWER DRAIN PIPE) with necessary slope including excavation refilling the trenches, providing 150 mm. thick B. B. C. C. (1:4:8) below joints filling the joints with C. M. (1:1) curing etc., complete as directed by E. I. C.
100 mm. dia. Pipe

1.0 Materials

(1) Water shall conform to M-1, (2) Cement mortar of proportion 1:1 shall conform to M-11, (3) 100mm dia glazed stone ware pipe shall conform to M-71.

2.0 Workmanship

2.1 The trenches for stone ware pipe drains shall be carried out as per relevant specifications item no. 1 & 35 except that the work is for stone ware pipes of 100 mm dia.
2.2 Laying
2.2.1 The pipes shall be laid accurately and perfectly true to line, levels and gradients. Great care shall be taken to prevent sand etc. from entering the pipes. The pipes between two man holes shall be laid truly in a straight line without vertical or horizontal undulation. All junctions and changes in direction and diameter shall be made inside manholes by means of curved tapered channels formed in cement concrete finished smooth and benched on both sides. The body of the pipe shall rest for its entire length, on an even level bed grips being made or left on the bed to receive the sockets of the pipes.
2.3 Jointing
2.3.1 Tarred gaskin or yarn socked in neat cement slurry first be placed around the spigot of each pipe and the spigot shall then be placed well in home into the socket of the pipe previously laid. The pipe shall then be adjusted and fixed in the correct position and gaskin caulked home so as to fill not more that 1/4th of the total depth or (13mm in depth) of the socket.
2.3.2 The remainder of the socket shall be filled with the stiff mixture of cement mortar in proportion of one part of cement and one part of sharp sand. When the socket is filled, a fillet, shall be formed round the joints trowel, forming an angle of 45° with the barrel of the pipe.
2.3.3 The mortar shall be mixed as necessary for immediate use.
2.3.4 After the joint is made, any extraneous materials shall be removed from the inside of the joints with a suitable scraper of 'badger'. The newly made joint shall be protected, until set, from the sun, dry winds, rain or frost, sacking or other suitable materials which shall be used for the purpose.
2.3.5 The mortar shall be cured for 10 days.
2.3.6 CC (1:4:8) 150mm thick shall be provided below joints so as joints are not affected due to any settlement. Specification of item no. 93 shall be applicable to this item.
2.4 Testing of joints
2.4.1 The pipes shall be tested as directed.
2.4.2 If any leakage is visible, the defective part of the work shall be made good at no extra cost.
2.4.3 A slight amount of sweating which is uniform may be overlooked, but excessive sweating from a particular pipe or joints shall be watched for and taken as indicating a defect to be made good.

3.0 Mode of measurements & payment:

3.1 Pounding or bottoming of the trenches bed to fit the lower part of the pipe and 'Grips' left to take socket, collars etc. are included in the rate of laying of the pipes.

3.1 CC (1:4:8) 150mm thick provided below the joints is also included in the rate of laying of the pipes.

3.2 The measurements shall be net without any allowance for cutting and waste. The length of bends, junctions and other connections shall be included in the total length of the drain pipes. Noting extra shall be paid for the same. The rate includes necessary excavation, refilling the trenches, etc. complete.

Providing & laying 300 mm dia. (NP - 2) 'A' Class R. C. C. hume pipe including necessary excavation, refilling the trenches, laying 150 mm. thick B. B. C. C. (1:4:8) below joints up to half the height of joints making water tight joints in C. M. (1:1) curing etc., complete as directed by E. I. C.

1.0 Materials

The reinforced concrete light duty non-pressure pipes of specified diameter shall conform to IS 458 – 1971.

2.0 Workmanship

2.1 The relevant specification of item no. 41 shall be followed for work of trenches except that the excavation in trenches shall be for reinforced concrete pipes of specified diameter.

2.2 Laying

2.2.1 The pipes shall be lowered into the trenches carefully. Mechanical appliances may be used. Where necessary pipe shall be laid in straight lines or with easy curves and true to line and gradient as specified and true to line and gradient as specified. The laying of pipe shall proceed upgrade of a slope. In the with loose collars, the collars shall be slipped on before the next pipe is laid.

2.2.2 In case where the foundation conditions are unusual such as proximity of trees or holes, under existing or proposed around in 150mm thick cement concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40mm nominal size) or compacted sand or gravel.

2.2.3 In case where the natural foundation is inadequate the pipe shall be laid either in concrete cradle, supported on proper foundation or on any other suitably designed structure. If concrete bedding is used, the depth of concrete below bottom of the pipe shall be at least ¼ th of the internal diameter of the pipe subject to a minimum of 100mm and maximum 300mm. The concrete shall be extended up to the sides of the pipe at least a distance of ¼ th of the outside diameter for pipes 300mm and over in diameter.

2.2.4 The pipes shall be laid in the concrete bedding before the concrete has set. Pipes laid in trenches in earth shall be bedded evenly and firmly and as up to the haunches of the pipe as to safely transmit the load expected from the back fill through the pipe to the bed. This shall be done either by excavating the bottom of the trenches to fit the curve of the pipe or by compacting the earth under round curve of the pipe to form an even bed. Necessary provision shall be made for joints wherever required.

2.3 Jointing

2.3.1 The joints shall be done by slipping the collar over and clear of the end of the pipe. The recess of the end of the pipe shall be filled with jute threading dipped in hot bitumen. The new pipe shall then be brought forward until the bitumen ring in recess of first pipe is set into the recess of the second pipe. This process shall be repeated for two or three pipe which shall then be jacked up to as to thoroughly compress the bitumen. The quantity of jute and bitumen shall be just enough to fill the recess when pressed hard by jacking, care being taken that no offset of the jute braiding shall be visible either outside or inside of pipe. The collar shall then be set up over the joints covering equally both the pipe and leaving an even caulking space all round. Cement and sand mortar 1:1 shall then be well punched or pressed home with a caulking tool within this caulking space. Care shall be taken that the underside of the joints is properly filled with mortar.

2.4 Curing

2.4.1 Every joint shall be kept wet for about 10 days for maturing, the section of the pipe line and joint shall be covered immediately to protect from weather effects. Minimum bore of 100mm is considered adequate.

2.4.2 The joints shall be left exposed for observation.

2.5 Testing of joints

2.5.1 The testing of joints shall be done as per relevant specification of item no. 44 except that the testing of reinforced concrete pipes shall be done.

3.0 Mode of measurements & payment:

3.1 The relevant specifications of item no. 44 shall be followed except that the rate includes for laying (to level or slope in trenches etc. measured separately) making the joints as indicated and testing to stand the water test.

3.2 The measurement shall be net without any allowance for cutting and waste. The length of bends, junctions, and other connections being numbered afterwards and paid for extra over pipes.

3.3 CC (1:4:8) 150mm thick provided below the joints is also included in the rate of laying of the pipes.

3.4 Nothing extra shall be paid separately from the use of mechanical appliances, where necessary, as described above.

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

Providing & fixing C. I. Nahani trap of approved size & make with additional aluminium perforated Jali Cover & C. I. Pipe outside the wall with plug, bend, etc., complete as directed by E. I. C.
75 mm. dia.

C.I. nahni trap of specified diameter shall be fixed at locations shown, Nahni trap shall be with arm, length as per thickness of wall so as to have joint outside wall and any leakage may not harm the wall. Nahni trap shall be fixed in concrete. Aluminum perforated jali of approved make and shape shall be provided on the nahni trap. Necessary C.I. pipe of the diameter of main line shall be connected from nahni trap to Gully Trap/main line outside the wall necessary plug bend etc. as required.

Payment shall be made per number of nahni trap fixed with necessary jali, plug bend, pipe pieces etc. complete.

Providing & Fixing 150 X 100 mm. stone ware gully trap with 300 X 300 mm. B. B. Masonry in C. M. (1:6) clear chamber including B. B. C. C. (1:4:8) 150 mm. thick bed concrete, plastering the chamber with 300 X 300 mm. C. I. Cover with frame curing etc., complete as directed by E. I. C.

Stoneware gully trap 150 x 100mm shall be as per I.S. specifications and free from crack, other defects and shall be uniformly glazed. Trap shall rest on B.B.C.C. (1:4:8) 150mm thick. Brick masonry chamber of 225 x 150mm clear size and of required height shall be built in c.m. (1:6). Height of chamber shall be constructed on site as per site conditions. Masonry wall shall be carried out on base concrete of B.B.C.C. (1:4:8). Direction of trap opening shall be as per line layout on site for drainage work. Gully trap shall be provided with C.I. Cover of 225 x 150mm with frame on top of camber. Inner side of chamber of 200mm below final ground level of other area shall be plastered 12mm thick in c.m. (1:3) C.I. cover shall be given three coats of black anticorrosive paint as per item No. 17 of Section F.

Payment shall be made on number basis for all described above.

Providing 300 X 300 mm. B. B. Masonry in C. M. (1:6) clear chamber including B. B. C. C. (1:4:8) 150 mm. thick bed concrete, plastering the chamber with 300 X 300 mm. C. I. Cover with frame curing etc., complete as directed by E. I. C.

B.B. masonry inspection chamber (manhole) of specified size, item shall be constructed at location shown with base concrete of (1:4:8) B.B.C.C. 150mm thick, 225mm thick. Brick masonry wall in c.m. (1:6) shall be constructed of width as per drawing or as per details furnished on site. Plastering inside including bottom and outside 300mm below final ground level shall be provided in c.m. (1:3) 12mm thick. Curing the cement work, fixing light type C.I. manhole cover with frame as per size of the chamber including necessary excavation, backfilling, disposed off surplus earth etc., complete, necessary chamber shall be provided with slope in bottom C.I. cover shall be given 3 coats of anticorrosive paint.

Specification of earth work and backfilling of section B, specification of brick masonry of section C, specification of concrete of section D, and plastering section E shall be followed.

Payment shall be made on number of chamber constructed of the size specified in the tender with all operations as per item.

Providing B. B. Masonry inspection chamber (MANHOLE) of 610 X 455 mm. Clear size including light type C. I. Cover having total weight including frame not to be less than 38 Kgs. (Weight of Cover 23 Kgs & Weight of frame 15 Kgs.) with frame, 100 mm. thick R. C. C. top slab in C. C. (1:2:4) with necessary excavation bottom concreting of B. B. C. C. (1:5:10) 150 mm. thick / 225 mm. thick

B. B. Masonry in C. M. (1:6) 12 mm thick cement plaster in C. M. (1:3) inside & to all exposed faces up to 300 mm. below ground level, curing etc., including disposal off surplus excavated earth up to radius of 300 mt. including 3 coats of white or colour wash to all exposed finished surface etc. complete as directed by E. I. C. (B. B. MASONRY UPTO 900 mm. DEPTH)

B.B. masonry inspection chamber (manhole) of specified size, item shall be constructed at location shown with base concrete of (1:4:8) B.B.C.C. 150mm thick, 225mm thick. Brick masonry wall in c.m. (1:6) shall be constructed of width as per drawing or as per details furnished on site. Plastering inside including bottom and outside 300mm below final ground level shall be provided in c.m. (1:3) 12mm thick. Curing the cement work, fixing light type C.I. manhole cover with frame as per size of the chamber including necessary excavation, backfilling, disposed off surplus earth etc., complete, necessary chamber shall be provided with slope in bottom C.I. cover shall be given 3 coats of anticorrosive paint.

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

The channel and benching shall be done in CC 1:2:4 (1 Cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) rising at a slope in line from edges of channel. The channels of the bottom of the chamber shall be plastered with C.M. (1:2) (1 cement : 2 coarse sand) and steel troweled smooth.

Manhole shall be tested by filling with water to a depth not exceeding 1.2 m as directed. After completion of work, manhole covers shall be sealed by means of thick grease.
Specification of earth work and backfilling of section B, specification of brick masonry of section C, specification of concrete of section D, and plastering section E shall be followed.
Payment shall be made on number of chamber constructed of the size specified in the tender with all operations as per item.

Providing B. B. Masonry inspection chamber (MANHOLE) of 500 X 700 mm. Clear size including light type C. I. Cover having total weight including frame not to be less than 38 Kgs. (Weight of Cover 23 Kgs & Weight of frame 15 Kgs.) with frame, 100 mm. thick R. C. C. top slab in C. C. (1:2:4) with necessary excavation bottom concreting of B. B. C. C. (1:5:10) 150 mm. thick / 225 mm. thick B. B. Masonry in C. M. (1:6) 12 mm thick cement plaster in C. M. (1:3) inside & to all exposed faces up to 300 mm. below ground level, curing etc., including disposal off surplus excavated earth up to radius of 300 mt. including 3 coats of white or colour wash to all exposed finished surface etc. complete as directed by E. I. C. (B. B. MASONRY UPTO 900 mm. DEPTH)

The relevant specification of item no. 50 shall be followed except that instead of 610 X 455 clear size of chamber 500 x 700 mm clear size chamber shall be constructed and paid for.

Providing & fixing best INDIAN make white or coloured porcelain rectangular wash hand basin size 500 X 400 mm. with C. I. M. S. Brackets fixed in wall including approved quality of 1 No. of brass C. P. Pillar cock (PRINCE TYPE) or its equivalent 15 mm. dia. Bottle trap, one brass C. P. 15 mm. dia. Stop cock, with P. V. C. pipe connection for stop cock to pillar cock 25 mm. dia. G. I. Waste pipe up to 1.0 M. length etc., complete as directed by E. I. C.

1.0. Materials

1.1. The white glazed earthenware wash basin shall be 550 mm. x 400 mm. of 1st quality and make as approved by the Engineer-in-charge. The wash basin shall conform to M-59.

2.0. Workmanship

2.1. The washbasin shall be fixed on the wall as and where directed. The wash basin shall be supported on a pair of M.S. or C.I. brackets fixed in C.M. 1:3 (1 cement : 3 sand). The bracket shall conform to I.S. : 775-1962. The wall plaster on the rear shall be cut to rest the top edge of the washbasin. After fixing the basin, plaster shall be made good and surface finished to match the existing one.
2.2. The brackets shall be painted white with ready-mixed paint.

2.3. The C.I. brass trap and union shall be connected to 32 mm. dia. waste pipe which shall be suitably bent towards the wall and which shall discharge into an open drain leading to a gully trap or direct in to gully-trap on the ground floor and shall be connected to a waste pipe through a floor trap on the upper floors. C.P. brass trap and union may not be provided where the surface drain or a floor trap is placed directly under the basin and the waste is discharged in to vertically.
2.4. The height of the front edge to the wash basin from the floor level shall be 80 cms.
2.5. The necessary inlet, outlet connections and fittings such as pillar cocks (Prince type), CP brass waste trap, waste pipe, stop cock, chain with rubber plug etc. shall be fixed.

3.0. Mode of measurements & payment

3.1. The rate includes cost of all labour, materials, tools and plant etc. required for satisfactory completion of this item as specified in workmanship.
The rate shall be for a unit of One number.

Providing & Fixing 500 mm X 700 mm size light type C. I. Manhole covers with water tight C. I. frame & fixing the same in concrete etc., complete as directed by E. I. C.

Materials

C.I. Manhole cover of 500 x 700 mm size shall be of best quality. The weight of C.I. cover and frame shall into be less than 35 Kg. The C.I. manhole cover shall be of light duty and conform relevant I.S.
2.0. Workmanship
2.1. The C.I, Manhole cover shall be fixed as per relevant specifications of item No. 50 except that the C.I. cover shall be fixed ad and where directed.
3.0. Mode of measurements and payment
3.1. The rate includes cost of all laobur and materials required for satisfactory completion of this item.
3.2. The rate shall be for a unit of One number.

Providing & Fixing WHITE / COLOURED ORISSA PAN W. C. SEAT of ROLEX / CLASSIC / JOHNSON MAKE and of approved quality of 580 mm. size including trap, necessary C. I. Piping with plug bends up to soil chamber for G. F. & up to the out side wall for floors including porcelain foot rests etc., in complete working condition & as directed by E. I. C.

Orissa Pan type WC. if specified size shall be of first quality and of approved make according to I.S. Specifications. It shall be fixed in B.B.C.C 1:5:10 shall be provided in 115mm portion with required slope towards WC. pan. Top surface shall be finished as per specified in item of I.P.S glazed or ordinary tiles, which shall be as pet item. W.C. shall be provided, with pipe from flush cock to pan, for flushing arrangement, trap with WC. pan and 100mm C.I. pipe for trap to chamber with plug bend. For W.C. on floors, pipe with plug bend shall be provided up to main soil pipe line in wall.. All joints shall be in CM. 1:1 and leak proof test be given.
Rate quoted shall be for providing & fixing WC. pan with all other accessories specified and whole thing shall be paid per No. of WC pan provided and fixed.

Providing & Fixing white or coloured porcelain lip shaped wall type URINAL PAN of 550 X 300 mm. of approved quality & make including waste coupling bends & necessary outlet of 25 mm. dia. G. I. Pipe connections including providing brass stop cock, PVC connection etc., completed as directed by E. I. C.

1.0 Materials

The white earthenware flat pack or corner type urinal of size 550 x 300mm shall conform to M-64

2.0 Workmanship

2.1 The urinals shall be fixed in position by using wooden plugs and screws and shall be at a height of 65 cms. from the floor level to the top of the lip or urinal unless otherwise directed. The wooden plugs shall be 50 mm x 50 mm at base tapering to 38mm x 38 mm at top and 50mm in length shall be fixed in wall in cement mortar 1:3 (1 cement : 3 coarse sand). The urinal shall be connected to32 mm dia galvanized mild steel waste pipe which shall discharge in the channel or floor trap. The connection between the urinal and flush or waste pipe shall between made by means of putty or white lead mixed with chopped hemp.
2.2 The urinal shall be provided with waste coupling bends, necessary outlet of 25mm dia GI pipe connection, brass stop cock, PVC connection pipe from stop cock to urinal inlet provided at the top.

3.0 Mode of measurement and payment.

3.1 The rate includes cost of all labours, materials, tools and plants, etc. required for satisfactory completion of this item.

3.2 The rate shall be for a unit of one number.

Providing Fixing 25 mm. thick POLISHED KOTAH STONE wall partitions 600 mm. wide & required height & all sides polished, machine cut & of approved quality including fixing the same in wall in line & level etc, complete as directed by E. I. C.

25mm thick polished kotah stone partition shall be provided for urinals. The quality of kotah stone shall be got approved. The stone shall be machine polished to all side. The outer edges of the stone shall be machine cut, rounded and polished properly. The size of the kotah stone shall be of 600mm wide and height according to the site condition. A groove shall be cut in wall for fixing of the stone. Stone shall be fixed with the wall in line, level and plumb as directed in the groove white c.m. 1:1 and finished smoothly with existing finishing.

Payment shall be made on square meters basis.

Providing & Fixing 75 mm. dia. C. I. cowl ventilator of LIGHT Type for water tanks etc., complete.

The material shall be got approved in advance prior to supplying the same on the site.

The relevant specification of item no. 43 shall be applicable to this item except that CI cowl ventilator of 75mm dia with socket and spigot ends and light type shall be provided and paid for.

Drilling of bore well of 300 / 400 mm. dia. by machine in all kinds of soil, sand, clay, murrum, soft rock and hard murrum, etc., complete, truly vertical with all equipments and labours etc., complete as directed by E. I. C.

a) **For 00.00 to 30.00 Mt. Depth**
b) **For 31.00 to 60.00 Mt. Depth**
c) **For 61.00 Mt. onwards**

Bore well 300mm / 400mm ∅ shall be drilled with drilling machine at the place shown, Necessary arrangement for required water for drilling, preparing water tank etc. may be made by contractor. The drilling shall be carried out to the depth decided on site as per availability of the water bearing strata. Necessary cutting edge and column length of the drilling shall be arranged by the contractor. Drilling shall be carried out truly vertical. Bentonite powder slurry circulation shall be arranged as required. Samples of various strata shall be collected, showing the depth of the strata. A chart of the various strata with depth shall be prepared and submitted for record. They shall be kept on site in a wooden box indication the strata with depth so the information is easily available for inspection.

Rate shall be quoted for various depth given in the item per running meter basis.

Providing and installing vertically 150mm dia 'C' class M S ERW casing pipe in the bore as per specifications including supplying graded gravel of suitable size & packing the same surrounding the pipe from the bottom including sealing the bottom of the pipe & welding at joints & top clamping etc. complete as directed by the Engineer – in – Charge.

"C" class ERW casing pipe conforming to IS specifications shall be provided and installed in the well as directed. Pipe shall be painted with 3 coats of anticorrosive paint from outside. Pipe shall be lowered slowly so that drilled well is not damaged or collapsed on some portion. Pipe shall be joined with couplings and couplings tack welded on both ends as directed or welded fully with specified thickness of welding as approved. Pipe shall be sealed at bottom by full welding of plate of 12mm thickness and applied with 3 coats of anti-corrosive paint. Necessary arrangement for lowering pipe shall be made by the contractor. After the pipe line is lowered completely and cleaned at top and covered at top, annular space all-round pipe shall be filled with pea size gravel uniformly all-round. Gravel collected shall be screened and all dust small and big size and gravel and other foreign materials shall be removed.

Rate shall be quoted for the diameter of pipe specified with all the operations and materials required with plant, machinery, tools and tackles, etc. for completing the item. Payment shall be made on pipe lowered as above with filling of gravel all-round on Rmt basis.

Labour charges for making slotted holes in pipe supplied under item no. 55 i.e. MS ERW casing pipe as directed by the Engineer – in – Charge for making strainer pipe.

Slotted holes of approved / required size shall be made in the pipes supplied under item no. 5 shall be made for the water bearing strata as approved by the Engineer – in – Charge.

Payment shall be made on Rmt. basis for the length of pipe through which required holes are made with all operations, plant, machinery, tools and tackles etc. for completing the item.

Providing & Laying 112 mm. thick brick on edge paving (SOLING) including leveling the ground & laying the bricks with required grade & camber etc., complete with two vertical bricks as kerbing on each side of the road filling the joints with yellow earth & spreading sand at the rate 0.15 M3/10 M2 including 3 coats colour wash to vertical kerbing bricks etc., complete as directed.

The bricks of approved quality shall be used. Bricks shall be laid on sub grade checked and approved for alignment level, camber and consolidation where area is infilling; Brick on edge i.e. 110mm thick shall be laid in haring bond, bond unless otherwise instructed. The sides of the road shall be provided with two vertical bricks to each side for curbing. Curbing shall be in line, level and grade as instructed and shall be laid close to the road edge. Excavation required for curbing shall not be paid separately; only good quality of full brick shall be used in curbing. No bricks or brickbats shall be allowed in the paving work, unless the same is required at the ends. Brick shall be laid closed so that no voids or space is left out between two bricks. All joints shall be filled with yellow earth by spreading, brooming and watering. Surplus earth shall be removed from the surface. Finally clean river sand usable in plasterwork shall be spread uniformly, at the rate of 0.15 cmt/10 smt of road surface.
Payment shall be made on actual square meter of work carried out including side curbing, earth filling and sand spreading. Rate quoted shall be inclusive of all materials, tools, tackles required for complete excavation of item.

Supplying & Stacking 40 to 60 mm. size hard stone road metal including transportation filling the box etc., complete

1. The field of machine cut metal shall be of approved quarry as shown on the quarry chart as well as approved by the Executive Engineer prior to collection.
2. The machine cut metal shall be hard, tough, sound, durable, black trap field metal of close texture, free from decay and weathering. Each piece of the stone shall be angular and roughly cubical in shape and round elongated or flaky material shall be rejected. No round or oblong pebbles or angular chips larger or smaller than specified size shall be allowed.
3. All unsound, weathered or disintegrated stone obtained from the upper surface layer of the quarry or other layer of boulders shall be rejected. The physical requirement for standard size metal shall conform to the test results indicated in para 3 of item 4.
4. Machine cut metal shall be as nearly uniform in size as possible and shall conform to following minimum requirements of passing through the rings :
63 mm 100
50 mm 95-100
40 mm 35-70
20mm 0-10
5. Wherever and doubt exists as to whether the above requirements are satisfied in whole or part, the collection of machine cut metal shall be got screened by the contractor if so ordered by the Executive Engineer and for which no extra payments shall be claimed by the contractor.
6. Any collection which does not fully satisfy the above requirements is liable to be rejected altogether.
7. Stacking shall be done by filling in the standard steel pharas of 2.00 x 1.50 x 0.50 metre and 20% deduction of voids shall be made from the gross measurements.
8. Regular stacks shall be done by the contractors on a fairly level ground. All the stacks shall be marked by white wash immediate on being measured and recorded by the Engineer-in-charge. The rate includes blasting the rock, it any, breaking the metal, stacking, measuring in pharas etc. complete.

Supplying & Stacking 25 to 40 mm. size hard stone road metal including transportation filling the box etc., complete

1. The field of machine cut metal shall be of approved quarry as shown on the quarry chart as well as approved by the Executive Engineer prior to collection.
2. The machine cut metal shall be hard, tough, sound, durable, black trap field metal of close texture, free from decay and weathering. Each piece of the stone shall be angular and roughly cubical in shape and round elongated or flaky material shall be rejected. No round or oblong pebbles or angular chips larger or smaller than specified size shall be allowed.
3. All unsound, weathered or disintegrated stone obtained from the upper surface layer of the quarry or other layer of boulders shall be rejected. The physical requirement for standard size metal shall conform to the test results indicated in para 3 of item 4.
4. Machine cut metal shall be as nearly uniform in size as possible and shall conform to following minimum requirements of passing through the rings :
63 mm 100
50 mm 95-100
40 mm 35-70
20mm 0-10
5. Wherever and doubt exists as to whether the above requirements are satisfied in whole or part, the collection of machine cut metal shall be got screened by the contractor if so ordered by the Executive Engineer and for which no extra payments shall be claimed by the contractor.
6. Any collection which does not fully satisfy the above requirements is liable to be rejected altogether.
7. Stacking shall be done by filling in the standard steel pharms of 2.00 x 1.50 x 0.50 metre and 15% deduction of voids shall be made from the gross measurements.
8. Regular stacks shall be done by the contractors on a fairly level ground. All the stacks shall be marked by white wash immediate on being measured and recorded by the Engineer-in-charge. The rate includes blasting the rock, it any, breaking the metal, stacking, measuring in pharas etc. complete.

STONE SPREADING AND ANTI-WEED TREATMENT

The layout of the area, where anti−weed treatment and stone spreading is to be done, shall be developed by the Contractor during detailed engineering and the same shall be submitted to the employer for approval. The Contractor shall arrange all labour, equipment and materials required for complete performance of the work in accordance with the drawings, specification and direction of the Employer.

Stone spreading over cement concrete layer shall be done in the areas of the switchyard under scope of work.
The material required for site surfacing/stone filling shall be free from all types of organic materials and shall be of standard quality, and as approved by the Employer.

The material to be used for stone filling/site surfacing shall be stone aggregate of 40mm nominal size (ungraded single size) conforming to Table 2 of IS:383 − 1970. Hardness, flakiness shall be as required for wearing courses are given below:

i) Sieve Analysis limits (Gradation) (IS: 383 − Table − 2) Sieve Size % passing by weight
63mm 100
40mm 85−100
20mm 0−20
10mm 0−5

ii) Hardness: Abrasion value (IS:2386 Part−IV) − not more than 40% Impact value (IS: 2386 Part−IV) − not more than 30%.
iii) Flakiness Index: As per IS: 2386 Part − I maximum value is 25%.
iv) Frequency of test shall be conducted for sieve analysis, Hardness & Flakiness index as per latest FQP Plan.

After all the structures/equipments are erected, antiweed treatment shall be applied in the switchyard where ever cement concrete is to be done and the area shall be thoroughly de−weeded including removal of roots. The recommendation of local agriculture or horticulture department may be sought where ever feasible while choosing the type of chemical to be used.

The antiweed chemical shall be procured from reputed manufacturers. The doses and application of chemical shall be strictly done as per manufacturer's recommendation. Nevertheless, the effectiveness of the chemical shall be demonstrated by the Contractor in a test area of 10MX10M (appx) and shall be sprinkled with water at least once in the afternoon every day after forty-eight hours of application of chemical. The treated area shall be monitored over a period of two to three weeks for any growth of weeds by the Engineer − in− charge. The final approval shall be given by Engineer − in −charge based on the results.

Engineer−in−charge shall decide final formation level so as to ensure that the site appears uniform devoid of undulations. The final formation level shall however be very close to the formation level indicated in the approved drawing.

After antiweed treatment is complete, the surface of the switchyard area shall be maintained, rolled/compacted to the lines and grades as decided by Engineer−in−charge. The sub grade shall be consolidated by using half ton roller/surface vibrator with suitable water sprinkling arrangement to form a smooth and compact surface. The roller shall run over the sub grade till the soil is evenly and densely consolidated and behaves as an elastic mass.
In areas that are considered by the Engineer−in−Charge to be too congested with foundations and structures for proper rolling of the site surfacing material by normal rolling equipments, the material shall be compacted by hand rammer, if necessary. Due care shall be exercised so as not to damage any foundation structures or equipment during rolling / compaction.

The sub grade shall be in moist condition at the time the cement concrete is placed. If necessary, it should be saturated with water for not less than 6 hours but not exceeding 20 hours before placing of cement concrete. If it becomes dry prior to the actual placing of cement concrete, it shall be sprinkled with water and it shall be ensured that no pools of water or soft patches are formed on the surface.

Over the prepared sub grade, 75mm thick base layer of cement concrete in 1:5:10 (1 cement: 5 fine aggregate: 10 graded stone aggregate 40mm nominal size) shall be provided in the area excluding roads, drains, cable trenches as per detailed engineering drawing. For easy drainage of water, the slope of 1:1000 is to be provided from the ridge to the nearest drain.

The ridge shall be suitably located at the centre of the area between the nearest drains. The above slope shall be provided at the top of base layer of cement concrete in 1:5:10.
A final layer of 100mm thickness of stone aggregate of 40mm nominal size shall be spread uniformly over cement concrete layer after curing is complete.

Supplying & Stacking murrum of approved quality including transportation filling the box etc., complete E. I. C.

Murrum of approved quality preferably Red shall supply. Sample of the murrum shall be got approved. It shall be free from dust, vegetation, foreign materials and powdery substance etc. The murrum shall be stacked at the places shown, in regular boxes approved by the Engineer-in-charge.
The measurements shall be paid on Cubic Meter basis on the box measurement. The contractors shall make arrangements for marking of the stacks measured for separating the same.

Supply & Stacking black trap stone machine crushed grit / stone dust including royalty, all Government taxes transportation, filling boxes etc., complete as directed by E. I. C.

1.0 The field of machine cut grit shall be of approved quarry as shown on the quarry chart as well as approved by the Executive Engineer prior to collection.
11. The machine cut grit shall be hard, tough, sound, durable, black trap field metal of close texture, free from decay and weathering. Each piece of the stone shall be angular and roughly cubical in shape and round elongated or flaky material shall be rejected. No round or oblong pebbles or angular chips larger or smaller than specified size shall be allowed.
12. All unsound, weathered or disintegrated stone obtained from the upper surface layer of the quarry or other layer of boulders shall be rejected. The physical requirement for standard size metal shall conform to the test results indicated in para 3 of item 4.
13. Machine cut grit shall be as nearly uniform in size as possible and shall conform to following minimum requirements of passing through the rings : 5. Wherever and doubt exists as to whether the above requirements are satisfied in whole or part, the collection of M.C metal shall be got screened by the contractor if so ordered by the Executive Engineer and for which no extra payments shall be claimed by the contractor.
12. Any collection which does not fully satisfy the above requirements is liable to be rejected altogether.
13. Stacking shall be done by filling in the standard steel pharas of 2.00 x 1.50 x 0.50 metre and no deduction of voids shall be made from the gross measurements.
14. Regular stacks shall be done by the contractors on a fairly level ground. All the stacks shall be marked by white wash immediate on being measured and recorded by the Engineer in- charge. The rate includes blasting the rock, it any, breaking the metal, stacking, measuring in pharas etc. complete.

Labour charges for spreading metal in 100 mm. thick layer for soling with required grade & camber & filling the voids with small size of chips and earth & watering consolidating by 8 to 10 tonnes power roller etc., complete as directed by E. I. C.

1. Metal shall not be spread without permission of the Engineer-in-charge. Metal should be spread under careful supervision by trained coolies. Contractor shall see that uniform spreading as per collection of metal is done. The contractor shall spread the metal fully from the stacks without keeping any balance unless directed by the Engineer-in charge to keep some stack in balance for making good unevenness or depressions during roiling works. To ensure that the material is spread to the required thickness, the road surface shall be marked out in to length over which the contents of heaps are to be spread. The bounds of earth or murrum (one on either side) shall be laid with a distance between them equal to the width of road to be metalled and shall be enough to prevent the loose metal from spreading during consolidation as well as to retain water used for consolidation. Payment for bunds will be made in the respective item.
2. The metal (including old metal) shall be screened and rubbish, dust, grass shall be removed and spread evenly on the prepared surface in grade and camber by using camber board etc. so as to ensure that the surface is true to camber and grade. At least two camber by using camber boards shall be in use at site. The surface shall be checked at every 50 ft. by means of template while the correctness of the camber in between shall be tested by string and corrected as required. Between the straight lengths and the curves in camber of road to super elevation shall be made very gradually as may be directed by the Engineer-in-charge.
3. The spreading of metal shall proceed only 20 mt.(max.) advance of the rolling operations. The collection and spreading of the metal shall not be carried out in one and the same kilometer.
4. At the time of rolling by 8 to 10 tonne roller all surface irregularities, hollows, depressions, humps etc. shall be straight. The spreading of metal in required layer shall be done by the contractor.
The rate for this item shall be paid on cmt. basis and includes all the above operations with all lead and lift and consolidation by 8 to 10 tonne power rollers up to the satisfaction of Engineer - in - Charge.

Labour charges for spreading murrum or yellow soil filling voids of metalling including watering consolidating by 8 to 10 tonnes power roller etc., complete as directed by E. I. C.

Murrum of yellow earth shall be spread uniformly on the surface as instructed. Murrum shall be collected from the stacks shown by department. Earth shall be excavated and taken from the places shown. After uniform spreading, dry rolling with 8 to 10 tone roller shall be carried out. After rolling, surface shall be broomed and voids shall be filled up. After dry rolling is complete, the surface shall be watered and rolled

again. All the voids shall be filed up again, watered and re - rolled. Rolling shall be carried out such that the layer already spread and rolled earlier shall not get disturbed. If required additional quantity of murrum/earth shall be spread at the places shown to get uniform surface. The operation of rolling, watering and re-rolling shall have to be continued, till uniform surface with required grade and camber is obtained.
Rate quoted shall be for all labour, tools, tackles and machinery. Payment shall be made for actual square meter of area provided with spreading of murrum/earth as above.

As above but grit / stone dust

Specification of above item shall also be applicable to this item except that instead of spreading murrum / yellow earth grit / stone shall be provided and paid for.

Providing & Laying 600 mm dia. NP - 3 class R. C. C. Hume Pipe of approved size with collars for road crossing including excavation up to 900 mm. depth & refilling the trenches, joining, the pipes with C. M. (1:1) & filling 150 mm. thick concrete (1:4:8) below joints, curing etc., completed as directed by E. I. C.

NP3 class R.C.C. Hume pipe of required diameter shall be of approved make. Contractor shall produce necessary test certificate. Pipes shall confirm to the IS.
Pipes shall be laid to required depth and to the slope as instructed on site. Marking or invert levels on both sides shall be erected and pipe laid accordingly in line and level, Joint of the pipes shall be filled with c.m. 1:1 with necessary hemp rope. Joint shall be packed properly with semi-wet mortar with pressing. Outer surface shall be chamfered and finished neatly. C. C. 1:4:8 shall be provided with crushed stone chips of 12mm and down graded. Curing arrangement shall be made for the cement mortar joint and concrete for keeping continuous wet for period of minimum 12 days.
The relevant specification of item no. 45 shall also be followed for workmanship and mode of measurement.
Rate quoted shall be inclusive of all materials like pipe, collars, cement, coarse and fine aggregate hump ropes, labour, excavation, back filling etc. complete and disposing extra earth as directed.
Payment shall be made on running meters of pipe laid.

ITEM : --- DO --- but 300 mm. dia Pipe

The relevant specification of item no. 45 shall also be followed for workmanship and mode of measurement.
Specification of above item shall be applicable to this item also but instead of 600mm dia pipe 300mm dia shall be provided and fixed and paid for.

Providing plantations to development of plants / trees / flowers, ornamental plants and gardens shrubs small trees of plants of selected and approved name, quality, size and growth in good condition. The work including the cost of plants, materials, digging pits in the soil of size 0.60 X 0.60 X 0.60 mtr, soil for planting trees mixing of manure & refilling the pit with good earth, watering as and when required. Providing pesticides / fertilizers with twelve months of maintenance, replacement and replacing of dead plants during maintenance, cleaning, removing, labourers tools and tackles, transportation, loading and unloading etc., complete as directed by E. I. C.

The work shall be carried out as per description of the item. The work includes all materials like plants, soil, manure, pesticides, fertilizers, labour, and maintaining the plants up to completion of work.
The plant selection its location and duration shall be got approved in advance.
The payment shall be made per no. of plant provided and maintained.

Providing & Fixing 20 mm. dia. M. S. bar steps 150 mm. wide & 300 mm. long clear including grouting in wall, 3 coats of oil painting etc., complete as directed by E. I. Concrete

20 mm dia MS bars steps are to be bent as per size specified in item with extra anchor length of 225 mm, with suitable hooks for proper grip in the wall. Grooves shall be cut in masonry at required distance as directed in the wall. The bar steps shall be properly grouted in wall in line & level with C. C. (1:2:4) and finishing smooth the same. Steel bar steps shall be given one coat of red oxide and 2 coats of approved brand, quality, tint enameled paint.
Payment shall be made on number bases for all above, including materials etc. complete.

Providing & Fixing 450 X 600 X 6 mm. thick size approved best quality of looking glass mirror with plastic moulded frame with shelf etc., complete as directed by E. I. C.

1.0. Materials

1.1. The 600 mm. x 450 mm. size mirror shall be of superior glass with edge rounded offer beveled as specified. It shall be free from flaws specks, or bubbles and its thickness shall not be less than 6 mm. The glass for the mirror shall be uniformly silver plated at the back and shall be free from silvering defects. Silvering shall have a protective uniform covering of red lead paint. The 6 mm, thick plywood shall conform to M-37. The 6 mm. thick A.C. sheets shall conform to M-24.

2.0. Workmanship

2.1. The mirror of 600 mm. x 450 mm. size mounted on A.G. Sheet or plywood 6 mm. thick with C.P. brass clips shall be fixed as directed, by fixing wooden plugs in wall and C.P. brass screws and washers. The work shall be carried out in best workman like manner.

3.0. Mode of measurements & payment

3.1. The rate includes cost of all labour and materials, tools and plant etc. required for satisfactory completion of this item. The rate shall be for a unit of One number.

ITEM NO. 69: Providing & Fixing a set of 6 Nos. of stainless steel coat racks of approved quality fixed on 20 mm. thick teak wood batten including 3 coats of oil painting etc., complete as directed by E. I. C.

Teakwood batten of 600mm x 100mm x 20mm thick shall be provided as per general specification of woodwork. The wooden batten shall be fixed at the place shown at the height instructed at site with the wall. 6Nos. of aluminum anodized coat racks of approved quality, shall be fixed on the batten at 150mm c/c 3 coats of oil paint shall be applied to wood work of approved quality make, tint shall be applied as per specification no. 16 of Schedule F.

Providing & Fixing 16 mm. dia. M. S. fan hooks embedded in slab or beam during casting as per instruction including 3 coats of oil painting etc., complete as directed by E. I. C.

16mm Dia M.S. bar fan hooks shall be provided in slab, beam, during casting as per instruction of Engineer-in-charge. The hook shall be kept vertical and binded with the slab, or beam bars as the case may be. The hooks shall be applied 3 coats of oil paint of approved color make in tint as per specification no. 17 of section F. If instructed by the Engineer - in - Charge to proved fan hook with smaller dia of bar, necessary reduction in the rate shall be made applicable by the Engineer - in – Charge.
Payment shall be made per number basis.

Providing & Fixing 300 X 300 mm. size marble year plate with black border all-round & letters including fixing the same in cement mortar etc., complete as directed by E. I. C.

The marble plate should be 25mm thick and 300 x 300mm size of approved white marble, free from cracks and other defects and machine polished. The size of letters for number and the year shall be provided as directed by Engineer-in-charge and engraved and finished black with border all round. Necessary groove shall be provided in wall at the place shown by Engineer-in-charge. The plate shall be fixed in line level and plumb with c.m . 1:2 and all the edges shall be well finished as directed.
Payment shall be made per number basis for all above operations.

Providing & Fixing 600 mm. long & 20 mm. dia. aluminium anodised towel rod with brackets etc., complete as directed by E. I. C.

1.0, Materials

1.1. The 20mm dia aluminum anodized towel rod shall be 600 x 20 mm. of best quality as approved by the Engineer-in- charge. The brackets shall be of anodized aluminum of best quality.

2.0. Workmanship

2.1. The brackets of the towel rail shall be fixed by means of CP, brass screws to wooden firmly embedded in the wall with C.M. 1:3 (1 cement: 3 coarse sand). The towel rail shall be fixed as and where directed.

3.0. Mode of measurements and payment

3.1. The rate includes cost of all labour and materials, tools and plant etc. required for satisfactory completion of this item.
3.2. The rate shall be for a unit of One number.

Painting the letters with best enamel oil paint in 200 to 250 mm. size etc., complete as directed by E. I. C. (Paint should be brought by the contractor.)

Letters shall be painted with best synthetic enamel paint of approved quality make and tint. Generally the letters shall be appointed with black letters with yellow background and black border of 12mm size or as per instruction of Engineer-in-charge and as specified in item. The letters shall be painted at the place shown by Engineer-in-charge. General specification of painting is applicable.
The rate shall be for a unit of one number.

Providing & Fixing SIGN BOARD having size 2000 X 1000 mm. for SUB-STATION made from 16 gauge M. S. Sheet having frame work of 35 X 35 X 3 mm. M. S. angle all-round & 4 vertical intermediate angle supports at equal distance welded to sheet with 3 Nos. of 50 X 50 X 6 mm. M. S. angle posts 3.0 M. long with arrangement of bolting, 3 coats of oil painting etc., complete as directed by E. I. C.

General specification of fabrication shall be applied. The signboard shall be prepared from 16 gauge M.S. Sheet of specified size with angle frame of 35 x 35 x 3 mm size with 2 vertical angle supports to be welded at intermediate portion with the frame, as instructed. The signboard shall be fixed with 50 x 50 x 6mm M.S. angle supports by bolts and nuts. The angle supports shall be erected in line level and plumb as directed including necessary excavation. c.c. (1:3:6), grouting, curing etc. complete as per instruction of Engineer-in-charge. All steel work shall be given one coat of anticorrosive paint 2 coats of approved enamel oil paint. The signboard is painted with letters with boarder as per instruction of Engineer-in-charge with approved synthetic enamel paint.
Rates shall be inclusive of all above materials, operation, tools, tackles etc. complete.
The rate shall be for a unit of one number.

Providing COOKING PLATFORM 3000 X 675 mm. size with approved quality of stainless steel sink of size 450 mm. dia. & 4 Nos. of partition walls (middle) with cement plaster in C. M. (1:3) to all exposed faces, 75 mm. thick R. C. C. Slab in C. C. (1:2:4) at top with necessary reinforcement making holes in slab for gas connection, including kotah stone flooring with side Patti of required size & thickness, with polishing etc., complete & fixing teak wood cupboard of frame size 75 X 50 mm with shutter for opening of size 1.20 X 0.60 Mtrs. made from 19 mm. thick Nova Pan / ECO Board exterior laminated with all round teak batten Patti including two coats of oil paints & one coat of primer including PVC waste pipe, Nahni trap, bib cock, etc., complete as per drawing & instruction of E. I. C.

R.C.C. cooking platform of 3000 x 675mm size shall be constructed at the place shown as per drawing and instruction of engineer-in-charge. The relevant specification of B.B. masonry cement, concrete, reinforcement, cement plastering etc. shall be applicable as per items of the respective sections. B.B. masonry of 225/115mm thick in c.m. (1:6) shall be constructed on bed concrete of floor up to the required height as per drawing or as directed. The top R.C.C. slab 75mm thick, with sink, shall be cast in c.c. 1:2:4 with necessary shuttering and reinforcement, keeping holes for gas connections and waste coupling. Masonry and R.C.C. work shall be extra plastered 40 x 12mm thick all round. Arrangement for keeping pot shall be made on the top as per drawing or as directed. One brass waste coupling of 30mm size shall be provided and fixed in the sink with necessary P.V.C. waste pipe up to nahani trap. All masonry, R.C.C. plastering work shall be cured fro minimum 10 days.
Payment shall be made per number which covers all above as specified with all materials, labour, tools, tackles, shuttering, curing etc. complete.

Providing of template & foundation bolt in line and level before concreting of foundation and making arrangement for fixing template in such a way as it remains in position during concreting etc., complete as directed by E. I. C.

The templates and foundation bolts shall be line and level before concreting.

Payment shall be made on number basis.

Supply, erecting and Commissioning 2 H. P. self priming Mono Block pump set of ISI make as per the instruction of Engineer-in-charge, with 2.0" suction and 1.5" delivery including casting cement concrete foundation for pump, with required length of G. I. pipe for suction with all necessary fittings like elbow, union, tees, bends, set of flange one brass float valve etc., complete as directed including supplying and fixing the starter of ISI make with ICTP switch & allied wiring of copper cable & board, testing etc., complete as directed by E. I. C.

Single phase 2 HP self priming mono-block pump having ISI mark with 2" suction and 1.5" as described in the item description, approved by Engineer – in – Charge shall be supplied and installed. Required panel BOARD, with all accessories, described in item description shall be installed, with steel framework and fixed as per instruction of Engineer – in – Charge with CC (1:2:4). Foundation of pump and motor shall be cast in CC (1:2:4), with necessary shuttering, reinforcement, supplying and fixing of foundation bolts, curing and finishing smooth of concrete work etc. complete. 18 gauge GI sheet cover with 25mm x 25mm x 5 mm angle frame shall be prepared as per approved design with hinges, locking arrangement etc. complete with 3 coats of oil painting as directed. All electrical installation will be carried out by licensed electrical supervisor only. Necessary test report shall be submitted for electrical installation.
Pump with motor shall be handed over in complete working condition with trial run as decided by the Engineer – in – Charge. Guarantee for pump and motor from manufacturer shall be submitted for minimum one year.
Rate quoted shall be for supplying, installing with all labour, materials, tools, tackles etc. and giving test to required delivery head as directed by Engineer-in-charge with manufacturers guarantee for satisfactory performance of pump and motor for minimum period of one year.

Payment will be made on number basis for all described in item and specifications.

Providing and fixing 24 gauge chicken mesh jali in plaster concrete and masonary joint work including required nails, tools tackles & approved quality of jali as directed by E. I. C.

The material to be used shall have to be got approved before start of work.
Payment shall be made on actual square meter basis.

Supplying and spraying "Round up" (Glyphosphate 41 % SL) or equivalent weedicide for weed control in proportion of 250 ml. Weedicide in 15 litre of clean fresh water in two spray as per the manufacturer's specification and as directed by EIC.

The Contractor has to carry out the work as per manufacturer's specification for the duration specified by the manufacturer of the product. Result shall be guaranteed for the duration specified and shall be backed by bank guarantee for the amount of 5 % of the operated item.

Providing and fixing of acrylic sign board of Acrylic sheet, computerised vinyl diagram in GI box with tube light fitting size 1800 mm X 1200 mm for various 66 KV S/S.

The matter in the board size of lettering and colors shall be got approved in advance.

Labour charges for leveling the transformer rail etc., complete as directed by E. I. C.

The work shall be carried out in line and level as directed EIC. The level of both the rail shall be uniform. The pockets to be grouted shall be properly cleaned. Dust and other foreign materials shall be removed from the pockets. If required, Air blower shall be used for cleaning the pocket. If surface is not rough, roughening shall be done, if necessary and instructed by Engineer – in – Charge for bonding purpose. Payment shall made for the pair of rails made available for grouting and will include all labours, tools, tackles, etc. complete.

Providing & Fixing 25 mm. dia. PVC, conduit pipe for electric wiring as directed by the EIC.

25mm dia OD PVC pipe of the ISI quality and approved brand specified by the Engineer – in – Charge shall be fixed in the RCC column as per the instruction. Care shall be taken to plug all the ends by cloth

so as to prevent entry of concrete or any other foreign material which may block the pipe for future insertion of cables. The pipe shall be so laid and fixed that while casting / constructing gate pillars, it remains in truly vertical position in centre of column.
The payment shall be made on running meter basis for the length of pipe fixed in the column and shall include all materials, specials such as bend, tee, etc, labour, tools, tackles, etc. complete.

Providing & Laying C. C. M. 7.5 for foundation & plinth with gravel or picked up metal or hand broken stone of size 40 mm. to 60 mm. as coarse aggregates including mixing in mixture machine only, watering, ramming, consolidating etc., complete as directed by EIC.

1.0. Materials

Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Stone aggregate 40mm nominal size shall conform to M-12.

2.0 Workmanship

2.1 The proportion of the concrete mix shall 1:4:8 (one cement : four coarse sand : 8 hand broken stone aggregate 40 mm to 60mm nominal size) by volume. Concrete work shall have surface or as specified in the item.
2.2 The designation ordinary M-7.5, specified as per IS corresponding approximately 1:4:8 nominal mix of ordinary concrete by volume respectively.
2.3 The ingredients required for ordinary concrete containing one bag of cement of 50 Kg by weight (0.0342 Cu. M.) for different proportions of mix shall be as under :
2.4 The quantity of water in a mix shall be just so adjusted to overcome the difficulties of placement and compaction.
2.5 Workability of the concrete shall be controlled by maintaining water cement ratio that is bound to give a concrete mix which is just sufficiently wet to be placed and compacted without difficulty with the means available.
2.6 The maximum size of the coarse aggregate shall be as large as possible within the limits specified.
2.7 Proportioning : Proportioning shall be done by volume, except cement which shall be measured in terms of bags of 50 Kg weight. The volume of one such bag being taken as 0.0342 Cu. meter. Boxes of suitable sizes shall be used for measuring sand aggregate. The size of the boxes (internal) shall be 35 cms. X 25 cms. and 40 cms. deep. While measuring the aggregate and sand, the box shall be filled without shaking, ramming or hammering. The proportioning of sand shall be on the basis of its dry volume and in case of damp sand allowance for bulkage shall be made.
2.8 When hand mixing is permitted by the engineer – in – Charge for small jobs or for certain other reasons it shall be done on the smooth water tight platform large enough to allow efficient turning over the ingredients of concrete before and after adding water. Mixing platform shall be so arranged that no foreign material gets mixed with concrete nor does the mixing water flow out. Cement in required number of bags shall be placed in a uniform layer on top of the measured quantity of fine and coarse aggregate which shall also be spread in a layer of uniform thickness on the mixing platform. Dry coarse and fine aggregate and cement shall then be mixed thoroughly by turning over to get a mixture to uniform colour. Specified quantity of water shall then be added gradually through a rose-can and the mass turned over till a mix of required consistency is obtained. In hand mixing, quantity of cement shall be increased by 10 percent above the specified.

3.0 Mode of measurements and payment

3.1 The concrete work shall be measured in length, breadth and depth as specified on the drawing limiting dimensions to those specified on drawing or as directed.
3.2 The rate shall be for a unit of one cubic meter.

Providing form work of ply sheathing and tubular steel support so as to give fair finish including centering, shuttering strutting and propping etc., height of propping and centering below supporting floor to ceiling not exceeding 4 M. and removal of the same for in situ reinforced concrete and plain concrete work in

1.0 Materials

1.1 The shuttering to be provided shall be of plywood make and shall conform to IS4990:2011.
1.2 The dimensions of scantlings and battens shall conform to the design. The strength of the wood shall not be less than that assumed in the design.

2.0 Workmanship

2.1 The form work shall conform to the shape, lines and dimension as shown on the plans and be so constructed as to remain sufficiently rigid during the placing and compacting of the concrete. Adequate arrangements shall be made by the contractor to safe-guard against any settlement of the form work during the course of concreting and after concreting. The form work of shuttering, centering, scaffolding, bracing, etc. shall be as per design.

2.2 Cleaning and Treatment of forms

2.2.1 All rubbish, particularly chippings, shaving and saw dust shall be removed from the interior of the form before the concrete is placed and the form work in contact with concrete shall be cleaned and thoroughly wetted or treated. The surface shall be then coated with soap solution applied before concreting is done. Soap solution for the purpose shall be prepared by dissolving yellow soap in water to get consistency of paint. Alternatively a coat of raw linseed oil or form oil of approved manufacture may be applied in case steel shuttering is used. Soap solution or raw linseed oil shall be applied after thoroughly cleaning the surface. Care shall be taken that the coating does not get on construction joint surface and reinforcement bars.

2.3 Stripping time

2.3.1 In normal circumstances and where ordinary cement is used, forms may be struck after expiry of following periods.

(a)	Sides of walls, columns, and vertical faces of beam	24 to 48 hours.
(b)	Beam soffits. (Props left under)	7 days.
(c)	Removal of props slabs	
	(i) Slabs spanning upto 4.5 m	7 days.
	(ii) spanning over 4.5 m	14 days.
(d)	Removal of props to beams and Arches	
	(i) Spanning up to 6 m	14 days
	(ii) Spanning over 6 m	21 days

2.4 Procedure when removing the form work

2.4.1 All form work shall be removed without such shock or vibrations as would damage the reinforced concrete surface. Before the soffit form work and struts are removed, the soffits and the concrete surface shall be exposed where necessary in order to ascertain that the concrete has sufficiently hardened.

2.5 Centering

2.5.1 The centering to be provided shall be got approved. It shall between sufficiently strong to ensure absolute safety of the form work and concrete work before, during and after pouring concrete. Watch should be kept to see that behaviour of centering and form work is satisfactory during concreting. Erection should also be such that it would allow removal of forms in proper sequence without damaging either the concrete or the forms to be removed.

2.5.2 The props of centering shall be provided on firm foundation or base of sufficient strength to carry the loads without any settlement.

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

2.6 Scaffolding

2.6.1 All scaffolding, hoisting arrangement and ladders, etc. required for the facilitating of concreting shall be provided and removed on completion of work by contractor at his own expense. The scaffolding, hoisting arrangements and ladders etc. shall be strong enough to withstand all live, dead and impact loads expected to act and shall be subject to the approval of the Engineer - in – Charge. However, contractor shall be solely responsible for the safety of the scaffolding, hoisting arrangement, ladders, work and workman etc.

2.6.2 The scaffolding, hoisting arrangements and ladders shall allow easy approach to the work spot and afford easy inspection.

2.6.3 The rate is applicable to all conditions of working and any height. The rate shall include the cost of materials and labour for various operations involved such as:

(a) Splayed edges, notching allowance for over laps and passing at angles, battens centering, shuttering, strutting, propping, bolting, nailing, wedging, easing, striking and removal.

(b) Filleting to form stop chamfered edges or splayed external angles not exceeding 20mm width to beams, columns and the like.

(c) Temporary openings in the forms for pouring concrete, if required, removing rubbish etc.

(d) Dressing with oil to prevent adhesion of concrete with shuttering, and

(e) Raking or circular cutting.
2.7 Re-use
2.7.1 Before re-use, all forms shall be inspected by the Engineer - in - Charge and their suitability ascertained. The forms shall be scarred, cleaned, and joints gone over, repaired where required. Inside surface shall be retreated adhesion of concrete.

3.0 Mode of measurements and payment

3.1 Form work shall be measured as the area in square metres of shuttering in contact with concrete except in the case of inclined member and portion of curved profile and upper side in which case only area of underside shall be measured for payment.
3.2 Form work to secondary beams shall be measured up to the sides of main beams but no deduction shall be made from the form work of the main beam at the inter section point. No deduction shall be made from the form work of a column at inter section of beams.
3.3 The rate is for the completed item.
3.4 The rate shall be for a unit of one square metre.

Providing fitting & fixing fully glazed/ partly glazed double leaf 20micron colour anodized aluminum entrance door using extruded section fabricated by standard manufactures with framing 10.15cm x4.45cm rectangular section & door shutter made from 10.15 cm x 4.45cm aluminum bottom section top & vertical section 6.35x3.80cm size using 5.5mm thick approved quality or HB4 plain glass with glazing deep rubber gasket with locking arrangement(Godrej type) with all fixtures & fastenings of anodized section with aluminum bedding floor spring mounted door closer with all labours & materials etc. Complete as per drawing and as directed by E.I.C.

The aluminium section to be utilized shall confirm to IS 1285/1980 and IS 1869/1968 for the material grade and anodizing respectively. The frame section shall be 61.85mm x31.75mm weighing 0.695kg per mtr. Minimum of section no 8687 Jindal Aluminum Ltd make or its equivalent and section for shutter shall be of 50 mm x 20 mm size weighing o.571kg per Mtr. minimum of section No 8305 of Jindal aluminum Ltd make or its equivalent.
Necessary additional / special sections shall be used to facilitate locking arrangement, handle stay if necessary. As directed by EIC.
Payment shall be made on Smt. Basis. No additional payment shall be made for fixture or addition /special section.

Providing & Fixing MS grill for exhaust fan of approved quality and design and drawing including welding or bolting fixtures and fastening MS hold fast with three coats of oil painting of approved shade and make with one coat of red - oxide primer including grouting the hold fasts in C C (1:2:4) / fixing in wall with required size of nails including tools, tackles and materials and all labours including making holes for fan etc., complete.

Specification shall be as per item description.

Payment shall be made on the basis of number of grills for exhaust fan fixed and shall include all materials, labour, tools, tackles, etc. complete.

Providing & Fixing Garware film of approved quality and make etc. complete.

Before starting the work, Garware film sample shall be got approved from the Engineer - in – Charge. Work shall be executed as per manufacturer's specification and instructions.

Payment shall be made on the basis of Sq. meter of film applied on the glass panel of windows / doors. The payment includes all materials, labour, tools, plants, wastage, if any etc. complete.

Providing & Fixing M. S. Cover for cable trench in control room made from 14 Gauge M. S. Sheet having M. S. Angle frame all-round of 40 X 40 X 5 mm. size and cover shutter frame of angle 30 X 30 X 5 mm. size & 2 supports at middle including oil painting of 3 coats of approved shade & make. Providing 2 handles of 6 mm. dia. M. S. bar as per instruction etc., complete as directed by E. I. C.

General specification of fabrication shall be applicable. The covers shall be fabricated as per detailed drawing given as instructed on site. Item provides for supplying, fabrication, painting and fixing M.S. Covers at site, with 2 handles of 6mm dia bars shall be provided with holes in the cover, with necessary flat welded at the bottom of the handle so that the handle do not project outside when the covers are placed on the cable trench.

Measurements shall be paid on the square meter of the covers provided.

Providing 2500 mm. internal dia meter and 3.0 mt. deep soak pit including excavation in all types of soil and soft / hard rock and B. B. C. C. (1:4:8) bedding 300 mm. thick below masonry and 450 mm. thick B. B. masonry in C. M. (1:6) up to 2000 mm height, 350 mm. thick for further 2000 mm and 230 mm thick for remaining height honey combed plastering in CM 1:3 inside up to full height and 100 mm thick R. C. C. slab with 600 X 600 mm. C. I. Heavy duty cover with frame, with necessary reinforcement as per design and C. I. Vent pipe 1800 mm. long with B. B. Masonry pillar 350 X 350 X 450 plastered all around filling 40 to 50 mm size brick bats up to 1.5 tm. depth, including 16 mm dia M. S. U Steps refilling and as directed and including disposal of the surplus excavated earth up to the lead of 500 tm. radius including 3 coats of white or colour wash to all exposed finished surface etc., complete as directed by E. I. C.

Soak pit of given dimension shall be constructed at place shown.
The specification of excavation, brick masonry, concrete, plaster etc. shall be as provided in respective section. Brick wall on B.B.C.C. 1:4:8 shall be constructed as described in item in C.M. (1:6). R.C.C. slab to be provided at top, shall be in c.c. 1:2:4 with necessary shuttering and reinforcement. 600 x 600mm heavy duty C.I. cover with frame as per I.S. standard shall be provided in top slab. Honeycombed brick masonry shall be provided for the depth as shown in drawing or as directed. 12mm thick outside plastering in c.m. 1:3 shall be provided for 1:5 tm. depth of masonry from top. The pit shall be filled with brickbats of 40mm to 50mm size up to 1.5 meter depth. Brickbats shall be of size specified and free from dust, small pieces and other foreign materials. If desired by Engineer-in-charge the same shall be screened and other foreign materials. If desired by Engineer-in-charge the same shall be screened and provided. 16mm dia M.S.U. shape steps shall be provided @ 200mm c/c as directed. Plastered surface and top shall be given 3 coats of whitewash, 75mm dia C.I. vent pipe of 1800 mm length shall be provided with brick masonry plastered pillar and C.I. cowl ventilator shall be provided at the top of vent pipe with joint filled in c.m. 1:1.
Payment shall be made per number, which covers all above as specified with all materials, labour, tools, tackles scaffolding, curing etc. complete.

Providing and fixing Acrylic name plates of required size including painting letters as directed and fixing as directed by engineer in charges.

Before starting the work, acrylic sheet sample as well as type of letter style and size of letter shall be got approved from the Engineer - in – Charge. Work shall be executed as per Engineer - in – Charge's instructions.

Payment shall be made on the basis of one number. The payment includes all materials, labour, tools, plants, wastage, if any etc. complete.

Labour charges for beveling the Kotah stone as directed.

The item shall be executed on the exposed edges of Kotah stone fixed on sills, steps and wherever directed by the Engineer - in – Charge. The Kotah stones shall be beveled in half round shape with smooth finishing.

The payment shall be made on the basis of running metre of edges beveled and shall include all tools, tackles and plant, labour, etc. complete.

Providing & laying CC (1:3:6) or M 10 for structural foundations and for erection of M. S. angle posts using 20 to 25 mm. size black trap machine crushed metal including shuttering for all side up to any height and mixing in mixer machine, ramming with mechanical vibrator & including grouting of foundation bolts simultaneously with the help of templates (setting of template of foundation bolts and finishing by plaster will be paid separately)

M-10 grade of concrete using machine cut black trap of size 12 to 20mm shall be laid using minimum cement content of 221 Kg / Cmt. and free water cement ratio of 0.60. Sample of ingredients to be used shall be got approved.
The general specification of concrete shall be applicable for this item. Rate quoted shall be of all materials, labour, tools, tackles, shuttering, scaffolding, curing, etc. as per item. Concreting work, involved in this item, is for the foundation work for various equipments and machinery.

Payment shall be made on actual cu. M. of concrete work done as per detailed drawing furnished by department.
The pockets to be grouted shall be properly cleaned. Dust and other foreign materials shall be removed. If required, it shall be cleaned by Air blower. If surface is not rough, roughening shall be done, if necessary and instructed by Engineer – in – Charge for bonding purpose. Existing surface shall be applied with thick paste of cement mortar. No separate payment will be admissible for this.
Payment shall be made for actual quantity of concrete work done for grouting.

Providing and Laying controlled cement concrete M-150 and curing complete excluding the cost of form work and reinforcement for reinforced concrete work in
(a) Foundation, footings, Bases of columns etc. and Mass concrete.
(b) Slabs, Landings, shelves, Balconies, Lintels, Beams, Girders and cantilever up to floor two level.
(c) Columns, pillars, posts and struts up to floor two level

1.1. The relevant specifications of item No. 12 shall be followed except that the work shall be carried out for M-150 reinforced concrete work. In addition, the following stipulations shall be followed for :
(a) The bars shall be kept in position by the following methods :
(i) In case of beam and slab construction, sufficient number of precast cover blocks in cement mortar 1:2 (1 cement : 2 coarse sand) about 4 cms. x 4 cms. section and of thickness equal to the specified cover shall be placed between the bars and shuttering as to secure and maintain the requisite cover of concrete over the reinforcement. In case of cantilevered or doubly reinforce beams or slabs, the main reinforcing bars shall be held in position by introducing chain spacers or supports bars at. 1.0 to 1.2 metre centres. (ii) In case of columns and walls, the vertical bars shall be kept in position be means of timber templates with slots accurately cut in them, the templates shall be removed after concreting has been done below it. The bars may be also be suitably tied by means of annealed steel wires to the shuttering to maintain their position during concreting.
1.2. All bars projecting form pillars, columns, beams, slabs etc, to which other bars and concrete are to be attached or bounded to later on, shall be protected with a coat of thin neat cement grout, if the bars are not likely to :be incorporated with succeeding mass of concrete within the following 10 days. This coat of thin neat cement shall be removed before concreting.
2.0. Mode of Measurement & Payment
2.1. The relevant specifications of item No. 12 shall be followed.
2.2. The volume occupied by reinforcement shall not be deducted from R.C.C. work.
2.3. The rate shall be for a unit of one cubic metre.

Providing & fixing sliding gate of 40 mm. dia. mild steel pipe 'B' Class all round and 20 mm. dia. mild steel pipe at 200 mm C/C and 12 mm. mild steel square bars at 200 mm. c/c alternatively i. e. One square bar between two pipe vertically welded to 40 mm dia. pipe frame as per drawing and design with necessary brackets, holdfasts, locking arrangement on top & aldrop on both sides including base rail for sliding the gate having ball bearing rollers & guide track of 50 X 6 mm. M. S. Flat with holdfast, fabrication of side supports including fixing the letters "GETCO" on front side etc. complete with three (3) coats of approved Oil Painting & one cost of red oxide primer as directed (The cost does not include the cost of reinforcement, column supports, joists, concrete masonry work)

Sliding gate with 40 mm dia M.S. Pipe frame shall be prepared as per detailed drawing. General specifications for fabrication shall be applicable. Holes shall be drilled in 40mm dia m.s. pipe in top and bottom members at 200mm c/c for 20mm dia pipe. Pipe shall be inserted at least 20mm inside and then welded to frame. Similarly 12mm M.S. Square bars shall be provided alternatively at 20mm c/c necessary brackets. hold fast, aldrop, locking arrangement shall be provided as per detailed drawing and as per item description. GETCO letters shall be of 250mm sizes and shall be fixed on gate as shown or as directed. Gate shall be erected in plumb, line and level with bottom rail and guide and rollers with bearing.
Gate shall be given one coat of red oxide and 3 coats of approved quality, brand and tint oil paint or 3 coats of aluminum paint as directed. Trial for smooth operation shall be given and defect observed during guarantee period of 12 months will have to be attended with replacing of parts etc. without any extra cost.
Payment shall be made on square meter basis. Area of gate provided & fixed shall be measured and paid, based on unit rate quoted.

Providing & Fixing hinged type 40 mm. dia. M. S. pipe "B" class all around & 20 mm. dia. M. S. Pipe gate as per drawing & design with necessary brackets, hold fasts welded to vertical girders, ball bearing wheels for sliding the gates with 50 x 6 mm. M. S. Flat, guide rail fixed in concrete with 3 coats of oil painting of approved shade & make, with one coat of red oxide primer etc., complete as directed by E. I. C. (COST DOES NOT INCLUDE THE COST OF COLUMNS, STEEL / JOISTS, CONCRETEM, MASONRY ETC.)

The specification of item No. 104 shall be applicable. The gate shall be hinged and provided with sliding arrangement with ball bearing wheels, 50 x 6mm guide holdfasts for fixing in concrete for guide as well as gate. Aldrop shall be provided on both side with locking arrangement at top. General specification of fabrication shall be applicable. After gate is completely fabricated and okayed. One coat of red oxide shall be given and after erection in position and testing, 3 coats of oil painting of approved quality, brand and tint shall be applied or 3 coats of aluminum paint shall be applied according to instruction at site. All fabrication, welding etc. shall be in best workmanship like manner. For frame of 40mm dia pipe elbow shall be provided at corners. For smooth bending shall be have to be adopted by approved method. Any damage, deshaping etc. during fabrication, bending or welding shall make member for rejection. Where bending is approved smooth and uniform bending shall be for all corners.
Payment shall be made for actual square meter area of gate provided as per drawing or per details furnished on site.

Providing & applying two coats of snowcem or equivalent cement paint including cleaning the surfaces, watering etc. complete as directed by EIC

Water proof cement paint Snowcem or equivalent quality shall be of approved brand and manufacture and shall be applied on surface as per manufacturer's specifications.
Prior to applying the paint the surface shall be cleaned, brushed and all loose adherences, mortar dropping, grease, etc. shall be removed. Surface shall be wetted with water before application of paint. Paint shall be mixed with water in such quantity that can be utilized within an hour. The paint shall be mixed with water in such proportion and by such method as recommended by the manufacturer. During application of the mix to the surface, it shall be stirred well. It shall be applied such that direct heat of sun is avoided during application. Next coat is applied after previous coat has set for 24 hours. Next coat shall be applied without wetting of surface, 2 coats of paint shall be applied as specified in the item to get uniform shade.
Painted surface shall be cured for 7 days by sprinkling water and keeping it wet.
Rate quoted shall be including of cleaning of surface before application of paint, cleaning area after application including stain removal, scaffolding, curing, etc. complete.

Providing & laying 75 mm thick built up spray grout base course double layer using tack coat at the rate of 5 kg of asphalt of required grade per 10 sq. mt. for first layer and 15 kg. of asphalt of required grade per 10 sq. mt. For grouting for second layer as per requirement and spreading grit at the surface using 0.13 cmt. of key aggregates of size 40 to 50 mm. (black trap metal) per 10 sq. mt. Area over existing surface including rolling & consolidating with 8 to 10 tonnes power roller for each layer etc., complete as per specification and as directed by EIC.

The surface shall be cleaned with wire brush and coir brush to remove the dust and foreign materials. 75 mm thick built up spray grout base course shall be provided in single layer as directed by Engineer-in-charge.
Asphalt of 60/70 or 80/100 grade satisfying the requirement of I.S.702 and grade as decided by Engineer-in-charge should be used. The binder shall be heated to optimum temperature in boiler. Aggregate of size 40 mm to 50 mm (black trap metal) of approved quality shall be used.
Payment shall be made on Sq. Mt. basis.

Supplying and pouring of 'Pidiproof' of PIDILITE brand or equivalent as waterproofing admixtures as per manufacturer's specifications in cement concrete during casting of concrete as directed by the Engineer - in - Charge.

Pidiproof waterproofing admixture manufactured by M/S Pidilite shall be mixed with concrete mix before laying the same in manner and 200ml per one cement bag or as recommended by the manufacturer. This admixture shall be used during concreting of slabs and all other water retaining structures

Providing and fixing broken glass pieces on top of compound wall coping. This item should be executed immediately after the casting of coping.

Broken glass pieces obtained from soda bottles shall be fixed during concreting of the top coping of compound wall in close proximity of each other at about 20 to 25 mm c/c and shall project from the top of coping by about 25 to 40 mm and shall be embedded in the concrete to a depth of 25mm and as per instruction of Engineer - in – Charge.

The payment for this item in running metre and shall include providing of glass and labour charges irrespective of the thickness of coping.

Conducting and carrying out verticality test as per ISS (The contractor shall have to submit the certificate of verticality test from reputed firms who are carrying out such tests.) If the verticality test is not satisfactory or not conforming to IS specifications the amount maximum upto 20 % of contract i.e. total value of work done will be recovered from contractor's bill.

Verticality test as per IS standard shall be carried out as instructed in the item with all necessary arrangement and materials. The results observed shall be noted for various depths and submitted with certificate as desired in the item. The test shall be carried out in the presence of Engineer – in – Charge or his authorized agent.
Rate shall be quoted for lump sum for the job.

Developing and cleaning and giving yield test for bore well, by required size of compressor and pump running for 12 hours with necessary pipes, lowering and removing the pipes in well etc., with all equipments etc. complete.

Bore well drilled shall be first developed by suitable compressor for 12 hours and observation of water coming out, shall be made for, sand particles in water shall be noted. Arrangement of "V" notch weir shall be made for measuring the water flow for yield with marking on the same. A chart showing the discharge with various depth of flow from V notch shall be submitted.
After compressor test is over, pump for running test yield test shall be arranged for 12 hours pumping for desired yield and the flow shall be measured with V notch weir. Results observed may be submitted. Draw down level for water in each case be noted and submitted and time taken for equipment shall be also noted and submitted. All observation shall be made and noted in presence of representation from GETCO. Due to pumping any difference in gravel packing level shall be observed, and qty, required to bring to top shall be also noted & informed & filled up.
Rate quoted shall be lump sump for above tests with all necessary equipments, tools, tackles, machineries etc. complete required for the job.

Providing water logging test with electro logging equipment and arranging for water potability test including defining the water availability test, chemical and bacteriological analysis of water sample as per parameters for drinking water sample from PH engineering lab or any Government body, etc. complete as directed.

Water logging test, with electro logging equipment, may be carried out in presence of authorized agent of Engineer-in-charge. Potability of water shall be got tested in Government, public health laboratory or other recognized laboratory approved by Engineer-in-charge. Results obtained shall be submitted. Total availability of water from bore and maximum discharge available, type of pump with it's capacity recommended shall be also obtained from authorized agency experienced in the work of from recognized institute as approved by Engineer-in-charge. Details of all test carried out with their observations and inference shall be informed.
Payment shall be made after completion of entire job on the basis of each job work completed.

Providing and fixing top cap for 200mm ∅ pipe, clamps and socket and other accessories required for completing for completing the job.

The cap for 200mm ∅ socket shall be provided on the well drilled so that pipe do not get chocked with foreign materials and no one can play misSuperintending. One clamp for supporting the pipe line lowered

in the well shall be provided at floor level/ground level so that pipe may not run down in the well due to any accident, Socket shall be provided on the top of pipe. All the work shall be carried out as directed by Engineer-in-charge.
Rate quoted shall be lump sump for all above providing and fixing including welding, fabrication etc., necessary.

Supplying and Lowering the Kalama or KSB Kalama/ Jyoti / Kirloskar / Amrut make submersible pump of 4 HP X 12 stage in bore well etc., completed as directed including ISI approved MEI type oil immersed auto transformer starter commissioning and testing to required delivery head. (ALL OTHER ACCESSORIES WILL BE PAID SEPERATELY.)

4.0 H.P. 12 stage submersible pump with motor of I.S.I. mark and approved make shall be supplied and installed as directed. Rate quoted shall be for supplying, installing with all labour, materials, tools, tackles etc. and giving test to required delivery head as directed by Engineer-in-charge with manufacturers guarantee for satisfactory performance of pump and motor for minimum period of one year.
Extra for one H.P. additional capacity mortar.
Rate shall be quoted for additional one H.P. capacity of the motor specified in the above noted item.

Extra for one stage additional capacity for pump.

Rate shall be quoted for additional one stage of the pump specified in the above noted item no. 101.

Providing & Fixing panel BOARD of metal box with a main fuse connection, Ampere meter, Voltmeter 30 Amp, 3 phase switch single phase preventor cum water level guard and male and female type socket 3 phase indicator lamps and toggle switch etc., including all wiring / earthing complete as directed by E.I.C.

A panel BOARD of T.W. 20mm thick shall be of the specified dimension required for the all the assessorial described in the item. All the accessories shall be as per I.S. specifications and shall be of approved make. All the accessories shall be as per I.S. specification and shall be of approved make. All accessories shall be connected with copper wire/cable suitable for 30 Amp. load, connected with indicator lamps etc., as directed by Engineer-in-charge.
Payment shall be for BOARD with all accessories, wiring, etc., on lump sump basis.

Providing and joining 4mm flat copper sufficient for 7.5 H.P. pump set etc. complete as directed.

4mm flat copper cable suitable for 20 H.P. pump shall confirm to I. S. specification and to approved make. Cable shall be jointed or fixed by licensed electrical supervisor only with necessary precaution and materials required for connection and joining.
Payment shall be made in running meter of the cable supplied and fixed.

Providing & fixing and lowering Ashirvad make required dia uPVC column pipe (standard pipe) with coupling and wire lock, O ring, rubber gasket, APPL marked bottom and top adaptor and pump guard with flange set as per requirement and specification, closing, clamping, etc. with required bend, plug etc. complete as directed by E.I.C. The pump shall be additionally supported by 2 nos. of 4mm dia GI HT wires along the entire length of column pipes and shall be taken out of the borewell and fixed with casing pipe etc. complete as directed by the Engineer – in – Charge.

uPVC Ashirvad make required dia square threaded column pipe with coupling and wire lock, O ring, rubber gasket, APPL marked bottom and top adaptor and pump guard with flange set shall be provided and installed in the well as directed. Pipe shall be lowered slowly so that drilled well is not damaged or collapsed on some portion. Pipes shall be joined by screwing male and female end as per manufacturer's instruction and specifications and couplers shall be locked with special wire lock system to ensure that during installation and removal of the pumps the coupler does not come out resulting in column slippage. Necessary arrangement for lowering pipe shall be made by the contractor. After the pipe line is lowered completely and cleaned it shall be covered at top.

The pump fixed at the bottom of the pipe shall be supported additionally on 2 nos. of 4mm dia GI HT wires passed along the entire length of the column pipes and taken out of the casing pipe and fixed with casing pipe top so that pump is restricted from falling inside the drilled borewell.

Rate shall be quoted for the diameter of pipe specified with all the operations and materials required with plant, machinery, tools and tackles etc., for completing the item. Payment shall be made on pipe lowered as above on Rmt basis.

Box cutting the road surface to proper slope and camber for making the base of road work including removing the excavated stuff and depositing on the road side slope as directed up to 50 mtr lead .

Cutting shall be done in proper grade and camber as per measurements given. Care must be taken that the tall slopes are evenly and truly dressed. Cutting shall be done to the exact depth required and shall be as per formation level in proper grade and the camber. If extra depth of cutting is done due to negligence of the contractor the same shall be refilled with approved quality of materials duly consolidated to the satisfaction of the Engineer – in – Charge (without any extra cost). Box cutting for soling and metalling in required width and the depth shall be done.

The stuff received from the cutting shall be utilized for filling cuts and correcting side slopes of band with all lead and lift as directed. Useful stuff shall be carefully stacked separately as directed.

The measurement shall be taken as per cross sectional measurement of the cutting based on length, breadth, depth measured with tape at every 25 metres interval.
The payment shall be made on Cmt. basis.

Providing & laying cement sealing work for the drilled bore-well hole to stop entry of upward salty water including clay packing as required in proper manner or suggested by geologist to required depth at site as directed by Engineer-in-charge etc. completed.

Specification for the item shall be as per item description.
Payment will be done on the basis of job work after completion of entire job.

Providing cement pointing in C.M.(1:1) including racking out of joints, scaffolding, curing finishing etc., completed as directed by E.I.C.

Before pointing work is taken up joints, if not racked shall be racked out for proper bondage. Surface shall be wetted with water and joints cleaned. Sand and cement are mixed in equal proportion. The mortar shall be pressed in the joints just sufficient to cover up the joint only. Horizontal and vertical impression shall be made with nail or M.S. flat piece. The impression shall be 6mm wide and 6mm deep freely horizontal and vertical. Pointed surface shall be kept wet for minimum 10 days. Sample of pointing to be got approved from Engineer in charge before starting work.

Rate quoted shall be inclusive of scaffolding and working at all levels. Payment shall be made for actual sq. metres of area provided with pointing.

Uncoursed rubble masonry with hard stone of approved quality in foundation and plinth in cement mortar 1:6(1 cement : 6 course sand) including levelling up etc complete

1.0 Materials :
The cement mortar shall conform to M-11. stones shall conform to M-16.
2.0 Workmanship :
2.1 Dressing of stones :
Stone used for uncoursed rubble masonry work shall be hammer dressed on the sides, and beds in such a way as to close up with the adjacent stone in the masonry work as strongly as possible. The face stone shall be dressed in such a manner as to give a specified pattern such as blygonal tucing etc. the face of the stones shall be so dressed that bushing on the exposed face shall not project by more than 40mm from the general wall surface and on the face to be plastered. It shall not project by more than 19mm nor shall have depressions more than 10mm from the average wall surface.
2.2 Laying :

All the stone shall sufficiently wetted before laying to prevent absorption from mortar. The wall shall be built true to plumb (or true to required batter when so specified). All connected walls in a structure shall normally be raised up uniformly and regularly. However, if for any specific reason, one part of masonry is required to be left behind, the wall shall be racked back at an angle not steeper than 45°. Vertical toothed joints in masonry shall not be allowed. The work shall be carried out regularly and masonry of any day will not be raised by more than 1 metre in height.

2.3 The stone shall be laid in an uncoursed fashion or random facing etc. However the masonry is required to be brought to level at various stages viz. plinth level, window sill level, roof level and any other level specifically shown in the drawings. This may be done by first adjusting the laying of stones to one level and then providing leveling course of cement concrete 1:6:12 (1 cement : 6 sand : 12 graded stone aggregate 20mm nominal size) or as otherwise specified.

2.4 Proper bonding shall be achieved by closely filling in adjacent stones as well as by using bond stones or through stones as described herein below. Face stone shall extend back sufficiently and bond well with the masonry. The stone shall be carefully set so as to break joints and avoid formation of vertical joints. The depth of stone from face of the wall inwards shall not be less than width or breadth at the face. The hearting or interior filling of the wall shall consist of rubble stones which may be of any shape. Neither the face stone nor the hearting stone shall be so small to pass through circular ring of 150mm internal diameter in any direction nor shall any of them shall have minimum thickness 100mm.

2.5 All stone shall be carefully laid, hammered down by a wooden mallet into position and solidly embedded in mortar, chips and spawls of stone may be used wherever necessary to avoid thick mortar beds or joints at the same time ensuring that no hollow space is left anywhere in the masonry. The chips shall not be more than 20% of volume of masonry. The hearting shall be laid nearly level with face stones except that at about one metre intervals vertical bond stone or plums projecting about 150 to 200 mm shall be firmly embedded to form vertical bonding in masonry.

2.6 Bond Stones :

Bond stones or through stones running right across the thickness of wall shall be provided in walls upto 600mm thick. In thicker walls two stones overlapping each other by at least 150mm shall be provided across the thickness of the wall to form bond stones. There shall be atleast one bond stone for every 0.5 sq. m. of wall surface. The bond stone shall be marked by a distinguishing letter during construction for subsequent verification and shall be laid staggered in subsequent layers.

2.7 Quoins :

The quoins or corners stone shall be selected stone nearly dressed with hammer and / or chisel to form the required corner angle and laid header and stretcher alternatively. The bed and top surface of quoins shall be chiseled dressed to give horizontal joints. The quoins shall have a uniform chisel draft of at least 25mm width at four edges of each exposed face, all the edges of the same face being in one plane. No quoins stone shall be smaller than 0.025 cum. in volume.

2.8 Jamb stones :

The jamb stone shall be made with stone specified for quoins, except that the stone provided on the jambs shall have their length equal to thickness of wall upto 600mm and a line of headers shall be provided for walls thicker than 600mm as specified for bone.

2.9 Joints :

All the joints shall be completely filled with mortar and their width shall not exceed 25mm. When plastering or pointing is not required to be done, the joints shall be struck flush and finished simultaneously while laying the stone. Otherwise the joints shall be racked to a minimum depth of 20mm by a racking tools during progress of laying while mortar is still green.

2.10 Scaffolding :

Single or double scaffolding shall be used. The scaffolding shall be strong and sound. The holes left in masonry for supporting scaffolding shall be filled and made good before plastering.

2.11 Curing :

Green work shall be protected from rains by suitably covering the same. Masonry shall be kept constantly moist on all the faces for a period of at least 7 days. The top of masonry shall be flooded at the close of the day.

3.0 Mode of measurement and payment :

3.1 All work shall be measured on the basis of finished dimensions and measured net except where otherwise specified. Only specified dimensions shall be allowed. Anything extra shall be ignored. The masonry work in foundation and plinth shall be measured under this item. No deduction shall be made nor extra payment made for the following :

(a) Ends of joints, beams, posts, girders, rafters, purlins, trusses, corbels, etc. each upto 500 sq. cm. In section.
(b) Opening each upto 0.1 sq. cm.
(c) Wall plates and bed plates bearings of chhaja and like upto 10 cm. Depth (bearing of floor and roof slabs shall be deducted from masonry).
(d) Drain holes and recesses for cement concrete blocks to embed hold fasts for doors, windows, etc.
(e) Building in the masonry iron fixtures, pipes upto 300mm dia hold fasts of doors and windows.
(f) Forming chases in masonry upto section of 350 sq. cm.
3.2 The rate shall be for a unit of one cubic metre.

Providing & fixing approved quality FRP door having FRP frame of size 100x50mm & 28mm thick FRP shutter with Depressed Panel shutter having extra reinforcement on side and edges and in Gel coat finish. The core of the shutter is to be filled up with injected fiber extinguishing grade polyurethane foam done in situ along with embedded wooden pieces for stiffening and also for fixing hinges and fixtures. The whole FRP frame and shutter is to be water proof, weather proof, termite proof and resistance to mild acid/Alkali resistance including SS hinges with necessary screws and aluminum fixture and fastenings etc complete. 28mm th. shutter & 100x50mm frame.

Specification shall be as per item description.

Payment shall be given on the basis of sq. m. and shall be measured out to out of the door shutter and shall not include wastage, if any and will be inclusive of tools, tackles, labour, transportation, etc. required to complete the item.

Providing & fixing approved quality FRP door having FRP frame of size 125x65mm & 35mm thick FRP shutter with Depressed Panel shutter having extra reinforcement on side and edges and in Gel coat finish. The core of the shutter is to be filled up with injected fiber extinguishing grade polyurethane foam done in situ along with embedded wooden pieces for stiffening and also for fixing hinges and fixtures. The whole FRP frame and shutter is to be water proof, weather proof, termite proof and resistance to mild acid/Alkali resistance including SS hinges with necessary screws and aluminum fixture and fastenings etc complete. 35mm th. shutter & 125x65mm frame.

Specification shall be as per item description.

Payment shall be given on the basis of sq. m. and shall be measured out to out of the door shutter and shall not include wastage, if any and will be inclusive of tools, tackles, labour, transportation, etc. required to complete the item.

Providing and fixing 30mm thick factory made PVC rigid foam paneled door shutters manufactured by Rajshri or its equivalent made from MS tube of 19 gauge thickness, size 19 x 19mm for styles and 15 x 15mm for top and bottom rails, covered with heat moulded PVC "C" channel of 6mm thick sheet and 30 x 50mm wide to form styles and 5mm thick and 75mm wide PVC sheets for top rail, lock rail and bottom rail on either side and 5mm thick, 20mm wide cross PVC sheet as gap insert for top rail and bottom rail, paneling of 5mm thick PVC sheet fitted in MS frame welded/sealed to the styles and rails with 5 x 30mm PVC sheet beading on either side and joined together with solvent cement adhesive etc. complete as per manufacturer's specification and direction of EIC fixed to frames with 4 nos. of powder coated butt hinges. (For W.C. and bathroom shutters)

Specification shall be as per item description.

Payment shall be given on the basis of sq. m. and shall be measured out to out of the door shutter and shall not include wastage, if any and will be inclusive of tools, tackles, labour, transportation, etc. required to complete the item.

Providing and fixing factory made PVC door frame manufactured by M/s. Rajshri or its equivalent of size 50 x 47 mm with a wall thickness of 5mm made out of extruded 5mm rigid PVC foam sheet mitred at corners and joined with 2 nos. of 150mm long brackets of 15 x 15 mm MS square tube,

the vertical door profiles to be reinforced with 19x19mm MS square tube of 19 gauge, EPDM rubber gasket weather seal to be provided throughout the frame. the door frame to be fixed to the wall using MS screws of 65/100mm size complete as per manufacturer's specifications etc. complete as directed.

Specification shall be as per item description.

Payment shall be made on the basis of running metre of the frame fixed and shall not include wastage, if any and will be inclusive of tools, tackles, labour , transportation, etc. required to complete the item.

Providing B.B. Masonry chamber for earthing pit of approved size and drawing including 40 mm thick. PSC cover with 25mm dia. hole in centre for watering, necessary excavation bottom concreting of 150mm thick BBCC (1:4:8) below RCC 1:2:4 lintel beam only, with 2 Nos. of lintel beam of size 1.52 x 0.23 x 0.15 and 2 Nos. of lintel beam of size 1.06 x 0.23 x 0.15 out to out with 5 Nos. of 8 mm dia. bars & 6mm dia., 11 Nos. rings, and 4 Nos. of 8mm dia. bars & 6mm 5 Nos. rings respectively, 225mm thick B.B. masonry in CM (1:6), 12mm thick. Cement plaster in CM (1:3) inside as per requirement (without bottom) and to all exposed faces upto 300mm below, including disposal of excavated earth within or outside S/S premises for any lead including making groove at top of masonry wall for fixing 40mm thick PSC cover flush to top of man hole, 3 coats of white or colour wash to all exposed finished surface & green colour oil paint to PSC cover etc. complete as directed by E.I.C.

A 600 x 600 clear size with BB masonry upto 1000mm depth.

B.B. masonry inspection chamber (manhole) of specified size, item shall be constructed at location shown with base concrete of (1:4:8) B.B.C.C. 150mm thick, 225mm thick. Brick masonry wall in c.m. (1:6) shall be constructed of width as per drawing or as per details furnished on site. Plastering inside including bottom and outside 300mm below final ground level shall be provided in c.m. (1:3) 12mm thick. Curing the cement work, fixing P. S. C. manhole cover as per size of the chamber including necessary excavation, backfilling, disposed off surplus earth etc., complete, necessary chamber shall be provided with slope in bottom P. S. C. cover shall be painted with 3 coats of green colour oil paint of approved make.

Specification of earth work and backfilling of section B, specification of brick masonry of section C, specification of concrete of section D, and plastering section E shall be followed.

Payment shall be made on number of chamber constructed of the size specified in the tender with all operations as per item.

Providing and fixing galvanized chain link jali 2" 10 x 10 gauge inserting 2 nos. of 4mm dia GI HT wire at top and bottom along the length in alternate links and fixing the same with angle supports using GI wires of appropriate size or GI 'U' pin approved by EIC including transportation, cutting, wastage. Joints shall be aligned at angle supports only.

Galvenized chain link jali having 2" (50mm) 10x 10 gauge wire and 2 metre height shall be used for execution of this item. The chain link jali shall be fixed with angle supports using 4mm dia GI HT wire at top and bottom passed through alternate links. To give sufficient fixity with angle supports extra GI wire shall be wound through links and along the supports or GI 'U" pins shall be used to fix the jali with angle supports as directed by the engineer – in – Charge.

Joints shall be aligned at the supports and an overlap of minimum 300 mm shall be given where jali ends.

Payment shall be made on the basis of running metre.

Supplying & Stacking rubble stone of approved quality for road soling of about 200 to 250 mm. size including transportation, stacking rubble close in rectangular stack etc., complete as directed by E.I.C. (FOR VOIDS 25% WILL BE DEDUCTED.)

Rubble of approved quality and size specified shall be supplied. Rubble shall conform to material specification M-16. Only rubble of required size shall be supplied and no undersize rubble shall be accepted. Rubble shall be stacked at the place shown in regular stacks of the size approved by the engineer – in – Charge.

Payment shall be made on stack measurement basis on cubic metre. 25 % of the quantity arrived at shall be deducted for voids.

Labour charges for laying rubble in 225 mm. thick layer for soling with required grade & camber & filling the voids with small size of chips and earth & watering consolidating by 8 to 10 tonnes power roller etc., complete as directed by E.I.C.

The rubble collected and stacked on site shall be used for soling work. Soling shall be done in such a manner that the required thickness of 225mm is obtained after the rolling. The rubble shall be provided close so as to leave minimum voids. All the voids shall be filled with small size chips of the same quality of rubble, when soling and filling is completed it shall be got checked and finally the yellow earth shall be spread over it. The surface shall be rolled dry with 8 to 10 tonnes roller and the voids shall be filled up by brooming. The surface shall be watered and rolled again and broomed so that all the voids are filled up. Due care shall be taken to see that the required grade and camber are maintained. The rolling shall be done as instructed by the Engineer-in-charge so that no undulation or wavy surface is obtained. The rolling operation shall be repeated for required final surface is obtained as desired.

The rate quoted shall be for all labour, tools, tackles, machineries etc. The measurements shall be paid on actual Sq. Meter of the work carried out.

Boring holes in ordinary soil, sand, clay soft murrum, hard murrum and soft rock (for cast in situ piles) under ream piles of 350 MM diameter up to 4.0 M depth from GL with two bulbs in each pile as per dimension and position, as per drawing including using the Bentonite as per requirement during drilling including all tools and tackles, labours and drilling equipment, manually or mechanically etc. complete as directed include disposing the stuff to a lead of 500 Mtr. radius as directed by E.I.C. (The concreting & reinforcement will be paid separately in respective items).

1.0 Workmanship :

1.1 The ground shall be roughly leveled and after marking the position of piles, the holes shall be bored with aspiral angle to the 4.0m depth and specified diameter using boring guide.

1.2 The bore holes shall be truly vertical and uniform bore throughout of specified diameter. After boring to the required depth, the bore shall be cleared off the loose soil and disposal of surplus excavated stuff as directed up to a lead of 500 metres.

1.3 The bore shall be enlarged at two places at the specified depth by an under reamer 2 to 2 ½ times the diameter of the bore to make a bulb as directed. It shall be ensured that the bore for the pile shall be enlarged to the correct diameter.

2.0 Mode of measurement and payments :

2.1 The rate of boring holes shall include :

(a) Roughly leveling the ground in positions where piles are to be provided.

(b) Marking the position of piles by pegs and boring guide and also for shifting of boring guide.

(c) Making of two nos. of bulbs.

(c) Bailing out water, if any met with during boring.

(d) Disposal of surplus excavated soil within a lead of 50m and

(e) All tools, plants, equipments and labour, materials like Bentonite, etc. required for satisfactory completion of work.

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

Providing & Fixing special G.I. 'R' brand or I.S.I. approved quality fittings including cutting the pipe, threading, making water tight joints etc., complete as directed by E.I.C. 50mm dia bend

All the fittings shall be heavy type 'R' brand or as per ISI standard for drinking water supply line. Fittings shall be fixed to the line with threading of pipe etc. and joint shall be made water tight as described in general specifications.

Payment shall be made for number supplied and fixed in line as per drawing or as instructed.

Disposing off the excavated stuff of the items of excavation for lead of 400 to 500 metres. For any lead less than the above, rate shall be reduced as per R&B SOR

Unsuitable materials obtained from clearing site and excavation shall be disposed off within the lead specified and as directed beyond the building area using necessary tools, tackles, equipments etc.

Payment shall be made on the cu. Metre basis for the material disposed off for specified lead. If required contractor may be asked to dispose off the stuff at a lesser lead for which rate will be reduced as per R&B SOR year 2015-16 for concern district. The rate is inclusive of all labour, tools, tackles, equipments, etc.

Drilling of bore of 300mm & 400 mm diameter as per approved design in all type of strata approximately upto 10-12metre depth (from excavated GL) for bore of RCC cast-in-situ type bored piles including procurement and using bentonite and/ or other equivalent compound as required. (no extra payment shall be made for empty bore i.e. from bed level to platform) with all plants and equipments.

1.0 Workmanship :

1.1 The ground shall be roughly leveled and after marking the position of piles, the holes shall be bored with aspiral angle to the 4.0m depth and specified diameter using boring guide.

1.2 The bore holes shall be truly vertical and uniform bore throughout of specified diameter. After boring to the required depth, the bore shall be cleared off the loose soil and disposal of surplus excavated stuff as directed up to a lead of 500 metres.

1.3 The bore shall be enlarged at two places at the specified depth by an under reamer 2 to 2 ½ times the diameter of the bore to make a bulb as directed. It shall be ensured that the bore for the pile shall be enlarged to the correct diameter.

2.0 Mode of measurement and payments :

2.1 The rate of boring holes shall include :

(a) Roughly leveling the ground in positions where piles are to be provided.

(b) Marking the position of piles by pegs and boring guide and also for shifting of boring guide.

(c) Making of two nos. of bulbs.

(c) Bailing out water, if any met with during boring.

(d) Disposal of surplus excavated soil within a lead of 50m and

(e) All tools, plants, equipments and labour, materials like Bentonite, etc. required for satisfactory completion of work.

Annexure A : Tech. Speci. For GSB, WBM and RCC Trimix Road work	
IN	**Granular Sub Base (GSB)**
	1.1 Scope This work shall consist of laying and compacting well-graded material on prepared subgrade in accordance with the requirements of these Specifications. The material shall be laid in one or more layers as sub-base or lower sub-base and upper sub-base (termed as sub- base hereinafter) as necessary according to lines, grades and cross-sections shown on the drawings or as directed by the Engineer. **1.2 Materials** 1.2.1 The material to be used for the work shall be natural sand, crushed gravel, crushed stone, crushed slag, or combination thereof depending upon the grading required. The material shall be free from organic or other deleterious constituents and shall conform to the grading given in Table -1 and physical requirements given in Table-2. Grading's III and IV shall preferably be used in lower sub-base. Grading's V and VI shall be used as a sub-base-cum-drainage layer. The grading to be adopted for a project shall be as specified in the

Contract. Where the sub-base is laid in two layers as upper sub-base and lower sub-base, the thickness of each layer shall not be less than 150 mm.

1.2.2 If the water absorption of the aggregates determined as per IS:2386 (Part 3) is greater than 2 percent, the aggregates shall be tested for Wet Aggregate Impact Value (AIV) (IS:5640).

Table 1 : Grading for Granular sub-base Materials

IS Sieve designation	Percent by weight passing the is Sieve					
	Grading I	Grading II	Grading III	Grading IV	Grading V	Grading VI
75.0 mm	100	-	-	-	100	-
53.0 mm	80-100	100	100	100	80-100	100
26.5 mm	55 –90	70-100	55-75	50-80	55-90	75-100
9.50 mm	35-65	50-80	–	–	35-65	55-75
4.75 mm	25 – 55	40-65	10-30	15-35	25-50	30-55
2.36 mm	20- 40	30-50	–	–	10-20	10-25
0.85 mm	–	–	–	–	2-10	–
0.425 mm	10-15	10- 15	–	–	0-5	0-8
0.075 mm	<5	< 5	< 5	< 5	–	0-3

Table 2 : Physical requirements for Materials for Granular sub-base

Aggregate Impact Value (AIV)	IS:2386 (Part 4) or IS:5640	40 maximum
Liquid Limit	IS:2720 (Part 5)	Maximum 25
Plasticity Index	IS:2720 (Part 5)	Maximum 6
CBR at 98% dry density (at IS:2720-Part 8)	IS:2720 (Part 5)	Minimum 30 unless otherwise specified in the Contract

1.3 Construction Operations

1.3.1: Preparation of sub-grade

Immediately prior to the laying of sub-base, the subgrade already finished to MoRTH Clause 301 or 305 as applicable shall be prepared by removing all vegetation and other extraneous matter, lightly sprinkled with water, if necessary and rolled with two passes of 80–100 kN smooth wheeled roller.

1.3.2 Spreading and Compacting

The sub-base material of the grading specified in the Contract and water shall be mixed mechanically by a suitable mixer equipped with provision for controlled addition of water and mechanical mixing. So as to ensure homogenous and uniform mix. The required water content shall be determined in accordance with IS:2720 (Part 8). The mix shall be spread on the prepared subgrade with the help of a motor grader of adequate capacity, its blade having hydraulic controls suitable for initial adjustment and for maintaining the required slope and grade during the operation, or other means as approved by the Engineer.

Moisture content of the mix shall be checked in accordance with IS:2720 (Part 2) and suitably adjusted so that, at the time of compaction, it is from 1 to 2 percent below the optimum moisture content.

Immediately after spreading the mix, rolling shall be done by an approved roller. If the thickness of the compacted layer does not exceed 100 mm, a smooth wheeled roller of 80 to 100 kN weight may be used. For a compacted single layer up to 200 mm the compaction shall be done with the help of a vibratory roller of minimum 80 to 100 kN static weight capable of achieving the required compaction. Rolling shall commence at the lower edge and proceed towards the upper edge longitudinally for portions having unidirectional cross fall or on super elevation. For carriageway having cross fall on both sides, rolling shall commence at the edges and progress towards the crown.

Each pass of the roller shall uniformly overlap not less than one-third of the track made in the preceding pass. During rolling, the grade and cross fall (camber) shall be checked and any high spots or depressions which become apparent, corrected by removing or adding fresh material. The speed of the roller shall not exceed 5 km per hour.

Rolling shall be continued till the density achieved is at least 98 percent of the maximum dry density for the material determined as per IS:2720 (Part 8). The surface of any layer of material on completion of compaction shall be well closed, free from movement under compaction equipment and from compaction planes, ridges, cracks or loose material. All loose, segregated or otherwise defective areas shall be made good to the full thickness of layer and re-compacted.

1.4 Surface finish and Quality control of work

The surface finish of construction shall conform to the requirements of MoRTH Clause 902. Control on the quality of materials and works shall be exercised by the Engineer in accordance with MoRTH Section 900.

1.5 Mode of Measurements:

Granular sub-base shall be measured as finished work in position in cubic meters.

The protection of edges of granular sub-base extended over the full formation as shown in the drawing shall be considered incidental to the work of providing granular sub-base and as such no extra payment shall be made for the same.

1.7 Rate

The Contract unit rate for granular sub-base shall be payment in full for carrying out the required operations including full compensation for:

i) Making arrangements for traffic except for initial treatment to verges, shoulders and construction of diversions;
ii) Supplying all materials to be incorporated in the work including all royalties, fees, rents where applicable with all leads and lifts;
iii) Carrying out the work in part widths of road where directed

IN **Wet Mix Macadam Sub-Base / Base**

1. Scope

This work shall consist of laying and compacting clean, crushed, graded aggregate and granular material, premixed with water, to a dense mass on a prepared sub-grade/sub- base/ base or existing pavement as the case may be in accordance with the requirements of these Specifications. The material shall be laid in one or more layers as necessary to lines, grades and cross-sections shown on the approved drawings or as directed by the Engineer.

The thickness of a single compacted Wet Mix Macadam layer shall not be less than 75 mm. When vibrating or other approved types of compacting equipment are used, the compacted depth of a single layer of the sub-base course may be up to 200 mm with the approval of the Engineer.

2. Materials

2.1 Aggregates

2.1.1 Physical requirements

Coarse aggregates shall be crushed stone. If crushed gravel/shingle is used, not less than 90 percent by weight of the gravel/shingle pieces retained on 4.75 mm sieve shall have at

least two fractured faces. The aggregates shall conform to the physical requirements set forth in Table -1.

If the water absorption value of the coarse aggregate is greater than 2 percent, the soundness test shall be carried out on the material delivered to site as per IS:2386 (Part-5).

Table -1: Physical requirements of coarse aggregates for wet Mix Macadam

SN	Test	Test Method	Requirements
1)	Los Angeles Abrasion value or Aggregate Impact value	IS:2386 (Part-4) IS:2386 (Part-4) or IS:5640	40 percent (Max.) 30 percent (Max.)
2)	Combined Flakiness and Elongation indices (Total)	IS:2386 (Part-1)	35 percent (Max.)*

*To determine this combined proportion, the flaky stone from a representative sample should first be separated out. Flakiness index is weight of flaky stone metal divided by weight of stone sample. Only the elongated particles be separated out from the remaining (non-flaky) stone metal. Elongation index is weight of elongated particles divided by total non-flaky particles. The values of flakiness index and elongation index so found are added up.

2.1.2 Grading Requirements

The aggregates shall conform to the grading given in Table -2.

Table -2 : Grading Requirements of aggregates Wet Mix Macadam

IS Sieve designation	Percent by weight passing the is sieve
53.00 mm	100
45.00 mm	95–100
26.50 mm	–
22.40 mm	60–80
11.20 mm	40–60
4.75 mm	25–40
2.36 mm	15–30
600.00 micron	8–22
75.00 micron	0–5

Material finer than 425 micron shall have Plasticity Index (PI) not exceeding 6.

The final gradation approved within these limits shall be graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve or vice versa.

3. Construction Operations

3.1 Preparation of Base

The surface of the sub-grade/sub-base/base to receive the water bound macadam / wet mix macadam course shall be prepared to the specified grade and camber and cleaned of dust, dirt and other extraneous material. Any ruts or soft yielding places shall be corrected in an approved manner and rolled until firm surface is obtained.

Where the WMM is to be laid on an existing metaled road, damaged area including depressions and potholes shall be repaired and made good with the suitable material. The existing surface shall be scarified and re-shaped to the required grade and camber before spreading the coarse aggregate for WMM.

3.2 Provision of Lateral Confinement of Aggregates

While constructing wet mix macadam, arrangement shall be made for the lateral confinement of wet mix. This shall be done by laying materials in adjoining shoulders along with that of wet mix macadam layer and following the sequence of operations.

3.3 Preparation of Mix

Wet Mix Macadam shall be prepared in an approved mixing plant of suitable capacity having provision for controlled addition of water and forced/ positive mixing arrangement like pug mill or pan type mixer of concrete batching plant. The plant shall have following features:

i) For feeding aggregates– three/ four bin feeders with variable speed motor
ii) Vibrating screen for removal of oversize aggregates
iii) Conveyor Belt
iv) Controlled system for addition of water
v) Forced/positive mixing arrangement like pug-mill or pan type mixer
vi) Centralized control panel for sequential operation of various devices and precise process control
vii) Safety devices

Optimum moisture for mixing shall be determined in accordance with IS:2720 (Part-8) after replacing the aggregate fraction retained on 22.4 mm sieve with material of 4.75 mm to 22.4 mm size. While adding water, due allowance should be made for evaporation losses. However, at the time of compaction, water in the wet mix should not vary from the optimum value by more than agreed limits. The mixed material should be uniformly wet and no segregation should be permitted.

3.4 Spreading of Mix

Immediately after mixing, the aggregates shall be spread uniformly and evenly upon the prepared sub-grade/sub-base/base in required quantities. In no case shall these be dumped in heaps directly on the area where these are to be laid nor shall their hauling over a partly completed stretch be permitted.

The mix may be spread by a paver finisher. The paver finisher shall be self-propelled of adequate capacity with following features:

i) Loading hoppers and suitable distribution system, so as to provide a smooth uninterrupted material flow for different layer thicknesses from the tipper to the screed.
ii) Hydraulically operated telescopic screed for paving width upto to 8.5 m and fixed screed beyond this. The screed shall have tamping and vibrating arrangement for initial compaction of the layer.
iii) Automatic levelling control system with electronic sensing device to maintain mat thickness and cross slope of mat during laying procedure.

In exceptional cases where it is not possible for the paver to be utilized, mechanical means like motor grader may be used with the prior approval of the Engineer. The motor grader shall be capable of spreading the material uniformly all over the surface.

The surface of the aggregate shall be carefully checked with templates and all high or low spots remedied by removing or adding aggregate as may be required. The layer may be tested by depth blocks during construction. No segregation of larger and fine particles should be allowed. The aggregates as spread should be of uniform gradation with no pockets of fine materials.

The Engineer may permit manual mixing and /or laying of wet mix macadam where small quantity of wet mix macadam is to be executed. Manual mixing/laying in inaccessible/ remote locations and in situations where use of machinery is not feasible can also be permitted. Where manual mixing/laying is intended to be used, the same shall be done with the approval of the Engineer.

3.5 Compaction

After the mix has been laid to the required thickness, grade and cross fall/camber the same shall be uniformly compacted to the full depth with suitable roller. If the thickness of single compacted layer does not exceed 100 mm, a smooth wheel roller of 80 to 100kN weight may

be used. For a compacted single layer up to 200 mm, the compaction shall be done with the help of vibratory roller of minimum static weight of 80 to 100 kN with an arrangement for adjusting the frequency and amplitude. An appropriate frequency and amplitude may be selected. The speed of the roller shall not exceed 5 km/h.

In portions having unidirectional cross fall/ super elevation, rolling shall commence from the lower edge and progress gradually towards the upper edge. Thereafter, roller should progress parallel to the center line of the road, uniformly over-lapping each preceding track by at least one-third width until the entire surface has been rolled. Alternate trips of the roller shall be terminated in stops at least 1 m away from any preceding stop.

In portions in camber, rolling should begin at the edge with the roller running forward and backward until the edges have been firmly compacted. The roller shall then progress gradually towards the center parallel to the center line of the road uniformly overlapping each of the preceding track by at least one-third width until the entire surface has been rolled.

Any displacement occurring as a result of reversing of the direction of a roller or from any other cause shall be corrected at once as specified and/or removed and made good. Along forms, kerbs, walls or other places not accessible to the roller, the mixture shall be thoroughly compacted with mechanical tampers or a plate compactor. Skin patching of an area without scarifying the surface to permit proper bonding of the added material shall not be permitted.

Rolling should not be done when the sub-grade is soft or yielding or when it causes a wavelike motion in the sub-base/base course or sub-grade. If irregularities develop during rolling which exceed 12 mm when tested with a 3 m straight edge, the surface should be loosened and premixed material added or removed as required before rolling again so as to achieve a uniform surface conforming to the desired grade and cross fall. In no case shall the use of unmixed material be permitted to make up the depressions.

Rolling shall be continued till the density achieved is at least 98 percent of the maximum dry density for the material as determined by the method outlined in IS:2720 (Part-8).

After completion, the surface of any finished layer shall be well-closed, free from movement under compaction equipment or any compaction planes, ridges, cracks and loose material. All loose, segregated or otherwise defective areas shall be made good to the full thickness of the layer and re -compacted.

3.6 Setting and Drying

After final compaction of wet mix macadam course, the road shall be allowed to dry for 24 hours.

4. Opening to Traffic

No vehicular traffic shall be allowed on the finished wet mix macadam surface. Construction equipment may be allowed with the approval of the Engineer.

5. Surface finish and Quality Control of work

5.1 Surface Evenness

The surface finish of construction shall conform to the requirements of MoRTH Clause 902.

5.2 Quality control

Control on the quality of materials and works shall be exercised by the Engineer in accordance with MoRTH Section 900.

6. Rectification of Surface Irregularity

Where the surface irregularity of the wet mix macadam course exceeds the permissible tolerances or where the course is otherwise defective due to sub-grade soil getting mixed with the aggregates, the full thickness of the layer shall be scarified over the affected area, re-shaped with added premixed material or removed and replaced with fresh premixed material as applicable and recomputed in accordance with MoRTH Clause 406.3. The area treated in the aforesaid manner shall not be less than 5 m long and 2 m wide. In no case shall depressions be filled up with unmixed and ungraded material or fines.

7. Arrangement for Traffic

	During the period of construction, arrangements for traffic shall be done as per MoRTH Clause 112. **8. Mode of Measurements:** Wet mix macadam shall be measured as finished work in position in cubic meters..
IN	**RCC Trimix Road**
	1. Materials: Water, Cement, Sand, Coarse Aggregate, Grit, Stone aggregate, Reinforcement Steel, sealent shall confirm to appropriate material clause and relevant IS. **2.Steel Forms** All side forms shall be of mild steel. The steel forms shall be of M.S. Channel sections and their depth shall be equal to the thickness of the pavement. The side forms shall have a length of at least 3.0 metres except on curves of less than 4.5 metres radius where shorter lengths may be used. When set to grade and stacked in place the maximum deviation of the top surface of any section from a straight line shall not exceed 3 mm. The method of connection between sections shall be such that the joint formed shall be free from play or movement in any direction. The use of bent, twisted or worn out forms shall not be permitted. At least three stake pockets for bracing pins or stakes shall be provided for each 3.0 M length of forms. Bracing and supports must be ample to prevent the springing of forms under pressure of concrete or weight or thrust of the machinery (like screed vibrator) operating on the forms. Support to the forms shall be sufficiently rigid to hold them in position during the entire operation of laying and compacting and finishing and that they shall not at any time deviate more than 3 mm from straight edge 3 metres in length. Forms which show a variation from the required rigidity of the alignment and levels shown on the plans shall be reset or removed as directed. The length and number or pins or stakes shall be such as to maintain the forms at the correct line and grade. The supply of forms shall be sufficient to permit their remaining in place for at least 12 hrs. after the concrete has been placed or longer, if in the opinion of the Engineer-in-Charge, it is necessary. The top line of the forms is not to vary from the correct level or alignment and the levels and alignment of the forms are to be checked and corrected as necessary immediately prior to the placing of concrete. The top edges and faces of the forms are to be carefully cleaned and maintained in clean condition. While removing the steel forms, care shall be taken to withdraw them gradually, any damage to the bull nosed edges shall be made good while the concrete is still green. **2.1 Workmanship:** Setting of Forms (a) Setting of forms shall be according to the slab plan subject to the approval of Engineer-in Charge and concreting shall not commence until the setting of forms is approved. (b) Forms shall be set for at least 50 metres in advance of the point where the concrete is being laid and shall not be removed until at least 12 hrs. of placing of the concrete or longer if in the opinion of Engineer-in-Charge is necessary. (c) After setting, the working faces shall be thoroughly oiled by using approved oil before concrete is placed against them. (d) The pavement joints of overlay layer would overlap with the joints of underlay cement concrete. **3. Joints:** The location and type of joints shall be as shown in the drawings. Where semi-mechanized method of construction is used, the concrete along the face of all joints and around all tie bars and dowels shall be compacted with an internal vibrator inserted in the concrete and worked along the joint and around all tie bars and dowels to ensure a concrete free from honeycombing. It shall be ensured that vibrator should not contact the dowel bar, and the vibration operation does not misalign the dowels. In case of mechanized construction, working and their vibration/RPM of all the fixed vibrators shall be checked. There shall be two

additional needle vibrators to compact the concrete near bulk head. Wherever, tie bars or dowel bars are inserted in the PQC/Trimix, proper marking on the projecting surface of DLC/PCC will help to cut the joint at proper location.

Initial cut or a slot of 2.5 to 5 mm wide and having a depth equal to one-third to one-fourth the depth of the PQC/Trimix slab at transverse and longitudinal joint is made as soon as the concrete sets. Normally, in summer when ambient temperature is more than 30°C initial cutting may be carried after 4-8 hours of laying and in winter when ambient temperature is less than 30°C, initial cut may be done at 8-12 hours of laying. In any case initial cut of all the transverse and longitudinal joints shall be completed within 24 hours to avoid the random cracking. Subsequent widening of joint groove will be done after 14-16 days of casting concrete pavements. No sealing of joints shall be undertaken before 21 days of construction. All joints shall be sealed using sealants and joints shall be sealed when grooves are dry and clean and free from foreign object or loose material. Alternatively, compression seals or solid seals can also be used to seal the joints after initial cut without widening with the permission of Engineer.

3.1 Preparation of Joint Grooves for Sealing

All grooves shall be cleaned of any dirt or loose material by air blowing with filtered , oil-free compressed air. If need arises, cleaning by pressurized water jets may be done depending upon the requirement of the sealant, the sides of the grooves may have to be sand blasted to increase the bondage between sealant and concrete.

The groove shall be cleaned and dried at the time of priming and sealing

3.2 Sealing with sealants

When sealants are applied an appropriate primer shall also be used in accordance with the recommendation of the manufacturer. The sealant shall be applied within the minimum and maximum drying times of the primer.

4. Placing of Concrete:

Where semi-mechanized construction technique is adopted, concrete shall be deposited between the forms directly from head loads or wheel barrows. Where a certain amount of redistribution is necessary, it shall be done with shovels and not with rakes. The concrete shall be compacted with needle vibrators and vibrating screeds in semi-mechanized construction where a paver finisher is not available. Use of vibrator near side forms is essential to eliminate honey combing. To effect adequate compaction, the concrete shall be placed with appropriate surcharge over the final slab thickness. The amount of surcharge will depend on the mode of placement of concrete and shall be determined by trial. In general, the required surcharge is about 20 per cent of the required slab thickness. Any portion of the batch of concrete that becomes segregated while depositing it on sub-base shall be thoroughly mixed with the main body of the batch during the process of spreading. In case of unavoidable interruption, a full depth transverse joint shall be made at the point of stoppage of work provided the section on which the work has been suspended is about 2 to 3 m long.

5. Compaction:

Where semi-mechanized technique is adopted, compaction of the pavement shall be accomplished by a vibrating screed supplemented by plate/internal vibrators. For slabs of thickness more than 125mm, vibrating screeds may be supplemented by needle vibrators. The vibrating screed shall rest on side forms. It shall be lowered vertically on to the concrete surface, evenly spread to the appropriate level above the base to provide the required surcharge for compaction; allowed to remain in position for a few seconds until compaction is complete, then lifted vertically and lowered to the adjacent strip of un-compacted concrete. The amplitude of vibration of the screed shall not be less than 1.5 mm and the speed of travel not more than 0.6 m per minute. The screed shall again be taken slowly over the surface, sliding with its axis slightly tilted away from the direction of sliding and the operation repeated until the required dense and closed surface is obtained. Compaction of concrete slabs up to 125 mm thickness may be done by means of vibrating screed alone. Even in the case of slabs

of lower thickness, internal vibrators may be used with advantage of compacting the slab corners and edges.

The working of the vibrators shall be regularly checked and stand by shall always be maintained for emergency use. Segregated particles of coarse aggregate which collect in front of the screed shall be discarded. Under no circumstances shall such segregated particles be carried forward and pushed on to the base in front of the mass. Compaction by screeding shall be carried on till the mortar in the mix just works up to the surface. Care shall be exercised and the operation of tamping so controlled as to prevent an excess of mortar and water from being worked on the top. Repeated operation other than to secure the necessary compaction and to eliminate voids shall be avoided. Immediately after the screening has been completed and before the concrete has hardened, i.e. while the concrete is still in the plastic stage, the surface shall be inspected for irregularities with a profile checking template and any needed correction made by adding or removing concrete followed by further compaction and finishing.

6. Floating :

As soon as practicable after the concrete has been compacted, its surface shall be smoothened by means of a longitudinal/skim float, operated from a foot-bridge. The longitudinal/skim float shall be worked with a sawing motion, while held in a floating position parallel to the carriageway centre line and passed gradually from one side of the pavement to the other. Movements ahead along the centre line of the carriageway shall be in successive advances of not more than one half the length of the float. This process may also be carried out in slip form or fixed form paving method. Forms shall not be removed from freshly placed concrete until it has set, or at least 12 hours, whichever is later. They shall be carefully removed in such a manner that no damage is done to the edges of the pavement. After the forms have been removed, the slab edges shall be cleaned and any limited honey-combed areas pointed up with 1:4 cement and sand mortar, after which the sides of the slab shall be covered with wet hessian for curing. Slabs with excessive honey-combing as a result of inadequate compaction shall be removed up to the nearest transverse joints.

7. Brooming :

After belting and as soon as the surplus water, if any, has risen to the surface, the pavement shall be given a broom finish with an approved steel or fiber broom not less than 45 cm wide. The broom shall be pulled gently over the surface of the pavement from edge to edge. Adjacent strokes shall be slightly overlapped. Brooming shall be perpendicular to the centre line of the pavement and so executed that the corrugations formed shall be uniform in character and width and not more than 1.5 mm deep. Brooming shall be completed before the concrete reaches such a stage that the surface is likely to be torn or unduly roughened by the operation. The broomed surface shall be free from porous or rough spots, irregularities, depressions, and small pockets such as may be caused by accidental disturbing of particles of coarse aggregates embodied near the surface. The brooming shall be of uniform pattern all through.

8. Curing:

Immediately after completion of the finishing operations, the surface of the pavement shall be entirely covered with wetted burlap, cotton or jute mats. The mats used shall be of such length (or width) that as laid they shall extend at least 45 cm beyond the edges of the slab. The mats shall be placed so that the entire surface and both edges of the slab are completely covered. This covering shall be

placed as soon as, in the judgment of the Engineer- in-Charge the concrete has set sufficiently to prevent damage to the surface prior to being placed, the mats shall be thoroughly saturated with water and shall be placed with the wettest side down. The mats shall be so placed and weighed down as to cause them to remain in intimate contact with the surface covered, and the covering shall be maintained

full wetted and in position for 24 hours after the concrete has been placed or until the concrete is sufficiently hard to be walked on without suffering damage. Water shall be gently sprayed so as to avoid damage to the fresh concrete. If it becomes necessary to remove a mat for any reason, the concrete slab shall not be exposed for a period of more than half an hour. Upon the removal of the burlaps/ mats, the slab shall be thoroughly wetted and then cured.

AII joints shall be filled with filler in order to prevent the edges of joints from getting damaged and entry of clay materials into the joints during final curing. Exposed edges of the slab shall be banked with a substantial berm of earth.

9. Protection of Concrete:

Suitable barricades and sign boards shall be erected and to exclude traffic from the newly constructed pavement for the period wherein prescribed.

Any part of the pavement damaged by traffic or other causes occurring prior to its final acceptance shall be repaired or replaced by contractor with his own expense in a manner satisfactory to the Engineer. The pavement shall be protected against all traffic usage including that of construction vehicles. Construction traffic may be allowed after 14 days of paving with permission of the Engineer.

10. Mode of Measurement:

Above operation the rate shall be including all materials, formworks, machinery and labour charges etc. except dowel bars, making of joints filling with sealant.

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

TECHNICAL SPECIFICATIONS FOR FIRE FIGHTING SYSTEM

1.01 Fire-fighting system work inclusive of water hydrant system, piping, sprinklers etc. including testing and commissioning of the system, but excluding fire detection and fire alarm system. The Contractor is required to completely furnish all the specialized services as described hereinafter and as specified in the schedule of quantities and/or shown on the drawings. Without restricting to the generality of the foregoing, the work shall include the following:

1.02 FIRE FIGHTING SERVICES

Work under this sub-head consists of furnishing all Labour, Materials, equipment and accessories necessary and required to completely install the Fire Fighting equipment etc., specified hereinafter and given in the Schedule of Quantities.

Without restricting to the generality of the foregoing the work of Fire Fighting System shall include the followings:

a) Providing M.S. black steel pressure pipe line main including Valves, Fire Hydrants, Excavation for Pipe, Laying of pipe, Painting of pipe and Making Connection to supply system.
b) Black Steel Pipe, Mains Laterals, Branches, Valves, Hangers and Appurtenances.
c) Hose Reels, Rubberized fabric lined hose pipes, Hose cabinets, Sprinkler heads and Landing Valves.
d) Portable Fire Extinguishers
e) Fire Fighting Pumps, diesel operated pumps, panels and all connected accessories including suction & delivery pipes.
f) Testing Commissioning and giving live demonstrations to the various Inspection Authorities and Obtain their "No Objection Certificate" (NOC) for occupation of the building.
g) GENERAL REQUIREMENTS

i. All materials shall be of the best quality conforming to the Specifications and subject to the approval of the Engineer-in-Charge.
ii. Pipes and Fittings shall be fixed truly Vertical, Horizontal or in slopes as required in a neat workman like manner.
iii. Pipes shall be fixed in a manner so as to provide easy accessibility for repair and maintenance and shall not cause any obstruction in shaft, passage etc.
iv. Pipes shall be securely fixed to walls and ceiling by suitable clamps at intervals specified. Only approved type of anchor fasteners shall be used for RCC ceilings.
v. Valves and other appurtenance shall be so located that they are easily accessible for operation, repairs and maintenance.

1.03 GENERAL SPECIFICATIONS:-

Entire installation shall be carried-out as per latest relevant regulations both statutory and those specified by Bureau of Indian Standards related to the works covered by the Specifications. In particular the equipment and installation shall comply with the following:-

a) NFPA Standards (Latest Edition)
b) Fire Protection Manual issued by TAC
c) Rules of TAC for Automatic Sprinkler Installations
d) Regulations under Indian Electricity ACT 1910
e) Fire Insurance Regulations
f) National Building Code of India, 2005
g) Indian Standard Specifications
h) Workman's Compensation Act
i) Explosive and Smoke Nuisance Regulations
j) C.P.W.D. Specifications, for electrical works
k) Industrial Safety Code
l) Any other applicable rules

1.04 ABBREVIATIONS: -

The work shall be executed and measured as per the dimensions given in the Bill of Quantities, Drawings, Designs, Specifications etc. The abbreviations used shall mean as under:-

"	-	Inch (25.4mm)
'	-	Foot (12 inches or 30.48 cms.)
Sq.Ft.	-	Square Feet.
Sq.Mt.(M^2)	-	Square Metre.
Cu.Ft.	-	Cubic Feet.
Cum (M^3)	-	Cubic Metre.
Kg.	-	Kilogramme (Equivalent to 1000 gms)
T.(M.T.)	-	Tonne (Equivalent to 1000 kgs.)
No.	-	Numbers.
Cm.	-	Centimetre.
M or R.M.	-	Metre or Running Metre.

1.05 EXECUTION: -

The works shall be carried out in accordance with the Fire Fighting Drawings read along with Architectural Drawings and Structural Drawings, to be issued by OWNER / ENGINEER-IN-CHARGE as "GOOD FOR CONSTRUCTION". The Fire Fighting Drawings, Structural Drawings and Architectural Drawings shall have to be properly Co-related before executing the works. In case of any difference noticed between

Architectural and Fire Fighting Drawings, the fact shall be immediately brought to the notice of ENGINEER-IN-CHARGE / CONSULTANT / OWNER whose decision in writing shall be obtained by the CONTRACTOR.

CONTRACTOR's shall maintain a register of daily deployment of Electrician, Skilled / Unskilled Labour etc. on various activities and get it signed from ENGINEER-IN-CHARGE on daily basis and shall produce before the OWNER as and when asked for.

1.06 QUALITY OF MATERIALS & GENERAL STANDARDS OF WORK:-

The CONTRACTOR under this contract commits himself to use first class materials and assumes full responsibility for the quality of all materials incorporated or brought for incorporation in the work. The work shall be executed in accordance with the best Engineering practice and as per directions of ENGINEER-IN- CHARGE. CONTRACTOR to obtain prior approval of make / model No. and Technical particulars of each item from the CONSULTANT before the material is supplied.

1.07 BAR CHART FOR EXECUTION OF WORK:-

The CONTRACTOR shall submit within one week of the acceptance of the tender, a BAR Chart to OWNER, which shall indicate the planning for the execution of the entire work under the contract within the stipulated time given for completion. This shall be scrutinized by the OWNER. The mutually agreed BAR-CHART shall be binding on the CONTRACTOR for progress of the work & for completion by the due date.

The CONTRACTOR shall during the entire tenure of site work, provide accurate monthly reviews of BAR- CHART showing work targets & completed works for discussions with the CONSULTANT & OWNER.

5.00 PARTICULAR SPECIFICATIONS

5.01 PIPES

All pipes within and outside the building in exposed locations and shafts including connections buried under floor shall be M.S. Pipes as follows:

a) Pipes 150 mm dia. and below IS: 1239 Heavy Class
b) Pipe 200 mm dia. and above IS 3589 of thickness specified.

5.02 PIPE FITTINGS.

Pipe fittings means tees, elbows, couplings, flanges, reducers etc. And all such connecting devices that are needed to complete the piping work in its totality.

Fabricated fittings shall not be permitted for pipe diameters 50 mm and below.

When used, they shall be fabricated, welded and inspected in workshops whose welding procedures have been approved by the TAC as per TAC rule 4102 for sprinkler system and applicable to hydrant and sprinkler system. The inspection shall be supervised by authorised representative of the OWNER. For "T" connections, pipes shall be drilled and reamed. Cutting by gas or electrical welding will not be accepted.

5.03 JOINTING

a) Screwed (50 mm dia. pipes and below):
Joint for black steel pipes and fittings shall be metal-to-metal thread joints. A small amount of red lead may be used for lubrication and rust prevention. Joints shall not be welded or caulked. (With screwed VS forged fittings) with hole tight.

b) Welded (65 mm dia. and above):
Joints between M.S. pipes and fittings shall be made with the pipes and fittings

having "V" groove and welded with electrical resistance welding in an approved manner. All pipes will be subject to X- Ray test from an approved agency as per the TAC norms at the cost of contractor. (With welded M.S. fittings heavy class with V-Groove). The welding machine shall be 3 Phase of required current and capacity With approved welding rod along with DP Test.

c) Flanges:
Flanged joints shall be provided on;

i. Straight runs not exceeding 30 m on pipelines 80 mm dia. and above

ii. Both ends of any fabricated fittings e.g. bends, tees etc. of 65 mm dia. or larger diameter

iii. For jointing all types of valves, appurtenances, pumps, connections with other type of pipes, to water tanks and other places necessary and required as good for engineering practice.

d) Flanges shall be as per I.S.6392-1971, Table 17/18 with appropriate number of G.I. nuts and bolts, half threaded of GKW make or equivalent with 3 mm insertion neoprene gasket complete.

e) Unions:
Approved type of dismountable unions on pipes lines 65 mm and below in similar places as specified for flanges shall be provided.

PIPE PROTECTION

a) All pipes above ground and in exposed locations shall be painted with one coat of Zinc chromate primer and two or more coats of Synthetic Enamel Paint of approved shade.

b) All black steel pipes under floors or below ground shall be provided with protection against corrosion by application of 100/ 150 mm wide and 4mm thick layer of PYPKOTE/ MAKPOLYKOTE over the pipe, as per manufacturers specifications Checking with holiday testing machine.

5.05 PIPE SUPPORTS

a) All pipes shall be adequately supported from ceiling or walls from existing/new inserts by Structural clamps fabricated from G.I Structural e.g. Rods, Channels, Angles and Flats as per details given in drawings and specifications. All clamps shall be painted with one coat of red lead and two coats of black/ approved shade Enamel paint of pre-approved brand.

b) Where inserts are not provided, the Contractor shall provide anchor fasteners. Anchor fastener shall be fixed to walls and ceilings by drilling holes with Electrical drill in an approved manner as recommended by the manufacturer of the fasteners (HILTI/FISHER).

5.06 PIPE TESTING

All pipes in the system shall be tested to a hydraulic pressure of 1.5 times of the working pressure or minimum of 18Kg/Cm2 without drop in the pressure for at least 24 hours. Rectify all leakages, make adjustment and retest as required.

5.07 ANCHOR BLOCK

Contractor shall provide suitable cement concrete, anchor blocks of ample dimensions at all bends, tee connection and other places required and necessary for overcoming pressure thrusts in pipes. Anchor blocks shall be of cement concrete 1:2:4 mix (1 cement: 2 coarse sand: 4 stone aggregate 20 mm nominal size).

5.08 VALVES

a) Valves, gauge and orifice plates

i) Sluice Valves above 65 mm shall be of Cast Iron body and Bronze/Gunmetal seat. They shall conform to type PN 1.6 of IS:780-1980, valves up to 65mm shall be of Gunmetal Full way Valve with wheel tested to 20 Kg./cm class-II as per I.S: 778-1971. Valve wheels shall be of right hand type and have an arrow head engraved or cast thereon showing the direction for turning open and closing. All exposed or above ground valves of 65mm dia. & above shall be slim-seal butterfly valves marked IS: 13095 with matching flanges.

ii) Non-return valves shall be of Cast Iron body and Bronze/Gunmetal seat. They shall conform to class of IS: 5312 and have flanged ends. They shall be swing check type in horizontal runs and lift check type in vertical runs of piping. They shall not be spring-loaded type.

5.09 EXTERNAL YARD HYDRANTS

The Contractor shall provide External Fire Hydrant in the Ring or on External Fire Line, as per specifications as specified in Schedule of Quantities and as shown in drawings. The spacing of the hydrants and the distance from the building shall be maintained as per relevant requirements of latest relevant codes, unless specified here with. The distance between two hydrants shall be 30-45mts.

Each External Fire Hydrant shall be provided with an External Fire Hose Cabinet of S.S or fibre glass, as specified in Schedule of Quantities of size 76.8 x 61.44 x 25.80 cm, as approved by the Architect to equip 2 nos. of 63 mm dia. controlled percolating hose and accessories as required. The cabinet shall be installed near the Hydrant as per details, approved by the Engineer-in-Charge/Architect.

INTERNAL HYDRANTS

The Internal Hydrant outlet shall comprise "Single Headed Single Outlet Gunmetal Landing Valve" conforming to type 'A' of IS: 5290-1977. Separate valve on the head shall form part of the landing valve construction.

A G.M. cap with chain is provided on one head of the outlet. The hydrant will have an instantaneous pattern female coupling for connecting to Hose Pipe.

The Landing Valve shall be fitted to a Tee connection on the wet riser at the landing. With G.I. nut, bolt & double washer.

5.10 FIRST-AID HOSE REEL EQUIPMENT

First aid hose reel equipment shall comprise reel, hose guide fixing bracket hose tubing globe valve, stopcock and nozzle. This shall conform to IS: 884 - 1969. The hose tubing shall confirm to IS: 1532-1969.

The hose tubing shall be 20 mm dia. and 36.5m long. The G.M nozzle 5mm and globe valve shall be of 20 mm size.

The fixing bracket shall be of swinging type, with G.I. support Operating instructions shall be engraved on the assembly. This heavy duty mild steel and cast iron brackets shall be conforming to IS: 884 - 1969. The first- aid hose reel shall be connected directly to the M.S. pipe riser taken independently from ring.

5.11 HOSE PIPES, BRANCH PIPES AND NOZZLES

a) Hose pipes

Two numbers Hose Pipes shall be rubber lined woven jacketed and 63mm in dia. 15m long. They shall confirm to type A (Reinforced rubber lined) of IS: 636 - 1979. The hose shall be sufficiently flexible and capable of being rolled.

Each run of hose shall be complete with necessary coupling at the ends to match with the landing valve or with another run of hose pipe or with branch pipe. The couplings shall be of instantaneous swinging type. This shall be conforming to IS: 903.

b) Branch pipes

Branch pipe shall be of Copper, Gunmetal or Aluminium alloy as given in BOQ 63 mm dia and be complete with male instantaneous spring lock type coupling for connection to the hose pipe. The branch pipe shall be externally threaded to receive the nozzle.

c) Nozzle

The nozzle shall be of Copper or Gunmetal, as specified in BOQ 20 mm in (internal) diameter. The screw threads at the inlet connection shall match with the threading on the branch pipe. The inlet end shall have a hexagonal head to facilitate screwing of the nozzle on to the branch pipe with nozzle spanner.

End Couplings, Branch pipe, and Nozzles shall conform to IS: 903 - 1985.

5.13 Two C.P hoses of 15m length with couplings shall be provided with each External (Yard) Hydrant. Two RRL hoses of 15m length, as specified, with couplings shall be provided with each Internal Hydrant. One nozzle and one branch pipe with coupling shall be provided with each Yard Hydrant and Internal Hydrant.

5.14 HOSE CABINET

The internal hose cabinet shall accommodate the Hose Pipes, Branch Pipe, Nozzle First aid Hose Reel and Hydrant Outlets and shall be fabricated from 2 mm thick or 14 mm gauge M.S / aluminium sheet as specified in Bill of Quantities. The overall size shall be 2100x900x715 mm, or as specified in the Architectural details. This shall have lockable center opening glazed doors as per the requirement and as per Architectural details. Where the niche for wet riser is provided with shutters, separate hose cabinet as above may be dispensed with.

The hose cabinet shall be painted red and stove enameled and woods FIRE written in front glazed portion.

5.14 FIRE BRIGADE INLET CONNECTIONS

Fire Brigade Inlet connection shall be provided near the pump house and to the wet riser system as specified and as described in the BOQ, for the following purposes:

i) Fire Brigade suction connection for fire static tank with provision of foot

valve Along with required pipe.

ii) Fire brigade inlet connection to fire static tank.

iii) Fire brigade inlet connection to the wet riser system. Each connection shall be provided with similar dia. of Sluice valve and Non return valve.

The locations of these Fire brigade connections shall be suitably decided with the approval of Consultant/Landscape Architect and with a view that these are easily accessible to the fire brigade, without any possible Hindrance.

5.15 HYDRAULIC SIREN

A siren shall be provided in the system, to indicate the flow of water in the wet riser system as may be specified in Bill of Quantities. Alternative arrangements may also be adopted. This shall be turbine type.

5.16 VALVE CHAMBERS

Contractor shall provide suitable Brick Masonry Chamber in cement mortar 1:5 (1 cement: 5 coarse sand) on cement concrete foundations 150 mm thick in 1:5:10 mix (1 cement: 5 fine sand: 10 graded stone aggregate 40 mm nominal size) 15 mm thick plaster inside and outside finished with a floating coat of neat cement inside with cast iron surface box approved by fire brigade including excavation, back filling complete.

Valve chambers shall be of size 90x90 cm for depths 100 cm and beyond.

5.17 PORTABLE FIRE EXTINGUISHER

i) Portable fire extinguishers shall be provided as per Bill of Quantities and shall confirm to IS: 15683

ii) Dry Chemical powder type - 6 Kg. Capacity as per I.S:15683

iii) CO_2 type - 4.5 Kg. capacity as per I.S:15683.

iv) Foam type - 9 Ltrs. capacity as per I.S:15683.

5.18 SPRINKLER HEADS

Sprinkler heads shall be provided at approximate spacing to cover 12 m^2 per Sprinkler head. The spacing shall however, be in conformity with the drawings and properly coordinated with Electrical Fixtures, Ventilation Ducts and Grills and other services along the ceiling.

Sprinkler heads shall be Chrome finished Brass/Gunmetal with quartz bulb with a temperature rating of 68°C. Sprinkler heads shall be of type and quality approved by the local fire brigade authority. The inlet shall be screwed with Teflon tape. Sprinkler heads shall be pendent, recessed or special application side wall Sprinkler types as shown in drawings. All Sprinklers should have the Specifications, as far as maximum possible as per NFPA requirements and shall be UL/FM approved.

Contractor shall supply spare Sprinkler Heads of each type as per requirement and one Spanner for each type of sprinkler neatly installed in a steel box with glass shutters at locations approved by the Engineer- in-Charge.

5.19 ALARM VALVE & AUTOMATIC WATER MOTOR GONG VALVE

The alarm valve & water motor gong valve is to be provided on the Sprinkler main delivery pipe with items No. 1 to 11 U.L. listed F.M. approved as per NFPA -13 complete in all respects.

5.20 FIRE FIGHTING PUMPS

a) Fire and Jockey Pumps

i. Pumping sets shall be single/multi stage horizontal/vertical centrifugal single or multi outlet with cast iron body and bronze dynamically balanced impellers. Connecting shaft shall be stainless steel with bronze sleeve and grease lubricated bearings.
ii. Pumps shall be connected to the drive by means of spacer type love-joy coupling, which shall be individually balanced dynamically and statically.
iii. The coupling joins the prime mover with the pump shall be provided with a sheet metal guard.
iv. Pumps shall be provided with approved type of mechanical seals.
v. Pumps shall be capable of delivering not less than 150% of the rated capacity of water at a head of not less than 65% of the rated head. The shut-off head shall not exceed 120% of the rated head.
vi. The pump shall meet the requirements of the tariff advisory committee and unit shall be design proven in fire protection services.
vii. Pump and Motor should have assembled at factory/at source along with company complete all test certificate.

b) Motors for Electric Driven Pumps

i. Electrically driven pumps shall be provided with totally enclosed fan cooled induction motors. For fire pumps, the motors should be rated not to draw starting current more than 3 times normal running current.
ii. Motors for fire protection pumps shall be at least equivalent to the horse power required to drive the pump at 150% of its rated discharge and shall be designed for continuous full load duty and shall be design proven in similar service.
iii. Motors for fire pumps shall meet all requirements and specifications of the tariff advisory committee.
iv. Motors shall be suitable for 415 volts, 3 Phase, 50 cycles A.C supply and shall be designed for 33' C ambient temperature. Insulation class F and Eff-1 motors shall conform to IS: 325.
v. Motors shall be designed for auto start system.
vi. Motors shall be capable of handling the required starting torque of the pumps.
vii. Contractor shall provide heating arrangements for the main fire pump motor to ensure that
viii. Motor windings shall remain dry.

c) Air Vessel for Fire Pumps

i) Air Vessel 3m³ capacity having 1320mm O.D x 2m cylindrical height, made out of 12mm thick Dishend and 10mm thick Shell of I.S:2062 Gr-A/B having dish end welded with shell manufacturing as per Design code I.S:2825, Class II suitable for working pressure 7Kg/cm², Hydrotested at 21Kg/cm², Joint efficiency 0.85, Radiography longitudinal seam 100%, Circumferential seam 10% spot with all necessary valves & fittings.

ii) The fire pumps shall operate on drop of pressure in the mains automatically or manually.

d) Diesel Fire Pump

i) Scope

This section covers the details of requirements of the standby fire pump, operated by a diesel engine.

ii) General

The diesel pump set shall be suitable for automatic operation complete with necessary automatic starting gear, for starting on wet battery system and shall be complete with all accessories. Both engine and pump shall be assembled on a common bed plate, fabricated from mild steel channel In the works.

iii) Drive

The pump shall be only direct driven by means of a flexible coupling. Coupling guard shall also be provided. The speed shall be 1500/2900 RPM as specified in bill of quantities.

iv) Fire pump

The fire pump shall be horizontal split casing centrifugal type. It shall have a capacity to deliver 4550 LPM as specified, developing adequate head so as to ensure a minimum pressure of 3.5 Kg./cm^2 at the highest and the farthest outlet. The delivery pressure at the pump outlet shall be not less than 7 Kg./cm^2 in any case. The pump may be single stage or multi stage as specified. The pump shall be capable of giving a discharge of not less than 150% of the rated discharge at a head of not less than 65% of the rated head. The shut off head shall be within 120% of the rated head.

The pump casing shall be of cast iron to grade FG 200 to I.S: 210 and parts like impeller shaft sleeve, wearing-ring etc. shall be of non-corrosive metal like bronze/brass/gunmetal. The shaft shall be of stainless steel. The pump shall be provided with mechanical seal.

The pump casing shall be designed to withstand 1.5 times the working pressure.

Bearings of pump shall be effectively sealed to prevent loss of lubricant or entry of dust or water.

e) Diesel Engine

i) Environmental conditions - The engine shall be required to operate under the conditions of environment as specified.

ii) Engine Rating - The engine shall be cold starting type without the necessity of preliminary heating of the engine cylinders or combustion chamber (for example, by wicks, cartridge, heater plugs etc). The engine shall be multi cylinder/vertical 4 stroke cycle, water cooled diesel engine,
developing suitable HP at the operating speed specified to drive the fire pump. Continuous capacity available for the load shall be exclusive of the power requirement of auxiliaries of the diesel engine, and after correction for altitude, ambient temperature and humidity for the specified environmental conditions as mentioned. This shall be at least 20% greater than the maximum HP required to drive the pump at its duty point. It shall also be capable of driving the pump at 150% of the rated discharge at 65% of rated head. The engine shall be capable of continuous non-stop operation for 8 hours and at least 3000 hours of operation before major overhaul. The engine shall have 10% overload capacity for one hour in any period of 12 hours continuous run. The engine shall accept full load within 15 seconds from the receipt of signal to start. The diesel engine shall conform to BS 649/IS 1601/IS 10002, all amended upto date.

iii) Engine Accessories - The engine shall be complete with the following accessories:-

- Flywheel dynamically balanced.
- Direct coupling for pump and coupling guard.
- Corrosion Resister
- Air cleaner, oil bath type/dry type
- Fuel service tank support, semi-rotary pump and fuel oil filter with necessary pipe work.
- Pump for lubricating oil and lube. oil filter
- Elect. starting battery (2x12 v)
- Exhaust silencer with necessary pipe work
- Governor
- Instrument panel housing all the gauges, including Tachometer, hour meter and starting switch with key (for manual staring).
- Necessary safety controls
- Winterisation arrangement, where specified.
- Heat Exchanger

iv) Starting system - The starting system shall comprise necessary batteries (2x12 v), 24 volts starter motor of adequate capacity and axle type gear to match with the toothed ring on the flywheel. By metallic relay protection to protect starting motor from excessively long cranking runs
suitably integrated with engine protection system shall be included within the scope of the work.

The battery capacity shall be suitable for meeting the needs of the starting system.

The battery capacity shall be adequate for 10 consecutive starts without recharging with cold engine under full compression.

The scope shall cover all cabling, terminals, initial charging etc.

v) Exhaust system - The exhaust system shall be complete with silencer suitable for outdoor installation, and silencer piping including bends and accessories needed to be taken out of the
building as per statutory requirement. The Contractors are advised to see the drawing and site to assess the length of exhaust pipe required and its cost & installation included with cost of pump. The total backpressure shall not exceed the engine manufacturer's recommendation. The exhaust piping shall be suitably lagged. All exhaust pipe properly covered with anti heat protection with AL. sheet cladding.

vi) Engine shut down mechanism - This shall be manually operated and shall return automatically to the starting position after use With solenoid stop valve.

vii) Governing System - The engine shall be provide with an adjustable governor to control the engine speed within 5% of its rated speed under all conditions of load up to full load. The governor shall be set to maintain rated pump speed at maximum pump load.

viii) Engine Instrumentation - Engine instrumentation shall include the following:-

- Lube. Oil pressure gauge.
- Lube. oil temperature gauge
- Water pressure gauge
- Water temperature gauge
- Digital Tachometer
- Digital Hour meter.

The instrumentation panel shall be suitably resident mounted on the engine.

ix) Engine Protection Devices - Following engine protection and automatic shut down facilities shall be provided:-

- Low lube. oil pressure
- High cooling water temp.
- High lube. oil temperature
- Over speed shut down.

Pipe work - All pipe line with fittings and accessories required shall be provided for fuel oil, lube. oil and exhaust systems, copper piping of adequate sizes shall be used for lube. oil and fuel oil.
M.S. piping will be permitted for exhaust with prv control valve for cooling line.

xi) Anti Vibration Mounting - Suitable vibration mounting duly approved by Engineer-in-charge shall be employed for mounting the unit so as to minimize transmission of vibration to the structure. The isolation efficiency achievable shall be clearly indicated.

xii) Battery Charger - Necessary float and boost charger shall be incorporated in the control section of the power and control panel, to keep the battery under trim condition. Voltmeter to indicate the state of charge of the batteries shall be provided.

5.21 CABLES

a) Contractor shall provide all power control cables from the motor control centre to various motors, level controllers and other control devices.
b) Cables shall conform to IS: 1554 and carry ISI mark.
c) Wiring cables shall conform to IS 694.
d) All power and wiring cables shall be copper conductor PVC insulated armoured and PVC sheathed of 1100 volts grade.
e) All control cables shall be copper conductor PVC insulated armoured and PVC sheathed 1100 Volt grade.
f) All cables shall have stranded conductors. The cables shall be in drums as far as possible and bear manufacturer's name.
g) All cables joints shall be made in approved manner as per standard practice.
h) The cable jointing shall be Crimping type.

5.22 CABLE TRAYS

a) Contractor shall provide G.I. perforated cable trays at locations as shown on the

drawings and of sizes as given in the bill of quantities, with G.I. sheet thickness of 1.5mm.

b) Cable trays shall be supported from the bottom of the slab at intervals of 60cms at both ends by ort rods with insert plates OR Anchor fasteners.

c) Cost of clips, bolts, nuts, support rods and any other materials required to fix the trays in proper manner shall be included in the rate for trays.

5.23 EARTHING

There shall be an independent earthing station. The earthing shall consist of an earth tape connected to an independent plate made of copper or G.I. having a conductivity of not less than 100% international standard. All electrical apparatus, cable boxes and sheath/armour clamps shall be connected to the main bar by means of branch earth connections of appropriate size. All joints in the main bar and between main bar and branch bars shall have the lapping surface properly tinned to prevent oxidation. The joints shall be riveted and sweated.

a) Earth plates shall be buried in a pit of 1.20x1.20M at minimum depth of 3M below ground. The connections between main bar shall be made by means of three 10mm brass studs and fixed at 100mm centres. The pit shall be filled with coke breeze, rock salt and loose soil. A G.I. pipe of 20mm dia. with perforations on the periphery shall be placed vertically over the plate to reach ground level for watering.

b) A brick masonry manhole 30x30x30xcm size shall be provided to surround the pipe for inspection. A bolted removable link connecting main bar outside the pit portion leading to the plates shall be accommodated, in this manhole for testing.

5.24 MOTOR CONTROL CENTRES

a) MCC shall be cubical type i.e. one motor feeder completely in one cubicle, and shall be fabricated from 14 gauge M.S. sheet with dust & vermin proof construction. It shall have Powder Coated finish and shall be fitted with suitable etched plastic identification plates for each motor. The cubicle shall comprise of the following: - with seven tank process.

i. Incoming main MCCB of required capacity.
ii. One MPCB for each motor.
iii. Fully automatic as specified soft starters suitable for motor H.P. with push buttons one for each motor and ON/OFF indicating LED type lamps.
iv. Single phasing preventer of appropriate rating for each motor.
v. Rotary duty selector switch.
vi. Panel type ampere meters one for each motor with ASS and CTS.
vii. Panel type voltmeter on incoming main with rotary selector switch to read voltage between phase to neutral and phase-to-phase.
viii. Indicating lamps for in incoming main and ON/OFF indicating lamps for each motor.
ix. Rotary switch for manual or auto operation for each pump (manual/auto/off).
x. Fully taped separate aluminium bus bars of required capacity.
xi. Space for liquid level controllers as specified.
xii. The panel shall be pre-wired with colour-coded wiring. All interconnecting wiring from incoming main to switch gear, meters and accessories within the switchboard panel.
xiii. Power wiring and Control wiring in MCC to be of Copper only and minimum

size 4 & 1.5 Sq.mm respectively.

b) All switchgears and accessories shall be of approved make such as "Siemens, L & T, Allen Bredly" or equivalent.

c) Switchboard cubicles shall be floor or wall mounted type as recommended by manufacturers.

5.25 VIBRATION ELIMINATORS

All suction and delivery lines shall be provided with double flanged reinforced neoprene flexible pipe connectors. Connectors should be suitable for a working pressure of each pump. Length of the connector shall be as per manufacturer's details. Flexible connectors shall be as manufactured by Relay Corp., New Delhi.

5.26 PIPING FOR PUMPS

a) Pipes for suction and delivery shall be galvanised/M.S tube (heavy duty) confirming to I.S:1239 up to 150mm dia. and as per I.S:3589 for dia. 200mm and above or as specified in bill of quantities. The flanges shall be G.I. or M.S.

b) Full way and check valves 65mm dia. and below shall be gunmetal tested to 20Kg/Sq.cm pressure certified and conforming to I.S:778.

c) Suction strainer or foot valves shall be C.I., confirming to I.S:4038 - 1979, as specified in bill of quantities.

d) Joints
All pipes and fittings shall be provided with flanged joints, with flanges either screwed or welded complete and jointed with 3.0mm thick gasket complete with all G.I nuts, bolts and washers etc.

e) Testing
All G.I. pipes shall be tested to hydrostatically for a period of 2 hours to a pressure of 16 Kg/cm^2 without drop in pressure.

5.27 MEASUREMENTS

a) Raw water pumps shall be measured by numbers and shall include all item as given in the bill of quantities.

b) Motor control panel and level controllers shall be measured by numbers.

c) Pipes for suction and delivery header and mains shall be measured per linear metre along the centre line of the pipe and shall be inclusive of all fittings.

d) Cable trays and cables shall be measured per linear meter.

e) G.I. Structural clamps including hangers shall be measured include in pipe rate No separate payment shall be admissible for supports, angel and channel bolts, anchor bolts, rawl plugs etc.
which shall be deemed to be included in the respective items of BOQ.

No separate payment shall be made for making connections of the existing service lines to the pumps. Vibration eliminator pads are included in the scope of all work/pump room

work.

5.28 COMMISSIONING

After successful testing of the different items in parts, the Contractor shall provide all facilities including necessary piping, labours, tools and equipments etc. for carrying out testing and commissioning of the entire fire fighting system complete as per requirement in the presence of Client representative and during the visit of the Fire Officer whenever and as may be required. Generally, the following test/inspection has to be carried out:-

(a) For the automatic operation of the Jockey/main fire pump and diesel pump as per the sequences required.

(b) For checking the pressure available at the farthest and highest point in the fire ring and for the wet riser system.

(c) For the automatic operation of the Sprinkler System either by a dummy fire below a sprinkler head by using the Inspection Test Valves. In this case, the annunciation panel indicating the particular zone and mechanical Gong valve should work.

5.29 GUARANTEE

a) The contractor shall submit a warranty for all equipment, materials and accessories supplied by him against manufacturing defects, malfunctioning or under capacity functioning.

b) The form of warranty shall be as approved by the Engineer-in-charge.
c) The warranty shall be valid for a period of one year from the date of commissioning and handing over with virtual certificate.
d) The warranty shall expressly include replacement of all defective or under capacity equipment. Engineer- in-charge may allow repair of certain equipment if the same is found to meet the requirement for efficient functioning of the system.
e) The warranty shall include replacement of any equipment found to have capacity lesser than the rated capacity as accepted in the contract. The replacement equipment shall be approved by the Engineer-in- charge.
f) The contractor shall include in his rates the operation of all mechanical equipment for a period of six months from the date of commissioning. No separate payment will be made on this account.

E. LIST OF CODES & STANDARD

SR. NO.	IS NO.	TITLE
1	1239 / 3589	G. I. Pipe / M.S. pipe
2	14846	Sluice valve
3	BS 5155/ API 609	Butterfly valves
4	5312 / API 594/598	Non Return Valves
5	5290	Fire Hydrants

6	884	Fire Hose Reel
7	903	Fire Hose, couplings, branch pipe, nozzles
8	636	RRL Hose
9	778	Gun Metal valves
10	5132	Rubber Hose Pipe
11	8423	C. P. Hose
12	6595 / 12469	Pumps
13	325	Motors
14	10001 / 10002	Diesel Engine
15	15683	Fire Extinguishers
16	10221	Coating / wrapping of underground M.S. pipe

Special Technical Condition for Electrification Work

1. Laying and termination of 415 V, PVC armored power cable from lighting panel to the junction box at the bottom of the gantry to lighting fixtures receptacles & looping from one gantry to other shall be buried underground. Contractor shall quote the unit price of cable erection separately. Cables glands and lugs are included in contractor's scope.

2. Laying & termination by 415 V, PVC armored power cable from street lighting panels to street lighting poles and power cables for looping from one gantry to gantry shall be in the scope of lighting contractor. These cables shall be buried underground. Cable glands and lugs are included in contractor's scope.

3. Materials & components not specifically stated in this specification & which are necessary for satisfactory installation & operation of the lighting system shall be deemed to be included in the scope of the specification.

4. The design manufacture & performance of equipment shall comply with all currently applicable statues, regulations and safety codes in the locality where the equipment will be installed. Nothing in this specification shall be construed to relieve the bidder of these responsibilities.

5. Unless otherwise specified, equipment offered shall confirm to latest applicable Indian and IEE standards. Equipments complying with one another authoritative standards such as British, U.S.A., V.D.E., etc., will also be consider if it insures performance equivalent of supplier to Indian Standards. In such cases the bidder shall clearly indicate the standard adopted and furnish a copy of the latest English version of the standards along with the tender should there by any dispute of design, work shall be followed.

6. Indian Standards as per latest amendment should be followed :-

(i) IS : 1913 -General & Safety requirement for Electric Lighting Fittings.
(ii) IS : 3523 -Water Proof Electric Lighting Fittings.
(iii) IS : 4012 -Dust Proof Electric Lighting Fittings.
(iv) IS : 4013 -Dust Tight Electric Lighting Fittings.
(v) IS : 1777 -Industrial Lighting Fittings with Metal Reflectors.
(vi) IS : 3287 -Industrial Lighting Fittings with Plastic Reflectors.
(vii) IS : 0993 -Well glass Lighting Fittings for use underground in mines. (Non flamp proof type).
(viii) IS : 1947 -Specification of Flood Light.
(ix) IS : 2149 -Luminaries for Street Lighting.
(x) IS : 2183 -High Pressure Mercury Vapor Lamps.
(xi) IS : 1534 -Ballasts for use in Fluorescent Lighting Fittings (PART-I).
(xii) IS : 1569 -Capacitors for use in Fluorescent Lamps.
(xiii) IS : 2215 -Starters for Fluorescent Lamps.
(xiv) IS : 2713 -Tubular Steel Poles.
(xv) IS : 5133 -Steel & Cast Iron Boxes.
(xvi) IS : 2629 -Hot Dip Galvanizing of Iron & Steel.
(xvii) IS : 694 -PVC Insulated Cables for Working Voltage up to & including 1100 V
(xviii) IS : 732 -Code of practice for Electrical Wring Installation (System Voltage not exceeding 650 Volts.)
(xix) IS : 3043 -Code of Practice for Earthing.
(xx) Indian Electricity Act.
(xxi) Indian Electricity Rules.

7. The Standards mentioned above are available from Indian Standards Institution.Manek Bhavan,9, Bahdoor Shah Zafar Marg, New Delhi – 110 001.

8. All Sodium Lamps fixtures shall be complete with accessories like balasts, lgnintors,Power Factor Improvement Capacitors etc. This shall be mounted as possible in the fittings assembly only. If these cannot be accommodated inside, then a separate metal enclosed box shall be included to accommodate the accessories and in addition with fuse & terminal block suitable for Loop – In – Loop – Out connections. Outdoor type Weather proof box. They shall indicate starting time of this lamps to get full light output. Curves for starting characteristics and variation of lamp characteristics with varying supply voltage etc to be furnished by the bidders.

9. Each lighting fixture shall be provided with and earthing terminal suitable to connection to 8 SWG G.I. Earthing Conductor.

SAFETY CUM INDEMNITY BOND

(On Non-judicial Stamp paper of value not less than Rs. 300.00)

KNOW ALL MEN BY THESE PRESENTS that we,_____By this SAFETY CUM INDEMNITY BOND Executed on this____Day of_____2019.I/We Having Registered Office NADIAD (herein after called "THE CONTRACTOR" which expression shall mean and includes my /our heirs, executors, administrators and legal representatives, successors and permitted assigns) do hereby binds myself/ourselves and also our company/firms after having the power to bind by this promise and undertaking in favor of the Gujarat Energy Transmission Corporation Limited (GETCO), Vadodara a State Transmission Utility under The Electricity Act 2003 having its registered office at Sardar Patel Vidyut Bhavan, Race course, Vadodara.(hereinafter called as GETCO, which expression shall mean and include its legal representative, administrators assigns) has agreed under the terms and conditions of the contract no. _____Dated____made between___GETCO and_____ for the contract of the_____value of Rs._____interalia on Production of Safety cum Indemnity Bond.

We do hereby undertake and agree to Indemnify and keep Indemnified GETCO from time to time to the extent of Rs._____Rupees _____ only against any losses or damages, costs, charges and expenses caused to or suffered by reason of the CONTRACTOR while Project, R&M, O&M work including work carried out by outsourcing agency, failing to take proper care or not complying the guidelines given hereunder as per Annexure-A and instructions which may be given from time to time during the continuance of the contract and we further undertake to unconditionally pay the amount claimed by the GETCO on demand and without demur to the extent aforesaid.

Whereas the CONTRACTOR has/have been awarded to execute the job/works under order no. , dated _____for _____issued by the GETCO after having observing necessary formalities, the details of which is described in the order no. dated and whereas the said job/works will be /likely to be done in places covered under Employees' State Insurance Act,1948 (ESI) and /or the Workmen Compensation Act,1923 and /or other laws relating to the Labour Management and Welfare Act. (Respective Amendments)

And whereas according to the condition of the Contract the CONTRACTOR is under obligation to execute this Safety cum Indemnity Bond before the commencement of actual execution of work

Now the indenture witnesses that I/We the CONTRACTOR do hereby undertake to follow the guidelines as per Annexure-A prepared by the GETCO.

Further we the CONTRACTOR agree that the GETCO shall be sole judge of and as to whether there has been any breach of the guidelines as per Annexure-A of this bond and as to the extent of the loss, damages, costs, charges and expenses caused to or suffered by the GETCO.

We the CONTRACTOR further agree that our liability under this bond shall not be discharged because of the change in the constitution of the GETCO or for the extension of the time limit or for any other reason.

We the CONTRACTOR further agrees to the given terms and conditions:

a. That the CONTRACTOR undertakes /undertake to indemnify and keep harmless the GETCO from all claims, actions, proceedings and risk, damage danger to any person whether belonging or not belonging to the. CONTRACTOR.
b. That the CONTRACTOR shall keep harmless the GETCO from all claims, compensation, damages any proceedings in respect of any of its employee / workmen under the Workmen Compensation Act or any other laws for the time being in force.
c. That, if during the course of execution of work as stated in the contract order mentioned hereinabove issued by the OBLIGEE, it is found that the CONTRACTOR has not complied with guidelines as per Annexure-A or terms and conditions / formalities within the meaning of Employees' State Insurance Act,1948 (ESI) or Workmen Compensation Act 1923 or any other laws relating to the Labour Welfare for the time being in force, and also has not observed the safety norms in accordance with the law prevailing at the place of work/job to the satisfaction of the GETCO, the GETCO shall have the right to stop the execution of work/job and the period of such stoppage shall not be taken into account for the calculation of the total period of completion of work for which the CONTRACTOR is responsible to complete the work/job and it will be deemed that discontinuance was due to default of the CONTRACTOR .

d. That, if any time, due to exigency, GETCO as the Principle Employer, becomes liable to pay any such compensation mentioned hereinabove, whether on failure of the CONTRACTOR or for any other reason the GETCO shall have the right to recover the said amount from any amount receivable by GETCO or any bank guarantee deposited or anything payable whether in connection with this contract or other contract by the CONTRACTOR to the OBLIGEE.

e. That the CONTRACTOR is/are aware and accept that for the persistent or repeated violation of any guidelines as per Annexure-A and terms and conditions mentioned in this Safety cum Indemnity Bond GETCO shall have right to terminate the contract of work issued to the CONTRACTOR .

f. In case if any safety related fatal Electrical / Mechanical accident occurred to any employee of agency or outsider due to negligence or non-compliance of GETCO safety norms then in addition to the compensation and liability as per statutory requirement, contractor / agency is hereby agreed to pay the penalty amount as given below:

a. case if any safety related fatal Electrical / Mechanical accident occurred to any employee of agency or outsider due to negligence or non-compliance of GETCO safety norms then in addition to the compensation and liability as per statutory requirement, contractor / agency is hereby agreed to pay the penalty amount as given below:

Sr.No	Amount of Contract in Rs.	Penalty amount
1	Up to 1Lac	Rs.5000/- plus GST as applicable
2	Above1Lac to 10Lacs	Rs.40000/-plus GST as applicable
3	10 to 100 Lacs	Rs.100,000/- plus GST as applicable
4	>100Lacs	1.0%of contract value plus GST as applicable

b. I/We the CONTRACTOR hereby confirm that in case of any dispute/difference for settlement of claims under this Safety Cum Indemnity bond the courts in Gujarat State wherever job/work is performed or as per GETCO norms shall have the jurisdiction to decide the rights & liabilities of the parties while adjudicating the matter of claims under this Safety Cum Indemnity Bond.

c. This Safety cum Indemnity Bond shall continue and hold good until it is released by the GETCO in Writing on the CONTRACTOR's application after the Contractor has discharged all his obligations under the order mentioned hereinabove and submitted a "NO DEMAND CERTIFICATE" from the GETCO under the said order. The Safety cum Indemnity Bond shall be valid for a CONTRACT PERIOD and renewable thereof (Claim Period).

d. This Safety cum Indemnity Bond and the guidelines as per Annexure-A herein contained are in addition to And not by way of limitation or substitution for any other guarantee, indemnities Hereto before given to the GETCO by the CONTRACTOR and this indemnity does not Revoke or limit such indemnities or guarantees. IN WITNESS WHEREOF the Parties hereto have executed this indenture the day the year First hereinabove written.

(Signature with seal of The CONTRACTOR)

In the presence of:

1.

2.

CONTRACT AGREEMENT

(Non Judicial Stamp Paper of Rs. 300/-)

This Agreement is made at BARODA the_____ day of _____ in the Christian Year Two thousand fourteen between M/s. _____ (address of office) _____ (hereinafter referred to as "THE CONTRACTOR" which expression shall unless excluded by or repugnant to the contract include its successors or permitted assigns) of the ONE PART and the Gujarat Energy Transmission Corporation Ltd, having their Head office at Vidyut Bhavan, Race Course, Baroda 390 007 (hereinafter called "The GETCO" which expression shall unless excluded by or repugnant to the context include its successors or assigns) of the other part.

WHEREAS the aforesaid GETCO has accepted the tender of the aforesaid contractors for _____ _____ as per GETCO's Order No. _____ _____ hereinafter called "the works" and more particularly described and enumerated or referred to in the specification, terms and conditions prescribed in the order letter, covering letter and other letters and schedule of price which for the purpose of identification have been signed by Shri _____ on behalf of the contractors and by ---------- on behalf of the GETCO, a list whereof is made out in the Schedule hereunder written and all of which said documents are deemed to form part of this contract and included in the expression "The works" wherever herein used, upon the terms and subject to the conditions hereinafter mentioned.

AND WHEREAS THE GETCO has accepted the tender of contractors for the construction of the said works for the sum of Rs. _____ Rupees (_____ _____) upon the terms and subject to the conditions herein mentioned.

NOW THIS AGREEMENT WITNESSESS AND IT IS HEREBY AGREED AND DECLARED THAT.

1. The contractors shall do and perform all works and things in this contract mentioned and described or which are implied therein or there from respectively or are reasonably necessary for the completion of the works as mentioned and at the times, in the manner and subject to the terms and conditions and stipulations contained in this contract, and in consideration of the due provision, executions, supply and completion of the works agreed to by the contractor as aforesaid the Board doth hereby covenant with the contractor to pay all the sums of moneys as and when they become due and payable to the contractors under the provisions of the contract. Such payment to be made at such times and in such manner as is provided by the contract.

2. The conditions and covenants stipulated here-in-before in this contract are subject to and without prejudice to the rights of the Board to enforce penalty for delays and / or any other rights whatsoever including the right to reject and cancel on default or breach by the contractor of the conditions and the covenants as stipulated in the general conditions, specifications, forms or tender schedule etc. attached with GETCO's Order No. _____ _____.

   The contract value, extent of supply & erection works, delivery dates, specifications and other relevant matters may be altered by mutual agreement and if so altered shall not be deemed or construed to mean or apply to affect or alter other terms and conditions of the contract and the general conditions and the contract so altered or revised shall be and shall always be deemed to have been subject to and without prejudice to said stipulation.

SCHEDULE

List of documents forming part of the contract:

1. GETCO's Tender Specification No. _____ and contractor's offer opened on dated ____/____/2018
2. GETCO order No. Dtd. _____ / _____/ 2019
3. Contractor's acceptance of order vide letter no. _____.
4. Contractor's Partnership Deed Dtd. _____.
5. Contractor's Power of Attorney / Board Resolution authorizing person to sign on behalf of Firm.

In witness whereof the parties here to have set their hands and seals this day and month, year first above written.

1) Signed, sealed and delivered by
(Signature with name, Designation and official seal)

For and behalf of M/s. _____ (Signature)

_____

Address: _____

_____

In the presence of (Full Name, Address and Signatures)

i) _____ (Signature)

_____

_____

ii) _____ (Signature)

_____

_____

2) Signed, sealed and delivered by

(Signature with name, Designation and official seal)

For and on behalf of Gujarat Energy Transmission Corporation Ltd., NADIAD.

In the presence of name, Full address and Signature:

(1) _____

_____

(2)_____

_____

SECTION :E
APPENDICES

ANNEXURE-A

OUR ENDEVOUR - Safety a habit

To create environment where Business Confidence is built through Best Business Practices and is fostered in an atmosphere of trust and respect between providers of goods and services and their users for the ultimate benefit of society a the nation, safety guidelines are agreed upon by the agency as under.

Safety is our prime concern and zero accident is our goal. In order to prevent the accident, while execution of works in indoor and outdoor systems of GETCO, the following guideline and preventive measures are identified.

Indoor safety precaution	**Outdoor safety precaution**
The method of work required T&P and manpower should be discussed between GETCO supervisor, contractor's supervisor and gang leaders.	The method of work required T&P and manpower should be discussed between GETCO supervisor, contractor's supervisor and gang leaders.
Prior to execution of work a joint survey must be conducted by GETCO supervisor and contractor's supervisor for risk assessment. • Clearly identify the work location, to distinguish between the equipment that is dead and other equipment / part that may be live. • Disconnect equipment from supply. • Protect against other live parts. • Take special precautions when close to bare conductors / Bus bar.	Prior to execution of work a joint survey must be conducted by GETCO supervisor, contractor's supervisor and DISCOM line man in order to identify the following : a. HT/LT line or tap line crossing under each span of line of the work. b. Isolation point of each line crossing. c. Each line crossing & isolation point under each span must be discussed and noted in maintenance register with sketch.
Following safety guidelines are mandatory for all contractors operating in GETCO premises for Electrical, non-electrical & civil works. **1.** The contractors must provide advance planning of work to concerned in-charge of substation in writing. **2.** Before starting any work whether switch yard, "permit to allow to work" must be taken from control room in-charge. **3.** Utilizing Electrical / non-electrical equipments, safety rules must be implemented. **4.** If the work is to be carried out on Sunday or public holiday, the necessary permission must be taken in advance, requesting in writing. **5.** Unwanted person including children of labours will not be allowed at working site/ in the switchyard and in the prohibited area. **6.** Any electrical work or electrical connections to equipment for any other work must be carried out by certified	Contractor's supervisor and GETCO Supervisor must ensure all isolations physically with adequate earthing technically prior to give clearance to gang leader for taking up job. While execution of stringing work, the identified line crossing must be isolated / de-energized and written clearance should be obtained from concerned DISCOM supervisor. The isolation of Tap line must be physically seen and verified by Contractor and GETCO supervisor. At D.O. fuse junction contractors person should be posted to ensure that no person restore D.O. supply while work is under execution Contractor's supervisor must ensure that concern officer take LCP for EHV line and power line crossing.

electrician/wiremen with adequate size of wire through MCB as per I.E. Rule. - Live penal area / bus bar must be isolated and sealed / bifurcated with red colour tape for visible warning. - Display Board must hang on LCP panel. - Transformer must be switched off whenever and wherever contractor and line workers are not satisfied with isolation, earthing or any equipment performance of GETCO, it will be pointed out and work shall begin only after resolution. Contractor shall not take up job in absence of GETCO authorized person. All wire temporary connection & material whenever erection activity has any connection and disconnection work of bus bar, string bus.	
All workers / labour of contractor & supervisors must use personal protective equipment (PPE) during the work like gloves, safety belt, Safety shoes, Helmet, earthing rods, etc, duly approved by GETCO.	All workers / labour of contractor & supervisors must use personal protective equipment (PPE) during the work like gloves, safety belt, Safety shoes, Helmet, earthing rods, Live line detector etc, duly approved by GETCO.
The local earthing must be done at the place of work before execution of any work.	The local earthing must be done at the place of work before execution of any work.
11 kV breaker in panel must be switched off and racked out only after ensuring no voltage in breaker and without door opening.	Circuit breaker opening is not an isolation and isolator on either side must be opened. No work during rains and cloudy weather condition.
	Transmission line activities. 1) Used of Voltage detector to ensure outage. 2) Earthing at three point, local, left & right side of bus bar / string bus. 3) Match line colour code with colour of wrist band.
	Local earthing of electrical equipments like filter M/c, welding machine, testing kits etc. is must. Crane shall only be used for material handling and erection. Working platform shall only be used for work in switchyard.

BG Draft for Civil Department

NON JUDICIAL STAMP PAPER OF RS. 300/- (Stamp Paper Validity Six Months):

To,
The Superintending Engineer(TR)
Gujarat-Energy. Transmission Corporation Ltd
Transmission Circle Office,
Dabhan,
NADIAD. 387320

BG. No.
Issue Date
Expiry Date
Amount

BANK GUARANTEE FOR SECURITY DEPOSIT

FORM OF BANKER'S UNDERTAKING (Combined Performance Guarantee (PBG) towards Execution/supply Period and Guarantee/Warranty Period as per commercial terms and conditions of Tender)

We _____(Name of the Bank and Address of the Branch Giving the Bank Guarantee) having our registered office at _____ (Address of Bank registered office) hereby Give this Bank Guarantee No. _____ date _____and hereby agree Unequivocally and Unconditionally to pay immediately on demand in writing from the Beneficiary Company _____ (Name of Gujarat Urja Vikas Nigam Ltd/ subsidiary Company) or any officer authorized by it in this behalf any amount up to not exceeding Rs. _____ (Amount of combined Performant Guarantees towards Execution / supply Period and Guarantee/ Warranty period (Rupees _____ (in words) to the said _____ (GUVNL/ subsidiary Company) on behalf of M/s _____ who have entered into a contract for the supply/ works specified below.
L.O.A. No. _____ dated _____

This agreement shall be valid and binding on this Bank Up to and inclusive of _____ (Date of validity of the Bank Guarantee) and shall not be terminable by notice or by change in the constitution of the Bank of the firm of Contractors / Suppliers or by any other reasons whatsoever and our liability hereunder shall not be impaired or discharged by any extension of time or variations or alterations made given conceded or agreed with or without our knowledge or consent, by or between parties to the said within written contract . Notwithstanding anything contrary contained in any law for the time being in force or banking practice this Guarantee shall not be assignable transferable by the Beneficiary (i.e GUVNL or Subsidiaries). Notice or invocation by any person such as assignee transferee or agent of beneficiary shall not be entertained by the Bank. Any invocation of the Guarantee can be made only by the beneficiary directly.

NOTWITHSTANDING anything contained herein before. Our liability under this guarantee is restricted to Rs. _____ (Rupees _____only) our Guarantee shall remain in force Until _____ (Date of validity of the Bank Guarantee). Unless demands or claims under this Bank Guarantee are made to Us in writing on or before _____(Date of validity of the Bank Guarantee), all rights or the Beneficiary Under this Bank Guarantee shall be forfeited and we shall be released and discharged from all liabilities there Under.
Signature(s) of
Name and Address

_____

Constituted Attorney with POA No. and
round seal of Bank
OR
Signature of Two Bank officials with their
sign, sign code nos. & round seal of Bank

(E) APPENDICES

Gujarat Energy Transmission Corporation Ltd.

APPENDIX –I

TENDERER'S EXPERIENCE

A List of Similar jobs executed by the Contractor &Name with address of a Person whom reference can be made, by the Corporation, if required necessary.

[Tenderers shall submit the information in the Format detailed here under]

Sr. No	Description of Work	Value Of Work Executed Rs.	Construction Period as per Contract	Actual Construction Period for the Completion of the work	Date Of Completion	Client	Persons to whom Reference may be made	Principal Features
1	2	3	4	5	6	7	8	9

Contractor's Representative legible signature: _____

Name of the person: _____

Seal of the company

Date & place:

Gujarat Energy Transmission Corporation Ltd.

APPENDIX – II
WORKS TENDERED / IN HAND

Details of other Works, tendered for & in hand , as on the date of the Submission of this tender [Tenderers shall submit the information in the
Format detailed here under]

Sr. No	Name of work with location and address	Work in hand			Work Tender for			Remarks
		Tender Cost	Cost of Remaining work	Anticipated Date of Completion	Estimated Cost	Date when decision Is Expected	Stipulated Date or period Of Completion	
1	2	3	4	5	6	7	8	9

Contractor's Representative legible signature: _____
Name of the person: _____
Seal of the company Date & place: _____

Gujarat Energy Transmission Corporation Ltd.

GETCO
APPENDIX-III
TENDERER'S DETAILS OF PERSONNEL

The List of Technical Personnel intended to be placed at the Work by the Contractor.
[Tenderers shall submit in the Format detailed here under]

Sr. No.	Description &Details of position	Name	Qualification	Professional Experience & details of works carried out	Remarks
1	2	3	4	5	6

Contractor's Representative legible signature: _____
Name of the person: _____
Seal of the company
Date & place: _____

Gujarat Energy Transmission Corporation Ltd.

APPENDIX-IV

TENDERER'S DETAILS OF MACHINERY

The List of Technical Personnel intended to be placed at the Work by the Contractor.
[Tenderer shall submit in the Format detailed here under.

Sr. No.	Description & Details machinery	Capacity	Numbers	Make	Remarks
(a)	(b)	(c)	(d)	(e)	(f)

Contractor's Representative legible signature: _____

Name of the person: _____

Seal of the company

Date & place: _____

Gujarat Energy Transmission Corporation Ltd.

APPENDIX-V

PERFORMA, SHOWING THE DETAILS OF SITE VISIT DONE BY AGENCY BEFORE QUOTING THE TENDER.

[Tenderers shall submit in the Format detailed here under]

Sr. No.	Name of firm	Name of Authorized representative of firm who has visited the site.	Qualification	Designation / post holding in company.	Remarks.
(a)	(b)	(c)	(d)	(e)	(f)

Contractor's Representative legible signature: _____

Name of the person: _____

Seal of the company

Date & place: _____

Gujarat Energy Transmission Corporation Ltd.

APPENDIX – VI
Qualification Requirement.

Contractor must fill up below details & should place at the top of the Technical Bid.

Sr No:	List of Documents	
1	Registration	Class – with valid up to
2	P.F. No.	GJ/
3	Partnership deed/Proprietor (Notarized copy)	
4	Power of Attorney (Notarized copy)	
5	Bl. Sheet / P&L A/C, Statement of last three years.	
6	Latest Solvency certificate.	Rs. Lacs issued by Bank, branch dtd.
7	**GST Registration No.**	
8	PAN NO	
9	Experience certificate – form 3A of last 5 years (minimum value of similar work done should be equal to or more than 50% of estimated cost	

Signature of Tenderer Company's Round Seal
Date :
Place

Gujarat Energy Transmission Corporation Ltd.

APPENDIX – VII
Qualification Requirement.

1.	PRICES: [FIRM ONLY] (Please Specify YES / NO.)	
2.	PENALTY TERMS AGREED (Please Specify YES / NO.)	
3.	SECURITY TERMS AGREED: (Please Specify YES / NO.)	
4.	TERMS AGREED: (Please Specify YES / NO.)	
5.	VALIDITY Of the offer for 180 DAYS From the date of opening of the Technical Bid: AGREED: (Please Specify YES / NO.)	
6.	PAYMENT TERMS AGREED: (Please Specify YES / NO.)	
7.	MOBILE NOS., TELEPHONE NOS. & FAX NO:	
8.	Authorized person of the firm :	
9.	Name of the proprietor, partners, directors [as the case may be], along with address, telephone, fax no. etc.	

Contractor must fill up above details

Signature of Tenderer
Date :
Place

Company's Round Seal

Placing Vendors/Contractors for Purchase/Works in a Stop deal/Banned for business dealing / blacklisting:

1.1. Stop deal / banned for business dealing / blacklist means debarment of parties from participating in the tendering process.

1.1.1. Firm will mean Bidder / Licensor / Tendered / Consultant / Vendor / Contractor.

1.1.2. Reasons for Putting a Firm on Stop deal / banned for business dealing / Blacklisting is to protect the GUVNL and its subsidiary Companies from dealing with an undesirable firm.

1.2. The list of indicative reasons for placing the firm in a Stop deal / banned for business dealing / Blacklist are as under.

A Firm will be placed in a Stop deal / banned for business dealing / blacklist, if the Firm-

1.2.1. Has submitted fake, false or forged documents / certificates,

1.2.2. Has revised / withdrawn price bid after opening of Techno – commercial bid, until and unless it is sought for,

1.2.3. Has tampered with the stipulated tendering procedure.

1.2.3. Has refused to accept letter of Acceptance / purchase Order / Work Order after the same is issued by the Company within the validity period and as per agreed terms and conditions,

1.2.5. Has committed breach of contract or has failed to perform a contract or has abandoned the contract,

1.2.6. Has failed to provide suitable expertise for the work as per per-scheduled Program.

1.2.7. Has failed to submit all the necessary tests reports / documents within time schedule / as per company's time limit, as mentioned in the LOI, if the letter of Acceptance (LOA) is placed subject to submission of type reports / documents to the firm.

1.2.8. Has indulged in construction and erection of defective works.

1.2.9. Has supplied inferior quality / defective materials and refused to replace with stipulated time frame, as specified by the company,

1.2.10. Has substituted materials in lieu of materials supplied by the company or has not returned or has short returned or has unauthorisely disposed of materials / documents / drawings / tools or plants or equipment supplied by the Company,

1.2.11. Has involved in malpractices such as bribery, corruption, fraud, canvassing and pilferage,

1.2.12. Has unauthorisely obtained official company information or copies of documents, in relation the tender / Contract.

1.2.13. Has failed to follow the stipulated mode of communication, if specified by the endering authority / purchaser.

1.2.14. Has parted with, leaked or provided confidential / proprietary information of the Company given to the firm only for its use (in discharge of its obligation against an order) to any third party without prior consent of the Company,

1.2.15. Any other ground for which in opinion of the company makes it undesirable to deal with the Firm

1.2.16**.** In case the State Government directs the Company to place a firm in stop dealing / banned for business dealing / banned for business dealing / blacklisting.

1.3. Every bidder should at the time of submission of bid, give a declaration that bidder and / or proprietor / partner / Director of the firm has not been placed on stop dealing / banned for business dealing / blacklisting by GUVNL and It's any subsidiary Companies as per **ANNEXURE-VIII (as per attached format).**

(On the letter head of the firm/company)

ANNEXURE-VIII

(UNDERTAKING IN REGARD TO STOP DEAL / BANNED FOR BUSINESS DEALING/ BLACK LIST THEREOF)

Sub: Undertaking in regard to Stop Deal/ Banned for Business dealing/ Black List thereof

Ref: Tender Notice No

All bidders will have to furnish the following undertaking dully filled in, signed and stamped for each quoted item of the tender along with the Technical Bid.

I/We _____ authorized signatory of M/S _____ here by certify that M/S _____ and their proprietor / any partner / any directors of the firm are not stop deal and / or banned for business dealing and / or black listed by GUVNL and / or their any subsidiary company viz. GSECL / GETCO / DGVCL / MGVCL / UGVCL / PGVCL.

Seal of the Firm

Signature of the Tenderer

(On the letter pad of the company / Firm)

Date:

Declaration of Conflict On Interest

TO,
THE SUPERINTENDING ENGINEER (TR),
GETCO, TRANSMISSION CIRCLE OFFICE,
P.O. DABHAN, NADIAD, DIST. KHEDA,
GUJARAT, PIN-387320

Ref: Tender Notice No……

With reference to above your tender Notice No……..
For the work of……

A Bidder shall not have conflict of interest with other bidders for particular quoted item. Such conflict o interest can lead to anti-competitive practice to the detriment of procuring entity's interests. The bidder found to have conflict o interest shall, be disqualified. In addition, bidder may be considered to have a conflict of interest with one or more parties in bidding process for particular quoted item if, only on base of context covered in earlier instruction will remain unaltered

We do not have any conflict of interest with any other bidder who has submitted the bid in this tender.

Yours Faithfully,

(Signature of the Tenderer)

(On the letter pad of the company / Firm)

Date:

Declaration of Relationship with employee

TO,
THE SUPERINTENDING ENGINEER (TR),
GETCO, TRANSMISSION CIRCLE OFFICE,
P.O. DABHAN, NADIAD, DIST. KHEDA,
GUJARAT, PIN-387320

Ref: Tender Notice No……

With reference to above your tender Notice No……..
For the work of……

If in any bidder company/firm, the interest (i.e. shareholding in company and share in partnership firm) of any employee of the tendering company or his/her relative as defined in section 2(77) of company's act 2013 in 10% or more, the tendering company will not deal with such company/firm at all.
Tenderer therefore, must specifically disclose this fact in his technical Bid. Non-discloser of such fact would immediately disqualify the tenderer for further dealing with the tendering company

We do not have any type of relationship with any current employees of GETCO.

Yours Faithfully,

GUJARAT ENERGY TRANSMISSION CORPORATION LIMITED					
CIRCLE NADIAD					
NAME OF WORKS :- "Providing & fixing Barbed Wire fencing for Various 66 KV & EHV S/S under Nadiad TR Circle."					
SCHEDULE-B:-					
SR. NO.	DESCRIPTION	APROX. QTY.	RATE	UNIT	AMOUNT
1	Excavation for foundation up to 1.5 m Depth including sorting out and stacking of useful materials, Refilling the trenches and disposing of the excavated stuff up to any lead (Manual Excavation) [B] Dence or Hard Soil	160.00	259.00	CMT	₹ 41,440.00
2	Providing and laying cement concrete 1:3:6 (1 Cement : 3-Course sand : 6-hand broken stone aggregate 40mm nominal size) and curing complete excluding cost of Formwork in - (A) Foundation and plinth.	160.00	2956.00	CMT	₹ 4,72,960.00
3	Providing & Fixing of PSC Poles 125mmx125mm size and 8 ft height in line & level as directed by E.I.C.	1,240.00	355.00	Nos	₹ 4,40,200.00
4	Providing & fixing G.I. Barbed wire fencing (12/14 Gauge) having mass & uniformity of Zinc coating & specifications shall be as per IS 2140-1978 & IS 4826-1979 code with minimum 70 micron coating having 6 horizontal row, fixing with RCC poles by 14 Gauge G.I. wire as per drawing etc. complete as directed by EIC.	16,800.00	184.00	Rmt	₹ 30,91,200.00
5	Site cleaning by Hydraulc excavator 1cum bucket capacity @60 cum per hour	100.00	712.00	Hr	₹ 71,200.00
6	Providing & Fixing **SIGN BOARD** having size 1000 X 750 mm. for SUB-STATION made from 16 gauge M.S. Sheet having frame work of 35X35X3 mm. M.S. angle all-round & 4 vertical intermediate angle supports at equal distance welded to sheet with 3 Nos. of 50X50X6 mm. M.S. angle posts 3.0 M. long with arrangement of bolting, 3 coats of oil painting etc., complete as directed by E.I.C	10.00	8,835.00	Nos	₹ 88,350.00
7	**Painting the letter** with best enamel oil paint in 200 to 250mm size etc. complete as directed by EIC (paint should be brought by the contractor)	500.00	22.00	Nos	₹ 11,000.00
				Total	₹ 42,16,350.00
				GST 18 %	₹ 7,58,943.00
				Total	₹ 49,75,293.00
				1% WC	₹ 49,752.93
				Total	₹ 50,25,045.93

NOTES:

1. **GST & Welfare cess as per rules will be applied & same shall be reimbursed on production of proof of such payments made by the contractor to the appropriate department.**
2. **Proof of payment of taxes made by the Contractor to the appropriate departments shall be produced to Gujarat Energy Transmission Corporation failing which appropriate amount shall be withheld on getting information / instruction from the concerned departments.**
3. **Submission of Bill : You should upload the original Invoice & relevant documents which are digitally signed by Vendors / Suppliers/Contractors on Vendor Management System (VMS) Portal, www.vms.guvnl.com. The supporting documents duly signed, stamped and scanned are required to be uploaded. The VMS portal also provides 'real time' tracking of invoice status, to monitor the process of submissions and to receive timely updates.**

SUPERINTENDING ENGINEER, GETCO, CO, NADIAD