

Notice Inviting On-line Tender

Department Name	AHMEDABAD MUNICIPAL TRANSPORT SERVICE
Circle/Division	CIVIL ENGINEERING DEPARTEMENT
IFB No / Tender Notice No.	1/26-27
Name of Project	RENOVATION OF COMMAND & CONTROL CENTRE AT TRANSPORT HOUSE, JAMALPUR, AHMEDABAD
Name of Work	RENOVATION OF COMMAND & CONTROL CENTRE AT TRANSPORT HOUSE, JAMALPUR, AHMEDABAD
Estimated Contract Value (INR)	Rs. 45,79,277.66
Period Of Completion(In Months)	03 Months (Including Monsoon Period)
Bidding Type	Open / Limited
Tender Currency Type	-----
Tender Currency Settings	-----
Joint Venture	Not Applicable
Rebate	Not Applicable
Sector Category	
Form of Contract	
Product Category	

Amount Details

Bid Document Fee :	Rs.1500 = 00
Bid Document Fee Payable To :	Transport Manager, Ahmedabad Municipal Transport Service, Ahmedabad
Bid Security/EMD (INR) :	Rs. 45,792 = 00
Bid Security/EMD In Favour Of :	Transport Manager, Ahmedabad Municipal Transport Service, Ahmedabad

Tender Dates

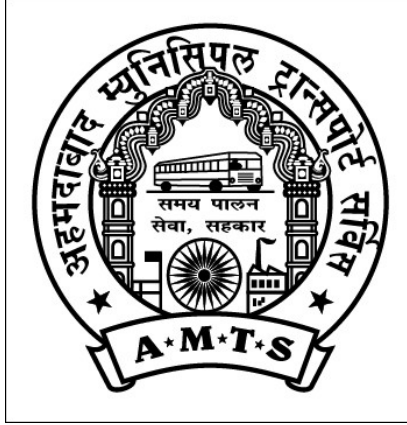
Bid Document Downloading Start Date	Automatic System Generated
Bid Document Downloading End Date	29/06/2026 ; 18:00 hrs.
Pre Bid Meeting	Not Applicable
Last Date & Time for Receipt of Bids	29/06/2026 ; 18:00 hrs.
Bid Validity Period	180 Days
Remarks	Submission of EMD, Tender fee and other Documents during office hours: On <u>Date : 30/06/2026 : 16:00 hrs.</u> in the office of Central Office, First Floor, Transport House, Outside Jamalpur Gate, Behrampura, Ahmedabad. Phone : (079) 25391881 - 86
Bid Opening Date	01/07/2026

Other Details

Officer Inviting Bids :	Transport Manager, A.M.T.S. Ahmedabad
Bid Opening Authority :	Deputy Transport Manager(Gen.), A.M.T.S., Ahmedabad
Address :	Transport House, Outside Jamalpur Gate, Behrampura, Ahmedabad 38 00 22
Contact Details :	Nitin Patel (Asst. Engineer) 7574807904

GST : GST will Be paid Separately as per governing Policy Which will be bidded to contractor.

AHMEDABAD MUNICIPAL TRANSPORT SERVICE



TENDER NO: 1/26x27

TENDER DOCUMENT FOR

“RENOVATION OF COMMAND & CONTROL CENTRE AT TRANSPORT HOUSE, JAMALPUR, AHMEDABAD”

DOWNLOADING OF TENDER : 18-06-2026 to 29-06-2026 up to 18:00 Hrs.
THE WEBSITE <https://tender.nprocure.com>

LAST DATE OF ONLINE SUBMISSION : 29-06-2026 up to 18.00 Hrs.

LAST DATE OF PHYSICAL SUBMISSION : 30-06-2026 up to 16.00 Hrs.
With Relevant Tender Document along with fees (Enclosures as asked)

CHECKLIST OF DOCUMENTS TO BE SUBMITTED ALONG WITH THE TENDER :

Bidders please strike out as appropriate in the following table.

Sr. No.	Document Required	Yes / No
1	Tender fee as mentioned.	Yes / No
2	Earnest Money Deposit as mentioned	Yes / No
3	Valid Copy of Registration of Contractor's Firm	Yes / No
4	Bank Solvency Certificate of appropriate amount and approved Bank	Yes / No
5	Company Details	Yes / No
a	Annual Turnover Certificate	Yes / No
b	Audited Balance Sheet of last 3 (Three) financial years certified from Chartered Accountant	Yes / No
c	List of Ongoing Projects with Photographs	Yes / No
d	Certificate of Completed works from the employer / client	Yes / No
e	List of Staff (Technical & Non-technical)	Yes / No
f	List of Tools, Equipment & Plants	Yes / No
g	Litigation History (Mandatory) (Self Declaration on Letter Head)	Yes / No

BIDDERS PLEASE MAKE SURE THAT ALL THE ABOVE DOCUMENTS ARE SUBMITTED ALONGWITH THE TENDER.

MOST IMPORTANT INSTRUCTIONS FOR THE BIDDER :

- THESE WORKS HAS TO BE DONE IN THE “**WORKING CONTROL ROOM**”WHERE THE FLOW OF THE WORK SHALL BE DONE SIMULTANEOUSLY. THE BIDDERS MAY PLEASE VISIT THE SITE AND KEEP IN MIND THE WORKING CONDITIONS BEFORE QUOTING THE TENDER.
- NO CLAIMS FOR ANY LOSS FOR MAN / MATERIAL / TOOLS / EQUIPMENTS OR ANY SUCH KIND, SHALL BE ENTERTAINED.
- IN NO CASE, TIME LIMIT SHALL BE EXTENDED FOR THE REASON QUOTED ABOVE OR ANY REASON THEREOF.
- THIS IS A TWO BID SYSTEM TENDER PROCEDURE.

AHMEDABAD MUNICIPAL TRANSPORT SERVICE

MEMORANDUM OF WORK IN BRIEF

1.	Estimated cost put up to tender	Rs. 45,79,277.66 (Rs. Fourty five lakhs seventy nine thousand two hundred seventy seven Rupees and sixty six paisa Only)
2	Tender Fees (Non-Refundable)	Rs. 1500=00 (Demand Draft or pay order in favor of Transport Manager, Ahmedabad Municipal Transport Service.
3	Tender validity period	180 days (One Hundred and Eighty Days) from the date of opening of the tender.
4	Time of Completion	03 Months (Including Monsoon Period)
5.	Earnest Money Deposit	Rs.45,792=00 (Demand Draft or pay order Or Bank Guarantee in favour of Transport Manager, AMTS. Demand Draft or Bank Guarantee shall be from Nationalized Bank / Scheduled Bank and valid for 180 days. Refer Annexure "C"
6.	Eligibility Criteria for Bidders	<p>1. Contractor Registered with in "D" Class and /or above Category with A.M.C./Government of Gujarat or other States Governments, Semi Government Bodies or with Central P.W.D. (Contractor shall submit the valid registration copy and if its under renewal kindly submit the document supporting the same.)</p> <p>2. The average annual financial turnover during last 3 years, ending 31st March of the previous financial year should be at least 30% of the estimated cost. It shall be supported with Chartered Accountant's Certificate. Turnover may be escalated with @ 10% as escalating factor for every year.</p> <p>3. Contractor shall preferably have all the mandatory respective authority licenses and registrations which are applicable, including Sales Tax, Service Tax, and Valid Contractor's Registration etc.</p> <p>4. The Contractor shall have experience of having successfully completed similar works during last 7 years ending last day of the month previous to the month in which tender is invited as following :</p> <p>1) <u>Three similar</u> completed works cost not less than the amount equal to the <u>40%</u> of the tender amount, OR (2) <u>Two similar</u> completed works costing not less than the amount equal to the <u>50%</u> of the tender amount, OR (3) <u>One similar</u> completed works costing not less than the amount equal to the <u>80%</u> of the tender amount. <u>Similar Works means buiding and road only from State government ,central government or central state undertaking organization</u> <u>The bidders shall also furnish the completion certificate along with the tender documents in physical format.</u></p>
7	Submission of EMD and Tender Fees	Scan Copy of Tender Fees and EMD drafts / instrument shall be sent physically in separate sealed cover each for EMD and Tender Fees along with Tender as described in the invitation of tender and submitted to Transport House First Floor, Central Office (Tender Box), Outside Jamalpur Gate, Behrampura, Ahmedabad 38 00 22. Price Bid shall not be sent in physical submission.
8.	(A) Security Deposit	5 % of value of accepted tender cost in form of Bank Guarantee (to be submitted on award of work and to be retained till 90 days more than the actual date of completion of work)
	(B) Performance Bond	5 % of <u>Actual Cost of work done</u> in form of Bank Guarantee (to be submitted on completion of work and to be retained

		till defect liability period)
	(C) Retention Money	2 % of the gross value of the work done in each Running Account bill.(to be retained till completion of work with Final Bill)
9	Solvency Certificate	Valid Solvency Certificate of value not less than 20% of the Tender Amount from the Nationalised or Scheduled Bank Only. (Also Refer Annexure “ C”)
10	Mode of sending the Tender Documents	Tenders should be submitted as per the dates mentioned in tender notice, along with all necessary documents as asked, it should be sent physically duly signed with the Seal of the contractor in the multi –envelope system By RPA/D/Speed post/ Hand Delivery in sealed covers.
11	Defect liability period	One year after issue of completion certificate as per the format given by the A.M.T.S.
12	Compensation for delay	@ 0.1% of the total project cost (Quoted amount) per day of Delay (for uncompleted works only per day) after Scheduled Date of Completion. <u>Maximum upto 10 %</u> of the contract amount put to tender from the date of delaying the said work upto the date of completion and handing over to the AMC or the amount as decided by the Transport Manager, A.M.T.S.
13	Last date of receipt of tender by R.P.A.D / Speed post / Courier / Hand delivery.	As per tender notice.
14	Rejection of Tender	Tenders which do not fulfill all or any of conditions or are submitted incomplete in any respect will be rejected outright. The Transport Manager reserves the right to reject any or all the tenders without assigning any reason thereof. Conditional tenders will not be accepted and will be rejected outright.
15	Scope of Work	The Transport Manager reserves the rights to increase / decrease the scope of work. No claim to that effect shall be entertained.
16	To Waive eligibility criteria	In case of insufficient numbers of bidder, or even if, The Transport Manager reserves right to accept or reject tender/s.
17	Secured , Material, Labour Advance	No secured / material / labour advance will be paid against any raw material procured & stocked at site.
18	Labour cess	1% of the gross value of the work done will be deducted in each running bill. (This shall be Non -refundable)
19	Value Added Tax (V.A.T)	0.60% of the gross value of the work done will be deducted in each running bill. (This shall be Non -refundable)
20	Material Testing Charges	Material Testing Charges shall be borne by the Contractor, and in any case, if the material testing charges are borne by A.M.T.S, the same shall be deducted from the Contractor's Immediate Next Running Bill.
21	Subletting	The tenderer shall not without the written consent of the Transport Manager assign or sublet the contract nor make any subcontract with any person / persons for the execution of the any portion of the work other than for raw materials or for any part of the work of which the manufacturers are named under this contract.
22	Date of Commencement of Work	Not later than 10 Days of receiving the Work Order From the Client or clear possession of site to start the work, which ever is late.

- ❖ Addendum / Corrigendum to the tender documents may be issued till the last date and time of submission of the tenders, to clarify documents or to affect modification in the Design or contract terms shall be downloaded from the A.M.T.S.'s official website www.nprocure.com and shall be duly signed and shall be submitted along with the technical bid. All addendum / corrigendum issued by the A.M.T.S. shall become part of the tender documents. **Any tender submitted without this addendum shall be rejected outright.**

Seal and Signature of the Bidder
Date:

Transport Manager (A.M.T.S.)
Ahmedabad Municipal Transport Service

INFORMATION FOR BIDDERS

The AHMEDABAD MUNICIPAL TRANSPORT SERVICE ,(hereinafter called “the Employer”) invites sealed Tender document from reputed and qualified bidders for the construction of Works detailed in the Table below:-

Sr. No.	Name of Works	Approximate value of works (Rs.)	Earnest Money Deposit (Rs.)	Completion Period
1	RENOVATION OF COMMAND & CONTROL CENTRE AT TRANSPORT HOUSE, JAMALPUR, AHMEDABAD	45,79,277.66	45,792.00	3 Months including Monsoon Period.

2. The time limit shall be considered from the actual possession of site given to the contractor to start the works.

3. Any documents attached herewith are liable for cross check with various agencies / departments, which may take time. Thus it is instructed hereby to the tenderers, that any fake data, if proven shall result into the breach of the contract. This may lead to terminate the contract on as and when basis and the final decision in this regard will be with Transport Manager, Ahmedabad Municipal Transport Service, and Ahmedabad. This decision shall be abiding to the contractors / bidders at any point of time.

4. The contractors shall be asked to co-operate for the evaluation process and checking the data furnished by them herewith.

AHMEDABAD MUNICIPAL TRANSPORT SERVICE

SECTION: I INSTRUCTIONS TO BIDDERS (ITB)

Procedure for Submission of Tender

- a) The Bidder should quote the price bid before schedule time along with tender fees & EMD (Draft /DD) or details asked and all other enclosures as asked in tender.
- b) The bidder shall submit the Tender document physically in schedule time by RPAD/ Speed Post/ Hand Delivery in duplicate. The envelope shall be sealed in an outer envelope. The Bid envelopes shall be marked as follows:-

Main Cover shall consist of Cover "A" and Cover "B".

In Cover "A" following things shall be submitted.

Tender Fees and Earnest Money Deposit

In Cover "B" : Technical Bid, Registration Copy , Power of Attorney (If any), Partnership Deed, Personal Technical details, and any other data which the contractors feels to submit to support the tender (But other than the price bid, and any thing that reflects the financial bid)

A. General

1. Scope of Bid

- 1.1 The Ahmedabad Municipal Transport Service hereinafter called "the Employer" invites bids for the Construction works (as defined in these documents, hereinafter referred to as "the Works") detailed in the table given in the IFB.
- 1.2 The Work is:

Name: **"RENOVATION OF COMMAND & CONTROL CENTRE AT TRANSPORT HOUSE, JAMALPUR, AHMEDABAD"**

- 1.3 The works under this Contract shall be carried out in accordance with the bidding documents constituting the contract and shall consist of various salient items as generally described below:

Carpentary work, Scrapping , Roofing, Electrification, Etc.

Before Casting, It should be checked By Structure Engineer from Project Architect, Which visiting Fes will be Born by Contractor. The report will be submitted by Contractor to Department.

2. Source of Funds

- 2.1 The expenditure on these Works will be met by AHMEDABAD MUNICIPAL TRANSPORT SERVICE.

3. Eligible Bidders

As explained earlier in Memorandum of Works Bidders shall provide such evidence of their continued eligibility satisfactory to the Employer, as and when the Employer shall reasonably request.

4. Appropriate Material, Equipment and Services

- 4.1 At the Employer's request, the bidder having offered the lowest evaluated financial bid may be required to provide evidence of the origin of materials, equipment, and services to the satisfaction of the Employer.
- 4.2 "Origin" means the place where the materials are mined, grown, produced or manufactured; similarly for equipments and from where the services are provided.

5. Qualification of the Bidder:

5.1 To be qualified for award of Contract, bidders shall:

- a) Submit a written power of attorney authorizing the signatory of the bid to commit the bidder; and
- b) Have adequate experience, financial capacity, adequate available bid capacity and technical capability to undertake the Contract. Confirmation of these matters may involve the updating, verification and reassessment of information.
- c) The bidder shall submit the following information on eligibility and qualification duly updated including any changes since pre qualification.

FORM 1

General information

All individual firms must complete the information in this form. Nationality information shall be provided for all owner(s) or applicant(s) that are partnership or individually owned firms.

1. Name of firm:

2. Head office address:

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.....

3. Local office address (if any):

.....
.....

4. Telephone/ Mobile/ Contact:

5. E-mail address / Web-site:

6. Place of incorporation/registration:

7. Year of incorporation/registration:

- Current contract commitments/works in progress
- Financial data
- Additional information regarding litigation, debarment, arbitration, etc.
- Affidavit.

5.3 Disqualification

Even though the Bidders may meet the above criteria, they are subject to be disqualified for any of the following reasons:

- a) Misleading or false representation in the forms, statements and attachments submitted.
- b) Record of poor performance such as abandoning the work, rescinding / revoking of contract for which the reasons are attributable to the non-performance of the contractor, consistent history of litigation awarded against the applicant or financial failure due to bankruptcy.
- c) Any tenders which are found conditional, shall be rejected outright, without assigning any reason thereof.

5.4 Debarment/Black listing

Notwithstanding the above, the Employer may debar or blacklist any of the bidder(s) for their misleading or false representations in the forms statements etc. for the period to be decided by the Employer.

6. One Bid per Bidder

6.1 Each bidder shall submit only one bid per contract package either by himself or as a partner in a joint venture.

7. Cost of Bidding

- 7.1 The bidder shall bear all the costs associated with the preparation and submission of his bid and the Employer will in no case be responsible or liable for those costs.

8. Site Visit

- 8.1 The bidder is advised to visit and examine the Site of Works and its surroundings and obtain for itself on his own responsibility all information that may be necessary for preparing the bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the bidder's own expense.

- 8.2.1 The bidder and any of its personnel or agents will be granted permission by the Employer to enter its premises and lands for the purpose of such inspection, but only upon the express condition that the bidder, its personnel and agents, will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof and will be responsible for death or personal injury, loss or damage to property and any other loss, damage, costs and expenses incurred as a result of the inspection.

B. Bidding Documents

9. **Contents of Bidding Documents**

- 9.1 The set of bidding documents listed below:

9.2 Document

Section I	Instruction to Bidders (ITB)
Section II	General and Special Conditions of Contract
Section III	Form of Bid and Appendix to Bid
Section IV	Form of Bid Security
Section V	Conditions related to the work
Section VI	Technical Specifications
	Annexures A, B & C
Volume – 2	Price Bid / Bill of Quantities (B.O.Q) (SEPERATE)
(Should not be submitted in physical submission)	

- 9.3 The bidder is expected to examine carefully the contents of all the above bid documents. Failures to comply with the requirements of bid documents will be at the bidder's own risk. The bids which are not substantially responsive to the requirements of the bidding documents will be rejected outright without assigning any reason thereof and the decision shall be binding to the bidder.

C. Preparation of Bids

10. Language of Bid

- 10.1 The bid, and all correspondence and documents related to the bid, exchanged between the bidder and the Employer shall be written in the English language. Supporting documents and printed literature furnished by the bidder may be in another language provided they are accompanied by an accurate translation of the relevant passages in the English language, in which case, for purposes of interpretation of the bid, the English translation shall prevail. The cost incurred for this translation shall be solely born by the bidder / contractor.

11 Documents comprising the Bid

- 11.1 The bids shall be submitted in hard copy also, which comprise the following documents: -

Tender Document:-

- i) Bid Security for an amount as specified in the Invitation for Bids (IFB).
- ii) Information as specified.
- iii) Tender fees as specified in the Invitation for Bids (IFB).

The Tender Document shall be bound and all pages numbered. EMD shall be furnished along with the "Original" set of Document.

- i) Form of Bid and Appendix to Bid – duly filled in and signed on each page
- ii) Priced Bill of Quantities – duly filled in by and signed on each page

Each part shall be separately sealed and marked in accordance with the sealing and marking.

11.2 The documents listed under Section III, V, for Bid Security shall be filled in without exception in the given format.

11.3 The bidder shall prepare and submit two copies of the bid. The tender shall be compulsorily submitted in spiral / comb binding only

11.4 The following documents are deemed to be part of Tender (The incomplete tender shall be rejected outright)

- Invitation for Bids (IFB)
- Instructions to Bidders (ITB)
- General Conditions of Contract
- Technical Specifications
- Form of Bids
- Annexures if any
- Bill of Quantities (duly filled)
- Amendment - if any

12. Bid Prices

12.1 Unless stated otherwise in the bidding documents, the Contract shall be for the whole Works as described in bidding documents, based on the percentage rate amount in the Bill of Quantities submitted by the bidder.

12.1.1 The bidder shall fill in item rates only. And then the final quoted amount in Figures and Words Both.

12.2 The bidder shall follow this:

- Fill in the amount (both in figures and words)
- The Final Amount (both in figures and words) filled in by the Bidder shall be final and shall be binding to the contractor for all items.
- Any error in calculation, if found so, shall be rectified by the Consultants / Clients and the new figure (if any) shall be acceptable to the bidder.
- This new figure and respective amount shall be considered as the Bidder's proposal for the works. (If the bidder does not agree to such modifications, his / their tender shall be rejected outright)
- All pages of the Tender shall be initialled(In Hard Copy)

12.2.1 All duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause shall be included in the rates and prices and the total bid price submitted by the bidder. The evaluation and comparison of bids by the Employer shall be made considering the same.

12.2.2 The rate shall be inclusive of VAT / Service Tax or any other taxes, duties, cess or levy GST etc. payable by the contractor for which no extra payment shall be made and no claim in this context shall be entertained.

13 Currencies of Bid and Payment

13.1 The rates and the prices shall be quoted by the bidder entirely in Indian Rupees

13.2 All payments shall be made in Indian Rupees.

14 Bid Validity

- 14.1 Bids shall remain valid for a period of 180 days (One hundred Eighty days) after the opening of the tender. The bid, which shall be valid for a shorter period, shall be cancelled and rejected by the employer as non-responsive.
- 14.2 In exceptional circumstances, prior to expiry of the original bid validity period, the Employer may request the bidders to extend the period of validity for a specified additional period. The request and the responses thereto shall be made in writing or by fax. A bidder may refuse the request without forfeiting his bid security. A bidder agreeing to the request will not be required or permitted to modify his bid but will be required to extend the validity of his Bid Security for the period of the extension.

15. Bid Security

- 15.1 The bidder shall furnish as part of its Bid, a Bid Security in the amount as stipulated in the Invitation for Bid (IFB) for particular work(s). The Bid Security shall be drawn in favor of The City of Ahmedabad Transport Fund, Ahmedabad, and may be in one of the following forms. (Please refer to Annexure "C")

- a) Bank Guarantee from any Nationalized or RBI approved foreign bank having net worth of more than Rs.500 crore of Indian operation and approved bank by A.M.T.S.
- b) Bank Guarantee from any bank included in the approved list of A.M.T.S.

The format of Bank Guarantee shall be in accordance with the sample form of Bid Security included in the bid document.

- c) Demand draft or pay order of any Nationalized Bank in favour of **Transport Manager, Ahmedabad Municipal Transport Service.**

- 15.2 Bank guarantees (and other instruments having fixed validity) issued as surety for the bid shall be valid for 28 days beyond the validity of the bid.

- 15.3 Any bid not accompanied by an acceptable bid security and not secured shall be rejected as non-responsive.

- 15.4 The EMD of the unsuccessful bidders, except for L1, L2 and L3 bidders will be returned as promptly as possible.

- 15.5 The EMD of the second and third lowest bidders shall be returned when the successful bidder has furnished the required performance security. Final decision for releasing the Bid Security of the second and third lowest bidders will be decided by the competent authority i.e. Transport Manager, A.M.T.S.

- 15.6 The Earnest Money Deposit (EMD) may be forfeited

- a) if the tender is rejected by any technical mistake,
- b) if the bidder withdraws his bid during the period of bid validity;
- c) if the bidder does not accept the correction of his bid price,
- d) in the case of a successful bidder, if the bidder fails within the specified time limit to
 - i) Furnish the required Performance Security or
 - ii) Sign the Agreement.

16. Alternative Proposals by Bidders – Deleted

17. Format and Signing of Bid

- 17.1 The bidder shall prepare price bid documents comprising the bid as described in Instructions to Bidders.

- 17.2 Cancelled.

- 17.3 The bid shall contain no alterations, omissions or additions, except those to comply with instructions issued by the Employer, or as necessary to correct errors made by the bidder, in which case the person or persons signing the bid shall initial all such corrections.

- 17.4 All witnesses and sureties shall be persons of status and probity and their full names, occupations and addresses shall be printed below their signatures.

D. Submission of Bids

18. Sealing and Marking of Bids

18.1 The hardcopy shall be sent as following.

18.2 The envelope shall be addressed to the employer at the following address.

Central Office (Tender Box),
First Floor,
Transport House,
Outside Jamalpur Gate,
Behrampura,
Ahmedabad 38 00 22, Phone: 079 2 539 18 81

- b) Indicate the name, address and contact numbers of the bidder.
- 18.3 If the envelope is not sealed and marked as above, the Employer will assume no responsibility for the misplacement or premature opening of the bid.

19. Deadline for Submission of Bids

- 19.1 Bids must be received by the Employer at the address specified above not later than the time and date specified earlier.
- 19.2 The Employer may, at his discretion, extend the deadline for submission of bids by issuing an amendment, in which case all rights and obligations of the Employer and the bidders previously subject to the original deadline will thereafter be subject to the deadline AS modified and extended.

20. Late Bids

- 20.1 Any bid received by the Employer after the deadline for submission of bids will be returned unopened to the bidder.

21. Modifications and Withdrawal of Bids

- 21.1 The bidder may modify or withdraw his bid after bid submission, provided that written notice of the modification or withdrawal prior to the deadline has been received by the Employer. Any MODIFICATIONS in respect of tender document shall be submitted in separate sealed envelope duly marked so.
- 21.2 The bidder's modification or withdrawal notice shall be prepared, sealed, marked and delivered in accordance with the provisions of Clause 21, with the outer and inner envelopes additionally marked as "MODIFICATIONS" or "WITHDRAWAL" as appropriate.
- 21.3 No bid shall be modified by the bidder after the deadline for submission of bids.
- 21.4 Withdrawal of a bid during the interval between the deadline for submission of bids and the expiration of the period of bid validity may result in the forfeiture of the Bid Security.

E. Bid Opening and Evaluation

22 Opening of Tender (Bid)

The Employer / Consultants will open the Tenders of those bidders whose documents has been determined to be substantially responsive, in presence of the bidders or their representatives who choose to attend on the date intimated to such bidders.

TO BE OPENED PREFERABLY IN PRESENCE OF FOLLOWING PERSONS

Evaluation Committee is:

- Assistant City Engineer / Assistant Engineer

- 22.1 In the event of specified date of bid opening being declared as a holiday for the Employer, the Tender will be opened at the appointed time and location on the next working day.
- 22.2 Bids for which acceptable notice of withdrawal has been submitted shall not be opened and shall be returned to the bidder unopened.
- 22.3 The envelopes shall be opened in following order
 - a) Envelope marked as "Tender Fee" & "E.M.D"
 - b) Envelope marked as "Tender Documents of whose envelope a) are found satisfactorily OK shall be opened."
- 22.4 The bidders or their representatives who are present shall sign attendance sheet evidencing their attendance.
- 22.5 The Employer shall prepare besides the record of bid opening, minutes of the Bid opening, including the information disclosed to those present.

23. Examination of Tender and Determination of Responsiveness of Tender

- 23.1 Prior to evaluation of Tender volume, the Clients will check whether the required Tender Fees and EMD accompany the bid.
- 23.2 If the EMD furnished does not confirm to the amount, mode and validity period as specified in the Invitation for Bid and has not been furnished in the form, the bid shall be rejected by the Employer / Consultants as non-responsive and shall be returned to the contractor unopened.
- 23.3 Subject to confirmation of the EMD by the issuing bank, the Tender volume accompanied with valid EMD will be taken up for further process of evaluation. In case, the Bank does not confirm the EMD, the bid shall be rejected, as non-responsive and no further evaluation shall be carried out. The EMD may be forfeited for this reason as well.
- 23.4 The tender volume will further be examined to determine whether the bid has been properly signed, meets the eligibility and qualification criteria, has the required available bid capacity, is accompanied by the requisite certificates, registration copy, solvency certificate, undertakings and other relevant information specified in the bid documents and is substantially responsive to the requirement of the bidding documents and provides any clarification for ascertaining the correctness of the information/details that the Employer may require.
- 23.5 If the Tender volume is not substantially responsive, it will be rejected by the Employer and will not subsequently be made responsive by correction or modification or withdrawal of the non-conforming deviation or reservation.
- 23.6 A substantially responsive Tender volume is one, which conforms to all the terms, conditions and specifications of the bidding documents, without material deviation or reservation. A material deviation or reservation is one (i) which affects in any substantial way the scope, quality or performance of the Works; (ii) which limits in any substantial way, inconsistent with the bidding documents, the Employer's rights or the bidder's obligations under the Contract; or (iii) whose rectification would affect unfairly the competitive position of other bidders presenting substantially responsive Tender volume.
- 23.7 If the Tender volume is not substantially responsive, it will be rejected and may not subsequently be made responsive by correction or withdrawal of the non-conforming deviation.

24. Deleted

25. Deleted

26. Correction of Errors

- 26.1 Tender volume determined to be substantially responsive will be checked by the Employer / Consultants for any arithmetic errors. Arithmetic errors will be rectified on the following basis:
 - i) where there is a discrepancy between the figures and words, for amount, the figure in words will govern and
- 26.2 The amount stated in the Form of Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and shall be considered as binding upon the bidder. If the bidder

does not accept the corrected amount of bid, his bid will be rejected and the L2 contractor shall be given a chance to perform ahead or as may be decided by the competent authority.

27. Evaluation and Comparison of Tender volume

27.1 The Employer / Consultants will evaluate and compare only that Tender volume which is determined to be substantially responsive and qualified for award of Contract.

27.2 In evaluating the Tender volume, the Employer / Consultants will determine for each Tender volume the evaluated Bid Price by adjusting the Bid Price as follows:-

- a) Making any correction for errors,
- b) Making appropriate adjustments to reflect any price modifications.

27.3 Deleted

27.4 If the Bid of the successful Bidder is seriously unbalanced in relation to the Consultants' estimate of the cost of the items of the Works to be performed under the Contract, the Consultants may require the bidder to produce detailed price analysis for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analysis, the Employer may require that the amount of the performance security, be increased up to an additional 5 (five) per cent at the expense of the successful bidder to protect the Employer against financial loss in the event of default of the successful bidder under the Contract.

27.5 A bid, which is unrealistically lower than estimate and which the bidder, could not substantiate satisfactorily, may be rejected as non-responsive by the consultants.

28 Clarification of Bids

28.1 To assist in the examination, evaluation and comparison of bids, the Consultants may, at his discretion, ask any bidder for authentication the correctness of the information/details furnished by him in his bid. Such request by the Employer / Consultants and the response by bidder shall be in writing or by cable/fax, but no change in the price or substance of the bid shall be sought, offered or permitted except as required to confirm the correction of arithmetical errors discovered by the Employer / Consultants in the evaluation of the bids.

28.2 No bidders shall contact the Employer / Consultants on any matter relating to his bid from the time of bid opening to the time of contract is awarded.

28.3 Any effort by the bidder to influence the Employer / Consultants in the bid evaluation, bid comparison or contract award decisions may result in the rejection of his bid.

29. Process to be Confidential

29.1 Information relating to the examination, clarification, evaluation and comparison of bids and recommendations for the award of a contract shall not be disclosed to bidders or any other persons not officially concerned with such process until the award to the successful bidder has been announced. Any effort by a bidder to influence the Employer's processing of bids or award decisions may result in the rejection of his bid.

F. Award of Contract

30. Employer's Right to accept/select any Bid and Reject any or all Bids

30.1 The Employer reserves the right to accept or reject any bid and to annul the bidding process and reject all bids, at any time prior to award of Contract, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders of the grounds for the Employer's action.

31. Notification of Award

31.1 Prior to expiration of the period of bid validity prescribed by the Employer, the Employer will notify the successful bidder by cable/fax and confirmed by registered letter that his bid has been accepted. This letter (hereinafter and in the Conditions of Contract called "the Letter of Acceptance") shall name the sum which the Employer will pay the Contractor in consideration of the execution, completion and maintenance of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Conditions of Contract termed "the Contract Price").

31.2 The notification of award will constitute the formation of the Contract.

31.3 The time limit of the work shall be starting from the Date of Issue of the L.O.I.

31.4 All clause shall be operative from the date of issue of work order and up to the expiry of original and extended time limit (If any)

32. Signing of Agreement

32.1 At the same time that the Employer notifies the successful bidder that his bid has been accepted, the Employer will direct him to submit the Performance Security and attend the Employer's office on a date determined by the Employer for signing the Form of Agreement.

33. Corrupt or Fraudulent Practices

33.1 The Employer will reject a proposal for award if he determines that the Bidder recommended for award has produced fake data or engaged in corrupt or fraudulent practices in competing for the contract in question. The Employer will declare the firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract by AHMEDABAD MUNICIPAL TRANSPORT SERVICE if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for the contract, or during execution.

- i) "corrupt practice" means behavior on the part of officials in the public or private sectors by which they improperly and unlawfully enrich themselves and/or those close to them, or induce others to do so, by misusing the position in which they are placed, and it includes the offering, giving, receiving, or soliciting of anything of value to influence the action of any such official in the procurement process or in contract execution; and
- ii) "fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Borrower, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Borrower of the benefits of free and open competition

34. Terms of Payment

- a) Part payment shall be made only after completion of the work worth Rs. Five Lacs and not less than that.
- b) Income tax / cess / taxes / other / statutory levies if any shall be deducted from every running bills and final bill payment as applicable time to time as per Government of India / State Government

Seal and Signature of the Bidder

Transport Manager (A.M.T.S.)

Date:

Ahmedabad Municipal Transport Service

Mobile No.

AHMEDABAD MUNICIPAL TRANSPORT SERVICE

Section II – (A) GENERAL CONDITIONS OF CONTRACT

DEFINITIONS:

1. The “CONTRACT” means the documents forming the tender and acceptance thereof any of the formal agreement executed between A.M.T.S. and the Contractor together with the documents referred to therein including these conditions, the specifications, bills of quantities, designs, drawings and instructions issued from time to time by A.M.T.S. or any person authorized by the competent Authority, and all these documents taken together shall be deemed to form one contract and shall be complementary to one another.
2. In the contract the following expressions shall unless the context otherwise required, have the meanings hereby respectively assigned to them.
 - (i) The expressions “Works” or “Work” shall unless there be something either in the subject or context repugnant to such construction, be constructed and taken to mean the works by or by virtue of the contract contracted to the executed whether temporary or permanent and whether original, altered, substituted or additional.
 - (ii) The “Contractor” shall mean the individual or firm or company whether incorporated or not undertaking the works and shall include the legal personal representative of such individual or the persons composing such firms or company and the permitted assigns of such individual or firm or firms or company.
 - (iii) The “Contract Sum” shall mean in case of item rate contracts, the cost of the works arrived at after extension of the quantities shown in the schedule of quantities by the items rates quoted by the Contractor / Tenderer for the various items.
 - (iv) A “Day” shall mean a day of 24 hours from midnight to midnight irrespective of the number of hours worked in that day.
 - (v) “Expected risks” are risks due to riots (otherwise than among Contractor’s labours / employees) and civil commotions (in so far as both these are uninsurable), wars (whether declared or not), invasions, act of foreign enemies, Hostilities, Civil war, rebellion, insurrection military or usurped power, any act of Governments, damage from aircraft, acts of God such as earthquake, lighting and unprecedented floods, and other causes over which the contractor has no control and accepted as such by A.M.T.S. of the part of works in respect of which a certificate of completions has been issued.
 - (vi) “Market-Rate” shall be the rate as decided by A.M.T.S. /Consultants on the basis of the cost of materials and labour at site when the work is to be executed plus the percentage mentioned in Schedule ‘F’ to cover all overheads and profits. This is applicable to Extra items.
 - (vii) “Schedule” referred to in these conditions shall mean the relevant schedule (s) annexed to the Tender documents / papers issued by the A.M.T.S. of the standard schedule of rates prescribed by A.M.T.S. and the amendments thereto issued from time to time.
 - (viii) “Project Consultants” shall mean M/s. *d’zine edge* and will include duly authorized representative / any other person empowered by them in this behalf to discharge all or any of their functions.
 - (ix) Engineer in charge shall mean qualified Engineer (Authorized official) duly appointed by A.M.T.S. who will act on their behalf.
 - (x) The competent authority shall mean Transport Manager, Ahmedabad Municipal Transport Service, Ahmedabad, and will include duly authorized representative / official or any other person empowered by A.M.T.S. in this behalf to discharge all or any of their functions.
3. Where the context so requires words imparting the singular only, include the plural and vice versa.

3. CANCELLATIONS OF CONTRACTS IN FULL OR PART:

- The contract may get cancelled in full or part If the contractor,
- a. At any time makes default in proceeding with the work with due diligence and continues to do so after a notice in writing within 7 days from the Engineer – in – charge / Authorised Official.
 - b. Commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is to given to him in that behalf by the Engineer in charge / authorized official.
 - c. Fails to complete the works or items of works within individuals / particular date of completion on or before the date(s) of completion and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer in charge.
 - d. Shall offer or give or agree to give to any person in A.M.T.S. service or to any other person on his behalf any gift or considerations of any kind as an inducement or reward for doing or for bearing to do or for having done or fore borne to any act in relations to obtaining or execution of this or any other contract for A.M.T.S.
 - e. Shall obtain / enter into a contract with A.M.T.S.in connection with which commissioned had been paid or agreed to be paid by him or to his knowledge unless the particulars of any such commission and terms of payments thereof have previously disclosed in writing to the competent authority / engineer in charge.
 - f. Being an individual or if a firm any partner thereof shall at anytime being adjudged insolvent or have a receiving order or order for administration of liquidation or composition (other than a voluntary liquidations for the purpose of amalgamation or construction) under an insolvent act for the time being in force or make any conveyance in assignment of his effective or composition or arrangement for the benefit of his traditions or purpose so to , or if any applications be made under any insolvency act for the time being in force for the sequestrations of his estate or if a trust deed be executed by him for the benefit of his creditors or.
 - g. Assigns, transfers, sublets (engagement of labours on a piece work basis or of with labour with materials not to be incorporated in the work shall not be deemed to be subletting) or attempts to assign transfer or subject the entire works or any portion of the work without prior approval of the competent Authority. The competent Authority may without prejudice to any other right to remedy which shall have accrued or shall accrue thereafter to the A.M.T.S. by written notice cancel the contract as a whole or only such item of work in default from the contract.
4. A.M.T.S. shall on such cancellation have power to:
- a. Take possession of the site and any materials, constructional plants / building etc,
 - b. Carry out the incomplete work by any means at the risk and cost of the awarded contractor.
5. On cancellations of such contract in full or in part the site Engineer in charge / authorized official shall determine what amount if any, is recoverable from the contractor for completion of the works or part of the works or in case of the works or part of the works is not to be completed the loss or damage suffered by A.M.T.S. in determining the amount credit shall be given to the contractor for the value of contractor's materials taken over and incorporated in the work and use of tackle and machinery belonging to contractor.
6. All the quantities herein are indicative and approximate; payments will be made on the actual measurements/ certified by the Engineer in charge authorized official and project consultants.
7. A.M.T.S. will have the right to omit, alter, add or cancel any/all of the items of work shown in the schedule without assigning any reason whatsoever and no claim for compensation will be entertained for the same, A.M.T.S. is further at liberty to carry out any items of work departmentally or through any other contractor and no compensation will be paid to the main contractor on that account.
8. Before submitting the Tender, the contractor shall visit and examine the site and satisfy himself as to the nature of the existing roads or other means of communications, the character of the soil and of the excavations, the correct dimensions of the work facilities for procuring various construction and other materials and shall obtain generally his own information on all matters and conditions affecting the execution of the works. No extra charge made in consequence of any misunderstanding or incorrect information on any of these points or on the grounds of insufficient description will be allowed.

The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices quoted in the schedule of quantities which rates and prices shall except as otherwise provided over all his obligations under the contract and all matters and things necessary for the proper completion and maintenance of the works.

9. It must be clearly understood that the whole of the conditions and specifications are intended to be strictly enforced and that no extra work will be allowed unless they are clearly outside the spirit and meaning of the conditions and have been ordered in writing by Engineer-in-charge (authorized official).
10. The rates quoted by the Contractor shall be for finished work measured on site and should include supply of all materials labour , tools tackles, marking out and clearing of the site and liaison charges, with licensed plumbers/electricians for preparing plans, line out permission from Municipal Corporation, Statutory bodies etc. Unless specifically mentioned otherwise. The rates shall be inclusive of Transportation, Insurance, Unloading, Freight, General tax, sales tax , Service tax, works contract tax, VAT, and any other duties / taxes / cess and all / any taxes levied by the Government or other authorities.
11. The rates quoted by the contractors shall also include for providing all scaffolding, hoists, tackle and other plants, shuttering profiles and apparatus generally required for the proper execution of the work. The contractor shall without any extra charge, provide all labours and apparatus required by A.M.T.S.for testing and measuring the works and for weighing measuring providing and testing the efficiency of any portion of the works and shall also at his own cost provide all planking, gangways, etc. necessary for affording access to every part of the works.
12. The Project Consultants and/or Engineer In charge (authorized official) shall have power to make any alterations, omissions from addition to or substitutions for the schedule of rates. The original specification, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work and the contractor shall be bound to carry out such altered / extra / new items of work in accordance with any instructions which may be given to him in writing signed by the engineer in charge and such alterations omissions, additions or substitutions shall not be invalidate the contract and any altered additional or substituted work which the contractor on the same conditions in all respects on which he agreed to do the main work. The time for completion of work may be extended for the part of the particular job at the discretion of the engineer in charge for only such alterations, additions, or substitutions of the work as he may consider as just and reasonable. The rates of such additional, altered, or substituted work under this clause shall be worked out in accordance with the following provisions.
 - a. If the rates for the additional, altered or substituted work are specified in the contract for the work, the contractor is bound to carry out the additional, altered, substituted work at the same rates as are specified in the contract.
 - b. If the rates for the additional, altered or substituted work are not specifically provided in the contract, for the work, the rates will be derived from the rates from latest Schedule of Rates +/- quoted rates OR if S.O.R. rates are not available then market rate analysis done by the Department (AMC).

The opinion of the consultant / engineer in charge, as to whether or not the rates can be reasonably so derived from the items in this contract, will be final and binding to the contractor.
 - c. If the rates for the altered, additional , or substituted work cannot be determined in the manner specified in sub clause (a) & (b) of the above, then the contractor shall, within 7 days of the date of receipt of order to carry out the work, inform the engineer in charge, authorized officer of the rate with his intention to charge for such class of work, support by analysis of rates claimed, based on standard market rate analysis handbook published by NBO, and the engineer in charge shall determine the rates on the basis of the prevailing market rates of materials and labour plus 15% as contractor's over heads and profit and pay the contractor accordingly. The opinion of engineer in charge or Project Consultants as to current market rates of materials and labour involved will be final.
13. No price variation shall be approved or allowed in any case
14. A.M.T.S. reserves the right to accept or reject any or all the tenders without assigning any reasons. In other words A.M.T.S. do not bind them to accept the lowest of any tender.

15. Tender submitted by tenderer shall remain valid for acceptance for a period of 120 days from the date of opening of the tender. The tenderer shall not be entitled during the said period of 120 days, without the consent in writing of A.M.T.S. to revoke or cancel his tender. In case of revoking or canceling his tender varying any terms in regard whereof without the consent of A.M.T.S. in writing the tenderer shall forfeit earnest money paid by him along with the tender.
16. In case discrepancies between schedule of quantities the specifications and or the drawings thereof, the following order of preference shall be observed.
- i) Particular specification and special conditions if any.
 - ii) Descriptions in Schedule of Quantities
 - ii) Drawings
- In any case the most stringent of the above three shall apply. The decision of the Consultants in this regard is to be final and binding to all.
17. In case of varying or conflicting provisions made in any one document forming part of the Contract A.M.T.S. shall be the deciding authority with regard to the intentions of the documents.
18. Any error in descriptions, quantities or rate in schedule of quantities or any omissions there from shall not vitiate (invalid) the contract or release the contractor from the execution of the whole or any part of the work comprised therein according to drawings and specifications or from any of his obligations under the contract.
19. Income tax / cess / taxes / other / statutory levies if any shall be deducted from every running bills and final bill payment as applicable time to time as per Government of India / State Government.
20. STANDARD PRACTICE OF MEASUREMENT:
- a) All the works in progress will be jointly measured by the representative of A.M.T.S. and the contractor progressively. Such measurements will be got recorded in the measurement book by the engineer in charge or his authorized representatives and signed in token of acceptance by the contractor or his authorized representative.
 - b) All items shall be entered in the measurement books, level book etc. prescribed by A.M.T.S. that complete record is obtained of all work performed under the contract.
 - c) For the purpose of taking joint measurements the contractor's representative shall be bound to be present whenever required by the engineer in charge. If, however, he remains absent for any reason whatsoever the measurements will be taken by the engineer in charge or his representative, and these will be deemed to be correct and binding to the contractor.
 - d) The Contractor shall give due notice to the Employer/Consultant whenever any work is to be buried in the earth, concrete or in the bodies, walls or otherwise becoming inaccessible later on in order that the work may be inspected and correct dimensions taken before such burial, in default whereof the same shall, at the opinion of the Employer/Consultant be either opened up for measurement at the Contractor's expense or no payment may be made for such materials. Should any dispute or difference arise after the execution of any work as to measurements etc. or other matters which cannot be conveniently tested or checked, the decision of the Employer/Consultant shall be accepted as correct and binding on the Contractor.
21. MODE OF MEASUREMENTS:
- Except where any general or detailed description of work in quantities expressly shows to the contrary schedule of quantities shall be deemed to have been prepared and measurements shall be taken in accordance with the procedure laid forth in specifications notwithstanding any provisions in the relevant method of measurement or any general or local custom. In the case of items which are not covered by the specifications, measurements shall be taken in accordance with the relevant and latest standard method of measurement issued by the Bureau of Indian Standards and as specified and directed by the consultants.
22. The contractor will be fully responsible for rectifying any defects brought to his notice by A.M.T.S. / ~~project~~ consultants in writing within seven days of receipt of the intimation. In case the contractor fails to attend the defects as stipulated therein, A.M.T.S. reserves the right to complete the rectification through another agency of its choice and recover the cost of such repairs from the contractors dues against running bills / final bill / retention money or any such kind for this or any other job.
23. Earnest Money Deposit in the form of Bank Draft (or as mentioned earlier) shall be drawn in favour of **Transport Manager, Ahmedabad Municipal Transport Service.**

On acceptance of the tender, the successful tenderer shall, within the time stipulated in the letter of intent/acceptance, (Not later than 10 Days after issuing the Letter of Intent from the Client) deposit with the Employer either Pay orders, Demand Draft or bank guarantee such further sum, as along with the earnest money paid by the contractor, will amount to 5% (Five percent) of the value of the contract, before he is allowed to execute the contract and commence the work. The security deposit furnished in the form of Bank Guarantee shall be drawn on the Nationalized Bank as per specimen approved by the employer. In case the security deposit is submitted in the form of bank guarantee it should be valid up to more than 3 months of the completion date of the entire project. Failure to deposit this additional amount, within the stipulated time which shall include any extension granted by the Employer at its discretion, will make the earnest money deposited by the tenderer liable to forfeit and the acceptance of his tender shall be considered as withdrawn.

24. If the Contractor or his workmen or employee shall injure or destroy any part of the building in which they may be working or any building road, fence etc., contiguous to the premises on which the work or any part of it is being executed or if any damage shall happen to the work while in progress, the contractor shall upon receipt of a notice in writing on the behalf make the same good at his own expenses.
25. The Contractor shall commence work within 10 days from the date of receipt of Work Order from A.M.T.S. confirming that the work order is being awarded to him.
26. Completion period for the entire work contained in the tender and such of the extra items, if any, which form an integral part of the contract, contained in the tender is **3(Three) months** (As explained earlier) from the date of commencement of work at site as specified above. The time limit specified herein will be strictly adhered to and will form the essence of the Contract. In case of delay in completion of job beyond the stipulated time, penalty would be levied @ 0.1% of the total project cost (Quoted amount) per day of Delay after Schedule Date of Completion. Maximum upto 10% of the contract amount put to tender from the date of delaying the said work upto the date of completion and handing over to the AMC or the amount as decided by the Transport Manager, AMC.
27. As soon as the work is completed the contractor shall give notice of such completion to A.M.T.S. and within thirty days of receipt of such notice project consultants / A.M.T.S. shall inspect the work and shall furnish the contractor with a certificate of completion indicating date of completion, defects to be repaired and any serious notings for rate reductions, after these due corrections / modifications, final bill payment shall be released.
28. The whole of the work including all extra and additional items, if any, and when ordered are to be completed in the time stated in the contract and the contractor will be required if necessary to work over time to stick to A.M.T.S. requirements to complete all the works by the stipulated date. No extra claim for working over time or extension of completion period will be allowed on account of this factor.
29. In case of delay in completion the work beyond a stipulated completion date, A.M.T.S. reserves the right to terminate the contract and get all the jobs completed through another agency of its choice. Any extra expenditure that A.M.T.S. will have to incur for completion of the balance jobs through another agency on account of higher rates quoted by the agency will be recovered from the contractor's Security Deposit, Retention Money and / or pending bills or otherwise.
30. Extension of completion period

If the work is delayed by

- a) Force Majeure or
- b) Serious loss or damage by fire or
- c) Civil commotions, local combinations of workmen, strikes or lockout affecting any of the trades employed on the work, or
- d) Delay on the part of other contractors or tradesman engaged by A.M.T.S. in executing work not forming part of contract.
- e) Non – availability of stores, if they are the responsibility of A.M.T.S. to supply.
- f) Non-availability or break – down of tools and plant incase they are to be supplied or supplied by A.M.T.S.

Request for extension of time to be eligible for considerations, shall be made by the contractor in writing within fourteen days of the happening of the event causing delay. The contractor may also if practicable, indicate in such a request the period for which extension is desired.

In any such case A.M.T.S. may give a fair and reasonable extension of time for completion of works. Such extension shall be communicated to the Contractor by A.M.T.S. in writing in one month of the date of

receipt of such request by A.M.T.S.

31. The Engineer – in – charge / Consultants shall supply dimensioned drawings, levels and other information necessary to enable the Contractor to set out the works. The Contractor shall provide all setting out apparatus required and set out the works and be responsible for the accuracy of the same. He shall amend at his own cost and to the satisfaction of the Engineer – in – charge / Consultant. Any error found at any stage which may arise through inaccurate setting out unless such error(s) is / are based on incorrect data furnished in writing by Engineer – in – charge / Consultant in which case the cost shall be on the account of A.M.T.S. The Contractor shall protect and preserve all bench marks upto the liability period unless the Engineer – in – charge directs their removal.
32. The contractor shall not at any time cause or permit any nuisance on the site or do anything which shall cause unnecessary disturbance or inconvenience to others at or near the site of work.
33. The contractor shall all the times give access to the staff of statutory bodies as well as other agencies associated with the project and shall provide them all facilities like scaffolding, water, lighting etc. at site for discharging their duties. The Contractor will provide a suitable temporary hut for his watchman in accordance with the Municipal Regulations and shall demolish the hut and clear the site before handing over the site to A.M.T.S. after completion / termination of contract.
34. The Contractor at his own cost shall provide proper temporary office accommodation for his staff in accordance with Municipal Regulations. This office shall be open at all reasonable working hours to receive instructions, notices or communications and clear away at completion of the project. Temporary office shall also have accommodation for the staff representing the client and the Project Consultants. One office table with 3 Nos of drawers having locking facility, and at least 4 chairs shall be always provided for the client / Project Consultants or their representative. No rent, tax or any such kind of charges shall be levied from the Municipal Corporation for this temporary construction in any case.
35. The Contractor shall at his own cost provide and maintain proper temporary sheds for the storage and protection of materials etc. and other work that may be brought or executed on the site including the tools and materials of sub contractors and remove on completion. Sheds for storage of cement (100 MT) are to have floors raised from the ground. The contractor will be responsible for storage of cement in good and water tight condition.
36. The Contractor shall at his own cost provide fenced storage facilities in the open for storing M. S. & Reinforcement steel required by him for the works. The Contractor shall be fully responsible for loss or damage as well as proper storage of material. All the materials at site will be stored and protected by the Contractor. No materials after dumped on site shall be taken out of site without notice of engineer in charge.
37. The water supply facilities and drainage shall be made available by A.M.T.S. at one point. All temporary plumbing work and its charges, cost involved for all piping connections control valves, fittings, water tanks and accessories shall be borne by the contractor.
 - a) The contractor shall make necessary arrangement for storage and distribution of water for the entire works and for his staff at his cost.
 - b) The Contractor shall provide at his cost all temporary lighting arrangement required for the works and to enable contractors and sub-contractors to complete the works in the specified time including that for the workmen of any sub – contractors or special tradesmen.
 - c) A.M.T.S. shall possibly provide Electricity power on chargeable basis as per standard rates for the works at one point. The necessary all electrification, wiring, lighting arrangement (including separate meter installation) shall be made available by the contractor and for which contractor shall not be paid any charges for the same.
38. The contractor shall provide and maintain at his own expense all lights, guards, fencing and watching arrangements when and wherever necessary or required by the Engineer – in – charge / Consultant for the protection of the works or for the safety and convenience of those employed on the works or the public.
39. The contractor must maintain a minimum labour force as may be required for the job and plan and execute the construction and erection according to the prescribed schedule. No extra rates will be considered for such work in monsoon.

If any electricity is used in any of such constructions the Contractor shall himself pay for the same. The Contractor shall at his own cost demolish all such constructions and remove the debris thereof, as also all his materials and equipments and clean and level the site thereof before handing over the completed work to A.M.T.S.

40. The Contractor shall have no right to put up any constructions of his own of any nature or type on A.M.T.S. land except temporary constructions for storage of equipment for the work under the contract or as a resting place for labourers employed by him for the work provided that he obtained the requisite previous permission in writing from A.M.T.S. or from the Engineer in charge in accordance with A.M.T.S. procedure which permission they would be entitled to refuse in their absolute discretion. Such construction will be erected at the contractor's own cost.
41. All drawings, tracings, photo prints shall be the sole property of A.M.T.S./Consultants and must be returned to them on completion of the works. If these drawings are found being circulated, the contractor shall be deemed to pay the fine as decided by the client / consultants.
42. During the execution of the work, Contractor must check his work with the drawings. The Contractor shall be responsible for all the errors in this connection and shall have to rectify all defects and / or error at his own cost, failing which A.M.T.S. reserves the right to get the same rectified at the risk and cost of the Contractor.
43. The Contractor shall supply to the Engineer in charge / Consultants, samples of _____ materials proposed to be used in the work. A set of all approved samples shall be maintained at site under lock & key by the Engineer in charge.
44. The Engineer – in charge / Project Consultants shall have full power to require removal of any or all the materials brought to the site by the Contractor which are not in accordance with the contract specifications or do not confirm in character or quality to sample approved by him. In case of default on the part of the Contractor in removing rejected materials, the Engineer – in – charge shall be at liberty to have them removed by other means. The Engineer – in – charge shall have full power to procure other proper materials and in the event of the Contractor refusing to comply, he may cause the same to be supplied by other resources. All costs which may attend upon / incurred upon such removal and / or substitution shall be borne by the Contractor.
45. In case of any work for which there is no such specification supplied by A.M.T.S. as is mentioned in the tender documents, such work shall be carried out in accordance with Indian Standard Specifications and if the Indian Standard Specifications do not cover the same the work should be carried out as per standard Engineering practice subject to the approval of the and Project Consultants.
46. The Contractor shall provide and do everything necessary for the proper execution of the works. This includes co-ordination with various agencies, authorities etc. to complete the project.
47. Not applicable
48. All works shall be subjected to examinations and approval at each stage thereof and the Contractor shall give due notice to the Engineer – in – charge / Consultants for the same.
49. The Contractor shall protect joints and make good all damages to the same from any cause whatsoever during the performance of the contract and leave perfect to the satisfaction of the Engineer – in – charge at the time of completion. Before giving up possession, the contractor must see that all doors latches etc. work easily and shall make all necessary adjustments.
50. The contractor will be fully responsible for complying with all relevant provisions of the Contractor Labour Act and shall pay rates of Wages and observe hours of work / conditions of employment according to the rules in force from time to time.
51. The contractor shall comply with provisions of payment (whichever is applicable) as per the following acts:
 - Child Labour (Prohibition and Regulation) Act, 1986
 - Payment of wages Act, 1936
 - Workmen's Compensation Act, 1923
 - Industrial Dispute Act, 1947

- Minimum Wages Act, 1948
- Employees State Insurance Act, 1948
- Maternity Benefit Act, 1961
- Mines Act, 1952

Any amendments / modifications thereof or any other law relating thereto and rules made there under from time to time. Engineer – in – charge shall on a report having being made by an inspecting office as defined in the contract labour regulations have the power to deduct from the money due to the Contractor any sum required or estimated to be required for making good the loss suffered by a worker (s) by reasons of non – fulfilment of conditions of contract for the benefit of workers non – payment of wages or of deductions made from his or their wages which are not justified by the terms of contract or non observance of the said contractor’s labour Regulation.

52. The Contractor shall at his own expenses arrange for the Safety provisions as amended to these conditions or as required by the Engineer – in – charge in respect of all labours directly or indirectly employed for performance of the works and shall provide all facilities in connections therewith. In case the contractor fails to make arrangements and provide necessary facilities as aforesaid, the Engineer – in – charge shall be entitled to do so and recover the cost thereof from the Contractor.

The contractor shall take safety precaution for all concern human being in all respects (till completion of works). The contractor shall be responsible for any damage or loss of part / limb or death human being on site. In no case, the employer shall be responsible for any mishappening.

Contractor has to arrange for the complete safety of the persons working for project, users of the surrounding area i.e. public and vehicles also. All the arrangements of safety equipment, first-aid treatment, mandatory signages, regarding work & traffic as per requirement is to be arranged at site by the contractor.

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

53. From the commencement to the completion of the works, the contractor shall be fully responsible for taking care. In the event of any such damage, loss or injury happening from any of the unexpected risks the contractor shall if any to the extent required by A.M.T.S. repair and make good the same as aforesaid at the cost of A.M.T.S.

54. The Insurance for the following will be covered and paid for by the contractor, and contractor shall indemnify the A.M.T.S. and hold the A.M.T.S. harmless in respect of all and any expenses arising from any such injury and / or damages in respect of Workmen’s Compensation and Risk of Accidents. The contractor shall furnish the copy of the policy of insurance as and when asked for.

55. **ARBITRATION:**
In case of all the disputes, decision of the Transport Manager, Ahmedabad shall be final and binding to the bidder. The Transport Manager shall be the sole Arbitrator.
For any judiciary procedures, the jurisdiction will be subject to Ahmedabad City Jurisdiction only.

56. The selection process will lay high emphasis on the ability and competency of contractors to do high quality work within the given time schedule.

57. The onus of providing, all necessary company / project related information, in appropriate manner and medium, so as to demonstrate the competency of the bidder and to allow proper evaluation, will rest entirely on the Bidder.

58. All informations has to be typed or hand written legibly. All pages of the Bid have to be initialed by the bidder as and where specified.

59. ALL INFORMATION HAS TO BE SUBMITTED IN THE PRESCRIBED FORMAT ONLY. Projects for which incomplete information has been provided will not be considered for evaluation.

The Bidder may attach separate sheets if so required. However, the final bound document submitted, has to be submitted in vertical A4 size (210 mm X 297 mm). The tender document not found in a spiral / comb or any such binding, and if found loose, shall be rejected outright.

60. The scope of work, project description mentioned in the document is indicative and is likely to change during detailed design. Project brief, is provided to assist the bidder in understanding the fundamental and specific requirements of the project.
61. Conditional tenders will not be accepted in any case.
62. Ahmedabad Municipal Transport service (A.M.T.S.'s) decision for selection or rejection of the tenders shall be final and binding to all.
63. If Ahmedabad Municipal Transport Service is convinced that the Bidder has resorted to material misrepresentation or provided fraudulent information / statement, the said Bidder will be liable for disqualification / rejection at any stage.
64. Proof for fulfilment of eligibility criteria should be submitted along with Tender volume. If the Tender volume is submitted without valid documents and without proof of eligibility criteria it will be rejected.
65. Those who do not meet with the eligibility criteria need not submit the Tender document. Even if they bid, the tender shall be rejected outright resulting to the forfeit of the Earnest Money Deposit.
66. Tenders, which do not fulfill all or any of the condition or are submitted incomplete in any respect or are conditional tenders, will be rejected out right.
67. The Transport Manager, A.M.T.S. reserves the rights to reduce/ increase the scope of work and contract without assigning any reason thereof.
The bidder agrees that at any point of time during progress, consultants/AMTS have the final authority to change any design and detail, and has all the rights to question the contractor for any kind of quality concerned questions, including the origin and supply of the material. Failing to which, the contractor shall be liable to dismantle the executed work and no cost of the demolished work and the work done shall be paid to the contractor.
68. Time and quality is the essence of the project, failing to which, the contractor shall be responsible for the quality and time.
69. No compromise with the tender specifications, documents, standard practices, make and brand of materials, material standards, etc. shall be made in any case.
70. If in any case, two copies of the tender documents reflects different percentage of quoted rate, the tender shall be rejected outright. The tenderer shall be detained or black listed for misguiding the department.
71. Contactor, after award of this project shall furnish photographs of progress at site every fortnight. Atleast 10 Nos. of photographs in size 5" x 7" shall be furnished at regular decided interval to monitor the progress on site. This shall be presented in a well manner and shall reflect the progress, failing to which may lead to misbehaviour from contractor's side.

PROCEDURE FOR REJECTION

- ❖ Ahmedabad Municipal Transport Service represented by Transport Manager, A.M.T.S. reserves the right to accept or reject any tender or reject any / all tenders without giving any reasons for their decision. The whole work may be split between two or more Contractors or accepted in part and not entirely, if considered expedient.
- ❖ Tenders are liable to be rejected in which any of the particulars/ prescribed Information is either missing or incomplete in any respect and or if the prescribed conditions are not fulfilled.
- ❖ Submission of fake data shall be leading to the rejection of tender outright, and even if any fake data / information found during the course of project time limit, any necessary actions taken by the Transport Manager, shall be abiding to the contractors.

CESS

1% cess non-refundable as per "Building and other construction works ROE & COS Act 1996 and Building and other construction workers welfare cess Act 1996 shall be deducted from contractors bills.

DEFECT LIABILITY PERIOD (12 Months from the date of handing over of the premises)

The Contractor shall make good and remedy at his own cost and expenses any defect which may develop or may be noticed or noticing such items which are not up to the quality standards stipulated in tender documents before the period mentioned hereunder. The contractor shall be responsible to repair/reconstruct such items at his own expense so as to maintain quality as prescribed in tender specifications for the entire period as hereunder. The Engineer in charge shall give the contractor a notice in writing about the defect /discrepancy and the contractor shall make good the same within 15 Days of receipt of the notice. In the case of failure on the part of the contractor, the Engineer in Charge may rectify or remove or re-execute the work at the risk and cost of the contractor. The Engineer in Charge shall be entitled to appropriate the whole or any part of the amount of security deposit towards the expenses, if any, incurred by him in rectification or re-execution.

CHILD LABOUR

No contractor shall employ any child having age up to 14 years, as it is prohibited by child labour prohibition and regulation act-1986. Hon. Supreme Court has given certain guide lines and as per those guide lines, if employment is detected on the site work the employer / contractor shall have to deposit Rs. 20,000/- (Rupees twenty thousand only) in the welfare fund.

If the employer refuses to deposit then action will be taken for contempt of court of Supreme Court judgment and prosecuted by concern authority. Because of the breach of any provision child prohibition and Regulation Act – 1986 by the contractor and for the Client has to pay any amount then the Client shall recover the said amount from the contractor.

Seal and Signature of the Bidder

Transport Manager (A.M.T.S.)

Date:

Ahmedabad Municipal Transport Service

Mobile No.

AHMEDABAD MUNICIPAL TRANSPORT SERVICE

Section II – (B) SPECIAL CONDITIONS OF CONTRACT

74. It shall be distinctly understood that not withstanding the reviews and Suggestion if any, by the Engineer – in – charge or Project Consultants the sole and ultimate responsibility for the stability and performance of the form work and all other temporary and permanent works shall be that of the Contractor.
75. The partners or Directors of the Contractor shall meet the officers of A.M.T.S. or its consultants at the site of works or at their respective offices whenever requested to do so.
76. Equipment from the Contractors.
- i) Compression testing machine of minimum capacity of 200 tonnes.
 - ii) A complete set of standard sieves
 - ii) Sieve vibrator.
 - iv) Slump Cones : 2 Nos.
 - v) Adequate Numbers of standard moulds (12 Nos. Minimum).
 - vi) Weighing balance (2 Nos.)
 - vii) Curing tanks for cubes / cylinders.
- Any other apparatus deemed necessary by A.M.T.S. or its Consultants for proper control shall be provided by the Contractor at his own cost.
77. The Project Consultants / Site Engineer- in-charge (authorized Official) may ask for any tests to be performed on any construction material. Such tests shall be performed at the contractors expenses whether at site, in the contractor's laboratory or else where as directed by the Project Consultants / Site Engineer – in – charge. The opinion of the Engineer – in – charge on the mode of testing and interpretation of the results thereof shall be final and binding on the contractors and shall be without appeal.
78. The Project Consultants / AMTS shall supply to the contractor reasonably complete engineering drawings. All the drawings required for the complete execution of the work will not be released simultaneously but in installments as the work progresses. If contractor has not submitted the BARCHART, the priority of the works shall not be understood which may affect submission of the drawings and details. A.M.T.S. And its Project Consultants to permit scrutiny, corrections resubmissions and final approval without causing any delay in the construction work.
79. Successful individual / firm / organization will have to renew themselves in the relevant class of contractor's registration with Ahmedabad Municipal Corporation, within 30(Thirty) working days from the date of Letter of Intent. If not done so, the contract shall be forfeited.
80. The Contractor shall confirm to the provisions of the Government Act relating to the work, and to the regulations and bye-laws of the local authorities. The contractor shall give all notices required by the said act, and obtain all required permissions and licenses and pay all fees payable to such authorities in connection with constructing and maintaining temporary electric and water supply at site for the said project. All aspects of temporary works including their stability shall be the sole and ultimate responsibility of the Contractor.
81. A.M.T.S. reserves the right to use the premises and any portion of site for execution of any work not included in this contract which A.M.T.S. may desire to get executed by other agencies. The Contractor shall allow all reasonable facilities for the execution of such work but shall not be required to provide any plant or material for such work except by special arrangement with A.M.T.S. in such a manner as not to impede the progress of the works included in this contract and the Contractor shall not be responsible for any damage or delay which may happen or be occasioned by such work.

82. Staff to be appointed by the Contractor on Site: In addition to previous stipulations, the Contractor shall be represented at site at all times during the tenure of the contract by responsible and qualified engineers. Such engineer shall form the Contractor's Project Management & Site Supervisory Team. They shall be in constant attendance upon all activities of the work. Contractors' staff shall comprise of at least the following to be permanently on site for the entire duration of the project. The bidders shall list out the permanent staff to be deployed for this particular project along with the tender.
- Senior Engineer – 01 Nos. (With atleast 5 -7 years experienced Degree Civil Engineer)
 - Junior Engineer – 01 Nos. (With atleast 3 -5 years experienced Degree Civil Engineer)
 - Site Supervisor – 1 No. (Atleast 5 years of Civil Construction Experience)
- (Failing to provide this staff may affect the work, which in no case shall be permitted, Payment Will be Deducted According To Engineer's On site)
83. Cost of recovery against materials, utilities or services supplied or arranged for, by A.M.T.S. shall be made by deducting the respective amount from the running bills and shall be settled in final bills.
79. ~~No advance payment shall be made to the Contractor~~ for the building material or anything thereof.
80. Any inspection of works if carried out by authorities, contractor shall extend his full co-operation to such authorities in examining records, works etc. on inspection by them, in their inspection report.
81. As a contract security, the tenderer to whom the award is made shall furnish a security deposit & performance guarantee each (Security Deposit) for the amount of 5% of the contract price to guarantee the faithful performance, completion and maintenance of the works of the contract in accordance with all condition and terms specified herein and to the satisfaction of the Engineers-in charge and ensuring the discharge of all obligations arising from the execution of contract in one of the forms mentioned below.
- b) The performance guarantee shall be delivered 5% of Actual Cost of work in form of Bank Guarantee to the AMC within **ten (10) days** of the completion of work under contract or as instructed by the Engineer-in-charge.
 - c) On satisfactory completion of the defect liability period in all respect, the performance guarantee will be returned to the contractor without any interest after the defect liability period of 12 months from the date of completion certificate of the work.
 - d) In case of security deposit, the contractor may deposit an amount of 5% of value of accepted tender cost in form of Bank Guarantee to the AMC after ten (10) days on award of work to be retained till completion of work with Final Bill .
 - e) In case of retention money, to be deducted in 2% of the gross value of the work done in each Running Account bill & to be retained till completion of work with Final Bill.

FOREFEIT OF SECURITY DEPOSIT:

In any case in which under any clause or clauses of this contract, the Contractor shall have rendered himself liable to pay liquidated damages amounting to the whole of his security deposit (whether paid in one sum or deducted by installments) the Employer/Consultant shall have the right to adopt any of the following courses as they may deem best suited to the interest of the Employer:-

- a) To rescind the contract (of which rescission notice in writing to the Contractor under hand of the Employer / Consultant shall be conclusive evidence), and in which case the security deposit of the Contractor shall stand forfeited and be absolutely at the disposal of the Employer.
- b) To employ labour paid by the Employer and to supply materials to carry out the work, or any part of the work, debiting the Contractor with the cost of the labour and price of material (of the amount of which cost and price of a certificate of the Consultant / Employer shall be final and conclusive against the Contractor) and crediting him with the value of the work done in all respects in the same manner and at the same rates as if it had been carried out by the contractor under the terms of this contract.
- c) To measure up the work of the Contractor, and to take such part thereof as shall be unexecuted , out of his hands, and to give it to another Contractor to complete in which case any expenses which may be incurred in excess of the such which would have been paid to the executed by him (of the amount of which excess the certificates in writing of the Consultant / Employer by the original Contractor and may be deducted from any money due to him by the Employer under the contract or otherwise , or from his security deposit or the proceeds of sale thereof, or a sufficient part thereof or from both or all.

In the event of any of the above courses being adopted by the Employer / Consultant the Contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any material or entered advance on account of, or with a view to executing the work or the

performance of the contract. And in case the contract shall be rescinded under the provision aforesaid, the Contractor shall not be entitled to recover or be paid any sum for any work thereto actually performed under this contract unless and until the Employer / Consultant will have certified in writing the performance of such work and the value payable in respect thereof, and he shall be the value payable in respect thereof, and he shall be entitled to be paid only the value so certified.

CONDITION FOR THE WATER & ELECTRIC SUPPLY

Water Supply:

The contractor shall arrange at his own cost, a suitable supply of piped water for the construction of the works and provide a satisfactory supply of potable water for drinking, washing, sanitation and cleaning down, The contractor will be responsible for all the costs where applicable of connection, meter installation, water consumed, water required for testing purposes, disconnection and the laying, maintenance and ultimate removal of any distribution system around the site. If water is provided through AMTS then charges will be paid by the contractor.

Electricity:

Electricity will possibly be made available at the site by the employer/client but the Contractor must make his own arrangements with the Corporation and Electricity Supply Authorities and with other contractors to connect to and take a supply from such services, paying all costs in Connection therewith.

The Contractor shall be entitled to use such supply. Electricity as may be available on the site for purpose of the work and shall pay such charges as is fixed by the appropriate supply Authorities.

In case if there is any delay in supply of power site of any interruption or fault in the power during the work. No compensation shall be paid for idle labor staff, machineries and for use of diesel operating sets etc. as the case may be.

The contractor is responsible for liaison with local authority for change in supply & connection or new connection on behalf of AMC. It includes filling the necessary application to power Supply Company, follow up and getting the supply, filling the necessary test reports to the power supply company. All official fees including security deposits and other expenses shall be of initially paid by the contractor.

Seal and Signature of the Bidder

Transport Manager (A.M.T.S.)

Date:

Ahmedabad Municipal Transport Service

Mobile No.

REGULATIONS FOR LABOURS FOR CONTRACTORS

LABOUR RULES:

The Contractor shall at all times during the continuation of the Contract, comply fully with all existing Acts, regulations and bylaws including all statutory amendments and re-enactment of State or Central Government and other local authorities and any other enactments, notifications and acts that may be passed in future either by the State or the Central Government or local authority, including Indian Workmen's Compensation Act, Contract Labour (Regulation and Abolition) Act 1970 and Equal Remuneration Act 1976, Factories Act, Minimum Wages Act, Provident Fund Regulations, Employees Provident Fund Act, schemes made under the same Act and also Labour Regulations as revised Health and Sanitary Arrangement for Workmen, Insurance and other benefits and shall keep Employer indemnified in case any action is commenced by competent authorities for contravention by the Contractor. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated henceforth on the part of the Contractor, the Architect/Employer shall have the right to deduct from any money due to the Contractor, his amount of Performance Security or recover from the Contractor personally any sum required or estimated to be required for making good the loss or damage suffered by the Employer, responsibility in connection with the employees of the contractor, who shall, in no case, be treated as the employees of the Employer at any point of time.

Fair Wages:

- a) The Contractor shall pay the labourers engaged by him on the work not less than fair wage which expression shall mean, whether for time of piecework, the respective rates of wages fixed by the local authorities as fair wages for the area payable to the different categories of labourers or those notified under the Minimum Wages Act for corresponding employees of the Employer, whichever may be higher.
- b) The Contractor shall, notwithstanding the provisions of a contract to the contrary, cause to be paid a fair wage to labourers indirectly engaged on the Works, including any labour engaged by sub/contractors in connection with the said works as if the labourers had been directly employed by him.

Notices:

- i) The Contractor shall before he commences the work, display, and correctly maintain in a clean and legible condition at a conspicuous place on the Site, notices in English and in a language spoken by the majority of the workers, stating therein the rate of wages which have been fixed as fair wages and the hours of work for which such wages are earned and send a copy of such notices to the Architect.

Record of wages etc.

The contractor shall maintain records of wages and other remuneration paid to his employees in such form as may be convenient and as per the requirements of the PMC/ Employer/ Architect and the Conciliation Officer (central), Ministry of Labour Government of India, or such other authorized person appointed by the central or State Government and the same shall include the following particulars of Each worker:

- a) Name, worker's number and grade;
- b) Rate of daily or monthly wage;
- c) Nature of work on which employed;
- d) Total number of days worked during each wage period;
- e) Total, amount payable for the work during each wage period; All deductions made from the wage with details in each case of the ground for which the deduction is made;
- f) Wage actually paid for each wage period.
- g) The Contractor shall provide a Wage Slip for each worker, employed on the Works.
- h) The Wage records and Wage Slips shall be preserved for at least 12 months after the last entry for Inspection of Wage Records.

- i) The Contractor shall allow inspection of the aforesaid Wage Records and Wage Slips to the Architect/PMC and to any of his workers or to his agent at a convenient time and place after due notice is received, or to the Employer or any other person authorized by him on his behalf.
- j) The Employer/Architect or any other person authorized by them on their behalf shall have power to make enquiries with a view to ascertaining and enforcing due and proper observance of the Fair Wages Clause. He shall also have the Power to investigate into any complaint regarding any default made by the Contractor or subcontractor in regard to such provision.
- k) No party shall be represented by a legal practitioner in any investigation or inquiry under this Clause, unless Architect/Employer agrees otherwise.

Payment of Wages

- i) Wages due to every worker shall be paid to him direct. All wages should be paid in current coins or currency or in both.
- ii) Wages of every worker employed on the Contract shall be paid where the wage period is one week, within THREE days from the end of the Wage period, and in any other case before the expiry of the 7th day or 10th day from the end of the wage period according as the number of workers does not exceed 1,000 or exceeds 1,000.

NOTE: The term "Working Day" means a day on which the work on which the labour is employed is in progress.

Register of Wages, etc.:

- i) A Register of Wages cum Muster Roll in the Form appended to these regulations shall be maintained and kept at the Work Site or as near to it as possible.
- ii) A wage slip in the form appended to these regulations shall be issued to every worker employed by the Contractor at least a day prior to disbursement of wages.

DECLARATION – 1

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

At present I/We am/are registered as approved contractor (s), firms in any state, CPWD / MES / Railways/Municipal Corporation / A.M.T.S.

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

I / We further declare that my / our near relatives are not working in A.M.C as a Deputy Municipal Commissioner / Additional City Engineer / Deputy City Engineer/ Assistant City Engineer/Assistant Engineer/ Technical / Non-Technical Supervisor, as on today.

Seal and Signature of the Bidder

Date:

DECLARATION - 2

APPLICABILITY OF PROVIDENT FUND AND MISCELLANEOUS PROVISIONS ACT 1952

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

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

Declaration of Depositing Provident Fund contribution

This to certify that we have deducted the employees' P.F. and deposited the same along with employer's contribution towards provident fund on labour charges / wages paid by us to the labourers engaged for the work of _____ with Provident Fund Authority under our Provident Fund Code No. _____

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

Seal and Signature of the Bidder

Date:

SAFETY CODE

1. The Contractor should maintain all first aid appliances including adequate supply of sterilised dressing and cotton wool in a readily accessible place.
2. In case of any injured person if hospitalization is needed even after proper first aid treatment then the injured person should be admitted to the nearest hospital without loss of time.
3. As the work is to be done on a Site where there is a running Branch and an Office, the Contractor shall segregate this area by M.S. Angles and C.G.I. / Aluminum Sheets upto the required height. This shall be done on all four sides of the site. In addition, mesh may have to be used so as not to endanger the passerby's / other users of the plot / adjacent plots. All safety measures are to be rigorously followed so that there is no disturbance of any kind to the running office / branch. Any and all openings / grading / ramps necessary for the project are to be done by the Contractor after taking permission from the appropriate authorities, without any extra payment for the same.

SCAFFOLDS

1. Suitable scaffolds shall be provided for workmen for all work that cannot safely be done from the ground, or from solid construction except in the case of short duration work which can be done safely from ladders. When a ladder is used, it, shall be of rigid construction made either of good quality wood or steel. The steps shall have a minimum width of 450mm and a maximum rise of 300 mm. Suitable hand holds of good quality wood or steel shall be provided and the ladder shall be given an inclination not steeper than 1/4 to 1 (1/4 horizontal and 1 vertical).
2. Scaffolding or staging more than 4m above the ground floor swung or suspended from an overhead support or erected with stationery support shall have a guard rail properly bolted, braced or otherwise secured, at least 1m above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
3. Working platforms, gangways and stairway shall be so constructed that they do not sag unduly or unequally and if the height of the platform, gangway or stairway is more than 4m above ground level or floor level, they shall be closely boarded and shall have adequate width and be suitably fenced as described in (ii) above.
4. Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 1m. Wherever there are open excavations in ground, they shall be fenced off by suitable railing and danger signals installed at night so as to prevent persons slipping into the excavations.
5. Safe means of access shall be provided to all working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m in length while the width between side rails in rung ladder shall in no case be less than 290mm for ladder up to and including 3m in length. For longer ladders this width shall be increased at least 20mm for each additional meter of length.
6. A sketch of the ladders and scaffolds proposed to be used shall be prepared and approval of the Consultant obtained prior to construction.

OTHER SAFETY MEASURES

1. All personnel of the Contractor working within the plant site shall be provided with safety helmets. All welders shall wear welding goggles while doing welding work and all metal workers shall be provided with safety gloves. Person's employer on metal cutting and grinding shall wear safety glasses.
2. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites of inconvenience to any person or the public. All safety rules to be observed while working on live electrical system or installation as stipulated in I.E rules shall be observed.

EXCAVATION AND TRENCHING

1. All trenches, 1.2m or more in depth, shall at all times be supplied with at least one ladder for each 30m in length or fraction thereof. The ladder shall be extended from bottoms of the trench to at least 1m above the surface of the ground. Sides of trenches which are 1.5m or more in depth shall be stepped

back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated material shall not be placed within 1.5m of the edges of the trench or half of the depth of the trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.

2. The Contractor shall take all measures on the site of the work to protect the public from accidents and shall be bound to bear the expenses of defence of every suit, action or other proceedings at law that may be brought by any persons for injury sustained owing to neglect of the above precautions and to pay any such persons or which may with the consent of the Contractor, be paid to compromise any claim by any such person.

DEMOLITION

1. Before any demolition work is commenced and also during the process of the work:
 - a. All roads and open areas adjacent to the work site shall either be closed or suitably protected;
 - b. No electric cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall remain electrically charged;
 - c. All practical steps shall be taken to prevent danger to persons employed from the risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe;

PERSONAL SAFETY EQUIPMENTS

1. All necessary safety equipments as considered adequate by the Engineer / Consultant should be kept available for the use of the person employer on the site and maintained in a condition suitable for immediate use, and the Contractor should take adequate steps to ensure proper use of equipment by those concerned:
 - a. Workers employer on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles;
 - b. Those engages in white washing and mixing or stacking of cement bags or any material which is injurious to the eyes shall be provided with protective goggles;
 - b. Those engaged in welding work shall be provided with welder's protective eyesight lids;
 - d. Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals;
 - e. When workers are employer in sewers and manholes, which are in use, the Contractor shall ensure that the manhole covers are opened and are ventilated at least for an hour before the workers are allowed to get into manholes and the manholes so opened shall be cordoned off with suitable railing and provided with warning off with suitable railing and provided with warning signals or boards to prevent accident to the public;
 - f. The Contractor shall not employ men below the age of 18 years and women on the work of painting with products containing lead in any form. Wherever men above the age of 18 are employer on the work of lead painting the following precautions should be taken:
 1. No paint containing lead or lead products shall be used except in the form of paste or ready made paint.
 2. Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.
 3. Overalls shall be supplied by the Contractor to the workmen and adequate facilities shall be provided to enable the working painters to wash during cessation of work.
 - g. When the work is done near any public place where there is risk of drawings all necessary equipments should be taken for prompt rescue of any person in danger and adequate provision should be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

HOISTING MACHINES

1. Use of hoisting machines and tackle including their attachments anchorage and supports shall conform to the following standards or conditions.
 - a. These shall be of good mechanical constructions sound material and adequate strength and free from patent defect and shall be kept in good repair and in good working order.
 - b. Every rope used in hoisting or lowering materials or as means of suspension shall be of durable quality and adequate strength, and free from patent defects.

- c. Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years shall be in charge of any hoisting machine including any scaffolding winch or give signals to operator.
 - d. In case of every hoisting machine and of every chain ring hook, shackle shovel and pulley block used in hoisting or as means of suspension the safe working load shall be ascertained by adequate means. Every hoisting machine and all year referred to above shall be ascertained by adequate means. Every hoisting machine and all year referred to above shall be plainly marked with the safe working load. Each safe working load and the conditions under which it is applicable shall be clearly indicated. No part of any machine or any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.
 - e. In case of departmental machines, the safe working load shall be notified by the Engineer. As regards Contractor's machines, the Contractor shall notify the safe working load of the machine to the Engineer whenever he brings any machinery to site of work and get it verified by the Engineer concerned.
2. Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with sufficient safeguards, hoisting appliances should be provided with such means as will reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energized, insulating mats, wearing apparel, such as gloves, sleeves, and boots as may be necessary, should be provided. The workers should not wear any rings, watches and carry keys or other materials which are good conductors of electricity.
 3. All scaffolds, ladder and other safety device mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use.
 4. These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at work spot. The person responsible for compliance of the safety code shall be named therein by the Contractor.
 5. To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the Contractor shall be open to inspection by the Labour Office / Engineers of the department or their representatives.

AHMEDABAD MUNICIPAL TRANSPORT SERVICE

Section III

A: FORM OF BID

Name of the contract: RENOVATION OF COMMAND & CONTROL CENTRE AT TRANSPORT HOUSE, JAMALPUR, AHMEDABAD

To,

The Transport Manager,
A.M.T.S,
Transport House,
Behrampura,
Ahmedabad,
Gujarat

Dear Sir,

1. Having examined the Conditions of Contract, Specifications, Bill of Quantities, for the execution of the above named works, we, the undersigned, offer to execute and complete such works and remedy any defects therein in conformity with the Conditions of Contract, Specifications, Bill of Quantities.
2. We acknowledge that the Appendix to Bid forms part of our Bid.
3. We undertake, if our Bid is accepted, to commence the Works on Site within the period stated by the A.M.C authorized Staff, hereto after receipt of an order of the Engineer's notice to commence, and to complete and deliver the sections and the whole of the Works comprised in the Contract within the period stated in the Appendix to Bid hereto.
4. If our Bid is accepted, we will furnish Performance Security (ies) in the form of Bank Guarantee(s) to be jointly and severally bound on us in accordance with the Conditions of Contract.
5. We agree to abide by this Bid for the period of One hundred and Eighty (180) days after the date of bid opening, and it shall remain binding upon us and may be accepted at any time before the expiry of that period.
6. Unless and until a formal Agreement is prepared and executed, this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.
7. We understand that you are not bound to accept the lowest or any Bid you may receive.
8. All the partners of our Joint Venture are legally bound by this Bid. @.
9. Transport Manager, A.M.T.S. Have rights to reject any or all bids without iving any reason.

Dated this _____ day of _____ 2025

Signature _____

In the capacity of _____ duly authorised to sign Bid for and on

Behalf of

Address (in block capitals)

Name of Witness _____

Occupation of the Witness _____

Address of Witness

Signature of Witness _____

@. To be deleted if the bidder is not a Joint Venture.

Seal and Signature of the Bidder

Transport Manager (A.M.T.S.)

Date:

Ahmedabad Municipal Transport Service

Mobile No.

AHMEDABAD MUNICIPAL TRANSPORT SERVICE

Section IV – FORM OF E.M.D (BANK GUARANTEE)

Where as M/s.....

(Hereinafter called the Tenderer) is desirous and preferred to tender for works in accordance with the term and conditions of tender for the work of

.....

1. Therefore. We hereby affirm that -we are guarantors on behalf of the Tenderer up to total Rupees.....(in words.....) Rs. (in figures) and we undertake to pay to Transport Manager, A.M.T.S. Specified tip to his first written demand, without demur without delay and without the necessary of a previous of judicial or administrative procedures and without the necessity of a previous of judicial or administrative procedures and without the necessity to prove to the Bank the defects or short comings or debits of the contractor any sum within the limit of Rs.....

2. We further agree that the Guarantee herein contemned shall remain in full force and effect during the period that would be taken for the acceptance of tender.

However unless a demand of claim under this guarantee is made on its in writing on or before the (Date to be specified will not be less than 180 days from the stipulated date of receiving the tender) we shall be discharge from all liabilities under the guarantee thereafter

3. We undertake not to revoke the guarantee during it currency except with the previous consent of the Transport Manager, A.M.T.S. Ahmedabad in writing.

4. We lastly undertake not to revoke the guarantee for any charge in constitution of the Tenderer or of the Bank.
Date:

Signature & Seal of Guarantor.....

Bank Address.....

5. The contractors shall have to furnish before his tender is accepted intimate assessment number and ward under which he is assessed.

6. Copies of certificate as regards previous experience, if any, must accompany the tender.

7. List of approved banks - ALL NATIONALISED BANKS and as per Annexure "C"

Seal and Signature of the Bidder

Transport Manager (A.M.T.S.)

Date:

Ahmedabad Municipal Transport Service

Mobile No.

AHMEDABAD MUNICIPAL TRANSPORT SERVICE

FORM OF AGREEMENT

THIS AGREEMENT made the ____ day of _____ 2025 between Ahmedabad Municipal Transport Service (here in after called "the Employer") of the one part and M/s. _____
_____ (here in after called "the Contractor") of the other part.

WHEREAS the Employer is desirous that certain works should be executed by the Contractor, viz.

_____ and has accepted the bid by the contractor for the execution and completion of such works and the remedying of any defects therein at a contract price of Rs. _____ (Rupees _____).

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz.:
 - a) the Letter of Acceptance;
 - b) the said Bid and Appendix to Bid;
 - c) the General Conditions of Contract
 - d) the Technical Specifications;
 - e) the Priced Bill of Quantities; and
 - f) other documents forming part of the contract.
3. In consideration of the payments to be made by the Employer to the Contractor as here in after mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract.
4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract. IN WITNESS whereof the parties hereto have caused this Agreement to be executed the day and year first before written.

Signed, sealed, and delivered by the said Employer and the Contractor in the presence
Of:

WITNESSES:

On behalf of Ahmedabad Municipal Transport Servicev	On behalf of Contractors M/s.
1.	1.
2.	2.

Binding Signature of the Employer:

Binding Signature of the Contractor:

Section- V

CONDITIONS OF WORKS

This section gives detail specifications for mainly used materials, for other materials refer Building Specifications.

For detailed specification refer R & B Dept. Booklet for General Technical Specification for building works. If any specifications are not found within the tender documents, the same shall be executed as per the instructions of the Assistant City Engineer and the decision of the Assistant City Engineer shall be final and governing.

GENERAL TECHNICAL SPECIFICATIONS FOR BUILDING WORK

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 or 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.			
5. The distance, which constitutes lead, shall be determined along the shortest practical route and not necessarily the route actually taken. The decision of the Engineer-in-charge in this regard shall be taken as final.
6. Where no lead is specified, it shall mean "all leads"
7. Lift shall be measured from plinth level.
8. Upto "floor two levels" means actual height of floor (Maxi. 4 M.) Upto 3.50 Mt. above plinth level.
9. Definite particulars covered in the items of work, through not mentioned or elucidated in it, specifications shall be deemed to be included there in.
10. Reference to specifications of materials as made in the detailed specification of the items of work 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.
12. The contract rate of the item of work shall be for the work completed in all respects.
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 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 shall be kept in sufficient numbers and in good working condition on the site of the work.
17. All works shall be carried out in a workman like manners 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 be 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 thereof 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 "Minor Minerals Act", and such other laws and rules prescribed by Government from time to time.
 23. All necessary safety measures and precaution (including those laid down in the various relevant Indian Standards) shall be taken to ensure the safety of men, materials and machinery on the works as also of the work itself.
 24. The testing charges of all materials shall be borne by the Contractor unless recovery at one percent towards testing charges is separately made.
 25. Approval to any of the executed items for the work does not in any way relieve the contractor of his responsibility for the correctness, soundness and strength of the structure as per the drawings and specification.

SPECIFICATIONS OF ITEMS OF B.O.Q.

BIDDERS PLEASE READ CAREFULLY AND COMPULSORY SIGN. WITH SEAL :

- This section gives detail specifications for mainly used materials, for other materials refer Building Specifications.
 - For detailed specification refer R & B Dept. Booklet for General Technical Specification for building works.
 - Proper care has been taken to note down specifications of all the items, but if any item is not found hereby, it shall be executed only as per the guidelines of the Assistant City Engineer, no payment shall be made if the guidelines are not followed.
- a) Samples of all the materials to be used shall be got approved before placing the order and then approved sample shall be deposited with the Assistant City Engineer / A.M.T.S. locker safely.
 - b) In case of non-availability of materials in metric unit, the unit shall be converted by the Project Consultants , for which neither extra cost shall be paid nor rebate shall be given/ recovered on those items / materials.
 - c) The contractor shall submit the original Testing Certificate of the material tested, if in any case, the Consultants finds the Tests to be repeated, the contractors shall do the same with no extra cost to be borne by the clients / consultants.
 - d) The contractor may also be asked for the originality of the material used, this certificate may be asked from the vendor / manufacturer from whom the materials has been procured.
 - e) For all materials stored on site, the contractors shall be sole responsible for the wastage, theft or any other kind of losses.
 - f) Wherever in the tender document, two statements or two brands conflicts/ differs, the superior material quality / brand shall be followed, and same for any construction activity such as strength of material / grade of the material / mortar / concrete mix shall be followed the superior one only, any discrepancy in this regard shall be solved by the AMC or Project Consultants and the decision of the Client shall be final and binding to the Contractors without any oppose.
- We agree and abide to follow the specifications / instructions given to us during the course of execution.

Sign. & Seal of the Bidders

SPECIFICATIONS OF MATERIALS – CIVIL

This section gives detail specifications for mainly used materials, for other materials refer Building Specifications.

ITEM NO. 1

BOQ Description: Carefully dismantling existing wall panelling and associated framework, including removal, disposal of debris and site clearance, complete as directed by the Architect.

Measurement shall be given on sq.mtr basis

ITEM NO. 2

BOQ Description: Carefully dismantling existing ceiling, including removal, disposal of debris and site clearance, complete as directed by the Architect.

Measurement shall be given on sq.mtr basis

ITEM NO. 3

BOQ Description: Dismantling of wooden floors including stacking of serviceable materials and disposal of unserviceable materials with all lead and lift.

Measurement shall be given on sq.mtr basis

ITEM NO. 4

BOQ Description: Dismantling wood work, wrought framed and fixed in frames trusses including stacking the materials with all lead and lift.

Measurement shall be given on cu.mtr basis

ITEM NO. 5

BOQ Description: Dismantling steel work including distempering and stacking the materials with all lead and lift.

Measurement shall be given on kg basis

ITEM NO. 6

BOQ Description: Dismantling doors, windows, ventilators etc. (wood or steel) shutters including chowkhats architraves, holdfasts and other attachment etc. complete and stacking them within all lead and lift.(i) Not exceeding 3 Sq.M. in area.

Measurement shall be given on nos. basis

ITEM NO. 7

BOQ Description: Removing and scraping of old deteriorated plaster of any thickness from wall / R.C.C member including stacking of serviceable material and disposal of unserviceable from site of work with all lead and lift

Measurement shall be given on sq.mtr basis

ITEM NO. 8

BOQ Description: Carefully dismantling existing AC's as directed by the Architect.

Measurement shall be given on nos. basis

ITEM NO. 9

BOQ Description: Carefully dismantling and removing existing stepped flooring, including floor finish, screed, risers, treads and associated materials, complete with disposal of debris, surface cleaning and preparation for new flooring work, as directed by the Architect.

Measurement shall be given on sq.mtr basis

ITEM NO. 10

BOQ Description: Providing 15mm thick cement plaster in single coat on Rough (Similar) side of single or half brick walls for interior plastering upto floor two level and finished even and smooth in (ii) Cement mortar 1:4 (1-cement :4-sand)

Measurement shall be given on sq.mtr basis

ITEM NO. 11

BOQ Description: Providing 20mm thick cement plaster in single coat on single or half brick walls for interior plastering upto floor two level and finished even and smooth in (iii) Cement mortar 1:6 (1-cement:6-sand)

Measurement shall be given on sq.mtr basis

ITEM NO. 12

BOQ Description: Scraping oil paint from steel and other metal surface and making the surface even (with Hand Scraping.)

Measurement shall be given on sq.mtr basis

ITEM NO. 13

BOQ Description: Removing dry or oil bound distemper by a washing and scraping and sand papering the wall surface smooth including necessary repairs to scratches complete.

Measurement shall be given on sq.mtr basis

ITEM NO. 14

BOQ Description: White washing with lime on wall surface (two coats) to give an even shade including thoroughly booming the surface to remove all dirt, dust; mortar drops and other foreign matter.

Measurement shall be given on sq.mtr basis

ITEM NO. 15

BOQ Description: Extra over on above items for every subsequent coat of white washing with lime on wall surface.

Measurement shall be given on sq.mtr basis

ITEM NO. 16

BOQ Description: Extra over item for white washing with lime on ceilings and/or sloping roofs.

Measurement shall be given on sq.mtr basis

ITEM NO. 17

BOQ Description: Extra over Item for every subsequent coat of white washing with lime on ceilings and/or sloping roofs.

Measurement shall be given on sq.mtr basis

ITEM NO. 18

BOQ Description: Applying two coats of putty & two coats of primer of approved brand and manufacture on new wall surface to give an even shade including thoroughly brushing the surface free from mortar dropping and other foreign matter and sand papered smooth.

Measurement shall be given on sq.mtr basis

ITEM NO. 19

BOQ Description: Wall Painting (two coats) with plastic emulsion paint of approved brand and manufacture and of shade required on undecorated wall surfaces to give an even shade, over and including a priming coat with alkali resistance primer of approved brand and manufacture after thoroughly brushing the surface free from mortar droppings, and other foreign matter and also including preparing the surface even and sand -papered smooth

Measurement shall be given on sq.mtr basis

ITEM NO. 20

BOQ Description: Extra over item for every subsequent coat of wall painting with plastic emulsion pain of approved brand

Measurement shall be given on sq.mtr basis

ITEM NO. 21

BOQ Description: Extra over above item for every subsequent coat on ceilings and sloping roofs painting with plastic emulsion paint of approved brand.

Measurement shall be given on sq.mtr basis

ITEM NO. 22

BOQ Description: Painting one coats (excluding priming coat) on previously printed steel and other metal surface with synthetic enamel paint, brushing to give an even shade including cleaning the surface of all dirt, dust and other foreign matter.

Measurement shall be given on sq.mtr basis

ITEM NO. 23

BOQ Description: Painting Two Coat (Excluding Priming Coat) On Previously Painted Wood And Wood Based Surfaces With Enamel Paint To Give Even Shade Including Cleaning Of All Dirt, Dust And Other Foreign Matter.

Measurement shall be given on sq.mtr basis

ITEM NO. 24

BOQ Description: Carrying out timber treatment to all wood work including drilling holes and spraying oil based chemical solution on surface of timber work for termite control including labor and material etc. complete. Using Chlorpyrifos20 EC as per 6313 2013 Part III (1% concentration by mass) is recommended one litre chemical emulsion diluted with 19 liters of kerosene. Total diluted concentration will be 20 liters inclusive of 1 liter chemical emulsion application in drilled holes and 0.75 / Litre chemical per one Sqmt two coat on wood surface not protected by paint or varnish.

Measurement shall be given on sq.mtr basis

ITEM NO. 25

BOQ Description: Providing and applying smooth wall punning using white cement-based putty of approved make over prepared wall surfaces, including surface preparation, filling of minor undulations, finishing and curing, complete as per manufacturer's specifications and Architect's instructions.

Measurement shall be given on sq.mtr basis

ITEM NO. 26

BOQ Description: Providing and fixing false ceiling comprising approved gypsum board/acoustic ceiling panels on GI framework suspended from the structural ceiling, including all necessary sections, hangers, supports, joint treatment, cut-outs for services, finishing, labour and installation, complete as per Architect's instructions.

Measurement shall be given on sq.mtr basis

ITEM NO. 27

BOQ Description: Providing and laying CAT-6 UTP data cable including conduits, accessories, I/O outlets, connectors, termination, testing and commissioning, complete as per approved drawings and specifications.

Measurement shall be given on Nos basis

ITEM NO. 28

BOQ Description: Providing, fixing, testing and commissioning 5A modular switch and 5A socket outlet complete with, screws and accessories, including making good the disturbed surface, complete as directed by Engineer-in-Charge.

Measurement shall be given on nos basis

ITEM NO. 29

BOQ Description: Providing, fixing, testing and commissioning 5A modular switch ,complete with, screws and accessories, including making good the disturbed surface, complete as directed by Engineer-in-Charge.

Measurement shall be given on Nos basis

ITEM NO. 30

BOQ Description: Providing, fixing, testing and commissioning 16A modular switch and 16A socket outlet complete with, screws and accessories, including making good the disturbed surface, complete as directed by Engineer-in-Charge.

Measurement shall be given on Nos basis

ITEM NO. 31

BOQ Description: Providing and fixing 1-module modular switch board complete with concealed GI/PVC box, mounting frame, modular front plate, fixing screws and accessories, including cutting, chasing and making good the wall surface, complete in all respects as directed by the Engineer-in-Charge.

Measurement shall be given on Nos basis

ITEM NO. 32

BOQ Description: Providing and fixing 2-module modular switch board complete with concealed GI/PVC box, mounting frame, modular front plate, fixing accessories and necessary hardware, complete in all respects.

Measurement shall be given on Nos basis

ITEM NO. 33

BOQ Description: Providing and fixing 3-module modular switch board complete with concealed GI/PVC box, mounting frame, modular front plate, fixing screws and accessories, including making good the disturbed surface, complete in all respects.

Measurement shall be given on Nos basis

ITEM NO. 34

BOQ Description: Providing and fixing 4-module modular switch board complete with concealed GI/PVC box, mounting frame, modular front plate and all fixing accessories, complete as specified and directed.

Measurement shall be given on Nos basis

ITEM NO. 35

BOQ Description: Providing and fixing 8-module modular switch board complete with concealed GI/PVC box, mounting frame, modular front plate, fixing screws, accessories and all necessary

hardware for accommodating switches, sockets, regulators and other modular devices, complete in all respects.

Measurement shall be given on Nos basis

ITEM NO. 36

BOQ Description: Providing and fixing 12-module modular switch board complete with heavy-duty concealed GI/PVC box, mounting frame, modular front plate, fixing screws, accessories and all necessary hardware for accommodating modular electrical accessories, complete as specified and directed by the Engineer-in-Charge.

Measurement shall be given on Nos basis

ITEM NO. 37

BOQ Description: Approved make ELCBs / RCCBs conforming to IS: 12640 and having sensitivity of 30 mA and Short Circuit withstand capacity of 6 KA and suitable for operation on single phase 240 V. having characteristic of quick action & tripping with all advance feature & do not incorporate any electronic component. for following Max. rating erected as directed (i) 25 Amps.DP Cat. III

Measurement shall be given on Nos basis

ITEM NO. 38

BOQ Description: Approved make ELCBs / RCCBs conforming to IS: 12640 and having sensitivity of 30 mA and Short Circuit withstand capacity of 6 KA and suitable for operation on single phase 240 V. having characteristic of quick action & tripping with all advance feature & do not incorporate any electronic component. for following Max. rating erected as directed (i) 63 Amps.DP Cat. III

Measurement shall be given on Nos basis

ITEM NO. 39

BOQ Description: Mains with 1.1 KV grade FRLS PVC insulated ISI marked stranded Copper conductor wire in following type of pipe to be erected concealed in /flushed on wall/ceiling, with 1.5 sq. mm copper conductor FRLS PVC insulated stranded wire of green colour for earth continuity of following size (a) with medium class Rigid PVC pipe and accessories (a) 2 wire 1.5 sq. mm materials, tools, tackles, transport, scaffolding, testing, protection, cleaning and all incidental works complete.

Measurement shall be given on mts basis

ITEM NO. 40

BOQ Description: Mains with 1.1 KV grade FRLS PVC insulated ISI marked stranded Copper conductor wire in following type of pipe to be erected concealed in /flushed on wall/ceiling, with 1.5 sq. mm copper conductor FRLS PVC insulated stranded wire of green colour for earth continuity of following size (a) with medium class Rigid PVC pipe and accessories (B) 2 wire 2.5 sq. mm

Measurement shall be given on mts basis

ITEM NO. 41

BOQ Description: Mains with 1.1 KV grade FRLS PVC insulated ISI marked stranded Copper conductor wire in following type of pipe to be erected in / on wall / ceiling with 2.5 sq. mm copper conductor FRLS PVC insulated stranded wire of green colour for earth continuity of following size.
(a) with medium class Rigid PVC pipe and accessories
(A) 2 wire 4 sq. mm

Measurement shall be given on mts basis

ITEM NO. 42

BOQ Description: Providing and erecting Sheet Steel powder coated MCB distribution board - flush / surface mounted fitted with busbar, neutral link, earth bar and DIN rail, confirming to IS 13032 and BS 5486-1986 without MCB to house appropriate nos. of MCBs N) Three phase 6 way SS Double door for horizontal single phase outgoing

Measurement shall be given on Nos basis

ITEM NO. 43

BOQ Description: 6" dia- 12W COB lights- 4000k ,, complete as per approved drawings and specifications

Measurement shall be given on Nos basis

ITEM NO. 44

BOQ Description: 6" dia- 18W COB lights- 4000k ,, complete as per approved drawings and specifications

Measurement shall be given on Nos basis

ITEM NO. 45

BOQ Description: Providing and fixing 26W LED recessed/surface mounted panel light of size 600 mm × 600 mm (24" × 24"), comprising CRCA powder-coated housing, high-transmission diffuser, energy-efficient LED module, and electronic constant-current driver.

Measurement shall be given on Nos basis

ITEM NO. 46

BOQ Description: provide & fitting Suspended 3" Profile Light is a modern linear LED pendant luminaire manufactured from an extruded aluminum profile with an opal diffuser, suspended from the ceiling using adjustable steel suspension cables with, 12 W, 4000K, CRI > 90, UGR < 19, Black powder-coated profile, Opal diffuser, Dimmable driver.

Measurement shall be given on rmt basis

ITEM NO. 47

BOQ Description: Providing and fixing FRLS PVC cable raceway/trunking of size 100 mm × 50 mm including base channel, snap-on cover, internal/external bends, junctions, end caps, fixing

accessories with screws and rawl plugs, suitable for electrical/data cable management, complete as directed by Architect/Engineer.

Measurement shall be given on rmt basis

ITEM NO. 48

BOQ Description: Reinstalling, testing and commissioning existing air-conditioning indoor and outdoor units, including providing and fixing new insulated copper refrigerant piping, condensate drain piping, control wiring, power cabling, supports and all necessary accessories, complete in all respects as per approved drawings and manufacturer's specifications. Complete as per Site Incharge instructions.

Measurement shall be given on Nos basis

ITEM NO. 49

BOQ Description: Providing and fixing of 2.2 Ton Inverter Split Air Conditioner (R-32 refrigerant preferred) complete with indoor unit, outdoor condenser unit, copper refrigerant piping, insulation, drain pipe, electrical interconnections, and commissioning, including all necessary accessories and testing as per manufacturer's guidelines. complete as per Site Incharge instructions. Make- Mitsubishi heavy Duty, Daikin, Blue Star or as suggested by department

Measurement shall be given on Nos basis

ITEM NO. 50

BOQ Description: Providing and fixing 35 mm thick main entrance door with Aluminium frame, flush door shutter finished with approved laminate/veneer, complete with SS hinges, mortise lock, pull handle, door closer, floor stopper and all necessary hardware, including polishing/finishing, fixtures, labour and installation, complete as per Architect's instructions.

Measurement shall be given on Nos basis

ITEM NO. 51

BOQ Description: Providing and fixing 35 mm thick Door for Rooms with Aluminium frame, flush door shutter finished with approved laminate/veneer, complete with SS hinges, mortise lock, pull handle, door closer, floor stopper and all necessary hardware, including polishing/finishing, fixtures, labour and installation, complete as per Architect's instructions.

Measurement shall be given on Nos basis

ITEM NO. 52

BOQ Description: Providing and fixing wall panelling in suggested Area, clad with 18 mm thick Commercial grade plywood finished with approved laminate/ veneer.

Measurement shall be given on sq.mt basis

ITEM NO. 53

BOQ Description: Providing and fixing wall panelling for mounting display screens in Command & Control Room, comprising structural framework of Aluminium sections of approved size and thickness, duly treated with anti-corrosive primer and paint, clad with 18 mm thick BWP grade plywood finished with approved laminate.

Measurement shall be given on sq.mt basis

ITEM NO. 54

BOQ Description: Providing and fixing Partition for All Rooms made with 40mm x 40mm Aluminium Framing, both side finished with 12mm Ply wood and 1mm Laminate as per architect

SOLID PARTITIONS : 3" Thk full height partitions made out of 16 gauge Aluminium Framing of 50 mm X 50 mm at 600 mm Centre to Centre both ways (vertically & horizontally). The frames must be rigidly fixed to the floor / walls & ceiling slabs. The frames must be rigidly fixed to the floor / walls/ ceiling. The 16 gauge aluminium angle cleats shall be used for joinery with aluminium metal screws. The aluminium framing shall be covered with 12mm thk. MR Ply of approved make finished in 1 mm thk laminate of approved make & shade on both sides as per the design / drawing. The Partition shall have 3" X 12 mm thk MDF moulding/ beading on the horizontal & vertical sides with matching polish. The necessary cuttings / openings shall be provided in the partition for the Electrical / Telephone cable conduits/ switches/ sockets etc. complete. The partition rate shall be inclusive of cost of the door including the door frame of size 4" X 2' 6", H - handle, door closure, hinges and tower bolts. Note: For the measurements of Partitions, area up to the false ceiling height only shall be considered. (In case door frames are not provided suitable deduction will be done) (As per Drawing given By Architect)

Measurement shall be given on sq.mt basis

ITEM NO. 55

BOQ Description: PART SOLID - PART GLASS : 3" Thk full height partitions made out of 16 gauge Aluminium Framing of 50 mm X 50 mm at 600 mm Centre to Centre both ways (vertically & horizontally). The frames must be rigidly fixed to the floor / walls & ceiling slabs. The frames must be rigidly fixed to the floor / walls/ ceiling. The 16 gauge aluminium angle cleats shall be used for joinery with aluminium metal screws. The aluminium framing shall be covered with 12mm thk. MR Ply of approved make finished in 1 mm thk laminate of approved make & shade on both sides as per the design / drawing. The partition shall have necessary 12mm thk toughened glass with speaker cut-out at specific location as per requirement. The Partition shall have 3" X 12 mm thk MDF moulding/ beading on the horizontal & vertical sides with matching polish. The necessary cuttings / openings shall be provided in the partition for the Electrical / Telephone cable conduits/ switches/ sockets etc. complete. The partition rate shall be inclusive of cost of the door including the door frame of size 4" X 2' 6", H - handle, door closure, hinges and tower bolts. Note: For the measurements of Partitions, area up to the false ceiling height only shall be considered. (In case door frames are not provided suitable deduction will be done) (As per Drawing given By Architect)

Measurement shall be given on sq.mt basis

ITEM NO. 56

BOQ Description: Supply and installation of powder-coated/anodized aluminium sections of approved make and profile, fixed vertically and horizontally as required, including necessary brackets, cleats, fasteners, screws, anchors, EPDM gaskets, rubber beading and accessories. Partition shall be fitted with 12 mm thick clear toughened glass (or as specified in drawings), machine-cut and polished at edges, fixed in aluminium frame using approved glazing system. Work shall include silicone sealing, alignment, levelling, finishing, protection during execution, and cleaning after completion.

Measurement shall be given on sq.mt basis

ITEM NO. 57

BOQ Description: Providing and fixing command room table of size 1200 mm × 750 mm × 750 mm, comprising 25 mm thick top finished with 6 mm thick back-painted toughened white glass, and 50 mm thick base, including integrated power, data, HDMI and USB charging points, concealed cable management system, wire conduits, cable trays, all necessary hardware, fittings and accessories.

Measurement shall be given on nos basis

ITEM NO. 58

BOQ Description: Providing and fixing conference table Of size 5000mm x 1200mm x 750mm, comprising 25 mm thick top finished with 6 mm thick back-painted toughened white glass, and 50 mm thick base, integrated power, data, HDMI, USB charging points, concealed cable management system, wire conduits, cable trays, and all necessary accessories complete.

Measurement shall be given on nos basis

ITEM NO. 59

BOQ Description: Providing and fixing expert table Of size 1650mm x 900mm x 750mm, comprising 25 mm thick top finished with 6 mm thick back-painted toughened white glass, and 50 mm thick base, integrated power, data, HDMI, USB charging points, concealed cable management system, wire conduits, cable trays, and all necessary accessories complete.

Measurement shall be given on nos basis

ITEM NO. 60

BOQ Description: Providing and fixing main cabin table Of size 1800mm x 750mm x 750mm, comprising 25 mm thick top finished with 6 mm thick back-painted toughened white glass, and 50 mm thick base, integrated power, data, HDMI, USB charging points, concealed cable management system, wire conduits, cable trays, and all necessary accessories complete.

Measurement shall be given on nos basis

ITEM NO. 61

BOQ Description: Supplying of 6' Sofa for Waiting Area as per Selection

Measurement shall be given on nos basis

ITEM NO. 62

BOQ Description: Supplying Chairs for Main Cabin as per Selection (Medium back revolving chair having denim blue color, 12 mm BWR grade ply, L ply frame, 45 mm mold sheet back, fibre base 27" custer (Nylon), Hidrolic Mechanism etc comp. As per sample approved by department.)

Measurement shall be given on nos basis

ITEM NO. 63

BOQ Description: Supplying Boss Chair for Main Cabin as per Selection

Measurement shall be given on nos basis

ITEM NO. 64

BOQ Description: Supplying Chairs for Expert Room, Conference Room & Command Room as per Selection (Medium back revolving chair having denim blue color, 12 mm BWR grade ply, L ply frame, 45 mm mold sheet

back, fibre base 27" custer (Nylon), Hidrolic Mechanism etc comp. As per sample approved by department.)

Measurement shall be given on nos basis

ITEM NO. 65

BOQ Description: Providing, fabricating and erecting stepped/tiered seating platform for command room, comprising MS square/rectangular hollow section framework with necessary bracings, anchor fasteners and supports, overlaid with 18 mm thick BWP grade plywood and finished with 8 mm thick wooden flooring, including edge trims, nosing, hardware, anti-corrosive treatment to steel members and all accessories complete as per approved drawings and directions of the Person-in-Charge. SPC FLOORING

Measurement shall be given on sq.mts basis

ITEM NO. 66

BOQ Description: PROVIDING AND FIXING LOW HEIGHT STORAGE MADE WITH 18MM, 12MM, 8MM PLYWOOD FINISH WITH LAMINATE INSIDE FINISH WITH 0.8MM LAMINATE RATE INCLUSIVE WITH ALL HARDWARE, LABOUR ETC AS PER DESIGN.

Measurement shall be given on nos basis

ITEM NO. 67

BOQ Description: Providing & Fixing in Position Vertical Roller Blinds with Minimum 3 % and Maximum 5 % Light Transperace Screen Fabric Incuding Providing & Fixing of Powder coated GChannel at the Top of Window with necessary Screw , Cleats etc. and PVC Roller (Weight Pipe) and PVC Chain For Up and Down Movement of Blinds etc. of Approved Make and as per Drawings / Instruction of Engg. in Charge For All Colors and Shades. Rates Includes all Lead and Lift For All Floor Level, All Height , All Material , Accessories, Fixing , Scaffolding , Labor etc. Complete in All Respects.

Measurement shall be given on nos basis

ITEM NO. 68

BOQ Description: PROVIDING AND FIXING PANELLING WITH 12 MM MDF WITH APPROVED LAMINATE ON SURFACE LAMINATE RATE INCLUSIVE WITH ALL HARDWARE, LABOUR ETC AS PER DESIGN.

Measurement shall be given on sq.mt basis

ITEM NO. 69

BOQ Description: PROVIDING AND FIXING CLOCK

Measurement shall be given on nos basis

ITEM NO. 70

BOQ Description: Providing and fixing 12 mm thick clear toughened glass door 900mm x 2100mm with heavy-duty SS pivot hinges, floor spring, SS pull handle, lockset and all necessary fittings and accessories, including cutting, edge polishing, fixing and installation, complete as per drawings and Architect's instructions.

Measurement shall be given on nos basis

ITEM NO. 71

BOQ Description: Providing & Fixing Sun Control Reflective Type Film / Frosted Film as Selected by Architect/ Engg. In Charge For Glass Doors / Windows etc. as Directed.

Measurement shall be given on sq.mt basis

ITEM NO. 71

BOQ Description: Supplying of 2'x2' Corner Table for Waiting Area as per Selection (MR)

Measurement shall be given on nos basis

SPECIFICATIONS FOR ELECTRICAL WORKS

SR.NO	PARTICULARS	PAGE NO
1	General Instructions for Electrical Works	
2	General Instructions for HT Cable.	DELETED
3	Technical Specification for OIL Type Transformer.	DELETED
4	Technical Specification for Diesel Generator.	DELETED
5	Technical Specification for LT Panels.	
6	Technical Specification for APFCR Panels.	DELETED
7	Technical Specification for LDBs & PDBs.	
8	Technical Specification for LT Cables & Cable Tray.	
9	Technical Specification for Internal Wiring.	
10	Technical Specification for Lighting Fixtures	
11	Technical Specification for Data, TV & Telephone wiring.	DELETED
12	Technical Specification for Earthing System.	
13	Technical Specification for PA system.	DELETED
14	Technical Specification for External lighting poles	DELETED
15	Technical Specification for 11KV DP Structure	DELETED
16	Make of Material	
17	Technical Specification for miscellaneous items	

1 GENERAL INSTRUCTIONS FOR ELECTRICAL WORKS

1) PREAMBLE :

The scope of this section is to describe materials and systems for electrical installation works which form together with the project documents, a complete volume of work and quality description.

All electrical installations shall be of high quality, safe, complete and fully operational including all necessary items and accessories whether or not specified in details. All electrical works shall be completed in accordance with the regulations and standards as per the statutory requirement to the satisfaction of the Employer. The general provisions, special provisions and general requirements apply to all items of this specification.

The work shall be carried out simultaneously with building work, civil work, etc. and shall be continued till it is completed satisfactorily along with the completion of essential portions of the building works.

During the progress of work, completed portion of the building may be occupied and be put to use by Employer but the contractor will remain fully responsible for the maintenance of electrical installations till the entire work covered by this contract is satisfactorily completed by him and handed over to Employer.

It is the intention of the specification and drawings to call for finished work, tested and ready for operation. Whenever the words "Supply" or "Provide" are used, it shall mean delivery of material as specified in an assembled manner, ready for installation. Any apparatus, material or work not shown on drawings but mentioned in the specification or vice versa, or any incidental accessories necessary to make the work complete and perfect in all respects and ready for operation, even if not particularly specified, shall be furnished, delivered and installed by the contractor without additional expenses to Employer. Minor details not usually shown or specified, but necessary for the proper installation and operation, shall be included in the work and in the contract.

Electrical contractor shall be Class A licensed Contractor registered with R&B Department of Gujarat and shall have completion certificate of three similar project Electrical jobs completed of same cost in last 3 years.

Civil Contractor shall provide the MOU signed with Electrical contractor (Class A) with Technical bid during bidding process.

2) INTERPRETATION OF PROJECT DOCUMENTS :

The Specification, Drawings and Bill of quantity shall be interpreted in accordance with good installation practice defined in the appropriate regulations and standards whether specifically referred to or not. If there are any discrepancies or shortfall in the application of the regulations to any aspect of this contract or the contractor

Considers there is anything detrimental to the standards or inconsistent with his obligations and guarantees, Employer shall be informed prior to signing the contract and thereafter inform the contractor in writing the course to be followed. Where the drawings are to a small scale or are expressed in symbolic terms or are in the form of a diagram, then exact location of items shall not be inferred and in all cases, the work shall be fully integrated with the work of other traders and with the fabric of the building. The contractor shall appraise the duties of all plants and equipments taking account of any additions or variations and shall inform the Employer of any matters which may affect the design. In all cases the equipment installed shall be of appropriate rating for the duty it performs.

The Specifications and bill of quantity shall be considered as part of this contract and any work or material shown on BOQ and not called for in the specification or vice versa, shall be executed as if specifically called for in both. The drawings indicate the extent and general arrangement of the Transformer, L.T. panel, H.T. & L.T. cable route layout etc. and are essentially diagrammatic.

The work shall be installed as indicated on the drawings, however, any minor changes found essential to co-ordinate the installations of this work with other services shall be made without any additional cost to the Employer. The drawings are for the guidance of the contractor, exact locations, distances and levels will be governed by the building. The contractor shall examine all structural and electrical drawings before starting the work, and report to Employer or its representative, any discrepancies, which in his opinion appear on them, and get them clarified.

If any discrepancy is noticed between General Conditions of Contract, specification, Bill of quantity and Drawings, the most stringent of the above shall apply. Bill of quantities, for electrical items, shall be read in conjunction with respective specification. However, in case of conflict between bill of quantities and the specification, former shall govern.

3) **SYSTEM PARTICULARS :**

LV	:	433 V, 3 Phase, 4 wire, 50 Hz.
Neutral earthing	:	Solid

4) **ABBREVIATIONS :**

The following abbreviations have been used in the accompanying specifications, drawings and bill of quantity.

IS	:	Indian Standard
BS	:	British Standard
HRC	:	High Rupturing Capacity
GI	:	Galvanised Iron
CU	:	Copper
MS	:	Mild Steel
MV	:	Medium Voltage
LV	:	Low Voltage
PVC	:	Polyvinyl Chloride
AMP	:	Amperes
V	:	Volts
KV	:	Kilo Volts
HV	:	High Voltage
KW	:	Kilo Watt

KVA	:	Kilo Volt Ampere
PF	:	Power Factor
Hz	:	Frequency
KWH	:	Kilo Watt Hour
XLPE	:	Cross Linked Polyethylene
ACB	:	Air Circuit Breaker
LED	:	Light Emitting Diode
PLC	:	Programmable Logic Controller
UPS	:	Uninterrupted Power Supply
DP	:	Double Pole
IEE	:	Institute of Electrical Engineers, London
MCB	:	Miniature Circuit Breaker
TPN	:	Triple Pole and Neutral
SP	:	Single Pole
MCCB	:	Moulded Case Circuit Breaker
VCB	:	Vacuum Circuit Breaker
CT	:	Current Transformer
DB	:	Distribution Board
DG	:	Diesel Generator
BOQ	:	Bill of quantity
SITC	:	Supply, Installation, Testing and Commissioning
L.O.I.	:	Letter of Intent / Acceptance letter
ELV	:	Extra Low Voltage System
MP	:	Mega Pixels
CCTV	:	Close Circuit Television
PA	:	Public Address System
FACP	:	Fire Alarm Control Panel
NVR	:	Network Video Recorder
NVMS	:	Network Video Monitoring Software

5) REGULATIONS AND STANDARDS :

The installation shall conform in all respects to Indian Standard Code of Practice for Electrical Wiring Installation IS: 732-1983 and IS: 2214 – 1983 (Silver Nitrate Pure and analytical reagent). It shall also be in conformity with the current Indian Electricity, Rules, Indian Electricity Act, National Electrical Code and Regulations of the Local Electrical Supply Authority in so far as these become applicable to the installation. Wherever this specification calls for a higher standard of material and/or workmanship than those required by any of the above regulations then this specification shall take precedence over the said regulations and standard. In general, the materials equipment and workmanship not covered by the above shall conform to the relevant Indian Standards.

The electrical installation work shall follow Codes, Indian Standard specifications and rules (Within the best meaning of the same) under this contract.

The following list is given for general guidance only in addition to list given in each individual section, however all other latest editions of Codes, Indian Standard specifications and Rules shall also be followed when it is required.

IS: 8623	Low voltage switchgear & control gear assemblies
IS: 10118	Code of Practice for selection, installation and maintenance of switchgear and control gear
IS: 4237	General requirement for switch gear and control gear for voltage not exceeding 1000 Volt A.C. or 1200 Volt D.C.
IS : 13947	Low voltage switchgear and control gear
IS : 9224	Low voltage fuses
IS : 8828	Circuit breakers for out protection for household and similar installations
IS : 12640	Earth leakage circuit breaker
IS : 1248	Direct acting indicating analog electrical measuring instruments
IS : 2705	Current transformers
IS : 4201	Application guide for voltage transformers
IS : 6875	Control switches for voltage upto and indicating 1000 V A.C. and 1200 V D.C.
IS : 5578	Guide for marking of insulated conductors
IS : 11353	Guide for uniform system of marking and identification of conductors and apparatus transmission
IS : 8197	Terminal markings for electrical measuring instruments and their accessories
IS : 694	Specifications for PVC insulated cables for working voltage upto and including 1100 volts
IS : 2551	Danger notice plates

IS : 3043	Code of practice for earthing
IS : 5216	Guide for safety procedures and practices in electrical work
IS : 1646	Code of practice for fire safety of building : Electrical Installation
IS : 1239	Code of pin plugs and sockets.
IS : 732	Code of practice for electrical wiring installation (system voltage not Exceeding 650 V)
IS : 1653	Rigid steel conduits for electrical wiring.
IS : 2667	Fittings for rigid steel conduits for electrical wiring.
IS : 3837	Accessories for rigid steel conduit for electrical wiring.
IS : 2509	Rigid non-metallic conduits for Electrical Wiring.
IS : 6946	Flexible (Pliable) non-metallic conduits for electrical installation.
IS : 1293 3	pin plugs and sockets.
IS : 8130	Specifications of conduits for electrical installation
IS : 3854	Switches for domestic purpose.
IS : 3415	Fittings for rigid non-metallic conduits.
IS : 4648	Guide for electrical layout in residential building Indian electricity act and rules.

Indian Electricity Act as amended up to date

Indian Electricity Rules as amended up to date

Rules and Regulations of Bombay Regional Council of Fire Insurance & Association of India for Electrical wiring.

6) FEES, PERMITS AND TESTS :

The Contractors shall pay for any and all fees and obtain permits required for the installation work. On completion of the work, the contractor shall obtain and deliver to the Employer, certificates of final inspection and approval by the local electric supply authority and the Electrical Inspector.

7) ACTUAL ROUTE OF CABLE :

The location of the cables, panel boards etc. is only indicative, therefore, the actual route of cables and the location of panel boards may differ from the plans according to the details of the building construction and the conditions of executions of the installations.

The contractor shall supply and install at his expense all secondary materials and special fittings found necessary to overcome the interference and to supply the modifications on the route of cables and conduits that are found necessary during the work, to the complete satisfaction of the Employer's representative.

8) MATERIAL AND EQUIPMENT :

All material and equipment shall conform to the relevant standards and shall be new, good quality, of the approved make and design. The materials and equipment shall confirm to relevant Indian Standards. The Contractor shall be responsible for

the safe custody of all materials and shall insure them against theft, damage by fire, earthquake etc. A list of items of materials and equipment, together with sample of each shall be submitted to the Employer within 10 days of the award of the contract. Any item which is proposed as a substitute, shall be accompanied by all technical details giving sizes, particular of materials and the manufacturer's name and shall be submitted along with the tender or bid offer. At the time of the submission of proposed substitute the Contractor shall state the credit, if any due to the Employer. In the event the substitution is approved, all changes and substitutions shall be requested in writing and approvals obtained in writing from Employer. Employer's decision in the matter shall be final.

All materials of the same kind of service shall be identical and made by the same manufacturers. Any deviation to this rule shall be approved by the Consultant. Top priority shall be given to the products that have a permanent agent providing spare parts and maintenance facilities in the same city where the project is situated.

The makes of electrical equipment's, components, accessories etc. have been mentioned in Tender document. However, Client / Electrical Consultant reserves the right to select from the specified make. Contractor shall clearly indicate in the bid document, the make they have considered. No extra claim shall be applicable if client / consultant suggests from the alternative make specified in the tender document.

9) MANUFACTURERS :

Where manufacturers have furnished specific instructions relating to the materials used in this job, covering points not specifically mentioned in these documents, these instructions shall be followed in all cases.

Where manufacturer's names and/or catalogue numbers are given, this is an indication of the quality, standards and performance required.

When interfacing occurs, equipment shall be mutually compatible in all respects.

10) RATING :

Rating of all items shall be appropriate for the conditions on the particular site on which the items will be used. All the equipment shall be fit for continuous work under the worst conditions of site and shall be rated for the following ambient condition.

- Outdoor temperature 50 deg.c.
- Temperature under shed 45 deg.c.
- Salty, dusty and humid
- Coastal area

11) INSPECTION AND TESTING :

Employer's representative reserves the right to request inspection and testing at manufacturer's works at all reasonable times for this contract. Tests on site of completed works shall demonstrate, among other things:

1. That the equipment installed complies with specification in all particulars and is of the correct rating for the duty and site conditions.
2. That all items operate efficiently and quietly to meet the specified requirements.
3. That all circuits are correctly fused and protected and that protective devices are properly co-ordinated.
4. That all non current carrying metal work is properly and safely grounded in accordance with the specifications.
5. The contractor shall provide all necessary instruments and labour for testing, shall make adequate records of test procedures and readings, shall repeat any tests requested by the Employer and shall provide test certificates signed by a properly authorised person. Such test certificates shall cover all works.
6. If tests fail to demonstrate the satisfactory nature of the installation or any part thereof then no claims for the extra cost of modifications, replacements or re-testing will be considered. Employer's decision as to what constitutes a satisfactory test shall be final.
7. The above general requirements as to testing shall be read in conjunction with any particular requirements specified elsewhere.

12) TEST CERTIFICATES :

The contractor shall submit test certificates for all the electrical material / system installed. These shall be issued by a government recognized inspection office certifying that all equipment, materials, construction and functions are in agreement with the requirements of these specifications, ISI and when ISI is not applicable other approved certifying agencies.

13) INSTRUCTION MANUAL :

The contractor shall prepare and produce instruction, operation and maintenance manuals in English for the use, operation and maintenance of the supplied equipment and installations, and submit 3 sets to Employer, at the time of handing over.

14) SAMPLES AND CATALOGUES :

Before ordering the material necessary for these installations, the contractor shall submit to Employer for approval, a sample of every kind of material such as cables,

conductors, conduits, switches, socket outlets, circuit breakers, lighting fixtures, boxes etc. along with the catalogues.

For big items such as switchboards, the submission of catalogues shall be enough. Prior to ordering any electrical equipment / material / system, the contractor shall submit to Employer, the catalogues, along with the samples, at least from three different manufacturers. After the selection of manufacturer by Employer, the contractor shall arrange inspection and testing at the manufacturer's factory or assembly shop for final approval. No material shall be procured prior to the approval of the Electrical consultant &

Data sheets shall be signed and stamped by consultant and one copy to be submitted to Client.

15) VENDOR AND SHOP DRAWINGS :

The contractor shall prepare and submit to Employer, for his approval, two sets of vendor detailed drawings of all distribution boards, switch boards, outlet boxes, special pull boxes and other likewise material, equipment to be fabricated by the contractor, or other vendor within 15 days of signing of the contract.

Before starting the work, the contractor shall submit to Employer for his approval in the prescribed manner, the shop / execution drawings for the entire installation, specially the main connections and junctions, the route of conduits and cables, no. and size of wires drawn through the conduits, location of all the outlet points, and switch boards and distribution boards and any other information required by Employer. Employer reserves the right to alter or modify these drawings if they are found to be insufficient or not complying with the established technical standards or if they do not offer the most satisfactory performance or accessibility for maintenance.

16) AS BUILT DRAWINGS :

At the completion of work and before issuance of certificate of virtual completion the contractor shall submit to Employer, three sets of layout drawing drawn at appropriate scale indicating the complete wiring system "as installed". These drawings must provide (in plan, folded elevation and section)

- a. Location and details of distribution boards, main switches, switchgear and other particulars.

17) GUARANTEE :

At the close of the work and before issuance of final certificate of virtual completion by Employer, the contractor shall furnish written guarantee indemnifying Employer against defective materials and workmanship for a period of one year after completion. The contractor shall hold himself fully responsible for reinstallation or replacement, free of cost to Employer, the following:

- a. Any defective work or material supplied by the contractor.
- b. Any material or equipment supplied by Employer, which is damaged or destroyed as a result of defective workmanship by the contractor.
- c. Any material or equipment damaged or destroyed as a result of defective workmanship by the contractor.

18) SPECIAL NOTES FOR BIDDER :

- a. All the major electrical components like Transformers, DGs, HT MV LT switchgears, DBs, UPS, etc including the external & internal electrical distribution system, earthing systems & various equipments (which is supplied &/or installed by the contractor) shall be maintain for 2 years from the date of virtual completion of work at free of cost.
- b. The contractor should co-operate & coordinate for LT connections to LT panel board of various blocks, so that day to day work should not suffer.

- c. It is in the scope of Contractor to preparing necessary drawing submitting to authorities (i.e. Local supply co., pollution control board, Electrical Inspector, etc), getting their approval / sanction and final certificate to energize the sub-station equipment's. Filling the necessary application to supply co. following up and getting the supply filling the necessary test report to the supply co. inclusive. All official / statutory fees shall be paid by clients & all other required expenses shall be on the contractors account; no extra payment shall be paid to contractor for said job.
- d. LT Panels shall be approved on site by Engineer in Charge & Electrical Consultant.
- e. Contractor shall submit Shop drawings for approval to Electrical consultant based on tender drawings before execution which shall not be on chargeable basis.
- f. The MCB and MCB DBs must be of same make.
- g. Make of components required to be used by contractor to complete the installation, if not mentioned anywhere, shall be required to GOT IT
- h. APPROVED by Client/Architect/Consultant before installation in writing manner.
- i. Within a week of work order, the contractor shall submit the sample of each item / component of above mentioned approved make for the approval of the Client/Architect/Consultant.

5 TECHNICAL SPECIFICATION FOR PCC, MCC, LT PANELS

1) SCOPE OF WORK

1. Main Distribution Panels, Sub-Distribution Panels and Final Distribution shall be covered under this section. Panels/Boards shall be suitable for operation on 3 Phase/single phase, 415/240 volts, 50 cycles, 4 wire system with neutral grounded at transformer. All Distribution panels shall be CPRI tested design and manufactured by an approved manufacturer. CPRI certificate shall be made available.
2. Distribution panels shall comply with the latest Relevant Indian Standards and Electricity Rules and Regulations and shall be as per IS-13947-1991.

2) CONSTRUCTION FEATURES:

1. Distribution panels shall be 2 mm thick sheet steel cabinet for indoor installation, dead front, floor mounting/wall mounting type and shall be form as per site construction requirements.
2. The Distribution panels shall be totally enclosed, completely dust and vermin proof and shall be with hinged doors and folded covers, Neoprene gasket, padlocking arrangement and bolted back.
3. All removable/ hinged doors and covers shall be grounded by flexible standard connectors.
4. Distribution panel shall be suitable for the climatic conditions as specified in Special Conditions. Steel sheets used in the construction of Distribution panels shall be 2 mm thick and shall be folded and braced as necessary to provide a rigid support for all components.
5. Joints of any kind in sheet metal shall be seam welded, all welding, slag shall be rounded off and welding pits wiped smooth with plumber metal.

6. The general construction shall confirm to IS-8623-1977 (Part-1) for factory built assembled switchgear & control gear for voltage up to and including 1100 V AC.
7. All panels and covers shall be properly fitted and square with the frame, and holes in the panel correctly positioned.
8. Fixing screws shall enter into holes tapped into an adequate thickness of metal or provided with wing nuts.
9. Self threading screws shall not be used in the construction of Distribution panels.
10. A base channel of 75 mm x 40 mm x 5 mm thick shall be provided at the bottom for floor mounted panels.
11. Minimum operating clearance of 300 mm shall be provided between the floor of Distribution panels and the lowest feeder compartment.
12. Distribution panels shall be of adequate size with a provision of spare switchgear as indicated on the Single Line Diagram. Feeders shall be arranged in multi-tier.
13. Knockout holes of appropriate size and number shall be provided in the Distribution panels in conformity with the location of cable/conduit connections.
14. Removable sheet steel plates shall be provided at the top to make holes for additional cable entry at site if required.
15. Every cabinet shall be provided with Trifoliate or engraved metal name plates.
16. All panels shall be provided with circuit diagram engraved on PVC sheet.
17. All live accessible connections shall be shrouded and shall be finger touch proof and minimum clearance between phase and earth shall be 20 mm and phase to phase shall be 25 mm.

3) BUSBAR CONNECTIONS:

1. Bus bar and interconnections shall be of high conductivity electrolytic grade aluminium / copper as indicated in the bill of quantities complying with requirement of IS : 5082 – 1981 and of rectangular cross section suitable for carrying the rated full load current and short circuit current and shall be extendable on either side.
2. Bus bars and interconnections shall be insulated with heat shrinkable sleeve of 1.1 KV grade and shall be colour coded.
3. Bus bars shall be supported on glass fiber reinforced thermosetting plastic insulated supports at regular intervals to withstand the force arising from in case of short circuit in the system.
4. All bus bars shall be provided in a separate chamber and all connections shall be done by bolting.
5. Additional cross sectional area to be added to the bus bar to compensate for the holes.
6. All connections between bus bars and breakers shall be through solid copper / aluminium strips of proper size to carry full rated current and insulated with insulating sleeves.

7. Maximum current density for the bus bars shall be 0.8-1A/sq.mm for aluminium and 1.4 A/sq.mm for copper bus bars.
8. The busbar shall be housed in a separate compartment. The busbar shall be isolated with 3 mm. thick bakelite sheet to avoid any accidental contact. The busbar shall be arranged such that minimum clearance between the busbar are maintained as below :

Between phases	:	25 mm. minimum
Between phases and neutral	:	25 mm.
Between phases and earth	:	25 mm.
Between neutral and earth	:	20 mm. minimum

Maximum allowable temperature for the Bus bar to be restricted to 85 deg C

4) TEMPERATURE – RISE LIMIT

1. Unless otherwise specified, in the case of external surface of enclosures of bus bar compartment which shall be accessible but do not need to be touched during normal operation, an increase in the temperature rise limits of 25° C above ambient temperature shall be permissible for metal surface and of 15° C above ambient temperature for insulating surfaces as per IS 8623(Part-2) 1991.
2. All main distribution panels and sub distribution panels shall be provided with MCCB of appropriate capacity as per Single Line Diagram.
3. All final Distribution boards shall be provided with Miniature Circuit Breakers.
4. Final Single Phase Distribution boards shall be connected to the incoming supply through double pole MCB units & earth leakage circuit breakers.
5. All wiring for final distribution boards shall be concealed behind 5 mm thick bakelite sheet or M S sheet cover.
6. All Distribution boards shall be completely factory wired, ready for connection.
7. All the terminals shall be of proper current rating and sized to suit individual feeder requirements.
8. Each circuit shall be clearly numbered from left to right to correspond with wiring diagram.
9. All the switches and circuits shall be distinctly marked with a small description of the service installed.
10. Continuous earth bus sized for prospective fault current shall be provided with arrangement for connecting to station earth at two points. Hinged doors/ frames shall be connected to earth through adequately sized flexible braids.

5) CABLE COMPARTMENTS

1. Cable compartment of adequate size shall be provided in the Distribution panels for easy clamping of all incoming and outgoing cables entering from the top/bottom. Adequate supports shall be provided in cable compartment to support cables.

6) SWITCHGEARS

6.1 MOULDED CASE CIRCUIT BREAKER (MCCB)

1. The MCCB should be current limiting type with trip time of less than 10 msec under short circuit conditions. The MCCB should be either 3 or 4 poles as specified in BOQ. MCCB shall comply with the requirements of the relevant standards IS13947 – Part 2/IEC 60947-2 and should have test certificates for Breaking capacities from independent test authorities CPRI / ERDA or any accredited international lab.
2. MCCB shall comprise of Quick Make -break switching mechanism, arc extinguishing device and the tripping unit shall be contained in a compact, high strength, heat resistant, flame retardant, insulating moulded case with high withstand capability against thermal and mechanical stresses
3. The breaking capacity of MCCB shall be as specified in the schedule of quantities.
4. The rated service breaking capacity (Ics) should be equal to rated ultimate breaking capacities (Icu).
5. MCCBs for motor application should be selected in line with Type-2 Co-ordination as per IEC-60947-2, 1989/IS 13947-1.
6. The breaker as supplied with ROM should meet IP54 degree of protection.

6.2 CURRENT LIMITING & COORDINATION

1. The MCCB shall employ maintenance free minimum let-through energies and capable of achieving discrimination up to the full short circuit capacity of the downstream MCCB. The manufacturer shall provide both the discrimination tables and let-through energy curves for all.

Protection Functions

1. MCCBs with ratings up to 200 A shall be equipped with Thermal-magnetic (thermal for overload and magnetic for short-circuit protection) trip units (as per Single line diagram).
2. Microprocessor MCCBs with ratings 250A and above shall be equipped with microprocessor based trip units (as per Single line diagram).
3. Microprocessor and thermal-magnetic trip units shall be adjustable and it shall be possible to fit lead seals to prevent unauthorised access to the settings
4. Microprocessor trip units shall comply with appendix F of IEC 60947-2 standard (measurement of rms current values, electromagnetic compatibility, etc.)
5. Protection settings shall apply to all poles of circuit breaker.
6. All Microprocessor components shall withstand temperatures up to 125 °C.
7. Rotary handles to be provided for operation where ever required as indicated in Single line diagram.

6.3 TESTING

1. Original test certificate of the MCCB as per IEC 60947-1 & 2 or IS13947 shall be furnished.
2. Pre-commissioning tests on the switch board panel incorporating the MCCB shall be done as per standard specifications.

6.4 INTERLOCKING

1. Moulded, case circuit breakers shall be provided with the following interlocking devices for interlocking the door of a switch board.
 - Handle interlock to prevent unnecessary manipulations of the breaker.
 - Door interlock to prevent the door being opened when the breaker is in ON position.
 - Defeat-interlocking device to open the door even if the breaker is in ON position.
 - PLC controller to operate the Motorised Breakers in sequence as indicated logic diagram in SLD.
1. The MCCB shall be current limiting type and comprise of quick make – Break switching mechanism. MCCBs shall be capable of defined variable overload adjustment. All MCCBs rated 200 Amps and above shall have adjustable over load & short circuit pick-up both in Thermal magnetic and Microprocessor Trip Units.
2. All MCCB with microprocessor based release unit, the protection shall be adjustable Overload, Short circuit and earth fault protection with time delay.
3. The trip command shall override all other commands.

6.5 MINIATURE CIRCUIT BREAKER (MCB)

1. Miniature Circuit Breaker shall comply with IS-8828-1996/IEC898-1995. Miniature circuit breakers shall be quick make and break type for 240/415 VAC 50 Hz application with magnetic thermal release for over current and short circuit protection.
2. The breaking capacity shall not be less than 10 KA at 415 VAC. MCBs shall be DIN mounted. The MCB shall be Current Limiting type (Class-3). MCBs shall be classified (B, C, D ref IS standard) as per their Tripping Characteristic curves defined by the manufacturer.
3. The MCB shall have the minimum power loss (Watts) per pole defined as per the IS/IEC and the manufacturer shall publish the values. MCB shall ensure complete electrical isolation & downstream circuit or equipment when the MCB is switched OFF.
4. The housing shall be heat resistant and having high impact strength. The terminals shall be protected against finger contact to IP20 Degree of protection. All DP, TP, TPN and 4 Pole miniature circuit breakers shall have a common trip bar independent to the external operating handle.

6.6 RESIDUAL CURRENT CIRCUIT BREAKER CURRENT OPERATED TYPE (RCCB)

System of Operation

1. Residual Current Circuit Breaker shall conform to IEC 61008.RCCB shall work on the principle of core balance transformer.
2. The incoming shall pass through the toroidal core transformer. As long as the currents in the phase and neutral shall be the same, no electro motive force shall be generated in the secondary winding of the transformer.
3. In the event of a leakage to earth, an unbalance shall be created which shall cause a current to be generated in the secondary winding, this current shall be fed to a highly sensitive miniature relay, which shall trip the circuit if the earth leakage current exceeds a predetermined critical value. RCCB shall be current operated independent of the line voltage, current sensitivity shall be of 30 mA at 240/415 volts AC and shall have a minimum of 20,000 electrical operations.

Mechanical Operation

1. The moving contacts of the phases shall be mounted on a common bridge, actuated by a rugged toggle mechanism. Hence, the closing /opening of all the three phases shall occur simultaneously. This also shall ensure simultaneous opening of all the contacts under tripping conditions.

Neutral Advance Feature

1. The neutral moving contact shall be so mounted on the common bridge that, at the time of closing, the neutral shall make contact First before the phases; and at the time of opening, the neutral shall breaks last after allowing the phases to open first. This is an important safety feature which is also required by regulations.

Testing Provision

1. A test device shall be incorporated to check the integrity of the earth leakage detection system and the tripping mechanism. When the unit is connected to service, pressing the test knob shall trip the ELCB / RCCB and the operating handle shall move to the "OFF" position.

7) ELECTRICAL POWER AND CONTROL WIRING CONNECTION :

1. Terminal for both incoming and outgoing cable connections shall be suitable for 1100 V grade, aluminium / copper conductor PVC insulated and sheathed, armoured cable and shall be suitable for connections of solderless sockets for the cable size as indicated on the appended drawings for the Panels.
2. Power connections for incoming feeders of the main Panels shall be suitable for 11000 V grade aluminium conductor (XLPE) cables.
3. Both control and power wiring shall be brought out in cable alley for ease of external connections, operation and maintenance.
4. Both control and power terminals shall be properly shrouded.
5. 10% spare terminals shall be provided on each terminal block. Sufficient terminals shall be provided on each terminal block, so that not more than one outgoing wire is connected to per terminal.

6. Terminal strips for power and control shall preferably be separated from each other by suitable barriers of enclosures.
7. Wiring inside the modules for power, control, protection and instruments etc. shall be done with use of 660 / 1100 V grade, PVC insulated copper conductor cables conforming to IS : 694 and IS : 8130. Power wiring inside the starter module shall be rated for full current rating of respective contactor, but not less than 4.0 sq.mm. cross-section area. For current transformer circuits, 2.5 sq.mm. copper conductor wire shall be used. Other control wiring shall be done with 1.5 sq.mm. copper conductor wires. Wires for connections to the door shall be flexible. All conductors shall be crimped with solderless sockets at the ends before connections are made to the terminals. All wires shall be FRLS grade.
8. Control power for the Motor starter module shall be taken from the respective module switchgear outgoing. Control power wiring shall have control fuses, (HRC fuse type) for circuit protection. All indicating lamps shall be protected by HRC fuses.
9. Particular care shall be taken to ensure that the layout of wiring is neat and orderly. Identification ferrules shall be fitted to all the wire termination for ease of identification and to facilitate checking and testing.
10. "CUPAL" washers shall be used for all copper and aluminium connections.
11. Final wiring diagram of the Panels power and control circuit with ferrules numbers shall be submitted alongwith the Panels as one of the documents against the contracts.

8) TERMINALS :

1. The outgoing terminals and neutral link shall be brought out to a cable alley suitably located and accessible from the panel front. The current transformers for instruments metering shall be mounted on the disconnecting type terminal blocks. No direct connection of incoming or outgoing cables to internal components of the distribution board is permitted, only one conductor may be connected in one terminal.

9) WIREWAYS :

1. A horizontal PVC wire way with screwed covers shall be provided at the top to take interconnecting control wiring between different vertical sections.

10) LABELS :

1. Engraved PVC labels shall be provided on all incoming and outgoing feeders. Single line circuit diagram showing the arrangements of circuit inside the distribution board shall be pasted on inside of the panel door and covered with transparent laminated plastic sheet.

11) NAME PLATE :

1. A name plate with the Panels designation in bold letters shall be fixed at top of the central panel. A separate name plate giving feeder details shall be provided for each feeder module door.
2. Inside the feeder compartments, the electrical components, equipments, accessories like switchgear, control gear, lamps, relays etc. shall suitably be identified by providing stickers.

3. Engraved name plates shall preferably be of 3 ply,(Red-White-Red or Black-White-Black) lamicold sheet. However, black engraved perpex sheet name plates shall also be acceptable. Engraving shall be done with square groove cutters.
4. Name plate shall be fastened by counter sund screws and not by adhesives.

12) DANGER NOTICE PLATES :

1. The danger notice plate shall be affixed in a permanent manner on operating side of the Panels.
2. The danger notice plate shall indicate danger notice both in Hindi and English and with a sign of skull and bones.
3. The danger notice plate, in general, meet the requirements of local inspecting authorities.
4. Overall dimensions of the danger notice plate shall be 200 mm. wide x 150 mm. high.
5. The danger notice plate shall be made from minimum 1.6 mm. thick mild steel sheet and after due pre-treatment to the plate, the same shall be painted white with vitreous enamel paint on both front and rear surface of the plate.
6. The letters, the figures, the conventional skull and bones etc. shall be positioned on plate as per recommendation of IS : 2551-1982.
7. The said letters, the figures and the sign of skull and bones shall be painted in signal red colour as per IS : 5-1978.
8. The danger plate shall have rounded corners. Location of fixing holes for the plate shall be decided to suit design of the Panels.
9. The danger notice plate, if possible, be of ISI certification mark.

13) EARTHING

1. Earthing shall be provided as per IS: 3043-1987.

14) PAINTING

7. All sheet steel work shall undergo a process of degreasing, pickling in acid, cold rinsing, phosphating, passivating (seven tank processing) and then painted with electrostatic paint (Powder coating).
8. The shade of colour of panel inside/outside shall be as per BOQ confirming to IS Code No.5.

15) LABELS

1. Engraved PVC labels shall be provided on all incoming and outgoing feeder.
2. Circuit diagram showing the arrangements of the circuit inside the distribution panels shall be pasted on inside of the panel door and covered with transparent plastic sheet.

16) METERS

1. All voltmeters and indicating lamps shall be through MCB's.
2. Meters and indicating instruments shall be flush type.

3. All CT's connection for meters shall be through Test Terminal Block (TTB).
4. CT ratio and burdens shall be as specified on the Single line diagram/BOQ.

17) CURRENT TRANSFORMERS

1. Current transformers shall be provided for Distribution panels carrying current in excess of 60 amps.
2. All phase shall be provided with current transformers of suitable VA burden with 5 amps secondaries for operation of associated metering.
3. The CTs shall conform to relevant Indian Standards. The design and construction shall be dry type, epoxy resin cast robust to withstand thermal and dynamic stresses during short circuits.
4. Secondary terminals of CTs shall be brought out suitable to a terminal block which shall be easily accessible for testing and terminal connections.
5. The protection CTs shall be of accuracy class 5P10 and measurement CTs shall be of accuracy class I.

18) POTENTIAL FREE CONTACTS

1. Potential free contacts shall be provided for connection to Building Automation System in panels indicated in Schedule of Quantities

19) INDICATING PANEL

1. All meters and indicating instruments shall be in accordance with relevant Indian Standards. Meters shall be flush mounted type. Indicating lamps shall be of low burden, and shall be backed up with 2 amps MCB/MPCB as per relevant fault level and toggle switch.

20) TESTING

1. Testing of panels shall be as per following codes:
 - I. IS: 8623 (Part -I) 1977 for factory built assemblies of switch gear for voltages upto and including 1000 VAC.
 - II. IS: 13947 : 1993 Degree of protection
 - III. IS: 5578 & 11353:1985 Arrangement of bus bars.

21) WIRING

1. In wiring a distribution panel it shall be insured that total load of various distribution panel and/or consuming devices is divided evenly between the phases and number of ways as per Consultants drawing.

22) INSTALLATION

1. Installation of all LT panels shall include but not limited to the following to complete the installation, testing and commissioning:
2. Transporting materials from stores to exact location of installation.

3. Supply and installation of required base frame made of MS angle or channel sections and duly painted with black paint.
4. Positioning, aligning, fixing, assembling, and installation of LT panel issued free of cost by Client after carrying out proper cleaning and inspection.
5. Site supervision, testing for proper functioning / operation, and pre-commissioning tests.

23) COMMISSIONING & ONSITE TESTING

1. All switchboards shall be tested for dielectric test with 1000V megger.
2. All earth connections shall be checked for continuity.
3. All busbar connections shall be checked and tightened properly.
4. All cable terminations and terminal shrouding shall be checked if they are properly done.
5. The operation of protective devices shall be tested by secondary injection test.
6. The operation of circuit breaker shall be tested for all interlocks.
7. Functional test shall be done for all ACBs, MCCBs and other components.
8. Indicating lamps and meters shall be checked for proper working.

24) WORKMANSHIP:

1. The contractor shall erect the panel at site in co-ordination with the supplier if required.
2. He should check for loose ends on the part of the supplier and shall inform client and consultant for the same.
3. Physical and continuity tests shall be carried out by contractor.
4. Also the field tests carried out by the supplier shall be recorded by the contractor.

25) MODE OF MEASUREMENT:

1. Contractor shall be paid for one panel erection as per BOQ Quantities part.

7 TECHNICAL SPECIFICATION FOR LDB & PDB

1) SCOPE OF WORK

1. Distribution Boards (DBs) shall be suitable for operation on 3 Phase/single phase, 415/240 volts, 50 cycles, neutral grounded at transformer. The DB shall be minimum di-electric strength of 1.5 KV / Sec. All Distribution Boards shall manufactured by a manufacturer listed in Appendix-I.
2. LDB's shall comply with the latest Relevant Indian Standards and Electricity Rules and Regulations and shall be as per IS-13947-1991.

2) CONSTRUCTION FEATURES

1. DB's shall be made out of 1.6 mm thick high quality CRCA sheet steel and shall be pre-treated and powder coated sheet steel used in the construction of LDB shall be folded and braced as necessary to provide a rigid support for all component.
2. DB shall be suitable for indoor / outdoor installation, wall mounting free standing type, in double door construction.

3. The Final Distribution Boards shall be totally enclosed, completely dust and vermin proof and shall be with hinged doors, Neoprene gasket, padlocking arrangement.
4. All removable/ hinged doors and covers shall be grounded by 1.0 sqm tinned stranded copper connectors.
5. Final Distribution Boards shall be suitable for the climatic conditions. Joints of any kind in sheet metal shall be seam welded, all welding, slag shall be rounded off and welding pits wiped smooth with plumber metal.
6. The general construction shall confirm to IS-8623-1977 (Part-1) for factory built assembled switchgear & control gear for voltage upto and including 1100 V AC.
7. All panels and covers shall be properly fitted and square with the frame, and holes in the panel correctly positioned. Fixing screws shall enter into holes tapped into an adequate thickness of metal or provided with wing nuts. Self threading screws shall not be used in the construction of LDBs.
8. Knockout holes of appropriate size and number shall be provided in the LDB's in conformity with the location of cable/conduit connections. Detachable sheet steel gland plates shall be provided at the top / bottom to make holes for additional cable entry at site if required.

3) DISTRIBUTION BOARDS SHALL COMPRISE OF THE FOLLOWING:

- 3.1 A panel for mounting where appropriate incoming supply circuit breaker & other auxiliaries for Control & distribution as required.
- 3.2 Installations accessories shall be part of the DB for fixing conductor and rails for mounting MCB's and RCCB's etc. Neutral bus bars & earthing bus bars required in the circuit. All busbars in the LDB shall be insulated type.
- 3.3 Service cable /interconnection shall be part of the Distribution Boards.
- 3.4 The board shall be installed at a height such that the operating is within reach of the normal human height i.e. 1.2 to 1.8 meters from finish floor level.
- 3.5 Degree of protection shall be IP-52 for indoor application, IP-54 for kitchen & laundry and IP-55 for outdoor application.
- 3.6 All three phase distribution boards shall have 4 rows and single phase distribution boards shall have single rows for housing of MCB's and RCCB's unless noted otherwise.
- 3.7 Phase segregation to be maintained in all three phase distribution boards.
- 3.8 Earthing shall be provided in each LDB's.

3.9 MINIATURE CIRCUIT BREAKER (MCB)

- 3.9.1 MCB's shall have quick make and break no welding self-wiping silver alloy contacts for 10 KA short circuit both on the manual and automatic operation.
- 3.9.2 Each pole of the breaker shall be provided with inverse time thermal over load and instantaneous over current tripping elements, with trip free mechanism.
- 3.9.3 In case of multi-pole breakers, the tripping must be on all the poles and operating handle shall be common. Breakers must confirm to BS 3871 with facility for locking in OFF position.
- 3.9.4 Pressure clamp terminals for stranded/solid conductor insertion are acceptable up to 4 sq.mm. Aluminium or 1.5 sq.mm.
- 3.9.5 Copper and for higher ratings, the terminals shall be suitably shrouded. Wherever MCB isolators are specified they are without the tripping elements.

3.10 RESIDUAL CURRENT CIRCUIT BREAKER CURRENT OPERATED TYPE (RCCB)

3.10.1 The RCCB should suffices all the requirements of IS as per code IS - 12640 - 1988. The RCA should be current operated and not on line voltage.

3.10.2 The RCCB should ensure mainly the following functions:

- Measurement of the fault current value.
- Comparison of the fault current with a reference value.
- The RCCB should have a torroidal transformer which has the main conductors of primary (P - N) which check the sum of the current close to zero.
- All metal parts should be inherently resistant to corrosion and treated to make them corrosion resistant.
- It should be truly current operated.
- It should operate on core balance torroidal transformer.
- Its accuracy should be $\pm 5\%$.
- It should operate even in case of neutral failure.
- It should trip at a present leakage current within 100 mA
- Its enclosure should be as per IP 30.
- Its mechanical operation life should be more than 20,000 operations.
- It should provide full protection as envisaged by IE rules - 61-A, 71 - ee, 73 - ee, 1985 and also rule 50 of IE rule 1956.
- It should conform to all national and international standards like IS: 8828-1993, IS: 12640-1988, BS 4293 - 1983, CEE 27 (International commission Rules for the approved of electrical equipment).

4) EARTHING

1. Earthing shall be provided as per IS:3043-1987.

5) PAINTING

1. All sheet steel work shall undergo a process of degreasing, pickling in acid, cold rinsing, phosphating, passivating (seven tank processing) and then painted with electrostatic paint (Powder coating). The shade of colour of panel inside/outside shall be of Siemens gray paint shade no. RAL-7032 of IS Code No.5.

6) LABELS

1. Engraved PVC labels shall be provided on all incoming and outgoing feeder. Circuit diagram showing the arrangements of the circuit inside the distribution panels shall be pasted on inside of the panel door and covered with transparent plastic sheet.

7) TESTING

1. Testing of panels shall be as per following codes:
 - i. IS: 8623 (Part -I) 1977 for factory built assemblies of switch gear for voltages upto and including 1000 VAC.
 - ii. IS: 13947 : 1993 Degree of protection

8) WIRING

1. In wiring a distribution panel it shall be insured that total load of various distribution panel and/or consuming devices is divided evenly between the phases and number of ways as per Consultants drawing.

9) WORKMANSHIP:

1. The D.B. shall be properly grouted in the wall in concealed manner taking care that the powder coating is not scratched and dents are not formed on the D.B., MCBs and ELCBs.
2. In the distribution boards shall be fixed as per the circuit details provided.
3. All the wires terminating in the MCBs and the ELCBs shall be lugged for proper contact and ferrules depicting the circuit nos shall be provided. D.B.s mounted in concealed manner shall have a groove around it so as to save the finish of the plaster and colour during future opening of the door.
4. The distribution boards shall have circuit chart tagged on the door for future maintenance. Danger notice plates shall be fitted to the distribution boards with screws and not stuck so as to assure its presence for a longer duration.

10) MODE OF MEASUREMENT:

1. The distribution boards shall be measured in Nos as per BOQ Quantities.

8 TECHNICAL SPECIFICATION FOR LT CABLES & CABLE TRAY.

1) SCOPE OF WORK

1. The Medium voltage cables shall be supplied, laid, connected, tested and commissioned in accordance with the drawings, specifications, relevant Indian Standards specifications, manufacturer's instructions. The cables shall be delivered at site in the original drums with manufacturer's name, size and type clearly written on the drums.
2. All cables shall be adequately protected against any risk of mechanical damage to which they may be liable in normal conditions of handling during transportation, loading, unloading etc.
3. The cable shall be supplied in single length i.e. without any intermediate joint or cut unless specifically approved by the client.
4. The cable ends shall be suitably sealed against entry of moisture, dust, water etc. with cable compound as per standard practise.

2) MATERIAL

1. The MV cables shall be cross linked polyethylene (XLPE) insulated PVC sheathed of 1100 volts grade as asked for in the schedule of quantities. Cables upto 10 sq.mm shall be with copper conductor and 16 sq.mm and above shall be with aluminium conductor.

3) Technical Requirements:

1. All XLPE Aluminium/Copper Power cables shall be 1100 Volts grade, multi core constructed as per IS : 7098 Part-I of 1988 as follows :
 - 1.1 Stranded Aluminium /Copper conductor in case of 10 sq.mm. and above whereas solid conductor in case of 10 sq.mm. and below.
 - 1.2 Cores laid up.
 - 1.3 The inner sheath should be bonded over with thermo-plastic material for protection against mechanical and electrical damage.
 - 1.4 Armoring should be provided over the inner sheath to guard against mechanical damage. Armouring should be Galvanised steel wires or galvanised steel strips. (In single core cables used in A.C. system armouring should be non-magnetic hard aluminium Wires/Strips. Round steel wires should be used where diameter over the inner sheath does not exceed 13 mm; above 13 mm flat steel armour should be used. Round wire of different sizes should be provided against specific request.)
 - 1.5 The outer sheath should be specially formulated heat resistant black PVC compound conforming to the requirement of type ST2 of IS : 5831-1984 extruded to form the outer sheath.
2. Conductor shall be of electrolytic Aluminium/Copper conforming to IS : 8130 and are compact circular or compact shaped.
3. Insulation shall be of XLPE type as per latest IS general purpose insulation for maximum rated conductor temperature 70 degree centigrade.
4. In Inner sheath laid up cores shall be bonded over with thermoplastic material for protection against mechanical and electrical damage.
5. Insulation, inner sheath and outer sheath shall be applied by extrusion and lapping up process only.
6. Uncoated, annealed copper / aluminium, of high conductivity, upto 4 mm² size the conductor shall be solid and above 4 mm² the conductors shall be concentrically stranded as per IEC: 228.
7. Repaired cables shall not be used.
8. Current ratings of the cables shall be as per IS: 3961.
9. The XLPE insulated cables shall conform to latest revision of IS and shall be read along with this specifications. The Conductor shall be stranded Aluminium/Copper circular/ sector shaped and compacted. In multi core cables the core shall be identified by red, yellow, blue and black coloring of insulation.
10. The cables shall be suitable for laying in racks, ducts, trenches, conduits and underground buried installation with uncontrolled back fill and chances of flooding by water.

11. Progressive automatic in line sequential marking of the length of cables in meters at every one meter shall be provided on the outer sheath of all cables.
12. Cables shall be supplied in non returnable wooden drums as per IS: 10418.
13. Both ends of the cables shall be properly sealed with PVC/Rubber caps so as to eliminate ingress of water during transportation, storage and erection.
14. The product should be coded as per IS: - 7098 Part-I as follows:-

Aluminium Conductor		A
XLPE Insulation		2X
Steel round wire armour		W
Steel strip armour	F	
Steel Double round wire armour		WW
Steel Double strip armour		FF
Non-magnetic (Al.) round wire armour		Wa
Non-magnetic (Al.) strip armour	Fa	
PVC outer sheath		Y

4) Core Identifications:

Two core	:	Red and Black
Three core	:	Red, Yellow and Blue
Four core	:	Red, Yellow, Blue and Black
Single core	:	Green, Yellow for earthing.

Black shall always be used for neutral.

5) Inspection

1. All cables shall be inspected by the contractor upon receipt at site and checked for any damage during transit.

6) Joints in Cables

1. The Contractor shall take care to see that all the cables received at site are apportioned to various locations in such a manner as to ensure maximum utilization and avoid cable jointing.
2. This apportioning shall be got approved by the Owner's site representative before the cables are cut to lengths.
3. Where joints are unavoidable heat shrinkable type joints shall be made.
4. The location of such joints shall be got approved from the Owner's site representative and shall be identified through a marker.

7) Jointing Boxes for Cables

1. Cable joint boxes shall be installed with heat shrinkable sleeve and of appropriate size, suitable for XLPE armoured cables of particular voltage rating.

8) Jointing of Cables

1. All cable joints shall be made in suitable, approved cable joint boxes and the filling in of compound shall be done in accordance with manufactures' instructions and in an

approved manner. All straight through joints shall be done in epoxy mould boxes with epoxy resin.

2. All cables shall be joined colour to colour and tested for continuity and insulation resistance before jointing commence.
3. The seals of cables must not be removed until preparations for jointing are completed.
4. Joints shall be finished on the same day as commenced and sufficient protection from the weather shall be arranged.
5. The conductors shall be efficiently insulated with high voltage insulating tape and by using of spreaders of approved size and pattern.
6. The joints shall be completely topped up with epoxy compound so as to ensure that the box is properly filled.

9) Cable End Terminations

1. Cable end termination shall be done in cable terminal box using crimping sockets and proper size of glands of double compression type.
2. Soldieries crimping type Aluminium/Cu lugs conforming to IS suitable for cable size evenly crimped with high pressure tool & connected to switchgear terminals with brass/cadmium plated nut bolts in an approved manner.

10) Bonding of Cables

1. Where a cable enters any piece of apparatus, it shall be connected to the casing by means of an approved type of armour clamp and gland.
2. The clamps must grip the armouring firmly to the gland or casing, so that no undue stress is passed on to the cable conductors.

11) Cable Installation in Cable Trays and Cable Trenches.

1. Cables shall be laid by skilled and experienced workmen using adequate rollers to minimize stretching of the cable.
2. The cable drums shall be placed on jacks before unwinding the cable. Great care shall be exercised in laying cables to avoid forming kinks.

12) Laying of Cables on Cable Trays

1. The relative position of the cables, laid on the cable tray shall be preserved and the cables shall not cross each other.
2. At all changes in direction in horizontal and vertical planes, the cable shall be bent smooth with a radius as recommended by the manufacturers.
3. All cables shall be laid with minimum one diameter gap and shall be clamped at every meter to the cable tray.
4. Cables shall be tagged for identification with aluminium tag and clamped properly at every 20M.
5. Tags shall be provided at both ends and all changes in directions both sides of wall and floor crossings.
6. All cable shall be identified by embossing on the tag the size of the cable, place of origin and termination.

7. All cables passing through holes in floor or walls shall be sealed with fire retardant Sealant and shall be painted with fire retardant paint upto one meter on all joints, terminations and both sides of the wall crossings by "VIPER CABLE RETARD".
8. This method may be adopted in places like indoor substations, air-conditioning plantrooms, generator rooms etc. or where long horizontal runs of cables are required within the building and where it is not convenient to carry the cable in open ducts.
9. This method is preferred where heavy sized cables or a number of cables are required to be laid. The cable trays may be either of perforated sheet type or of ladder type.

PERFORATED TYPE CABLE TRAY

10. The cable tray shall be fabricated out of slotted/perforated MS sheets as channel sections, single or double bended. The channel sections shall be supplied in convenient lengths and assembled at site to the desired lengths. These may be galvanized or painted as specified. Alternatively, where specified, the cable tray may be fabricated by two angle irons of 50mmX50mmX6mm as two longitudinal members, with cross bracings between them by 50mmX5mm flats welded/bolted to the angles at 1 m spacing. 2mm thick MS perforated sheet shall be suitably welded/bolted to the base as well as on the two sides.
11. Typically, the dimensions details to be considered as per BOQ.
12. The jointing between the sections shall be made with coupler plates of the same material and thickness as the channel section. Two coupler plates, each of minimum 200mm length, shall be bolted on each of the two sides of the channel section with 8mm dia round headed bolts, nuts and washers. In order to maintain proper earth continuity bond, the paint on the contact surfaces between the coupler plates and cable tray shall be scraped and removed before the installation.
13. The width of the cable tray shall be chosen so as to accommodate all the cables in one tier, plus 30 to 50% additional width for future expansion. This additional width shall be minimum 100mm. The overall width of one cable tray shall be limited to 800mm.
14. Factory fabricated bends, reducers, tee/cross junctions, etc. shall be provided as per good engineering practice. (Details are typically shown in figure 3). The radius of bends, junctions etc. shall not be less than the minimum permissible radius of bending of the largest size of cable to be carried by the cable tray.
15. The cable tray shall be suspended from the ceiling slab with the help of 10mm dia MS rounds or 25mmX5mm flats at a span spacing of 1mtr.
16. Flat type suspenders may be used for channels upto 450mm width bolted to cable trays.
17. Round suspenders shall be threaded and bolted to the cable trays or to independent support angles 50mmX50mmX5mm at the bottom end as specified. These shall be grouted to the ceiling slab at the other end through an effective means, as approved by the Engineer-in-Charge, to take the weight of the cable tray with the cables.
18. The entire tray (except in the case of galvanized type) and the suspenders shall be painted with two coats of red oxide primer paint after removing the dirt and rust, and finished with two coats of spray paint of approved make synthetic enamel paint.
19. The cable tray shall be bonded to the earth Terminal of the switch bonds at both ends.
20. The cable trays shall be measured on unit length basis, along the center line of the cable tray, including bends, reducers, tees, cross joints, etc. and paid for accordingly

LADDER TYPE CABLE TRAY

21. The ladder type of cable tray shall be fabricated of double bended channel section longitudinal members with single bended channel section rungs of cross members welded to the base of the longitudinal members at a center to center spacing of 250cm.

22. Alternatively, where specified, ladder type cable trays may be fabricated out of 50mmX50mmX6mm (minimum) angle iron for longitudinal members, and 30mmX6mm flat for rungs.
23. Typical details of fabrication and dimensions of both the types of trays are shown in figure 4A, B,C and D.
24. The maximum permissible loading, jointing of channel sections, width of the cable tray, provision of elbows, bends, reducers, horizontal tee/ cross junctions etc. suspension of cable tray from the ceiling slab; painting and measurement of the cable tray shall be as per sub-clauses (ii) to (x) below clause 2.6.11.2, except that the overall width of one cable tray may be limited to 800mm.

13) Laying of Cables in Ground

1. Cable trench shall be dug to the minimum depth of 1 mtr and the width shall dependent on the no of cables to be kept with the layer of brick in between two cables.

EXCAVATION OF TRENCHES :

2. The trenches shall be excavated in reasonably straight lines.
3. Wherever there is a change in direction, suitable curvature shall be provided.
4. Where gradients and changes in depth are unavoidable, these shall be gradual.
5. The excavated soil shall be stacked firmly by the side of the trench such that it may not fall back into the trench.
6. The bottom of the trench shall be levelled and shall be made free from stone, brick bats etc. The trench shall then be provided with a layer of clean, dry sand cushion of not less than 100 mm in depth.
7. Prior to laying of cables, the cores shall be tested for continuity and insulation resistance. The cable drum shall be properly mounted on jacks, at a suitable location, making sure that the spindle, jack etc. are strong enough to carry the weight of the drum and the spindle is horizontal.
8. Cable shall be pulled over rollers in the trench steadily and uniformly without jerks and strains. The entire drum length shall be laid in one stretch.
9. However, where this is not possible the remainder of the cable shall be removed by 'Flaking' i.e. by making one long loop in the reverse direction.
10. After the cable has been uncoiled and laid into the trench over the rollers, the cable shall be lifted off the rollers beginning from one end by helpers standing about 10 meters apart and laid in a reasonably straight line.
11. Cable laid in trenches in a single tier formation shall have a cover of clean, dry sand of not less than 150 mm. above the base cushion of sand before the protective cover is laid.
12. In the case of vertical multi-tier formation after the first cable has been laid, a sand cushion of 300 mm shall be provided over the initial bed before the second tier is laid.
13. Finally the cables shall be protected by second class bricks before back filling the trench. The buried depth of uppermost layer of cable shall not be less than 750mm.
14. **Back Filling** : The trenches shall be back filled with excavated earth free from stones or other sharp edged debris and shall be rammed and watered, if necessary, in successive layers not exceeding 300 mm. Unless otherwise specified, a crown of earth not less than 50 mm in the centre and tapering towards the sides of the trench shall be left to allow for subsidence.

14) Route Marker

1. Route marker shall be provided along straight runs of the cables not exceeding 30 meters also for change in the direction of the cable route and underground joints.
2. Route marker shall be of cast iron painted with aluminium paint.
3. The size of marker shall be 100 mm dia with "Cable" and voltage grade inscribed on it.

15) Testing of Cables

1. Cables shall be tested at works for all routine tests as per IS including the following tests before being dispatched to site by the project team.
 - a) Insulation Resistance Test.
 - b) Continuity resistance test.
 - c) Sheathing continuity test.
 - d) Earth test.(in armoured cables)
 - e) Hi Pot Test.
2. Test shall also be conducted at site for insulation between phases and between phase and earth for each length of cable, before and after jointing.
3. On completion of cable laying work, the following tests shall be conducted in the presence of the Owner's site representative.
 - f) Insulation Resistance Test(Sectional and overall)
 - g) Continuity resistance test.
 - h) Sheathing continuity test.
 - i) Earth test.
4. All tests shall be carried out in accordance with relevant Standard Code of Practice and Electricity Rules.
5. The Contractor shall provide necessary instruments, equipment and labour for conducting the above tests and shall bear all expenses in connection with such tests.
6. All tests shall be carried out in the presence of the Owner's site representative, results will be noted and signed by all present and record be maintained.

16) WORKMANSHIP

1. Cables shall be laid in the routes marked in the drawings. Where the route is not marked, the Contractor shall mark it out on the drawings and also on the site and obtain the approval of the CLIENT AND/OR ITS ARCHITECT before laying the cable.
2. Procurement of cables shall be on the basis of actual site measurements and the quantities shown in the schedule of work shall be regarded as a guide only.
3. Cables shall be laid on walls, cable trays, inside shafts or trenches.
4. Saddling or support for the cable shall not be more than 500 mm apart. Plastic identification tags shall be provided at every 30 m.
5. Cables shall be bent to a radius not less than 12 (twelve) times the overall diameter of the cable or in accordance with the manufacturer's recommendations whichever is higher.

6. In the case of cables buried directly in ground, the cable route shall be parallel or perpendicular to roadways, walls etc unless marked on drawing by architect / consultant.
7. Cables shall be laid on an excavated, graded trench, over a sand or soft earth cushion to provide protection against abrasion.
8. Cables shall be protected with brick or cement tiles on all the three sides as shown on drawings. Width of excavated trenches shall be as per drawings.
9. Back fill over buried cables shall be with a minimum earth cover of 750 mm to 1000 mm. The cables shall be provided with cables markers at every 10 meters and at all loop points.
10. All cables shall be full runs from panel to panel without any joints or splices.
11. Cables shall be identified at end termination indicating the feeder number and the Panel/Distribution board from where it is being laid.
12. Cable termination for conductors up to 4 sq.mm. may be insertion type and all higher sizes shall have compression type lugs.
13. Cable termination shall have necessary brass glands. The end termination shall be insulated with a minimum of six half-lapped layers of PVC tape. Cable armouring shall be earthed at both ends.
14. In case of cables entering the buildings. It would be done duly only through pipes. The pipes shall be laid in slant position, so that no rainwater may enter the building.
15. After the cables are tested the pipes shall be sealed with M. seal & then tarpaulin, shall be wrapped around the cable for making the entry watertight.
16. Testing : MV cables shall be tested upon installation with a 500 V Meggar and the following readings established:
 - 16.1 Continuity on all phases.
 - 16.2 Insulation Resistance.
 - 16.3 between conductors.
 - 16.4 all conductors and ground.
 - 16.5 All test readings shall be recorded and shall form part of the completion documentation.
 - 16.6 Cable joints shall be done as per regular practice and check shall be carried out for loose connections and leakages. Insulation cutting shall be done properly taking care that no area of the conductor remains exposed. Crimping shall be done with the help of hydraulic tool. Proper insulation tape shall be applied at the cable and lug joint.
17. Format for cable testing certificate :
 - a. Drum no. from which cable is taken :
 - b. Cable from _____ to _____
 - c. Length of run of this cable _____ mtr
 - d. Insulation resistance test
 - between core 1 to earth _____ mega-ohm
 - between core 2 to earth _____ mega-ohm
 - between core 3 to earth _____ mega-ohm
 - between core 1 to core 2 _____ mega-ohm
 - between core 2 to core 3 _____ mega-ohm
 - between core 1 to core 3 _____ mega-ohm
 - duration used:
 - e. High voltage test: Voltage Duration
 - between core and earth
 - between individual cores

18. The cable shall be laid side by side in trench with brick covering on all the three sides.
19. The trench shall be such that sharp bends shall be avoided while laying the cable.
20. The bedding of fine sand under the cable shall be not less than 6 mm. The trench shall be terminated in Manholes with specified size of R.C.C. hume pipes as shown in drawing. Cable markers shall be provided through out the route of cable at 10 mtrs distance.
21. The trenches shall be refilled after the cable are laid and the Ground level shall be done as per original after pressing the same. The cables shall be checked for insulation resistance and continuity tests shall be carried out.

17) MODE OF MEASUREMENT:

17.1 Mode of Measurement for Cable Trench & Cable Tray.

The cable laying shall be measured in rmt. The trenches dug and refilled shall be measured in cu. Mtr. The bricks and sand bedding shall be measured in rmt. The cable trays shall be measured in rmt.

17.2 Mode of Measurement for Cable and Cable End Terminations.

The cables shall be measured in rmt and terminations on unit basis.

9 TECHNICAL SPECIFICATION FOR INTERNAL WIRING.

1) SYSTEM OF WIRING

1. The system of wiring shall consist of PVC insulated copper stranded conductor flexible FRLS wires in metallic / non metallic (Rigid heavy/Medium Duty ISI -marked fire retarded PVC Conduits of minimum 2mm Wall thickness and Sizes of conduits shall be 25 mmdia. conduits for both mains and point wiring and shall be concealed or surface mounted above false ceiling as called for.

2) GENERAL DESCRIPTION

1. Prior to laying and fixing of conduits, the contractor shall mark the conduit route, carefully examine the working drawings prepared by him and approved by the Consultant indicating the layout, satisfy himself about the non interference in the route, sufficiency of number and sizes of conduits, location of junction boxes, sizes and location of switch boxes and other relevant details.
2. Any discrepancy found shall be brought to the notice of the Owner's site representative.
3. Any modifications suggested by the contractor should get written approval before the actual laying of conduits is commenced.
4. In laying of conduits it is important that not more than two right angle bends are provided for each circuit without a pull box.
5. No junction box shall be provided in the entire length of conduit run for drawing of wires.
6. Only switch outlets, lighting fixture outlets, equipment power outlets and socket outlets shall be considered for drawing of wires.

3) LIGHTING & POWER WIRING

1. All final branch circuits for lighting and appliances shall be single conductor/ stranded/ flexible wires run inside conduits.
2. The conduit shall be properly connected or jointed into sockets, bends, and junction boxes.
3. Branch circuit conductor sizes shall be as shown in the schedule of quantities and or drawings.
4. All circuits shall preferably be kept in a separate conduit up to the Distribution Board. No other wiring shall be bunched in the same conduit except those belonging to the same phase.
5. Each lighting branch circuit shall not have more than ten outlets or 800 watts whichever is lower. Each conduit shall not hold more than three branch circuits.
6. Flexible cords for connection to appliances, fans and pendants shall be 650/1100 V grade (three or four cores i.e. with insulated neutral wire of same size) with tinned stranded copper wires, insulated, twisted and sheathed with strengthening cord. Colour of sheath shall be subject to the CLIENT AND/OR ITS ARCHITECT'S approval.
7. Looping system of wiring shall be used. Wires shall not be jointed. Where joints are unavoidable, they shall be made through approved mechanical connectors.
8. No such joints shall be made unless the length of the sub-circuit, sub-main or main is more than the length of the standard coil.
9. Control switches shall be connected in the phase conductors only and shall be 'ON' when knob is down. Switches shall be fixed in 3 mm. thick painted or galvanized steel boxes with cover plates as specified. Cadmium plated brass screws shall be used.
10. Power wiring shall be distinctly separate from lighting wiring. Conduits not less than 25 mm. and wires not less than 1.0 sq.mm. copper shall be used.
11. Every conductor shall be provided with identification ferrules at both ends matching the drawings.

4) TESTING

1. The entire installation shall be tested for:

Insulation resistance.
Earth continuity.
Polarity of single pole switches.

2. All the wiring switch board, outlet points shall be done in a concealed manner in wall & slab in PVC conduit of minimum 25 mm dia. (medium gauge) & with 650v / 1100v grade PVC insulated flexible copper conductor wire.
3. The switches should be modular with moulded cover plates, blank plates for outlet boxes.
4. The accessories, connectors, sockets, should be fixed with brass chrome / cadmium plated machine screw. For fan points the rates should be with hum -free type 300 W regulators as required to complete the point wiring.
5. The wiring shall be as per IS: 732 and IS: 4648. The wiring shall be done in a looping manner so as to avoid junction boxes at any place.
6. All the looping shall be done only in the switchboard and outlet points. The size of the wire shall be as per the specification. Colour code shall be strictly followed.
7. The size of wires shall as follow as per BOQ and as per clients requirements:

8. Light, fans, exhaust fan, 5 Amp. On board plug point, two way light points, bell point etc from switch to outlet.

Phase / Neutral	1.5 m m ²
Earth	1.5 m m ²

9. From D.B. to switch board – lighting / 5 A socket etc – i.e. circuit mains part of point wiring

Phase / Neutral	2.5 m m ²
Earth	1.5 m m ²

10. From D.B. to 16A power point etc – i.e. circuit mains part of point wiring

Phase / Neutral	4.0 m m ²
Earth	1.5 m m ²

11. Separate pipes shall be laid for off wires and circuit mains.

12. Circuit mains of same phase shall be drawn in one pipe with prior permission/discussion with the consultant.

13. Separate phase, neutral and earthing wire of sizes recommended by consultant shall be drawn for each and every circuit mains.

14. Mains for lighting and on board plug points shall be of one-size higher wires than those used in off.

5) COMPUTER WIRING :

1. Wiring for short extensions to outlets in hung ceiling or to vibrating equipments, motors etc., shall be installed in flexible conduits. Otherwise rigid conduits shall be used. No flexible extension shall exceed 1.25 m.
2. Conduits run on surfaces shall be supported on metal 12 mm. thick G.I. pressure saddles which in turn are properly screwed to the wall or ceiling. Saddles shall be at intervals of not more than 500 mm.
3. Fixing screws shall be with round or cheese head and of rust-proof materials. Exposed conduits shall be neatly run parallel or at right angles to the walls of the building.
4. Unseemly conduit bends and offsets shall be avoided by using fabricated mild steel junction/pull through boxes for better appearances.
5. No cross-over of conduits shall be allowed unless it is necessary and entire conduit installation shall be clean and neat in appearance.
6. Conduits embedded into the walls shall be fixed by means of staples at not more than 500 mm. intervals. Chases in the walls shall be neatly made and refilled after laying the conduit and brought to the finish of the wall but the building Contractor will do final finish.
7. Conduits buried in concrete structure shall be put in position and securely fastened to the reinforcement and got approved by the CLIENT AND/OR ITS ARCHITECT, before the concrete is poured.
8. Proper care shall be taken to ensure that the conduits are neither dislocated nor choked at the time of pouring the concrete suitable fish wires shall be drawn in all conduits before they are embedded.
9. Where conduit passes through expansion joints in the building, adequate expansion fittings shall be used to take care of any relative movement.

10. Inspection boxes shall be provided for periodical inspection to facilitate withdrawal and removal of wires. Such inspection boxes shall be flush with the wall or ceiling in the case of concealed conduits. Inspection boxes shall be spaced at not more than 12 meters apart or two 90° solid bends or equal.
11. All junction and switch boxes shall be covered by 6 mm clear plate. These junction boxes shall form part of point wiring or conduit wiring as the case may be including the cost of removing the cover for painting and re-fixing. No separate charges shall be allowed except where specially mentioned.
12. Conduits shall be free from sharp edges and burrs and the threading free from grease or oil. The entire system of conduits must be completely installed and rendered electrically continuous before the conductors are pulled in. Conduits should terminate in junction boxes of not less than 32 mm. deep.
13. An insulated earth wire of copper rated capacity shall be run in each conduit.

The point definition shall be conduiting and wiring from D.B. to S.B. and there from to final outlet point including switches and accessories, junction boxes, fan boxes, zarri work with cement –sand etc of approved make.

6) CONDUCTORS

1. All PVC insulated copper conductor flexible FRLS wires shall conform in all respects to Standards as listed under sub-head Indian Standards and shall be IS approved and ISI marked.

7) BUNCHING OF WIRES

1. Wires carrying current shall be so bunched that the outgoing and return wires are drawn into the same conduit.
2. Wires originating from two different phases shall not run in the same conduit. All wires shall have ferrules for identification.
3. Lighting and power circuits shall be separate. Each Power/ Light Circuit's Neutral shall be individual per Circuit and shall not be looped from any other Circuit.

8) LOAD BALANCING

1. Balancing of circuits in three phase installation shall be as planned by the Consultants in the tender drawings and shall be checked by the contractor before the commencement of wiring and shall be strictly adhered to.

9) COLOUR CODE OF CONDUCTORS

1. Colour code shall be maintained as indicated by the Consultant for the entire wiring installations. Red, yellow, blue shall be for three phases, black for neutral and green with yellow band shall be for earthing.

10) WORKMANSHIP

Drawing Conductors

1. The drawing and jointing of PVC insulated copper conductor wires shall be executed with due regard to the following precautions.
2. While drawing wires through conduits, care shall be taken to avoid scratches and kinks which may cause breakage of conductors.
3. There shall be no sharp bends. Wire reel stands to be used for pulling of wires to avoid kinks.

4. Care shall be exercised while drawing the wires from reels, by taking appropriate measures to ensure that wires are not spread on ground, causing dust and dirt accumulation on the new wires.
5. Maximum permissible number of 1100 volt grade PVC insulated wires that may be drawn into rigid non metallic or PVC Conduits are given below:

Size of wires Nominal Cross Section Area (Sq. mm.)	Maximum number of wires within conduit size(mm)				
	20	25	32	40	50
1.5	7	12	16	--	--
1.5	5	10	14	--	--
4	4	8	12	--	--
6	3	6	8	--	--
10	--	4	5	6	--
16	--	3	3	6	6
25	--	--	2	4	6
35	--	--	--	3	5

6. Insulation shall be removed by insulation stripper only. Few Strands of wires shall not be cut/reduced for convenience in connecting into terminals.
7. The terminals shall have sufficient cross sectional area to take all strands and it's connecting brass screws shall have flats ends.
8. All looped joints shall be connected through terminal block/connectors. The pressure applied to tighten terminal screws shall be just adequate, neither too much nor too less. All light points shall be terminated through a connector.
9. Only licensed wiremen (Before doing the work or before appointing him on site contractor has to submit his wiring licence to Owner) and cable jointers shall be employed to do jointing work.
10. Before entrusting cable jointing work to any technician, or before appointing Cable Jointers or Wiremen on Site, Contractor has to submit such Technicians' / Wireman's / Cable Jointer's licence to Owner.
11. All wires and cables shall be embossed with the manufacturer's label with ISI mark and shall be brought to site in original packing. For all internal wiring. PVC insulated wires of 1100 volts grade (FRLS) shall be used.
12. The sub-circuit wiring for point shall be carried out in loop system and no joints shall be allowed in the length of the conductors.
13. No wire shall be drawn into any conduit until all defective work of conduit installation of any nature that may cause injury to wire is completed.
14. Care shall be taken while pulling out the wires so that no damage occurs to conduits/wire itself, the conduits shall be thoroughly cleaned of moisture, dust , dirt or any other obstruction.
15. The minimum size of PVC insulated copper conductor wires for all sub-circuit wiring for light points shall be minimum 1.0 sq.mm copper. Separate neutral to be pulled for each circuit.
16. Conduits shall be kept at a minimum distance of 100 mm. from the pipes of other non-electrical services. And maintain minimum 300 mm distance between telephones, TV & Computer piping.
17. Separate conduits/raceways shall be used for following points as applicable and as requirements of site conditions:

- 17.1 Normal lights and 5 A 3 pin sockets on lighting circuit.
- 17.2 Separate conduit shall be laid from D.B. to switch board.
- 17.3 Power outlets - 15 A 3 pin 20 A/30 A, 2 pin scraping earth metal clad sockets.
- 17.4 Emergency lighting.
- 17.5 Telephones.
- 17.6 Fire alarm system.
- 17.7 Public address system & Music system.
- 17.8 For all other voltages higher or lower than 230 V.
- 17.9 T.V. Antenna.
- 17.10 Water level guard.

11) FISH WIRE

1. To facilitate subsequent drawing of wires in the conduit, GI fish wires of 1.0 mm (14 SWG) shall be provided along with the laying of recessed conduit.

12) MODE OF MEASUREMENT

1. The items shall be measured on unit basis or on mtr basis as per BOQ.

10 TECHNICAL SPECIFICATION FOR LIGHT FIXTURES & ACCESSORIES.

1) SCOPE :

- 1 The scope of work shall cover the supply, installation and testing of various types of light fixtures. The scope also includes the supply of heavy duty exhaust fan and ceiling
- 2 fan.

2) STANDARDS :

The following standards and rules shall be applicable :

- (a) IS 3646 - 1960 Code of practice for interior illuminator.
 - (b) IS 1913 - 1969 General and Safety requirements for electric lighting fittings.
 - (c) Indian Electricity Act and Rules issued thereunder.
- 1 All codes and standards mean the latest. Where not specified otherwise the installation shall generally follow the Indian Standard Code of Practice or the relevant British Standard Code of Practice in the absence of Indian Standard.

3) GENERAL REQUIREMENTS :

- 1 All fixtures shall be complete with accessories and fixings necessary for installation whether so detailed under fixture description or not.
- 2 Fixture housing, frame or canopy shall provide a suitable cover for the fixture outlet box of fixture opening.
- 3 Fixture shall be installed at mounting heights as detailed on the drawings or instructed on site by the client's representative.
- 4 Fixtures and/or fixture outlet boxes shall be provided with hangers to adequately support the complete weight of the fixture. Design of hangers and method of fastening

other than shown on the drawings or herein specified shall be submitted to the client's representative for approval.

- 5 Fixture shall be completely wired and constructed to comply with the regulations and standards for Electric Lighting Fixtures, unless otherwise specified. Fixtures shall bear manufacturer's name and the factory inspection label unless otherwise approved.
- 6 Wiring within the fixture and for connection to the branch circuit wiring shall be not less than 1.5 sq.mm. copper for 250 Volt application. Wire insulation shall suit the temperature conditions inside the fixture and wires bypassing the choke shall be heat protected with a heat resistant sleeve.
- 7 Metal used in lighting fixtures shall be not less than 22 SWG or heavier if so required to comply with specifications or standards. Sheet steel reflectors shall have a thickness of not less than 20 SWG. The metal parts of the fixtures shall be completely free from burrs and tool marks. Solder shall not be used as mechanical fastening device on any parts of the fixture.
- 8 Ferrous metal shall be bonderized and given a corrosion resistant phosphate treatment or other approved rust inhibiting prim coat to provide a rust-proof base before application of finish.
- 9 Non-reflecting surfaces such as fixture frames and trim shall be Alluminium die cast.
- 10 All the fixtures are as per the IP - 54 insulation class
- 11 Vendor shall be responsible for measuring the level of illumination after installation.
- 12 Lighting fixtures shall be designed for minimum glare and for continuous operation under specified atmospheric condition.
- 13 All fixtures shall be complete with accessories like power factor improvement capacitors, ballast, ignitor etc.
- 14 Flourescent fixture shall be of sheet steel casing with corrosion resistance finish. It shall be provided with separate wiring channel with cover plate and an earth terminal. All screw shall be chromium brass only. Lamp and starter holders shall be of tough moulded plastic with spring loaded rotor type connector. Condensers shall be low loss paper impregnated hermetically sealed. Internal wiring shall be neatly clipped and where by passing the ballast, a suitable heat resistance barrier or sleeve shall be provided.

4) REFLECTOR :

- 1 Light reflecting surface shall be mirror finished having the reflection factor of not less than 80%. All parts of reflector shall be completely covered by finish and free from irregularities. It shall be capable of withstanding a 6 mm. radius bend without showing sign of cracking, peeling or loosening from the base metal. Finish shall be capable of withstanding 72 hours exposure to ultra violet sun lamp placed 10 cm. from the surface without discoloration, hardening or warping and retain the same reflection factor after exposure. Test result shall be furnished for each lot of fixtures.
- 2 Lighting fixture reflectors shall generally be manufactured from sheet steel of aluminium of not less than 20 SWG. They shall be readily removable from the housing for cleaning and maintenance without disturbing the lamps and without the use of tools. They shall be security mounted to the housing by means of positive fastening devices of a capative type.
- 3 Polystyrene egg-box type louvers shall be provided whenever specified. Appropriate captive type fixing devices shall be incorporated for securing these.

5) BALLAST :

- 1 Lighting fixtures ballasts shall be designed manufactured and supplied in accordance with the relevant standard IS 6616 and shall function satisfactorily under site conditions specified. The ballasts shall have a long service life and low power loss.
- 2 Ballasts shall be mounted using self-licking, anti-vibration fixings and shall be easy to remove without removing the fittings.
- 3 Ballast shall contain a thermosetting type compound not subject to softening or liquefying under any operating conditions or upon ballast failure. The ballasts shall be of the inductive and heavy duty type Filled with polyester or equivalent. They shall be free from hum and protected from the atmospheres. Ballasts which produce a humming sound shall be replaced free of cost by the supplier. HPMV lamp ballasts shall be provided with suitable tapings.

6) **STARTERS** :

- 1 Lighting fixtures starters shall be of the safety type (i.e. if the lamps fails to ignite at the first start, no further starting must be possible without attending to the tube light. Starters shall have bimetal electrodes and high mechanical strength.
- 2 Starters shall be replaceable without disturbing the reflector or lamps and without the use of any tool. Starters shall have brass contacts and radio interference capacitor.

7) **CAPACITORS** :

- 1 Lighting fixture capacitors shall have a constant value of capacitors and shall be connected across the supply of individual lamp circuits.
- 2 Each capacitor shall be suitable for operation at 240 volts \pm 5% single phase 50 Hz with a suitable value of capacitance so as to correct the power factor of lists corresponding lamp circuit to the extent of 0.98 lag.
- 3 The capacitors shall be hermetically sealed preferably in metal container to prevent seepage of impregnating material and ingress of moisture.

8) **LAMP HOLDERS** :

- 1 **Lamp holders for fluorescent tubes shall be of the spring loaded, low contact resistance, bi-pin rotor type, resistant to wear and suitable for operation at the specified temperature, without deterioration in insulation value, contact resistance of lamp holding quality. The shall hold the lamp in position under normal condition of shock and vibration.**
- 2 Lamp-holders for incandescent and HPSV lamps shall be of G.L.S. type manufactured in accordance with relevant standards and designed to give long and satisfactory service.

9) **LUMINAIRES** :

- 1 Fixture shall be of single die cast aluminium made out of LM6 canopy , anodised high purity aluminium reflector, toughened glass at the front and die cast aluminium control gear box complete with all accessories mention in 3.22 with prewired upto connector block and loop in and loop out facilities .
- 2 Street light fixture shall be of single die cast aluminium housing with provision for the easy removal of gear box during maintenance. Acrylic bowl shall be linked to one end

and toggle shall be provided. Neoprene rubber and felt gasket shall be provided between acrylic bowl and fixture to prevent entry of insects and moisture.

- 3 Industrial low bay fitting shall be of die cast aluminium housing, high purity Al. Reflector, acrylic cover and wire guard.

10) LAMPS :

- 1 Lamps shall be supplied and installed in all lighting fixtures furnished under this contract.
- 2 Lamps used for temporary lighting service shall not be used in the final lamping of fixture units.
- 3 Lamps shall be of wattage and type as shown on the drawings and schedules. Where not shown, the details shall be ascertained from the client before procurement.
- 4 Lamps for permanent installation shall not be placed in the fixtures until so directed by the Client's representative, and this shall be accomplished directly before the respective portions are ready for occupation.

11) TEST :

- 1 **The following routine tests shall be conducted as per the relevant Indian Standards :**
 - a) Each fixture shall be tested at 1500 volts r.m.s. 50 Hz for one minute and no flashover or breakdown shall occur between current carrying parts and ground.
 - b) Insulation resistance of each fixture shall be tested at 500 V.D.C. and the insulation resistances so measured shall not be less than 2 mega ohms between all current carrying parts and ground.
 - c) Each fixture complete with its proper lamp/lamps shall be shown to operate satisfactorily at its normal voltage and frequency.
 - d) Each fixture shall be examined visually to ensure that it is complete in all respects and satisfactorily finished.
 - e) Type and routine test certificates shall be submitted for tests conducted as per relevant IS/BS for the fixture and accessories.

12) DRAWINGS AND DATA:

As per of the proposal the bidder furnish relevant descriptive and illustrative literature on lighting fixtures and accessories and following drawings/ data for the respective lighting fixtures :-

- i) Dimensional Drawings.
- ii) Mounting details cable entry facilities and weights.
- iii) Light distribution diagrams (Zonal & Isokandora)
- iv) Light absorption and utilisation factors.
- v) Lamp output V/S temp. curves.

13) WORKMANSHIP:

- 1 The fixture shall be installed on wall / ceiling as directed and as per manufacturer's instruction, with necessary accessories for surface, concealed, suspended from ceiling, bracket mounting etc.
- 2 The job also includes connection of fixture with respective outlet point with heat resistant wires through heat resistance sleeve and PVC connector. The exhaust fan shall be installed complete with M.S. angle iron mounting frame/ ring, G.I. louvers, wire mesh and plug at the end of the cord including wiring & earthing etc. Proper earthing shall be provided to the fixtures.

14) MODE OF MEASUREMENT:

The unit rate shall be considered for fitting one fixture. The rate shall include following

- 1 All fixing accessories, mounting bracket, ballast condensers and control gear wherever applicable.
- 2 Supplying and fixing Ball and socket joints wherever required.
- 3 Earthing of fittings.
- 4 Electrical connections to fittings/fans from the junction box/ceiling rose.
- 5 Installation and interconnection of Electronic regulators for ceiling fans.
- 6 Supplying and fixing 300 mm. GI down rod for ceiling fans.

12 TECHNICAL SPECIFICATION FOR EARTHING SYSTEM.

1) GENERAL DESCRIPTION

1. All the non-current carrying metal parts of the electrical installation and mechanical equipments shall be earthed properly.
2. The metal conduits, trunking, cables armour and sheath, electric panels' boards, lighting fixtures, ceiling and exhaust fan and all other parts made of metal shall be bonded together and connected by means of specified earthing system.
3. An earth continuity conductor shall be installed with all the feeders and circuits and shall be connected from the earth bar of the panel boards to the conduit system, earth stud of the switch box, lighting fixture, earth pin of the socket outlets and to any metallic wall plates used.
4. All the enclosures of motors shall be also connected to the earthing system.

2) SCOPE OF WORK

1. The scope of work shall cover supply, laying, installation, connecting, testing and commissioning of:
 - 1.1 Earthing station.
 - 1.2 Earthing Aluminium/copper strips from earthing station to equipotential bar.
 - 1.3 Earthing Aluminium / copper strips / wires from equipotential bar to lay feeder mains and circuit to connect power panels, DBs, switchboards etc.
 - 1.4 Bonding of Non-current carrying parts, and metallic parts of the electrical installation.

3) STANDARDS

1. The following standards and rules shall be applicable:
 - 1) IS: 3043 - 1966 Code of practice for Earthing.
 - 2) Indian Electricity Act and Rules

All codes and standards mean the latest. Where not specified otherwise the installation shall generally follow the Indian Standard Code of Practice or the British Standard Codes of Practice in absence of Indian standard.

4) TYPE OF EARTHING STATION

PLATE EARTHING STATIONS

1. The equipment neutral earthing shall be with Cast Iron plate earthing station, Cast Iron Earth plate shall be 30 x 30 x 0.35 mm for earthing.
2. The earth resistance shall be maintained with suitable soil treatment.
3. The resistance of each earth station should not exceed 1 ohm.
4. The earth lead shall be connected to the earth plate through Hot Dip G.I. bolts.
5. The earthing conductors shall be of copper strip in case of GI earthing.
6. G.I. pipe with funnel of approved quality shall be used for watering the earthing electrodes / stations.
7. The block masonry chamber with chequered plate shall be provided for housing the funnel and the pipe for watering the earthing electrodes / stations.
8. The hardware and other consumables for earthing installation shall be of copper/bras in case of copper earth plate and shall be hot dip galvanised iron material in case of G.I. earth plate,.
9. Test link / test pit cover through chequered plate.

PIPE ELECTRODE EARTH STATION

1. The earth station shall be as shown on the drawing and shall be used for equipment earth grid and/or street light pole earthing.
2. The earth electrode shall be 150 cms long 1.5 cms dia class "A", Galvanised iron pipe.
3. The earth resistance shall be maintained with a suitable soil treatment as shown on the drawing.
4. The resistance of each earth station should not exceed 1 ohm.
5. The earth lead shall be fixed to the pipe with a nut and safety set screws. The clamp shall be permanently accessible.
6. The earthing grid and the earthing conductor shall be hot dip Galvanised iron strips of the size as shown in the drawing.
7. G.I. pipe with funnel of approved quality shall be used for watering the earth electrode \ station.
8. The block masonry chamber with chequered plate shall be provided for housing the above referred funnel and pipe.

9. The hardware and other consumables for earthing installation shall be hot dip Galvanised iron material as shown on the drawing.

CHEMICAL PIPE-IN-PIPE EARTHING

1. The substation earthing shall be with copper plate earthing station unless otherwise specified & earthpit of minimum bore dia. 225mm size ASH or approved make Safe Earthing Electrode consisting Pipe-in-Pipe Technology as per IS 3043-1987 made of corrosion free G.I.Pipes.
2. The earthing station shall be as shown on the drawing. The two earth electrodes shall be 80mm & 40 mm dia GI pipes plate. The earth resistance shall be maintained with a suitable crystalline conductive materials and back fill compound.
3. The resistance of each earth station should not exceed 1 ohms.
4. The earth lead shall be connected to the earth pipe through copper/brass bolts.
5. The pipe-in –pipe earth station shall be as shown on the drawing and shall be used for equipment protective earth grid.
6. The earth electrodes shall be galvanized pipes 3.0 long with outer pipe 80 mm dia & inner pipe 40 mm dia. The outer pipe shall be plated with 80-200 microns & inner pipe shall be plated with 200-250 microns with connection terminal dia of 14 mm.
7. Crystalline Conductive material-Mixture of nature minerals and a chemical compound, highly conductive and non corrosive, which prevents the inner pipe from corrosion and dissipates the current evenly.
8. Back fill compound - Moisture retaining compound having 13 times more (Hygroscopic) water retaining capacity than its dry volume & shall be 2 bags of 25 kgs.
9. The earth lead shall be fixed to the pipe with a clamp and safety set screws. The clamps shall be permanently accessible.

5) WORKMANSHIP

INSTALLATION AND CONNECTION

1. The plate/pipe electrode, as far as practicable, shall be buried below permanent moisture level but in no case less than 3 M below finished ground level.
2. The plate/pipe electrode shall be kept clear of the building foundation and in no case, it shall be nearer by less than 2 M from outer face of the respective building wall / column.
3. The plate electrode shall be installed vertically and shall be surrounded with 150 mm. thick layers of Charcoal dust and Salt mixture.
4. 20 mm. dia. G.I. pipe for watering, shall run from top edge of the plate / pipe electrode to the mid level of block masonry chamber.
5. Top of the pipe shall be provided with G.I. funnel and screen for watering the earth / ground through the pipe.

6. The funnel with screen over the G.I. pipe for watering to the earth shall be housed in a block masonry chamber as shown in the drawing.
7. The masonry chamber shall be provided with a Cast Iron hinged cover resting over the Cast Iron frame which shall be embedded in the block masonry.
8. Construction of the earthing station shall in general be as shown in the drawing and shall conform to the requirement on earth electrodes mentioned in the latest edition of Indian Standard IS : 3043, Code of Practice for Earthing Installation.
9. The earth conductors (Strips / Wires, Hot dip G.I.) inside the building shall properly be clamped / supported on the wall with Galvanised Iron clamps and Hot Dip GI screws / bolts. The conductors outside the building shall be laid atleast 600 mm. below the finished ground level.
10. The earth conductors shall either terminate on earthing socket provided on the equipment or shall be fastened to the foundation bolt and / or on frames of the equipment. The earthing connection to equipment body shall be done after removing paint and other oily substances from the body and then properly be finished.
11. Over lapping of earth conductors during straight through in joints, where required, shall be of minimum 75mm. long.
12. The earth conductors shall be in one length between the earthing grid and the equipment to be earthed.

EARTH LEADS AND CONNECTIONS

1. Earth lead shall be bare copper or Galvanised steel as specified with sizes shown on drawings. Copper lead shall have a phosphor content of not over 0.15 %. Galvanised steel buried in the ground shall be protected with bitumen and hessian wrap or polythene faced hessian and bitumen coating. At road crossing necessary hume pipes shall be laid. Earth lead run on surface of wall or ceiling shall be fixed on saddles so that strip is atleast 8 mm away from the wall surface.
2. The complete earthing system shall be mechanically and electrically bonded to provide an independent return path to the earth source.
3. Wherever crossing is required, earthing jumper shall be of insulated wires.

EQUIPMENT EARTHING

1. All apparatus and equipment transmitting or utilising power shall be earthed in the following manner. Copper /G.I. earth strips/wires shall be used unless other-wise indicated in the Schedule.

6) TEST

1. The entire earthing installation shall be tested as per requirements of Indian Standard Specification IS: 3041.
2. The following earth resistance values shall be measured with an approved earth megger and recorded.
 - 2.1 Each earthing station
 - 2.2 Earthing system as a whole

2.3 Earth continuity conductors

3. Earth conductor resistance for each earthed equipment shall be measured which shall not exceed 1 ohm in each case.
4. Measurements of earth resistance shall be carried out before earth connections are made between the earth and the object to be earthed.
5. All tests shall be carried out in presence of the consultant / client.

7) **MODE OF MEASUREMENT**

1. Provision of earthing station complete with excavation, electrode, watering pipe, soil treatment, masonry chamber with cast iron cover etc. shall be treated as one unit of measurement.
2. The following items of work shall be measured and paid per unit length covering the cost of the earth wires / strips, clamps, labour etc.
 - a) Main equipment earthing grid and connection to the earthing station.
 - b) Connection to the switch board, power panels, DB etc.
3. The cost of earthing the boq items shall become part of the cost of the item itself and no separate payment for earthing shall be made.

13 **TECHNICAL SPECIFICATION FOR PA SYSTEM.**

1) **SCOPE OF WORK**

1. The scope of work under this head shall include designing supplying and installing of Public Address System. The work under this system shall consist of furnishing all materials, equipment's and appliances and labour necessary to install the said system, complete with Speakers, Amplifiers, Mike and Zone selection Panel.
2. The PA system is designed to serve the multi purpose of playing music, making general announcement or to transmit the fire tone under fire condition.

2) **SYSTEM DESIGN**

1. The Speakers shall be distributed in the entire floor and shall be configured in different zones. The announcement can be made in zone wise or to all the speakers simultaneously in ALL CALL mode. Fire Alarm shall be announced immediately on receipt of Fire signal from the panel to all zones.

GLOSSARY OF TERMS

3) **AMPLIFIERS**

1. All amplifiers shall be mixing type for combining speech and music.
2. The power amplifiers shall have adequate continuous (RMS) power output to meet the requirement of the configuration.
3. The unit shall be capable of delivering the rated output watts with less than 0.05% harmonic distortion in the design bandwidth.
4. The amplifier shall have a broad band frequency response of 20 Hz to 20 KHz.

5. The output voltage and impedance shall meet with the system requirements.
6. Amplifiers shall be protected against over loads and output shorts and a special thermal overload on the heat sink.
7. The distributed audio amplifiers shall be magnetically coupled switch mode type with two input signal sources selectable manually or automatically by the fire alarm system.
8. Output wattage shall be as shown in the schedule of work or as required to meet the needs of the PA system.
9. Power as well as audio amplifiers shall be mounted in suitable wall mounted / floor standing enclosures.

4) SPEAKERS

1. Speakers shall be especially designed for broadcasting high quality, integrated emergency fire alarm signals and voice communications and approved by an appropriate authority for use in such situations.
2. Speakers shall be ceiling or Column mounted as shown in the schedule of work and shall be completed with mounting brackets accessories etc.
3. Speakers shall be in wooden or metal enclosures.
4. Speakers shall be of high efficiency yielding maximum output at minimum power across 200 – 12000 Hz frequency ranges.
5. Speakers shall have a line-matching transformer for direct connection to amplifiers with multiple taps.
6. Speakers shall be mounted in a rugged metal housing with vandal resistant grille if specified.
7. Speakers shall be interconnected in the zone configuration.

5) P A SYSTEM WIRING

1. PA system wiring shall be done with 2 X 0.75sq.mm cable in 19mm dia PVC conduit including termination complete as required.
2. The speakers in each zone are connected in parallel and are connected to the respective output.
3. The cables from each zone are separately routed and terminated in the Panel.

6) TESTING AND COMMISSIONING

1. Entire PA system shall be tested to establish the following.
 - a) Functionality of the PA system
 - b) Combined systems shall be tested for the overriding feature for prioritizing fire alarm and life safety requirements.

- c) Acceptable audibility of the public address in all spaces and record sound pressure levels of the Public address viz a viz the ambient noise levels.
- d) Noise level (Decible) output shall be measured and tested on site as per standards.

7) MODE OF MEASUREMENT

1. The quantities shall be measured in units as per boq items.

14 TECHNICAL SPECIFICATION FOR EXTERNAL LIGHTING

1) SCOPE :

1. The scope of work covers the supply, installation and testing of lighting poles, weather proof light fixtures, wiring to the fixtures, cable laying, earthing as specified and shown on drawings.

2) STANDARDS :

1. As per BOQ standard

3) LIGHT FIXTURES :

1. The light fixture construction shall be of IP 65 die cast aluminium with a separate compartment for integral ballast equipment. The reflector shall be anodized polished aluminium. The glass refractor shall be heat-resistant.
2. Lamp holder shall be of porcelain and shall comprise of a terminal block of non-hygroscopic material. The luminaries shall have integral ballast housed in water tight and dust tight metal cases. Ballast shall be pre-wired to the Lamp socket and terminal block, requiring only power supply leads to the ballast primary terminals.
3. The Lamp & Laminar shall generally follow the specification under section 'LIGHT FIXTURES'.

4) LIGHTING POLES : LIGHTING POLES FOR STREET LIGHTS /FLOOD LIGHTS SHALL BE SWAGED TYPE GI POLE CONSTRUCTION

1. The lighting poles shall be fabricated from heavy duty cold-rolled steel tubes to IS:1239-1958 and hot dip galvanized or painted as specified. The pole shall have a base plate, a large access panel, and necessary fixture mounting bracket at top. The access panel shall provide easy access to a multi-way porcelain connector and fuse board, to be mounted inside the pole. The access shall be specially fabricated with adequate reinforcement and weather gasket to prevent ingress of moisture and vandal proof. Poles shall have large diameter entries for incoming and outgoing cable and two earth studs. The pole fabrication shall conform to the drawings and where such drawing is not available, the contractor shall make such drawing and have it approved before fabrication.
2. The pole shall house a multi-way porcelain terminal block and re-wirable fuse as shown on the drawings. Pole shall have a concrete coping.

5) CABLE LAYING :

1. Cabling shall be generally as specified in the section 'CABLING'.
2. Cables shall be terminated in a 4-way terminal block inside the pole or attached therewith as shown on drawings.
3. Cable route shall be as shown on the drawings or the contractor shall mark out the route and lay the cables only upon approval of the route.

6) EARTHING :

1. All street lights fixtures and poles shall be earthed as specified under section 'EARTHING'.

7) MODE OF MEASUREMENT :

1. Each light fitting with lamp, control gear, earthing etc. shall be considered as one unit for measurement and payment.
2. Each lighting pole, concrete coping, base plate earthing etc. shall be considered as one unit for measurement and payment.
3. All cabling work shall be measured on the basis of unit length and the cost shall include, cost of cable ,cable termination in junction boxes or pole terminal box etc.

17 TECHNICAL SPECIFICATION FOR MISCELLANEOUS ITEMS

1) SHOCK TREATMENT CHART:

Providing printed instruction shock treatment chart both in English and Gujarati duly framed and laminated.

2) HAND GLOVES:

Providing pair of rubber hand gloves suitable for working on 11 KV/22 KV supply.

3) RUBBER MAT:

Supplying 6.00 mm thick rubber mat for L.T of required length and breadth.

4) FIRST AID BOX:

Supplying standard first aid box with all the standard contents.

5) FIRE BUCKET:

Supplying FIRE bucket round bottom of 9 litres capacity made out of 24 guage G.I. sheet with extra handle at bottom duly painted white inside and Red out side with FIRE mark, filled with dry-sand and kept on existing stand provided or hung on wall hook /stand.

6) STAND:

Supplying and erecting floor mounting stand for keeping four nos. of FIRE buckets comprising 1500 mm in length, 900 mm height frame made out of 30mm X30 mm X 4 mm angle iron with cross supports for legs, welded with 4 hooks and duly painted with one coat

7) FIRE EXTINGUISHER:

Supplying & erecting carbon dioxide (CO2) fire extinguisher user of following capacity with necessary clamps made from 50 x 6 mm M.S. Flat with nut & bolts grouted in wall complete. For 4.5 Kg Capacity.

List of Approved Make for Electrical Materials

1	PVC pipe MMS type and accessories	NIHIR / PRECISION ELECTRIC / POLYCAB/ VRAJ / BBC / BEC
2	HDPE Flexible pipe (ISI)	JAIN / DUTRON
3	DWC Pipes (Anti Rodent Type only)	DUTRON/REX/GEMINI/DURALINE
4	UPVC Trunking	MK / LEGRAND /OBO
5	Back Box for above UPVC Trunking	MK / LEGRAND /OBO
6	Weather proof Junction Boxes	Gewiss/ Hensel / Spelsberg
7	Modular Switches and Accessories	HONEYWELL / LEGRAND / SCHNEIDER /ABB/ ANCHOR PANASONIC
8	Cu flexible wires FRLS / Round Flexible cu cable	KEI wire & cable/RR KABEL FINOLEX/POLYCAB/ HAVELLS
9	XLPE- Cable 1.1KV as per IS 1554 / HT cable	KEI wire & cable/RR KABEL FINOLEX/POLYCAB/ HAVELLS
10	H.T. Cable Joint Kit	RAYCHEM, 3M
11	GLANDS (Brass compression type, Heavy duty)	HMI (ISI MARKED)/ COMET/DOWELL'S/ALCON
12	Cable Lugs	Dowells / 3-D / Raychem
13	PVC Tape	Steel grip / Anchor
14	MCBs , MCBDBs and Contactor	SCHNEIDER-Act-9 / ABB / Legrand-DX3 / Lauritz Knudsen(L&T)/ HAGER
15	MCCB TM / Microprocessor based	SCHNEIDER –Easy pact / ABB / Legrand-DX3 / Lauritz Knudsen(L&T) / HAGER
16	Panel Fabricators CPRI approved	Shivshakti Engineers / Swati switchgear / Patel Brothers / Active Engineers
17	Digital Meters and Load Manager	Rushabh / L & T / Conserve/ Schneider/ Trinity/ Multi span
18	AMETER / Voltmeter Digital	ELMEASURE / CONSERVE/ IMP / TRINITY/ Multi Span
19	Selector Switch, Push button	KAYCEE / C & S / L & T / TEKNIC,
20	LED Indication Lamps	AE / C & S / VAISHNOV / VINAY LED
21	CURRENT TRANSFORMERS	AE / KAPPA / MECO / PRAGATI / UNIVERSAL
22	Digital TIMER	THEBEN / LEGRAND/ Indo-ASIAN /Multi Span
23	POWER CONTACTORS	L & T / SIEMENS / Schneider/Legrand
24	APFC Relay	Conserve/ Secure /Ducati /Schneider / Multi Span
25	Capacitors MPP can type/APP Box type	L & T / Epcos / Neptune / Subodhan
26	Surge Protection Device	ABB / Schneider / Legrand / Multi Span
27	Chemical Earthing	AXIS / ABB
28	Light Fixtures LED	Philips / Crompton / Bajaj / LT / KESELEC
59	Ceiling / Exhaust fans / BLDC Ceiling fans/ HVLS FAN	Crompton / Havells / Usha / Bajaj / ORIENT
30	GRP Poles	Sumip / Satyam composite / Bajaj / Reytek / RR Ispat / KESELEC /Creative composite
31	Submersible pump vertical/ Horizontal	Kirloskar /KSB / KALAMA /AMRUT /PRIMA

32	PUMPS	KIRLOSKAR / CG / KSB / JYOTI
33	Water cooler / Water purifier	USHA / Blue star / Voltas / Eureka Forbes
34	DELETED	
35	Water Level controller	OCLEG / GELCO
36	CABLE TRAYS	Indianaa /MM Engineering, Labh Engineers, Rushabh
37	PVC PIPE 6 Kg/ sqcms	Astral / Prince / Dutron
38	Batteries	Exide/ AMCO / PRESTOLITE
39	UPS	APC / NUMERIC / SOCOMEC/ EATON
40	DRAIN PIPE / PVC PIPE	FINOLEX/ SUPREME/ASTRAL
41	COPPER PIPE	RAJCO/MANDEV/TOTALLINE/HARIOM/Mexflow
42	DELETED	
43	NITRILE RUBBER Class O	ARAMAFLEX/ AEROFLEX / KFLEX/HIRA
44	INSULATION PROTETIVE COATING	PIDILITE/ FOSTER/CHILDER/MIRACLE
45	Expanded Polystyrene	Beardsell / Cooline /Shrushi /LLOYD
46	SPLIT HI WALL	OGENERAL / Mitsubishi Electrical / Mitsubishi HEAVY

47	Interior Emulsion Paint (Premium)	Asian Paints / Berger Paints / Nerolac Paints / Dulux Paints
48	Exterior Acrylic Paint	Asian Paints / Berger / Nerolac / Dulux
49	Cement Primer & Putty	Birla White / JK Cement Wall Putty / Asian Paints / Berger
50	Gypsum Plaster Board (12.5 mm)	Saint-Gobain Gyproc / USG Boral / Armstrong
51	GI Framework for Gypsum Ceiling	Gyproc / USG Boral / Armstrong / Ultraframe
52	Mineral Fibre Ceiling Tiles	Armstrong / Saint-Gobain / USG Boral / Everest
53	Calcium Silicate Boards	Hilux / Everest / Aerolite / Ramco
54	MDF Board	Greenpanel / CenturyPly / Action TESA / Rushil Decor
55	HDHMR Board	Action TESA / CenturyPly / Greenpanel / Rushil
56	Commercial Plywood	CenturyPly / Greenply / Kitply / National
57	BWR/BWP Marine Plywood	CenturyPly / Greenply / Kitply / Austin
58	Particle Board	Greenpanel / Action TESA / CenturyPly / Merino
59	Decorative Laminates	Merino / Greenlam / Century Laminates / Royale Touche / Rotolam

60	Veneer Sheets	Century Veneers / Greenlam / Durian / Duro
61	Edge Band Tape	Rehau / Dolken / Merino / Greenlam
62	Modular Workstation System	Godrej Interio / Featherlite / Durian / Wipro Furniture
63	Office Working Desk	Godrej Interio / Featherlite / Durian / Wipro Furniture/ Balas
64	Executive Tables & Storage	Godrej Interio / Featherlite / Durian / Spacewood/ aq2b2bbbb22 n
65	Office Chairs	Godrej Interio / Featherlite / Wipro Furniture / Durian
66	Solid Surface (Corian Type)	DuPont Corian / LG HI-MACS / Staron / Krion
67	SPC Flooring	Responsive Industries / Welspun Flooring / Action TESA SPC
68	Vinyl Flooring	Tarkett / Gerflor / Armstrong / Responsive
69	Wooden Flooring	Pergo / Greenlam / Action TESA / Armstrong
70	Carpet Tiles	Interface / Milliken / Welspun Flooring / Armstrong
71	Glass (Float/Toughened)	Saint-Gobain / AIS Glass / Modi Guard
72	Aluminium Sections	Hindalco / Jindal Aluminium / Banco / Indal
73	Hardware (Hinges, Channels, Locks)	Hettich / Hafele / Ebco / Dorset
74	Door Closers & Floor Springs	Dorma / Ozone / Dorset / Hafele
75	Modular Kitchen Hardware	Hettich / Hafele / Ebco / Grass
76	Adhesives & Wood Glue	Fevicol / Henkel / Astral Adhesives
77	Silicone Sealant	Dow Corning / Wacker / Sika / Asian Paints SmartCare
78	Window Blinds	Vista / Mac / Hunter Douglas / Resha
79	Acoustic Panels	Armstrong / Saint-Gobain Ecophon / Anutone
80	Signage & ACP Panels	Aludecor / Alstrong / Virgo / Eurobond

"ANNEXURE – C"

The Banks shall be as per the Finance Department (AMC) Resolution No. 22 Dated 11-08-2011 as following:

- (A) Guarantee issued by following banks will be accepted as SD/EMD on permanent basis.
 - (1) All Nationalized Banks including the Public Sector Bank-IDBI LTDP
 - (2) Private Sector Banks authorized by RBI to undertake State Government Business (at present: AXIS Bank, ICICI Bank, HDFC Bank)
- (B) Guarantees issued by following Banks will be accepted as SD/EMD.
 - (1) Commercial Banks:
 - (1) Kotak Mahindra Bank
 - (2) Yes Bank
 - (3) IndusInd Bank.
 - (2) Regional Rural Banks of Gujarat
 - (1) Saurashtra Gramin Bank
 - (2) Baroda Gujarat Gramin Bank
 - (3) Dena Gujarat Gramin Bank
 - (3) Co-Operative Banks of Gujarat
 - (1) The Kalupur Commercial Co-Operative Bank Ltd.
 - (2) Rajkot Nagarik Sahakari Bank Ltd.
 - (3) The Ahmedabad Mercantile Co-Operative Bank Ltd.
 - (4) The Mehsana Urban Co-Operative Bank Ltd.

The branches of above banks from Ahmedabad and Gandhinagar shall be Valid. If the bank guarantee is issued from the branch other than Ahmedabad City, it shall clearly mention that the financial and other responsibilities shall be of Ahmedabad City Branch.(Mention the Branch).

Signature of Contractor

Date

Note Contractor will be bidding to perform & follow " Form B1 " used in AMC