# TENDER DOCUMENT

# FOR

# UPGRADATION & REVAMP of HT & LT ELECTRIFICATION AT EXISTING OLD BUILDINGS AT MDI GURGAON

**REF.NO. MDI/Estate/Electrical/2024 dated 27 Sept. 2024**


**Management Development Institute Gurgaon**
Mehrauli Road, Sukhrali,
Gurgaon-122007
Ph: +91-124-4560000,
Fax:=91-124-4560005 www.mdi.ac.in

## SECTION - A

## NOTICE INVITING TENDER

## FOR

# UPGRADATION & REVAMP of HT & LT ELECTRIFICATION

# AT EXISTING OLD BUILDINGS AT MDI GURGAON

Management Development Institute (MDI) Gurgaon, (hereinafter referred to as the "**Institute**") established in 1972, is a top-ranking business school in India with the vision to be a 'Global Business School', a center of excellence in management education, high-quality research, executive management development programs, and value-added consultancy. The institute integrates knowledge, research, industry experience, and international exposure to offer comprehensive programs. The Postgraduate programs in Management offered by MDI are recognized and accredited by the All-India Council for Technical Education (AICTE).

The Institute invites proposals from interested eligible, reputed, and well-established Electrical Contractors cum renovation agencies who have adequate experience in "**Electrical HT/LT Distribution Upgradation work"** for existing OLD Buildings at MDI, Gurgaon.

The Institute invites bids from the interested eligible and reputed vendors in "**Two Bid System**" consisting of "**Technical Bid" and "Financial Bid"** as mentioned hereunder, strictly in the format attached, for engaging "**UPGRADATION & REVAMP of HT & LT ELECTRIFICATION AT EXISTING OLD BUILDINGS AT MDI GURGAON".** Interested eligible bidders may submit bids in two separate envelopes duly super-scribed as "**Technical Bid"** and "**Financial Bid".** Both these bids in two separate envelopes duly super-scribed "**UPGRADATION & REVAMP of HT & LT ELECTRIFICATION AT EXISTING OLD BUILDINGS AT MDI GURGAON".**

The Tender can be downloaded from MDI Gurgaon website: https://www.mdi.ac.in before 18 October 2024 up to 3 p.m. and the same is duly filled along with enclosures be submitted in physical form, addressed to Chief Administrative Officer (Institutional Services), Management Development Institute Mehrauli Road, Sukhrali, Gurgaon -122007 (Haryana) through speed post /by hand only, latest by 18 October 2024 up to 3 PM. The Tender may be dropped in the Tender Box placed at the Estate Department Office at Takshashila building before the last date and time.

Any bid received after the last date and time for bid submission will not be accepted and summarily rejected.

The prospective Bidders are advised to read the entire tender document carefully and satisfy themselves about the work and site condition by visiting the MDI Campus (Estate office) on any working day between 10 a.m. and 5 p.m. before submitting their bid (nothing is payable for visiting the MDI campus in this regard).

## SECTION - B

## IMPORTANT INFORMATION RELATED TO TENDER

There are two stages of the selection process –

**Stage I** – Technical Qualification
**Stage II** – Only Technically qualified Agencies, Financial Bids will be Opened. The bidder has to visit the site visit before Bidding to evaluate and understand the Scope of work. It may please be noted that the "Final selection of the agency (ies) for issue of Letter of Award shall be on completion of Stage II" only.

The following are the important information for the participating agencies: -

| Sl. No. | Information | Details |
|---|---|---|
| 1 | Work Requirement | **Upgradation & Revamp of HT & LT Electrification of existing old building at MDI Gurgaon** |
| 2 | EMD (interest-free) | **Rs 2,50,000/- submitted in the form of Demand Draft in favour of "Management Development Institute Society", payable at Gurgaon**. |
| 3 | SECURITY DEPOSIT | **5% of the Total Final bill (inclusive of the EMD) to be deducted from each progressive bill. The SD shall be retained for a period of one years after the date of completion & acceptance of works by client** |
| 4 | Date of Publishing of Tender | 27 September 2024 |
| 5 | Pre-submission of proposals meeting of participating agencies at MDI Gurgaon. | 08 Oct 2024 at 11 A.M. |
| 6 | Date and Time of closing of proposals | 18 October 2024, up to 3 P.M. |
| 7 | Period of work completion | 180 days from the date of issue of Letter of Award (LOA) |

**SUBMISSION OF TENDER:**

The Tender document can be downloaded from MDI Gurgaon website https://www.mdi.ac.in/tenders.

The duly filled bid in original along with all requisite documents enclosed, duly signed by the authorized person, official stamp on each page should be sealed in an envelope and submitted in the TENDER Box placed at Estate Department, MDI Gurgaon on or before 18 October 2024 up to 3 p.m. through Speed Post/By hand only. Bids received through e-mail/online will not be considered and summarily rejected. Agencies should read the document carefully before submission of quotation documents at MDI Gurgaon.

The participating agency may please note that MDI Gurgaon at its discretion may cancel any/ all proposals received without assigning any reason, at any point of time.

Bids received without Earnest Money Deposit and/or confirming the validity of bid for 180 days shall not be considered under any circumstances. The earnest money to unsuccessful bidders shall be refunded after award is finalized. The earnest money of successful bidder shall be retained till such time bidder deposits the security amount.

Besides the Earnest Money & Validity offer, this Bid shall also contain all Technical, Commercial, and other terms and conditions. The following documents duly filled in, must also accompany the Tender Bid Part-1.

## ENCLOSURE:

**SECTION-1-GENERAL CONDITIONS**
**SECTION- 2- SPECIAL CONDITIONS**
**SECTION- 3-ELECTRICAL GENERAL CONDITION**
**SECTION- 4- TECHNICAL SPECIFICATION**
**SECTION-5- BILL OF QUANTITY (BOQ) – PART 1/2/3**
**SECTION-06- FIANACIAL BID**

**NOTES:**

1. **Bidder shall visit the site to understand the work and to get the first-hand information.**
2. **This BOQ is to be read in conjunction with technical specifications and Single Line Diagram (attached for reference). If any discrepancy occurs that should be brought to the notice of institute before quoting the price.**
3. **The Bidder must have experience of Upgradation & Revamping of an Infra Complex.**
4. **Bidder shall submit company profile with work experience, which shall clearly mention financial and technical capabilities.**

## BRIEF DESCRIPTION OF WORK:

**This work essentially comprises the following:**

**PART-1; Developing and Upgrading the Existing Electrical HT Distribution System**

**PART-2; Upgradation of Electrical Internal Distribution system of existing Old Buildings**

**PART-3: Upgradation of Existing Street Light System**

Agencies should read the document carefully before submission of quotation documents at MDI Gurgaon. The participating agency may please note that MDI Gurgaon at its discretion may cancel any/ all proposals received without assigning any reason, at any point of time.

| Sr. No. | Existing Building for Electrical Upgradation | Experience of Agencies to participate |
|---|---|---|
| 1. | ELECTRICAL HT/LT Distribution Upgradation work of existing OLD Buildings at MDI, Gurgaon | Electrical Contactor having adequate experience for the Upgradation & Remodeling of Electrical HT/LT System of Existing Old buildings like Institution /Hospital /hotels / Mall /Township or any infra work should submit the proposal. |

NOTE: Please note that the Upgradation & Remodeling of Electrical HT/LT Distribution is required to have reliable & sustainable Electrification of existing Old Buildings. It is planned to start the work after issuing of LOI and to complete it as per the prescribed timeline, with minimum disruption of occupancy in the buildings.

### 1. Eligibility Criteria:

Bidding Agencies who fulfill the following criteria shall be eligible for submitting their proposals. Joint ventures/Consortium agencies are not allowed to participate and their proposals will not be accepted.

2.0 Should be a regular profit-making agency.

2.1 The Tender will not be considered if the bidder does not possess a valid 11KV/ `A GRADE' Electrical Contractor's license issued by a competent authority with a validity of minimum of 12 months from the date of issue of the Work Order.

2.2 Should have satisfactorily completed similar Upgradation /remodeling of Electrical HT/LT distribution Electrification works during the period from 01 April 2019 to 31 March 2024 as per details mentioned below. For this purpose, cost of work shall mean gross value of the completed work including cost.

Three similar completed works each of value not less than Rs.1 Crores

OR

Two similar completed works each of value not less than Rs.1.50 Crores.

OR

One similar completed work of value not less than Rs.3 Crores.

**"Similar Work" shall mean:**

a) Work/s comprising of Upgradation & Remodeling of Electrical HT/LT System of Existing Old buildings like Institution/Hospital /Hotel/ Mall/Township or any infra work

b) At least one completed similar work should have a minimum of One lacs Sq. foot covered area

c) Should have an Average Annual Financial turnover of Rs.5 Crores and above in respect of Electrification of HT/LT Distribution system of existing Old Buildings completed during financial years starting 01 April 2019 to 31 March 2024 (excluding COVID years 2019-20 and 2020-21). The financial details duly audited by Chartered Accountants Firm should be submitted. Year(s) in which if there is no turnover shown will also be taken for calculation of average Annual Financial turnover.

## 2. Documents to be submitted in support of eligibility and Qualification:

Bidding Agency should submit the following documents with the proposal: -

a) Self-attested copy of the Certificate of Registration / Incorporation in respect of the applicant organization.

b) Self-Attested copies of Telephone bill/Electricity Bill/Registered Lease Deed indicating the address evidencing its location in Delhi/NCR for last two years.

c) Self-attested copies of all valid and applicable ELECTRICAL licenses for running the business.

d) Self-attested copies of the GST registration certificate, and PAN registration.

e) Statement of Annual Turn Over in respect of Electrical Contractor works completed during financial years starting 01 April 2019 to 31 March 2024 (excluding COVID years 2019-20 and 2020-21) in support of eligibility criteria mentioned above as per Annexure III. Also, please enclose a Certificate for the same from a registered practicing Chartered Accountant as per Annexure III. Year(s) in which if there is no turnover shown will also be taken for calculation of Average Annual Financial turnover.

f) Work Experience proof documents i.e. Work Orders and successful completion certificates) issued by the competent authorities of the organizations served on the organizations' letterhead during the period 01 April 2019 to 31 March 24 as per Annexure II.

g) Tender document duly signed and official stamp on all the pages to be submitted in original.

**EARNEST MONEY Deposit (EMD):** The bidder will have to deposit the specified amount in the form of a **Demand Draft in favour of "Management Development Institute Society", payable at Gurgaon** at the time of submission of tender as Earnest Money. No interest shall be paid on the earnest money. The earnest money of unsuccessful tenderers will be refunded without any interest soon after the decision to award the work is taken or after the expiry of the validity period of the tender.

**RETENTION MONEY:** Apart from the Initial security Deposit made above, retention money shall be deducted from the progressive running bills @ 30% (Thirty percent) of the Gross value of each running bill (Amount payable is 70%). Out of this 25% of the total running bills will be paid after successful commissioning of the project. 5% of the total running bills will be paid after twelve months after commissioning

**Total retention money will be 5 % of the final bill and will be kept for 0ne Year i.e. up to Defect Liability Period.**

**TOTAL SECURITY DEPOSIT:** The Total Security Deposit amount will be refunded to the bidder 14 days after the end of the defect's liability period provided, he has satisfactorily carried out all the work and attended to all defects by the condition of the contract. No interest is allowed on retention money. In place of the Total Security Deposit, a Bank Guarantee from the Bank for the period of defects liability is also accepted.

3. **Validity of the Proposal**: The validity period of the proposal will be 180 days from the last date of submission of bid documents at MDI Gurgaon. A proposal valid for a shorter period may be rejected as non-responsive.

4. **Preparation and Submission of Quotations:**

   a) All entries in the proposal should be legible and filled clearly.

   b) The proposal should be typewritten in English and any corrections and interlineations in the quotation should be attested with full signature by the Agency, failing which the quotation will be treated as ineligible. No overwriting will be accepted.

   c) All documents/papers should be numbered, signed, and officially stamped by the Agency on each page.

5. **Bids should be submitted in sealed envelope duly superscribed" UPGRADATION & REVAMP OF HT/LT ELECTRIFICATION at existing OLD Buildings at MDI, Gurgaon."**

6. **Proposal Submission**

   Sealed bids should be addressed and submitted along with requisite documents to Chief Administrative Officer (Institutional Services), Management Development Institute Gurgaon, Mehrauli Road, Sukhrali, Gurgaon-122007 Haryana on or before 18 October 2024 by 3 p.m. through Speed Post/by Hand only. Any proposal received online shall be rejected.

7. **Late Proposals received:** Quotations submitted or received after the closing date and time will not be considered at all. The Agencies shall ensure that timelines are adhered to and any quotations received later than the specified time and date shall not be entertained.

## PREAMBLE:

1. All items of Supply under this Contract shall be executed strictly to fulfill the requirements laid down under "Scope" in the specification and BOQ. Type of equipment, material specification, methods of installation and testing, and type of control shall be in accordance with the specifications, approved shop drawings, and the relevant Indian Standards, however capacity of each component and their quantities shall be such as to fulfill the above-mentioned requirement.
2. The rate for each item of work included in the Schedule of Quantities shall, unless expressly stated otherwise, include cost of:
    a. All materials, accessories, essential spares, and tools to operate equipment
    b. Loading, transporting, unloading, handling/double handling, hoisting to all levels.
    c. Necessary checking and supervision at the time of commissioning.
    d. Liabilities, obligations, and risks arising out of Conditions of Contract.
    e. All requirements of Specifications, whether such requirements are mentioned in the item or not. The Specifications and Drawings where available, are to be read as complimentary to and part of the Schedule of Quantities and any work called for in one shall be taken as required for all.
    f. In the event of a conflict between the Schedule of Quantities and other documents including the Specifications, the most stringent shall apply. The interpretation of the institute Engineer-in-Charge shall be final and binding.

3. The bidder shall visit the site and shall satisfy himself as to the conditions under which the work is to be performed. He shall also check and ascertain the location of the existing structure or equipment or any other situation which may affect the work. No extra claim as a consequence of ignorance or on grounds of insufficient description will be allowed at a later date.
4. All equipment and materials shall be IS-approved.
5. All approvals shall be obtained from the institute Engineer-in-Charge.
6. All equipment and material shall be inspected at the manufacturer's works as per relevant IS by the Engineer-in-Charge or his representative before dispatch to site.
7. All vendor drawings shall be approved by the institute Engineer-in-Charge before fabrication work starts.

8. All Testing and Commissioning shall be as per relevant IS for equipment and IS: 732:1989 for the installation. All these testing records are to be maintained and submitted to institute engineer.
9. No alteration whatsoever is to be made to the text or quantities of this Schedule unless such alteration is authorized in writing by institute engineer. Any such alterations, notes, or additions shall, unless authorized in writing, be disregarded when tender documents are considered.
10. In the event of an error occurring in the amount of the Schedule, as a result of wrong extension of the unit rate and quantity, the unit rate quoted by the tenderer shall be regarded as firm and the extensions shall be amended on the basis of rates.
11. Any error in totaling in the amount column and in carrying forward total shall be corrected. Any error, in description or in quantity, omission of items from this Schedule shall not vitiate this Contract but shall be corrected and deemed to be variation required by the institute Engineer-in-Charge.

    The unit rate for all local equipment or materials (not being procured against duty benefit) in Indian Rupees shall include cost of equipment and materials including all taxes and duties and also including forwarding, freight, insurance, and transport into Contractor's store at site, storage, installation, testing, balancing, commissioning and other works required.

Chief Engineer
Estate, MDI Gurgaon

# SECTION-1

# GENERAL CONDITIONS OF CONTRACT

# 1. GENERAL CONDITIONS OF CONTRACT

Except where provided for in the description of the individual items in the schedule of quantities and in the specifications and conditions laid down hereinafter and, in the Drawings, the work shall be carried out as per standard specifications and under the direction of the institute Engineer-in-Charge.

**1.1 DEFINITIONS / INTERPRETATIONS:**

- The `Contract' means the documents forming the tender and acceptance thereof and the agreement duly executed between the MDI Gurgaon (Institute) and the Contractor, together with the documents referred to therein including those conditions, the specifications, schedule of quantities, tender agreement, designs, drawings and instructions issued from time to time by the institute Engineer-in-Charge. All these documents taken together, shall be deemed to form one contract and shall be complementary to one another.
- In the contract, the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them: -
- The `Tenderer' or `Supplier' or `Contractor' shall mean the agency, firm or Company, undertaking the works and shall include the legal heirs/representatives of such individual or the partners composing firm and their legal heirs and successors, or companies authorized and constituted attorneys/agents and permitted assignees of such firm or company.
- The `Engineer-in-Charge' means the Institute Engineer who shall supervise and be in charge of the work or any other authorized representative or person specifically deputed by the Institute and/or the Consultant, as the case may be.
- `Contract Price' shall mean the final accepted rates in the Price Bid hereto.
- `Date of Contract' means the `Calendar date on which the MDI Gurgaon and Contractor have signed the Agreement on the Stamp Paper.
- "Accepting Authority" shall mean the authorized person deputed by the Director, MDI Gurgaon.
- 'Approval' wherever used in the specifications or schedule of Quantities shall mean, respectively, approved by or approval of the `Accepting Authority' in writing.
- 'Appellant Authority' shall mean Director, MDI Gurgaon. Who shall also be the authority to consider any extension of time or compensation as defined in clause hereunder?
- 'Notice in writing' or 'written notice' shall mean a notice in writing typed or printed characters delivered to or sent by registered post to the last known address, and shall be deemed to have been received when in the ordinary course of post it would have been delivered, and/or delivered personally, or otherwise proved to have been received.
- 'Virtual completion' shall mean that the work/installation is complete in all respects in the opinion of the Engineer-in-Charge and for which the completion/clearance certificate has been issued by the engineer-in-charge and is fit for usage.
- 'Drawings' shall mean all drawings and/or design drawings furnished by the contractor/sketches duly signed by the authorized Engineer-in-charge or the Consultant on behalf of the institute before commencement or during the progress of the work.
- 'Letter of Acceptance' shall mean an intimation by a letter issued by the Accepting Authority of the institute to tenderers that his tender has been accepted by the provisions in the said letter.
- "Defect Liability Period" shall mean One Year from the certified date of virtual completion issued by the Consultant/Engineer-in-charge and accepted by the institute.
- "Schedule of quantities" shall mean the schedule of quantities as specified and forming part of this

contract.

- "Priced Schedule of Quantities" shall mean the schedule of quantities duly priced with the accepted quoted rates of the contractor.
- "The work" shall mean the work or works to be executed or done under this contract.
- "Act of Insolvency" shall mean any act defined by the Presidency Towns Insolvency Act or in Provincial Insolvency Act or any amending statutes.

**1.2. SCOPE OF WORKS**

This work essentially comprises of the following:

**PART-1; Developing and Upgrading the existing ELECTRICAL HT Distribution System**

**PART-2; Upgradation of Electrical Internal Distribution system of existing Old Buildings**

**PART-3: Upgradation of Existing Street Light System**

**General Scope of Work:** Minor civil works as per the "drawings" and "schedule of quantities". It includes providing all the materials, wastage of material, labour, transport, tools & equipment, and management necessary for and incidental to the completion of the work. All work during its progress and upon completion shall conform to the lines, elevations, and grades as shown on the drawings furnished by the institute, Officers/Engineer-in charge. Should any detail essential for the efficient completion of the work be omitted from the drawings and specifications it shall be the responsibility of the contractor to inform the institute, Officers /Engineer-in charge so that upon completion of the work the same will be acceptable and ready for use.

If there are varying or conflicting provisions made in any one or more document(s) forming part of the contract, the Accepting Authority shall be the deciding authority about the intention of the document and his decision shall be final and binding on contractor.

Any error in description quantity or rate in Schedule of Quantities or any omission therefrom shall not vitiate the Contract or release the contractor from the execution of the whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the Contract.

Institute, Officers/Engineer-in charge or the authorized representative may in their absolute discretion issue further drawings and/or written instructions, details, directions & explanations which are, hereafter collectively referred to as "The Institute instructions" regarding:

a) The variation or modification of the design quality or quantity of works or the addition or omission or substitution of any work.
b) Any discrepancy in drawings or between the schedule of quantities and/or drawings and/or specifications.
c) The removal from the site of any defective material brought thereon by the contractor and substitution of any other material thereof.
d) The demolition, removal and re-execution of any work executed by the contractor/s.
e) The dismissal from the work of any persons employed thereupon.
f) The opening up for inspection of any work covered up.
g) The rectification and making good of any defects under clauses hereinafter mentioned and those arising during the defect liability period (retention period).

The contractor shall forthwith comply with and duly execute any work comprised under such instructions of Officers/Engineer in-charge or any other official authorized by the institute, provided

always that verbal instructions, directions, and explanations given to the contractor or his representative upon the works shall if involving a variation, be confirmed in writing to the contractor/s within seven days. No works for which rates are not specifically mentioned in the priced schedule of quantities shall be taken up without written permission of the above-mentioned institute officials. Rates of items not mentioned in the priced schedule of quantities shall be fixed by the institute as provided in clause "variation".

Regarding all factory-made products for which ISI marks are available, only products bearing ISI markings shall be used in the work.

Materials of approved make as prescribed in tender shall only be used and also colors to be as advised by the Officers/Engineer in-charge.

1. **TENDERER SHALL VISIT THE SITE**: The Tenderer shall visit the site and make himself thoroughly acquainted with the local site conditions, nature and requirements of the works, facilities of transport condition, effective labor and materials, access and storage for materials and removal of rubbish. Tenderer shall provide in their tender for the cost of carriage, freight and other charges for any special difficulties including the police restriction for transport etc. For proper execution of works as indicated in the drawings. The successful tenderer will not be entitled to any claim of compensation for difficulties faced or losses incurred on account of any site condition which existed before the commencement of the work or which in the opinion of the Officers/Engineer in-charge might be deemed to have reasonably been inferred to be so existing before commencement of work.
2. **TENDERS:** The entire set of tender papers issued to the tenderer should be submitted fully priced and also signed on the last page together with initials on every page. Initials/signatures will indicate the acceptance of the tender papers by the tenderer (Also see General Rules and instructions for the guidance of Tenderers).

**The schedule of quantities shall be filled as follows**

- The "Rate" column is to be legibly filled in ink in both English figures and English words.
- Amount column to be filled in for each item and the amount for each subhead as detailed in the schedule of quantities.
- All corrections are to be initialed.
- The "Rate" column for alternative items shall be filled up.
- The "Amount" column for alternative items of which the quantities are not mentioned shall not be filled up.
- In case of any errors/omissions in the quoted rates, the rates given in the tender marked "Original shall be taken as correct Rates.

No modifications, writings or corrections can be made in the tender papers by the tenderer, but he may at his option offer his comment modifications in a separate sheet of paper attached to the original papers.

The institute reserves the right to reject the lowest or any tender and also to discharge any or all of the tenders for each section or to split up and distribute any item of work to any specialist firm or firm, without assigning any reason.

The tenderers should note that the tender is strictly on an item rate basis and their attention is drawn to the fact that the rates for every item should be correct, workable and self-supporting. If called upon by the Officers/Engineer in-charge / Consultant, a detailed analysis of any or all the rates shall be

submitted. The Officers/Engineer in-charge / Consultant shall not be bound to recognize the contractor's analysis.

The works will be paid for as “measured work" based on actual work done and not as a "lump sum" contract unless otherwise specified.

All items of work described in the schedule of quantities are to be deemed and paid as complete works in all respects and details including preparatory and finishing works involved, directly, related to and reasonably detectable from the drawings, specifications schedule of quantities and no further extra charges will be allowed in this connection. In the case of lump-sum charges in the tender in respect of any item of work, the payment of such items of work will be made for the actual work done based on lump-sum charges as will be assessed to be payable by the Officers/Engineer in-charge. The Officers/Engineer in-charge has the power to add to, omit from any work as shown in the drawings or described in the specifications or included in the schedule of quantities and intimate the same in writing but no addition, omission or variation shall be made by the contractor without authorization from the Officers/Engineer in-charge. No variation shall vitiate the contract. Please also refer to Para 9 hereinafter.

3. **AGREEMENT:** The successful contractor, shall be required to sign the contract agreement, the performance of which is enclosed, and shall pay for all stamps and legal expenses, incidental thereto.

4. **PERMITS AND LICENSES:** Permits and licenses for the release of materials or its purchases which are under Government control will be arranged by the contractor. The Officers/Engineer in-charge will render necessary assistance and sign any forms or applications that may be necessary. It may be clearly understood that no compensation or additional charges can be claimed by the contractor for the non-availability of such materials in due time on this account or according to his requirements. The contractor may, however, be eligible for a proportionate extension of time on this account that in the opinion of the Institute is reasonable.

5. **GOVERNMENT AND LOCAL RULES**: The contractor shall conform to the provisions of all local by-laws and acts relating to the work and to the regulations etc. of the Government and Local Authorities. The contractor shall give all notices required by the said Act, Rules, Regulations and bylaws, etc. and shall indemnify the Institute against such liabilities and shall defend all actions arising from such claims or liabilities.

6. **TAXES AND DUTIES**: The tenderers must include in their tender prices quoted for all duties, cess and sales /GST /TDS tax, value added tax or any other taxes or local charges if applicable. No extra claim on this account will in any case be entertained. The contractor shall keep necessary books of accounts and other documents for this condition as may be necessary and shall allow inspection of the same by a duly authorized representative of the Institute and/or the Engineer-in-charge and further shall furnish such other information/document as the institute may require from time to time.

7. **QUANTITY OF WORK TO BE EXECUTED**: The quantities shown in the schedule of quantities are intended to cover the entire works as per the drawings/scope of work, and therefore the contractor is bound to complete the works at the same quoted rates in the event of quantity exceeding the specified bill of quantity, but the institute reserves the right to execute only a part or the whole or any excess thereof without assigning any reason therefore.

8. **OTHER PERSONS OR AGENCIES ENGAGED BY THE INSTITUTE**: The institute reserves the right to execute any part of the work included in this contract by other agencies or persons and the contractor shall allow reasonable facilities and use of his facilities for the execution of such work. The main contractor shall extend all cooperation in this regard.

9. **EARNEST MONEY, RETENTION MONEY:** The contractor will have to deposit the specified amount in the form of a Bank Draft drawn in favour of **"Management Development Institute Society"** at the time of submission of tender as Earnest Money. No interest shall be paid on the earnest money. The earnest money of unsuccessful tenderers will be refunded without any interest soon after the decision to award the work is taken or after the expiry of the validity period of the tender.

**Total retention money will be 5 % of the final bill and will be kept for 0ne Year ie. up to Defect Liability Period.**

The Total Security Deposit amount will be refunded to the contractor 14 days after the end of the defect's liability period provided, he has satisfactorily carried out all the work and attended to all defects by the condition of the contract. No interest is allowed on retention money. In place of the Total Security Deposit, a Bank Guarantee from the Bank for the period of defects liability is also accepted.

10. **CONTRACTOR TO PROVIDE EVERYTHING NECESSARY**: The contractor shall provide everything necessary except mentioned for the proper execution of the work according to the intent and meaning of the drawings, technical specifications, and schedule of quantities taken together whether the same may or may not be particularly shown or described therein provided that the same can be reasonably inferred therefrom, and if the contractor finds any discrepancies therein, he shall immediately and in writing, refer the same to the Institute, Officers/Engineer in-charge whose decision shall be final and binding.

The rates quoted against individual items will be inclusive of everything necessary to complete the said items of work within the contemplation of the contract, and beyond the unit price, no extra payment will be allowed for incidental or contingent work, labour and/or materials inclusive of all taxes and duties whatsoever except for specific items, if any, stipulated in the tender documents.

The contractor shall supply, fix, and maintain at his own cost, the execution of the work, all tools, tackles, machinery and equipment, and other required facilities for the execution of work including the safety aspects.

The institute on no account shall be responsible for the storage of materials or loss or pilferage or theft either in respect of the material stored or material already built and paid for by the institute.

The contractor shall at all times give access to other workers deployed at the institute, ensuring safety and security provisions all the time.

Any facilities available at the site shall be utilized only with prior permission of the Officers/Engineer in-charge and for such services utilized the institute is entitled to charge. No extra charges shall be paid over and above what has been quoted for any of the above or similar such services.

11. **TIME OF COMPLETION, EXTENSION OF TIME & PROGRESS CHART**:

i**). Time of Completion**: The entire work is to be completed in all respects within the stipulated period. The work shall be deemed to be commenced within 07 days from the date of the acceptance letter or date of handing over the site whichever is later. Time is the essence of the contract and shall be strictly observed by the contractor.

The work shall not be considered as complete until the Officers/Engineer in-charge / Consultant has certified in writing that the work has been virtually completed and the defect liability period shall commence from the date such certificate.

ii). **Extension of Time**: If in the opinion of the Officers/Engineer in-charge **a)** because of any exceptionally inclement weather, or **b)** by the works, or delay, of other contractors or tradesmen engaged or nominated by the institute and not referred to in the specification or **c)** because of authorized extra and additions or **d)** because of any combination of workmen or strikes or lockout affecting any of the building trades or **e)** from other causes which the institute may consider being beyond the control of the contractor, the institute after the time allowed for the contract shall make a fair and reasonable extension of time for completion in respect thereof. In the event of institute failing to give possession of the site upon the day specified above the time of completion shall be extended suitably.

In case of such strikes or lock-outs, as are referred to above, the contractor shall immediately give the institute, written notice thereof. Nevertheless, the contractor shall use his best endeavors that to prevent delay and shall do all that may be reasonably required to the satisfaction of the Officers/Engineer in-charge to proceed with the works and in his doing so that it will be ground of consideration by the institute for an extension of time as above provided.

The decision of the institute as to the period to be allowed for an extension of time for completion hereunder (which decision shall be final and binding on the contractor) shall be promulgated on completion of the work or after such events based on which the extension of time was sought by the contractor, and the institute shall then, in the event of an extension being granted, determine and declare the completion date. The provision in clause 12 concerning payment of liquidated damages shall in such case, be read and construed as if the extended date fixed by the institute were substituted for and the damage shall be deducted accordingly.

iii). **Progress of Work**: During the period of work, the contractor shall maintain proportionate progress based on a **program chart submitted by the contractor before the commencement of work**. The contractor should also include planning for procurement of scarce materials well in advance and reflect the same in a program chart so that there is no delay on the part of the contractor in the completion of the project.

**12. LIQUIDATED DAMAGES**: **Time is the essence of the contract**. Hence the contractor shall be aware that non-completion of the work will affect the MDI Gurgaon committed programs and thus the loss by way of delayed services/completion of related works etc. are valuable and cannot be easily quantified. Therefore, it is part of the agreed terms that in the event of any delay in the completion of the work, the MDI is liable to charge the contractor without the necessity of providing any details of such losses suffered by the MDI Gurgaon.

Hence if the work is not completed as per the contract terms or to the satisfaction of the MDI Gurgaon within the stipulated period, the contractor shall be bound to pay to the MDI Gurgaon a sum of amount calculated **at 1 (one) percent of the accepted contracted sum per week of delay subject to a ceiling of 10% of the accepted contract sum** by way of liquidated damages and not as penalty during which the work remains un-commenced or unfinished after the expiry of the completion date.

For this purpose, the term `Contract sum' shall be valued at the tender rates of the work as ordered/accepted.

Therefore, the contractor is required to maintain progress in terms of the contract to complete the work within the stipulated period.

13. **TOOLS, STORAGE OF MATERIALS, PROTECTIVE WORKS AND SITE OFFICE REQUIREMENTS:** The contractor shall provide, fix up and maintain his establishment in an approved position at the site and clear away on completion of the works and make good all works disturbed. The contractor shall not fix or place any placards or advertisement of any description or permit the same to be fixed or placed in or upon any hoarding, gantry, or, building structure other than those approved by the Institute.

**TOOLS**: All other instruments found necessary for the works shall be provided by the contractor for the due performance of the contract as instructed by the Officers/Engineer in-charge.

All suitable scaffolding, ladders and stools that may be required for the safe taking of the measurements shall be supplied by the contractor.

**STORAGE OF MATERIALS**: The contractors shall provide and maintain proper enclosures for the storage and adequate protection of materials, and tools in the space allocated for the purpose including their watch & ward arrangements shall be the responsibility of the contractor.

**PROTECTIVE MEASURES**: The contractor shall make suitable arrangements for watching and protecting the works and materials. The contractor shall indemnify the MDI Gurgaon against any possible damage to the building, roads and members of the public in the course of the execution of the work.

The contractor should cover in his rates for making provisions for all the above and reasonable facilities for the use of his scaffolding, tools plant etc., for their work.

14. **NOTICE AND PATENTS OF APPROPRIATE AUTHORITY**: The Contractor shall conform to the provisions of any Acts of the Legislature relating to the work, and to the regulations and bye-laws of any authorities, and or other Companies (Indian or International) and/or Statutory Authorities, with whose system and design or technical know-how are/were proposed to have connection with this work.

Also, the contractor shall before making any variations from the drawings or specifications that may be associated to so conform, give the Officers/Engineer in-charge / Consultant written notices specifying the variations proposed to be made and the reasons for making them and apply for instruction thereon. The Officers/Engineer in-charge/ Consultant on receipt of such intimation, shall give a decision within a reasonable time.

The contractor shall arrange to give all notices required for by the said Acts, regulations or Bye-laws to be given to any authority, and to pay to such authority or to any public officer all fees that may be properly chargeable in respect of the work and lodge the receipts with the Officers/Engineer in-charge.

The contractor shall indemnify the MDI Gurgaon against all claims in respect of patent rights, royalties, damages to buildings, roads, or members of the public in the course of execution of work and shall defend all actions arising from such claims and shall keep the MDI Gurgaon saved and harmless and indemnified in all respects from such actions, cost and expenses.

15. **CLEARING SITE AND SETTING OUT WORKS**: The site shall be cleared of all obstructions, waste materials, and rubbish of all kinds. All material damages at the site like on the walls, ceiling flooring or any other connected place/equipment, materials or installations shall be re-done to maintain originality and shall be leveled at the contractor's own cost.

The contractors shall set out the works and shall be responsible for the true and perfect setting out of the works and for the correctness of the positions, levels, dimensions and alignment of all parts thereof. If at any time, any error shall appear during the progress of any part of the work, the contractor shall at his own expense rectify such error, if called upon to the satisfaction of the MDI Gurgaon.

The contractor shall further set out the works to the alternative positions at the site until one is finally approved and the rates quoted in his tender should include this and no extra on this account will be entertained.

16. **CONTRACTOR IMMEDIATELY TO REMOVE ALL OFFENSIVE MATTERS**: All waste materials and other matters of any offensive nature shall be taken out once the works are completed. The contractor shall keep the site free from dangerous materials like industrial gases, welding machines, and any such devices or material of a toxic and poisonous nature & shall not carry within the site or building any explosive materials. Any such offensive materials which are essentially required in the course of work shall be undertaken with due written permission of the Officers/Engineer in-charge provided such materials are permissible under Law.

17. **ACCESS:** Any authorized representatives of the institute shall at all reasonable times have free access to the works and/or to the workshops factories or other places where materials or equipment are being fabricated or constructed for the work and also to any place where materials are lying or from where they are being obtained, and the contractor shall extend the necessary facility to the institute or their representatives for inspection examination and testing of the materials and workmanship.
Except the authorized representatives of the institute, no person shall be allowed at any time without the written permission of the institute**.**
The work shall be offered for inspection at every stage of the work and more specifically before painting, polishing, and lamination.

18. **MATERIALS, WORKMANSHIP, SAMPLES, TESTING OF MATERIALS:** All the works specified and provided for in the specifications or which may be required to be done to perform and complete any part thereof shall be executed in the best and most workmanlike manner with materials of the best and approved quality of the respective kinds by the particulars contained in and implied by the specifications and as represented by the drawings or according to such other additional particulars, and instructions as may from time to time be given by the institute during the execution of the work, and to his entire satisfaction.
If required by the institute the contractor shall have to carry out tests on materials and workmanship in approved material testing laboratories or as prescribed by the institute at his own cost to prove that the materials etc. under test conform to relevant I.S. standards or as specified in the specifications. The necessary charges for sample material, transporting, testing, etc. shall have to be borne by the contractor. No extra payment on this account should in any case be entertained.

All materials required for the full performance of the work under the contract must be provided through proper channels and must include duties, taxes octries, and other charges if any, and must be the best of their kind available and the contractor must be entirely responsible for proper and efficient carrying out of the works. Samples of all the materials to be used must be submitted to the Officers/Engineer in-charge / Consultant when so directed by the institute.

Should the work be suspended for any reason, the contractor shall take all precautions necessary for the protection of work and at his expense shall make good any damages arising from any of these causes.

19. **REMOVAL OF IMPROPER WORK:** The institute shall during the progress of the work have the power to order in writing from time to time the removal, from the work site within such reasonable time or times as may be specified in the order, of any materials which in the opinion of the Officers/Engineer in-charge are not by specification or instructions, the substitution or proper re-execution of any work executed with materials or workmanship not by drawings and specifications or instructions.

In case the contractor refuses to comply with the order the Officers/Engineer in-charge shall have the power to employ and pay other agencies to carry out the work and all expenses consequent thereon or incidental thereto as certified by the Officers/Engineer in-charge shall be borne by the contractor or may be deducted from any money due to or that may become due to the contractor.

No certificate which may be given by the MDI GURGAON shall relieve the contractor from his liability in respect of unsound work or bad materials.

20. **SAFETY PRECAUTIONS:** The contractor shall follow all necessary safety precautions concerning the work. All necessary safety equipment/gadgets shall be used by the workmen. The contractor shall comply and ensure the enforcement of rules and regulations relating to safety precautions. The arrangements made by the contractor shall be open for inspection by any statutory authorities.

21. **CONTRACTOR'S EMPLOYEES:** The contractor shall employ technically qualified and competent supervisors for the work who shall be available (By turn) throughout the work and shall participate during site meetings and be available to take and comply with instructions of the institute. The contractor shall employ in connection with the work persons having the appropriate skill or ability to perform their job efficiently. Any labors supplied by the contractor to be engaged in the work on a day-work basis either wholly or partly shall be deemed to be a person employed by the contractor.

**CHILD LABOUR:** No Laborers below the age of sixteen years and who are not Indian nationals shall be employed on the work.

**LABOUR LEGISLATION:** The contractor shall comply with the provisions of the payment of all legislation including the requirement of The Payment of Wages Act, 1936, Minimum Wages Act, 1948, Employer's Liability Act, 1938, Workmen's Compensation Act, 1923, Industrial Disputes Act, 1947, Maternity Benefits Act, 1961, and the Contract Labor (Regulation and Abolition) Act 1970, Apprentices act 1961, or the modifications thereof or any other laws relating thereto and the rules made there under from time to time.

The contractor shall keep the MDI Gurgaon saved harmless and indemnified against claims if any of the workmen and all costs and expenses as may be incurred by the institute in connection with any claim that may be made by any workmen.

The contractor shall arrange to provide first-aid treatment to the Labours engaged in the works. He shall within 24 hours of the occurrence of any accident at or about the site or in connection with execution of the works, report such accident to the Officers/Engineer in-charge/ Institute and also to the Competent Authority where such report is required by law.

The contractor shall indemnify and keep indemnified the MDI Gurgaon against payments to be made under and for the observance of the laws aforesaid and the Contractors' Labor Regulations. The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract.

**Compliance of Labour Regulations**: The Contractor shall at his own expense arrange for all the safety provisions for the safety of all workers and employees directly or indirectly employed on the work by the contractor.

The contractor shall be fully responsible for compliance at his own expense with all the labour regulations and rules to be observed by him. The Contractor shall fully indemnify the MDI Gurgaon against any action by the state and/or Central Government for any default or alleged default by the Contractor, or subcontractor of any of such rules and regulations. If, due to any default of the contractor or his sub-contractors, the MDI Gurgaon has to incur any expenditure for compliance with the rules and regulations or for any other reason connected with such default, the MDI Gurgaon shall be entitled to recover from the contractor all such expenditure in full from any payment due to the contractor.

22. **DISMISSAL OF WORKMEN:** The contractor shall on request of the MDI Gurgaon immediately dismiss from works any person employed thereon by him, who may in the opinion of the institute be unsuitable or incompetent or who may misconduct himself. Such discharge shall not be the basis of any claim for compensation or damages against the institute or any of their officer or employee.

23. **ASSIGNMENT:** The whole of the works included in the contract shall be executed by the contractor and the contractor shall not directly or indirectly transfer, assign or underlet the contract or any part, share or interest therein nor, change in constitution and no subletting shall relieve the contractor from the full and entire responsibility of the contract or active superintendence of the work during their progress.

24. **INJURY TO PERSONS AND PROPERTY DAMAGE-INSURANCE:** The Contractor shall be responsible for any/all injury to the work or workmen to persons, animals or things and for all damages to the structural and/or decorative part of the property which may arise from the operations or neglect of himself or his employees, whether such injury or damage arising from carelessness, accident or any other cause whatsoever in any way connected with the carrying out of this contract.

The clause shall be held to include inter-alia, any damages to buildings whether immediately adjacent or otherwise, and any damage to roads, streets, footpaths or ways as well as damages caused to the buildings and the works forming the subject of this contract by rain, wind or other inclemency of the weather.

The contractor shall indemnify the MDI Gurgaon and hold harmless in respect of all and any expenses arising from such injury or damages to persons or property as aforesaid and also in respect of any claim made in respect of injury or damage under any acts of compensation or damage consequent upon such claim.

The contractor shall reinstate all damage of every sort mentioned in this clause, to deliver the whole of the contract works complete and perfect in every respect and to make good or otherwise satisfy all claims for damages to the property or third parties.

The contractor shall affect the insurance necessary and indemnify the MDI Gurgaon entirely from all responsibility in this respect. The insurance must be placed with a company approved by the MDI Gurgaon and must be affected jointly in the name of the contractor and the MDI Gurgaon and the policy lodged with the latter. The scope of insurance is to include loss or damage to the work and workmen due to carelessness, accidents including fire, earthquake, floods, etc., and damage or loss to the contract itself till this is made over a complete state. Insurance is compulsory and must be affected from the very initial stage. The contractor shall also be responsible for anything which may be excluded from damage to any property arising out of incidents, negligence or defective carrying out of this contract.

The institute shall be at liberty and is hereby empowered to deduct the amount of any damages, compensations, costs, charges and expenses arising or occurring from or in respect of any such claim for damages from any sums due or to become due to the contractor.

The contractor shall insure the works and keep them insured until the virtual completion of the contract against loss or damages by fire and/or earthquake, or flood.

**25.** **ACCOUNTS RECEIPTS & VOUCHERS:** The contractor shall, upon the request of the Officers/Engineer in-charge furnish them with all the invoices, accounts, receipts and other vouchers that they may require in connection with the works under this contract. If the contractor shall use materials less than what is required under the contract, the value of the difference in the quantity of the materials that were required to be used and that use shall be deducted from his dues. The decision of the MDI Gurgaon shall be final and binding on the contractor as to the amount of materials the contractor is required to use for any work under this contract.

**26.** **MEASUREMENT:** Measurements of completed works shall be as per Bureau of Indian Standards Code IS- 1200 & its relevant parts.

Before taking any measurement of any work, the Officers/Engineer in-charge shall give reasonable notice to the Contractor. If the contractor fails to attend to the measurements after such notice or fails to countersign or to record the difference within a week from the date of measurement in the manner required by the Officers/Engineer in-charge then in any such event the measurements taken by the Officers/Engineer in-charge or by the subordinate deputed by him as the case may be is final and binding on the contractor and the contractor shall have no right to dispute the same.

The measurements particularly concealable in nature shall be jointly taken and recorded and such statement of measurement shall be enclosed along the bill or running bills.

The works will be paid for as “measured work" on an item rate basis i.e. On actual work done. All items of work described in the schedule of quantities are to be deemed and paid as complete works in all respects and details including preparatory and finishing works involved, directly, related to and reasonably detectable from the drawings, specifications and schedule of quantities and no further extra charges will be allowed in this connection. The work shall be strictly according to the design/dimensions given in the drawings. The payment will be restricted to the design dimensions and no payment will be made due to an increase in thickness/ depth/width. All the dismantling items shall be PREMEASURED and the APPROVAL of the Institute shall be sought before dismantling.

**27.** **VARIATION / DEVIATION**: The institute shall have the power to alter, omissions from, additions to or substitutions for the original specifications, drawings, designs, and instructions that may appear to him to be necessary or advisable during the progress of the work, and the contractor shall be bound to carry out the works by any instructions given to him in writing signed by the Officers/Engineer in-charge. Such alterations, omissions, additions or substitution shall form part of the contract as if originally provided therein, and any altered, additional or substituted work that the contractor may be directed to do in the manner specified above as part of the works, shall be carried out by the contractor on the same conditions in all respects including price on which he agreed to do the main work except as hereafter provided.

(a) No work that radically changes the original nature of the contract shall be ordered by the Institute as a deviation.

(b) The price of all such additional items / non-tendered items will be worked out based on rates quoted for similar items in the contract wherever existing or on engineering rate analysis based on the prevalent fair price of labour, material, and other components as required.

The tendered rates shall hold good for any increase or decrease in the tendered quantities up to a variation of 25% and as stipulated elsewhere for legitimate completion of works as per the original design or scope of work and on account of any modification or alteration suggested and where the variation is for the respective item is beyond 25%, the rate for the respective item may be reviewed on mutually agreed terms.

In the event of any deviation being ordered which in the opinion of the contractor changes the original nature of the Contract, he shall within fifteen days of having been so ordered bring this to the notice of the Officers/Engineer in-charge with the reasons but carry it out and the disagreement as to the nature of work and the rate to be paid therefore shall be resolved by Clause under the caption "SETTLEMENT OF DISPUTES AND ARBITRATION".

**28.** **SUBSTITUTION:** Should the contractor desire to substitute any materials and workmanship, he must obtain the approval of the Officers/Engineer in-charge in writing for any such substitution well in advance. In respect of Materials whose makes are not specified in the tender, specific approval of the Officers/Engineer in-charge has to be obtained in writing before their usage.

**29.** **PREPARATORY WORK FOR UTILIZATION OF THE FACILITY AFTER COMPLETION:** The whole of the work shall be thoroughly inspected by the contractor and deficiencies & defects, if any shall be set right. On completion of such inspection, the contractor shall inform the Officers/Engineer in-charge that they have completed the work and it is ready for inspection. On completion, the contractor shall clean the area and its surroundings, equipment etc. and will leave the entire area clean and ready for immediate usage to the satisfaction of the Officers/Engineer in-charge.

**30.** **CLEARING SITE ON COMPLETION:** On completion of the works the contractor shall clear away and remove from the site all construction materials, plant & equipments, tools, surplus materials, scraps, rubbish and temporary works of every kind and leave the whole of the site and the works clean and in a workmanlike condition to the satisfaction of the Officers/Engineer in-charge.

**31.** **DEFECT AFTER COMPLETION (defect liability period):** The contractor shall make good at his own cost and to the satisfaction of the institute all defects, or other faults which may appear within 12 months after completion of the work (defect liability period). In default, the institute may employ and pay other agencies or persons to amend and make good such damages, losses, and expenses consequent thereon or incidental thereto such expenses shall be made good and borne by the contractor and such damages, loss, and expenses shall be recoverable from the payment due to the contractor and in the event of the amount retained being insufficient, recover the balance from the contractor from the amount retained under Clause No 11 together with any expenses the institute may have incurred in connection therewith.

**32.** **CONCEALED WORKS:** The contractor shall give due notice to the Officers/Engineer in-charge wherever any work is to be buried or concealed in the building in the earth, flooring, walls or otherwise becoming inaccessible later on so that the work may be inspected and corrected dimensions or measurements taken before such burial. In default whereof the same shall, in the opinion of the Officers/Engineer in-charge / 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 matter which cannot be conveniently tested or checked, the notes of the Officers/Engineer in-charge shall be accepted as correct and binding on the contractor.

**33.** **ESCALATION:** The rate quoted shall be firm throughout the tenure of the contract (including the extension of time, if any is granted) and will not be subject to any fluctuation due to increases in the cost of materials, labour, sales tax, Octroi or any other reason.

**34.** **IDLE LABOUR:** Whatever the reasons may be, no claim for idle labor, additional establishment cost of

hire and labour charges of tools and plants would be entertained under any circumstances.

35. **SUSPENSION OF WORKS:** If the contractor except on account of any legal restraint upon the institute preventing the continuance of the work or in the opinion of the institute shall neglect or fail to proceed with due diligence in the performance of his part of the contract or if he shall more than once make default, the institute shall have the power to give notice in writing to the contractor requiring the work to be proceeded within a reasonable manner and with reasonable dispatch, such notice purport to be a notice under this clause.

    After such notice shall have been given the contractor shall not be at liberty to remove from the site of the works or from any ground contiguous thereto any plant or materials to subsist from the date of such notice being given until the notice shall have been complied with. If the contractor fails to start the work within seven days after such notice has been given to proceed with the works as therein prescribed, the Institute may proceed as provided in clause (Termination of Contract by MDI Gurgaon).

36. **TERMINATION OF CONTRACT BY MDI Gurgaon (Institute):** If the contractor being a company goes into liquidation whether voluntary or compulsory or being a firm shall be dissolved or being an individual shall be adjudicated insolvent or shall make an assignment or a composition for the benefit of the greater part, in number of amount of his creditors or shall enter into a Deed or arrangement with his creditors, or if the Official Assignee in insolvency, or the Receiver of the contractor in insolvency, shall repudiate the contract, or if a Receiver of the contractor's firm appointed by the court shall be unable, within fourteen days after notice to him requiring him to do so, to show to the reasonable satisfaction of the institute that he is able to carry out and fulfill the contract, and if so required by the institute to give reasonable security therefore, or if the contractor shall suffer execution to be issued, or shall suffer any payment under this contract to be attached by or on behalf of and of the creditors of the contractor, or shall assign, charge or encumber this contract or any payments due or which may become due to the contractor, there under, or shall neglect or fail to observe and perform all or any of the acts matters of things by this contract, to be observed and performed by the contractor within three clear days after the notice shall have been given to the contractor in manner hereinafter mentioned requiring the contractor to observe or perform the same or shall use improper materials or workmanship in carrying on the works, or shall in the opinion of the institute not exercise such due diligence and make such due progress as would enable the work to be completed within due time agreed upon, and shall fail to proceed to the satisfaction of the institute after three clear days' notice requiring the contractor so to do shall have been given to the contractor as hereinafter mentioned, or shall abandon the contract, then and in any of the said cases, the Bank may notwithstanding previous waiver determine the contract by a notice in writing to the effect as hereinafter mentioned, but without thereby effecting the powers of the institute of the obligations and liabilities of the contractor the whole of which shall continue in force as fully as if the contract, had not been so determined and as if the works subsequently executed had been executed by or on behalf of the contractor (without thereby creating any trust in favor of the contractor) further the institute or his agent, may enter upon and take possession of the work and all plants, tools, scaffolding, sheds, machinery, steam and other power, utensils and materials lying upon premises or the adjoining lands or roads and sell the same as his own property or may employ the same by means of his own servants and workmen in carrying on and completing the works or by employing any other contractors or other persons or person to complete the works, and the contractor shall not in any way interrupt or do any act, matter of thing to prevent or hinder such other contractors or other persons or person employed from completing and finishing or using the materials and plants for the works when the works shall be completed, or as soon thereafter as conveniently may be, the institute shall give notice in writing to the contractor to remove his surplus

materials and plants and should the contractor fail to do so within a period of 14 days after receipt by him the institute may sell the same by Public Auction and shall give credit to the contractor for the amount so realized. Any expenses or losses incurred by the institute in getting the works carried out by other contractors shall be adjusted against the amount payable to the contractor by way of selling his tools and plants or due on account of work carried out by the contractor before engaging other contractors or against the Security Deposit.

**37. SETTLEMENT OF DISPUTES AND ARBITRATION:** All disputes or differences of any kind whatsoever which shall at any time arise between the parties hereto touching or concerning the works or the execution or maintenance thereof of this contract or the rights touching or concerning the works or the execution of maintenance thereof of this contract or the construction remaining operation or effect thereof or to the rights or liabilities of the parties or arising out of or in relation thereto whether during or after determination foreclosure or breach of the contract (other than those in respect of which the decision of any person is by the contract expressed to be final and binding) shall after written notice by either party to the contract to the other of them and to the institute hereinafter mentioned be referred for adjudication to a sole Arbitrator to be appointed as hereinafter provided. To appoint the sole arbitrator referred to above, the institute will send within thirty days of receipt of the notice, to the contractor a panel of three names of persons who shall be presently unconnected with the organization for which the work is executed.

The contractor shall on receipt of the names as aforesaid, select any one of the person's name to be appointed as a sole Arbitrator and communicate his name to the institute within thirty days of receipt of the names. The institute shall thereupon without any delay appoint the said person as the sole Arbitrator. If the contractor fails to communicate such selection as provided above within the period specified, the competent authority shall make the selection and appoint the selected person as the Sole Arbitrator.

If the institute fails to send to the contractor, the panel of three names as previously mentioned within the period specified the contractor should send to the institute a panel of three names of persons who shall all be unconnected with either party. The institute shall on receipt of the name as previously mentioned select any one of the person's names and appoint him as the Sole Arbitrator. If the institute fails to select the person and appoint him as the Sole Arbitrator within thirty days of receipt of the panel and inform the contractor accordingly, the contractor shall be entitled to appoint one of the persons from the panel as the Sole Arbitrator and communicate his name to the institute.

If the Arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever another Sole Arbitrator shall be appointed as aforesaid. The work under the contract shall, however, continue during the arbitration proceedings and no payment due or payable to the contractor shall be withheld on account of such proceedings.

The arbitrator shall be deemed to have entered on the reference on the date he issued notice to both parties fixing the date of the first hearing. The arbitrator may from time to time with the consent of the parties enlarge the time for making and publishing the award.

The arbitrator shall give a separate award in respect of each dispute or difference referred to him. The arbitrator shall decide each dispute by the terms of the contract and give a reasoned award. The venue of arbitration shall be such place as may be fixed by the arbitrator in his sole discretion.

The fees, if any, of the arbitrator shall if required be paid before the award is made and published be paid half and half by each of the parties. The cost of the reference and the award including the fees,

if any, of the Arbitrator who may direct to and by whom and in what manner, such costs or any part thereof shall be paid and may fix or settle and amount of costs to be so paid.

The award of the arbitrator shall be final and binding on both parties.

Subject to aforesaid the provisions of the Indian Arbitration Act, 1992 or any statutory modification or re-enactment thereof and the rules made there under and for the time being in force shall apply to the arbitration proceeding under this clause.

The institute and the contractor hereby also agree that arbitration under the clause shall be a condition precedent to any right to action under the contract about the matters hereby expressly agreed to be so referred to arbitration.

**38. CO-ORDINATION OF WORKS:** The contractor shall execute the works in coordination with the other agencies involved in the works. The work site shall be neatly cleaned as and when necessary so that the works of other agencies can be carried out. Failure on the part of the contractor to clean the work site will empower the Institute to engage other agencies and recover the cost from the contractor.

**39. ELECTRICAL POWER, WATER AND TOILET FACILITIES:** The electrical power required for the works shall be supplied at one single point free of cost and the contractor shall make his arrangements to draw the same to the required work spots. The contractor shall engage a licensed electrician to carry out and maintain his electrical system. In case of power failure, the contractor at his own cost, has to make his arrangements by hiring or installing the DG set. The institute shall not entertain any charges for engaging the DG set. The work shall not be stopped on account of power failure. Further, no extension of time shall be permissible on account of the power failure. Water shall be provided free of cost at one point. A common toilet facility is available at the work site and the contractor shall maintain the same hygienically clean.

40. The work should be carried out with full coordination/cooperation of occupants without damaging any permanent structures or ELECTRICAL belonging to them. If any damage occurs, the cost of same will have to be reimbursed by the Contractor.

41. **THE WORK SHALL BE CARRIED OUT WITHOUT AFFECTING THE SMOOTH FUNCTIONING OF THE INSTITUTE.**

SIGNATURE OF BIDDER/ CONTRACTOR

## SECTION _-2

## SPECIAL TERMS & CONDITIONS

## 2. SPECIAL TERMS AND CONDITIONS

**BRIEF INSTRUCTION**

- The selection of the agencies will be purely based on the merit and fulfilling the eligibility criteria.
- MDI Gurgaon reserves the right to reject any or all the proposals received and change scope of work for bringing any improvement to the work without assigning any reason.
- MDI Gurgaon reserves the right to terminate the engagement of agencies for the work process at any stage without assigning any reason to the agencies.
- The participating agencies are requested to compulsorily visit the Institute and get acquainted themselves about the work requirements, specifications and existing building conditions, etc. before submitting the proposal.
- Any request regarding change of time of submission of proposal may not be considered.
- For making presentation/walk-through or attending the pre-submission of proposal meeting at MDI Gurgaon no payment will be made to the agency at any cost.
- The selected agency will be required for completion of the work within the period of work completion only

**2.1 Evaluation of Proposals (STAGE I):**

- The committee constituted by the competent authority of MDI Gurgaon shall evaluate the proposals received with reference to technical requirements and other criteria mentioned in the Tender Document. All eligibility conditions have to be satisfied on the date of submission of bid and not later.
- The bid of the agencies who submit their proposal in the proper format and technical eligibility qualify will be considered for financial evaluation. The bids of the non-conforming agencies shall be rejected without further evaluation.
- Any conditional bid received shall not be considered and will be summarily rejected in very first instance without any recourse to the agency and shall not be evaluated.
- MDI Gurgaon may seek such clarification/information/document as may be required for it to satisfy the eligibility of the bidding agencies. Failure on the part of the biding agency to submit such information within the stipulated time may entail cancellation of the bid of such agency. MDI Gurgaon Committee at its own discretion may visit any of the premises of the client(s) as per list provided by the agency and make quality assessment of the services provided, at its own expense.

2.2 **Examination of Bids and Determination of Responsiveness:** Prior to detailed evaluation of Bids, MDI will determine whether each Bid:-

(a) Meets the Minimum Eligibility Criteria defined as per clause

(b) Has been properly signed by an authorized signatory (accredited representative) holding Power of Attorney in his favour. The Power attorney shall initially include a provision to bind the Bidder to settlement of disputes clause;

(c) Is accompanied by the required Bid Security and cost of bid document.

(d) Undertaking in the Technical Bid that he has not incorporated any conditions in the Price Bid. A responsive Bid 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;

(e) Which affects in any substantial way the scope, quality or performance of the Works;

(f) Which limits in any substantial way, the Institute rights or the Bidder's obligations under the Contract; or

(g) Whose rectification would affect unfairly the competitive position of other Bidders presenting responsive Bids.

(h) Is responsive to the requirements of the Bidding documents.

(i) If a Bid is not substantially responsive, it shall be rejected by the Institute, and shall not subsequently be made responsive by correction or withdrawal of the non-conforming deviation or reservation.

2.3 **Correction of Errors:** Bids determined to be responsive will be checked by the institute for any arithmetic errors. Errors will be corrected by the institute.

The amount stated in the Bid will be adjusted by the institute in accordance with the above-stated procedure for the correction of errors and shall be considered as binding upon the bidder. If the Bidder does not accept the corrected amount, the Bid shall be rejected and the Bid security shall be forfeited in accordance.

**2.4 Evaluation and Comparison of Bids:** The institute will evaluate and compare only the Bids determined to be responsive in accordance with eligibility Clause of TENDER. In evaluating the Bids, the institute will determine for each Bid the evaluated Bid Price by adjusting the Bid Price as follows:

(a) Making any correction for errors pursuant.

(b) Making appropriate adjustments to reflect discounts or other price modifications offered.

**2.5 Alteration of tender documents:** No alteration shall be made in any of the tender documents or in the Bill of Quantities and the tender shall comply strictly with the terms and conditions of the tender document.

The institute may however ask any tenderer for clarifications of his tender if required. Nevertheless, no tenderer will be permitted to alter his tender price after opening of the tender.

**2.6 Alternative Conditions and Proposals:** The Tenderer shall note that alternative or qualifying tender conditions, or alternative design proposal for whole or part of the work will not be acceptable. Tenders containing any qualifying conditions or even Tenderer's clarifications in any form will be treated as non-responsive and will run the risk of rejection. Price Bid of such Tenderer's will not be opened.

**2.7 Award of Contract:** The institute will award the Contract to the bidder whose bid has been determined to be responsive to the bidding documents and who has offered the lowest evaluated bid price, provided that such bidder has been determined to be

(a) Eligible in accordance with the provisions of Clauses of Eligibility Criteria

(b) Qualified in accordance with the provisions of Clauses

**2.8 PAYMENTS:** All bills shall be prepared by the contractor in the form agreed or furnished by the institute based on the accepted measurements. The bills shall be in proper forms must be duly accompanied by detailed measurements in support of the quantities of the work done and must show deductions for all previous payments.

The institute will deduct retention money as described in under clause of payments of these conditions. The refund of retention money will be made as specified in the said clause.

All payments are subject to statutory deductions of Income Tax & its Surcharge, Sales tax deductions or any other statutory deductions as notified by the respective State/Central Government/Authority and any such instructions conveyed from time to time. From the interim bills, the retention money as detailed elsewhere in this tender shall also be deducted.

The final bill shall be submitted by the contractor within 1 (one) month from the date of completion of work or the date of certification of virtual completion certified by the institute. No further claims shall be made by the contractor after submission of the final bill.

The final bill shall be accompanied by a certificate of completion from the institute. Payments of the final bill shall be made after the deduction of all previous payments and Retention Money as specified in under payment clause of these conditions, which sum shall be refunded after the completion of the Defects Liability Period after receiving the institute certificate that the contractor has rectified all defects to the satisfaction of the institute. The acceptance of payment of the final bill by the contractor would indicate that he will have no further claim in respect of the work executed.

**2.9** **EMD (Earnest Money Deposit):** EMD shall be required to submit along with bid amounting Rs. 2,50,000/-, and is to be paid through a Demand Draft in favor of "Management Development Institute Society", payable at Gurgaon. The DD has to be attached with Technical BID without which the bid would not be considered valid. The EMD of the selected agency will be retained for a period of 6 months from the date of satisfactory Completion of work. The EMD of unsuccessful agencies shall be returned within 1 month.

**2.10** **PENALTY:** Since the Execution is meant for accommodating the Reliable and sustainable Electrification of existing Building and most importantly work is executed in the occupancy stage it will required that the selected agency complete the work strictly as per the stipulated time. If the execution of the project is delayed a penalty amount @ Rs. 1% PER WEEK and a maximum of 10% OF THE CONTRACT VALUE will be levied. Director, MDI Gurgaon may condone/ reduce the penalty amount at his discretion on valid grounds of the agency.

**2.11** **Award of Work:** MDI Gurgaon will award the work to the successful agency (ies) and issue "Letter of Award" that shall prescribe the terms of payment to the agency (ies) in consideration of the execution of work/services by the agency. Performance Security:

- Within not later than 15 days of receipt of the Letter of Acceptance, the Successful Bidder shall deliver to the institute a Performance Security in the form of Bank Guarantee (BG) for an amount equivalent to 5% of the Contract price rounded off to the nearest Rs. 1,000/- in the following forms;
- Banker's Cheque/Demand Draft/Pay Order from any Nationalized Bank / Scheduled Bank.
- An irrevocable Bank Guarantee (BG) enforceable and cashable at GURGAON, drawn from any Nationalized Bank / Scheduled Bank operating in India as per the performance.
- If the Performance Security is provided by the Successful Bidder in the form of a Bank Guarantee, it shall be issued by a Nationalized /Scheduled Indian bank having its branch in Gurgaon. The BG shall be issued in favor of "**. Management Development Institute Society".**

2.12 **Signing of Agreement:** The Successful Tenderer will be required to execute an Agreement at his expense within 15 (Fifteen days) days from the date of Letter of Acceptance / Work Order, on proper

value HARYANA State Stamp Paper in the prescribed form. The agreement as finally executed will include the Tender Documents and the Bidder's offer as finally accepted by the institute together with Addendum/ Corrigenda, bid clarification, and all correspondences exchanged between institute and the bidder, if any. Till the formal agreement is executed, the Letter of Acceptance together with the offer as finally accepted along with correspondence shall form a binding contract between the two parties.

The Contractor shall made three copies of the Agreement and submit to the Institute within 7 days following the date of signing of Agreement.

**2.13 SCHEDULE OF QUANTITIES:** The schedule of probable quantities in respect of the work along with specifications is enclosed with those terms and conditions. The schedule of quantities is liable to be revised for any omissions, deductions or additions at the discretion of the CLIENT. The rates quoted however shall remain unaltered for any changes in quantities / deletion of terms.

2.14 **STATUTORY APPROVALS:** The contractor shall be responsible for obtaining statutory approvals, if any, relating to the entire project from the start of project until completion of the project and handover of the same with all the compliances. Any official fees towards this shall be paid by the contractor and the same shall be reimbursed by the client upon production of documentary proof of payment. Other expenses, if any, shall be borne by the Contractor.

**2.15 LIAISON WORK:** The Contractor shall be responsible for all liaising work with Electricity Board, or any other Statutory Authority for expediting power connection and obtaining permits, certifications, etc. MDI Gurgaon shall only provide necessary paperwork and only reimburse/pay statutory fees, if any on submission of proof of payment.

**2.16 CIVIL WORK: All Civil Works Related to Electrical Works such as:**

- Earthing
- Cable Trench Routing.
- METER CUBICAL & VCB Yard Plinth & Foundation.
- Making of opening and closing inside/outside of the building.
- Digging, laying and road crossing including placing Hume pipes and manholes below the roads.
- PCC concreting wherever necessary.
- Any other civil works required for the completion of the electrical services are included in the electrical contractor's scope and all the other civil works, are also in the electrical contractor's scope.
- Client scope is limited to official paperwork & if required payment of deposits / any other statutory payments only. If at all, there are any other statutory requirements from the client's side to be complied to; they are required to be intimated by the bidder in writing along with the tender.
- The bidder needs to take into consideration above factors while submitting the tender.

**2.17 CONDITIONS OF CONTRACT:** The bidders shall go through all general and special conditions supplied along with the blank tender carefully before submitting the tender. Those shall form a part of the contract agreement.

## 2.18 COMMERCIAL TERMS & CONDITIONS

The bidder shall study the commercial terms and conditions specified in the tender and a written acceptance of all the terms and conditions needs to be furnished by him in this regard.

## 2.19 GENERAL GUIDELINES FOR CONTRACTORS.

- The contractor shall be responsible for ESI insurance for the labour/working persons on the project. All the insurances like ESI/PF/MEDICAL as per the labour department Acts and the project directory to be submitted to the client for any verification from any departmental person during execution & until the project completion. A workmen compensation policy must be obtained and a copy submitted, which is valid for the entire duration of works.
- All safety measures and accessories like helmets/jackets, gloves first aid box kit, as applicable need to be arranged & implemented by the contractor during the execution /completion of the project.
- Any accidental injuries to the workers deployed by the contractor at the site shall be the contractor's responsibility and need to be treated/compensated at their own cost.
- In case of any ambiguity in tender conditions/technical specifications, the decision/interpretation of IDRBT will be final and binding on all bidders.
- In case of suspension of works due to guidelines of various authorities from time to time, the contract period shall be extended by the period of suspension of works.
- All the As-built drawings, workshop drawings in coordination with other services & site conditions needs to be submitted to the client for the approval. All operating manuals guarantee/warrantee certificates including 3 sets of as-built drawings needs to be submitted.
- All pages of the tender document must be signed and stamped by the authorized representative of the Bidder.
- It is advisable that the bidders visit the site on the pre-bid meeting day and clarify all the queries they might have before they quote the tender. It shall be the responsibility of the bidder to get all clarifications obtained before submitting the tender. The submission of tender by a bidder shall be construed as the bidder is well aware of the scope of entire work and has quoted all rates keeping in mind all tangible payments shall be released as progressive Running Account (RA) bills subject to the following:
  - Only completed items of Supply and Installation may be claimed in any RA bill.
  - Security deposit will be deducted from each progressive bill @ 5% of bill value (Inclusive of all taxes)
  - Payment for items to be measured shall be done only on actual measurement basis after due verification of quantities executed.
  - Taxes if & as applicable will be deducted from the bills.

MDI has appointed a consultant for the said project. A periodical meeting (Once in a fortnight/ month) to review the progress of works will be called. The representatives from Contractor, Consultant & Client are required to be present.

A PERT chart/schedule of activities must be submitted at the initial kickoff meeting a time & quality in execution is the essence of the contract. It's the contractor's responsibility to take

utmost care towards completion of the entire project on time. A penalty of 1% of the total work value per week of delay up to a maximum of 10 % of the total work value may be levied for delays beyond the stipulated completion period of the project. Further, care should be taken to complete all the works ina qualitative manner.

Supreme standards of quality has to be maintained in all works carried out in the project. The officials of the client shall be at liberty to reject works of poor quality and the contractor is bound to replace/ rectify such works at their own costs. Any damage to MDI property due to the contractor's activity during the course of this project shall have to be made good by the contractor at his or her own costs.
Director, MDI Gurgaon shall be the appellate authority for any dispute at site and his resolution in any dispute shall be final and binding upon the contractor. Any dispute pertaining to the said project, which cannot be resolved amicably, shall be limited to the jurisdiction of the courts of **GURGAON** only.

The Contractor must obtain all necessary insurances for transportation and storage of items at site and the copy must be submitted to the client for records.

All rates quoted in the BOQ shall deemed to be inclusive of cost of all insurances, transportation costs, incidental costs etc. and no additional payment shall be made under these heads.

**PAYMENTS TERM:**

I. Running Account payment against the work done shall be paid on submission of the bills by the agency after completion of the work.
II. Retention Money (interest-free): Retention money amounting 5% of the final bill value will be deducted from the final bill to be paid to the agency, after satisfactory completion of the work. Retention money will be released after completion of one-year period (to be counted from the date of actual handing over the site to the Institute, on satisfactory completion of the work).
III. No request for advance payment shall be considered by the Institute.

2.20 This document constitutes no form of commitment on the part of MDI Gurgaon. Furthermore, this document confers neither the right nor an expectation on any agency to participate in the selection process.

2.21 When any proposal is submitted pursuant to this TENDER, it shall be presumed by MDI Gurgaon that the agency has fully ascertained and ensured about its eligibility to render services, in the event of the same being selected ultimately to act as such, under the respective governing laws and regulatory regime and that there is no statutory or regulatory prohibition or impediment to acting such Service Provider and it has the necessary approvals and permissions and further suffers no disability in law or otherwise to act as such.

2.22 MDI Gurgaon reserves the right to vary/alter/amend the eligibility criteria at any time, in its discretion, before the last date of submission of proposals.

2.23 The selected agency(ies) shall comply with and abide by such directions that MDI Gurgaon may issue

from time to time.

2.24 The proposal and all correspondence and documents shall be written in English. All proposals and accompanying documents received within the stipulated time shall become the property of MDI Gurgaon.

2.25 Any matter relating to the appointment of selected agency for the work(s) shall be governed by the Laws of Union of India and state of Haryana from time to time. Disputes, if any, shall be subject to exclusive jurisdiction of courts at Gurgaon.

Chief Engineer

Estate, MDI Gurgaon

**PROFORMA FOR APPLICATION**
**(To be printed on the letter head of the Agency)**

1. Name of the bidder Agency.....

2. Permanent address of the bidder Agency.....
Tel No. ..... Email .....
Mob.....

3. Registration & incorporation particulars of the bidder Agency.....
(please attach attested copies of document of registration/incorporation of your firm)

4. Permanent Account Number, Income Tax Circle .....

5. GST No .....

Declaration:

I/We hereby declare that the information furnished above is true and correct. In case the above information is found incorrect at any stage, the Director, MDI Gurgaon may take appropriate action as warranted.

Signature of authorized person of bidder Agency

Name: .....

Place: .....

Date: .....

Official Seal

**ACCEPTANCE LETTER**
**(To be printed on the letter head of the Agency)**

To,

The Chief Administrative Officer
Institutional Services Department
Management Development Institute, Gurgaon
Gurgaon -122007

**ACCEPTANCE OF TERMS AND CONDITIONS**

Sir,

This refers to the Tender document for the**." ELECTRICAL HT/LT Distribution Upgradation work of existing OLD Buildings at MDI, Gurgaon p**ublished by Management Development Institute Gurgaon.

2 I/we hereby certify that I/we have inspected the site, read and understood the complete details provided in the Tender document, and entire terms and conditions mentioned in the TENDER document that shall form part of the contract agreement.

3 I/We hereby unconditionally accept the details and terms and conditions mentioned in the NIQ document in its entirety for the above work.

Signature of authorized person of Agency

Name: .....

Place: .....

Date: .....

Official Seal

AGENCY DETAIL'S FORM

**(To be printed on the letterhead of the Agency)**

| Sl. No | Description | Information |
|---|---|---|
| 1 | Name and complete details of Agency | |
| 2 | Date of Incorporation of Agency (Attach Proof) | |
| 3 | Full Address with Pin Code of Registered Office of Agency:<br>Landline No.<br>Mobile No.:<br>E-Mail Address: | |
| 4 | Full address with Pin-Code of Operating Branch/Office at Delhi/NCR:<br>Landline No.<br>Mobile No.<br>E-Mail Address. | |
| 5 | PAN No. (attach documentary proof) | |
| 6 | GST Registration No. (attach documentary proof) | |
| 7 | PF Registration details (Establishment ID and other details) | |
| 8 | ESIC Registration details (Employee Code No. and other details) | |
| 9 | Total number of years of experience in providing similar services | |
| 10 | Experience proof documents (Work Orders/Purchase Order and successful completion certificates) issued by the competent authorities of the organizations served on the organization letterhead during the period from 01 April 2019 to 31 March 2024 as per Annexure I (attach documentary proof). | |
| 11 | Annual Financial Turnover during financial year 2019-20, 2020-21, 2021-22, 2022-23 and 2023-24 as per format given at Annexure III. | |

**Note:** Agency may annex separate sheets wherever required for furnishing details. However, such sheets must be duly signed with seal. Unsigned documents may lead to rejection of quotation submitted.

Signature of authorized person of Agency
Name: ……

Place: .....

Date: .....

Official Seal

**Annexure- I**

**AGENCY TECHNICAL MANPOWER DETAILS**

**(To be printed on the letterhead of the Agency)**

**Please provide information about full-time/ permanent staff in regular appointment of the agency during last three years (Do not include any part-time or contract staff).**

| No. | Description | Total No. |
|---|---|---|
| 1. | Senior Electrical Engineer | |
| 2. | Electrical Engineer | |
| 3. | Diploma Engineer | |
| 4. | Technical Supervisors | |
| | **Total Technical Manpower** | |

**Note: (i) Please submit the CV and portfolio of the Electrical Engineer who will be actually working on the project, if selected by MDI Gurgaon.**

(ii) Please add extra lines if any important information is required to be provided.

Signature of authorized person of Agency

Name: .....

Place: .....

Date:

Official Seal

**Annexure II**

**SIMILAR WORK EXPERIENCE**
**(To be printed on the letterhead of the Agency)**

Details of similar works successfully completed during the period from April 2019 to 31 March 2024

| S. No | Details of Similar Project executed (Attach copy of work order/completion certificate) | Period | | Project Cost (Rs) | Whether completed in time (YES/NO) |
|---|---|---|---|---|---|
| | | Start | Complete | | |
| 1. | | | | | |
| 2. | | | | | |
| 3. | | | | | |
| 4. | | | | | |
| 5. | | | | | |
| 6. | | | | | |
| 7. | | | | | |
| 8. | | | | | |
| 9. | | | | | |
| 10. | | | | | |

Signature of authorized person of Agency

Name: .....

Place: .....

Date: .....

Official Seal

Annexure III

**PROFORMA FOR ANNUAL TURNOVER**

**(**To be printed on the letter head of the Chartered Accountant Agency)

**(ATTACH AUDITED DOCUMENTS)**

**Details of Annual Turnover and Net profit earned during financial years from 01 April 2019 to 31 March 2024.**

| Year | Financial Turnover (Rupees in Crores) | Net Profit (Rupees in Crores) | Remarks |
|---|---|---|---|
| 2019-20 | | | |
| 2020-21 | | | |
| 2021-22 | | | |
| 2022-23 | | | |
| 2023-24 | | | |
| **Gross Total** | | | |
| **Average Annual Turnover** | | | |

Copy of Audited balance sheet for the relevant financial years and duly certified Performa by the Chartered Accountant must be attached.

Signature of Chartered Accountant
Name:
Place:

Date: .....

Official Seal

**CHECKLIST FOR AGENCY**

| Sl. No. | Details | Please mention if the document attached YES/NO |
|---|---|---|
| a. | Self-attested copy of the Company Registration Certificate and Profile of the Company. | |
| b. | Self-Attested copies of Telephone bill/Electricity Bill/Registered Lease Deed indicating the address evidencing its location. | |
| c. | Self-attested copies of valid registration certificate from State/Central Government, as may be required for smooth operation of the business. | |
| d. | Self-attested copies of the GST registration certificate, PAN, PF and ESIC registration. | |
| e. | Statement of Annual Turnover of financial years i.e. 2019-20, 2020-21, 2021-22, 2022-23 and 2023-24 in support of eligibility criteria mentioned, from a registered practicing Chartered Accountant | |
| f. | Experience proof documents (Work Orders/Purchase Order and Successfully Completion certificates) issued by the competent authorities of the organizations served on the organizations letter head | |
| g. | TENDER document dully signed and official stamped on all the pages to be submitted in original. | |

Signature of authorized person of Agency
Name:
Place:

Date: .....

Official Seal

# SECTION _-3

# ELECTRICAL GENERAL PROVISION

## 3. ELECTRICAL GENERAL PROVISIONS

3.0 **Work Description:** The scope of works for all electrical works and systems comprises of supply, delivery, installation, testing and commissioning, handover, training, maintenance, and warranty all as described or reasonably implied in the Contract.

- The ELECTRICAL Contractor is obliged to provide fully functioning works and systems in conformance with the requirements of the Contract and approved design and development documents prepared by the ELECTRICAL contractor.
- In the event certain items are not fully described or indicated in the Contract, but deemed essential by the ELECTRICAL contractor for the performance of the works and systems then the provision of such items shall form part of the ELECTRICAL Contractors scope of works at no additional cost to the Institute.
- The drawings and documents from consultant shall be used as guidance for the ELECTRICAL contractor in producing his detail design and shop drawings for carrying out works at site.
- The ELECTRICAL Contractor shall be responsible for coordinating the equipment and services and shall produce and properly co-ordinate shop drawings to demonstrate the installation complies with the performance requirement with shop drawings, calculations, and details. The Consultant shall monitor the process of shop drawings and document preparation.
- Shop drawings shall take into account actual measurement and setting out dimensions/levels obtained and determined by the ELECTRICAL Contractor on site, actual equipment/material used, actual routing of services, coordination with all installation, and site conditions /constraints.
- ELECTRICAL Contractor shall coordinate with all other agencies working at site for interconnection and safety aspects.
- Also, the ELECTRICAL Contractor shall furnish combined guarantee minimum for 1 year from the date of successful commissioning from the manufacturer. In case there is any defect, the free replacement of any part or in whole will be made immediately at no extra cost to Institute.

**3.1 Fee, Permits & Tests:**

3.2 The ELECTRICAL contractor shall obtain all sanctions and permits required for the above said works from all the relevant authorities. On completion of the work, the ELECTRICAL Contractor shall obtain N.O.C from concerned authorities including, Chief Electrical Inspectorate of State. The original of the same shall be delivered to the Institute through Consultant. However necessary fees shall be reimbursed by Institute on production of requisite documents.

- The Institute shall have full power regarding the equipment's/ materials get tested by an authorized/ recognized independent agency at the ELECTRICAL contractor's expense in order to prove their soundness and adequacy.
- The ELECTRICAL contractor will rectify the defects/ suggestions pointed out by an independent agency through Institute at ELECTRICAL contractor's expense.
- The installation shall comply in all respects with the requirements of Indian Electricity Act 1910, Indian Electricity Rules (IER) 1956 and other related Laws and Regulations (for F.F. etc.) as amended up to date, there under and special requirements, if any, of the State Electricity Boards etc. The ELECTRICAL contractor shall be liable to furnish the list of authorized licensed persons/ employed/ deputed to carry out the works/ perform the assigned duties to fulfill the requirement of Rule No.3 of IER 1956 as amended up to date.

**3.3 Codes & Standards:**

- The design, manufacture, inspection, testing and performance shall comply with all the currently applicable statutes, safety codes, relevant Bureau of Indian Standards (BIS), British Standards (BS), International Electro Technical Commission (IEC) publication, Standards amended up to date.
- The design engineering, manufacturing and the installation shall be in accordance with established codes, sound engineering, practices and specifications. Further, the same shall conform to the statutory regulations applicable in the country.
- ELECTRICAL Contractor shall obtain all approvals from statutory authorities, e.g. electrical inspector, DHBVN or any other agency as applicable before commissioning of electrical system if required.
- Some of the relevant Indian and British Standards are listed below.
  Indian Electricity Act.
  3.0.1.1 Indian Electricity Rules.
  3.0.1.2 Factory Act.4 NBC 2016
- Any other standard may be followed provided it is equivalent or more stringent than the standards specified above.
- In case of any deviation/conflict with the codes & standards, the following order of precedence shall govern
- Recommended Design guidelines of consultant
- International standards & requirements.
- Local codes of practice
- Approved design development documents

**3.4 ELECTRICAL contractor shall be responsible for:**

- Detailed co-ordination with other services, shop drawings for various electrical layouts such as equipment layout, cabling layouts, earthing layouts, including equipment installation and cable termination details etc. prior to start of work.
- Protection co-ordination drawings/ tables for complete power system.
- Shop inspection and testing procedures.
- Field-testing and commissioning procedures.
- Preparation of as built drawings.
- ELECTRICAL contractor shall also be responsible for: Any other work/activity which is not listed above however is necessary for completeness of electrical system.

**3.5 Date of Commencement and Completion Period:** The ELECTRICAL contractor shall be allowed admittance to the site on the date of commencement as described in the General Conditions and he shall there upon and forthwith begin the works and shall regularly proceed with and complete the same on or before the date of completion subject, nevertheless to the provisions for the extension of time. The time being the essence of the contract, the ELECTRICAL Contractor will adhere to the time, progress chart and project schedule and will give proportional output/progress in proportional time.

**3.6 Schedule and Manner of Operations:** Time being the essence of this Contract, the ELECTRICAL Contractor will be expected to furnish all labor and materials in sufficient quantities and at appropriate times, expedite and schedule the work as required and so manage the operation that the work will be completed within the time stated in the Contract.

**3.7** **Electrical Power Supply Interface:** The ELECTRICAL Contractor shall provide power supply power supply points/isolators at certain designated locations within the development for all mechanical and electrical installations as indicated on the drawings. It is the responsibility of the Contractor to coordinate and make connections to these power supply points/isolators and to provide all the necessary 'down-stream' power supply distribution board/network to the mechanical system's control panels, equipment, sensors, field devices, etc. interfacing With All Services and Systems

**3.8** **Examination of Site:** Prior to the submitting of bids, visit the project site and become familiar with all conditions affecting the proposed installation and make provisions as to the cost thereof.
The Contract Documents do not make representations regarding the character or extent of the sub-soils, water levels, existing structural, mechanical and electrical installations, above or below ground, or other sub-surface conditions which may be encountered during the work, based on examination of the site or other information. Failure to examine the drawings or other information does not relieve the ELECTRICAL Contractor of responsibility for satisfactorily completion of the work.

3.9 **Excavation and Backfill:** Where ever required provide trenches details, duly approved by the consultant with all relevant section etc. as per IS codes, minimum before 1 month of laying the pipes, etc. Co-ordinate with during the excavation, and ensure that the excavation and backfilling is being properly done as per requirement.
Where ever it is asked by the Institute/ Consultant for providing trenches in ELECTRICAL Contractor's scope. It is deemed that the cost of the pipe is inclusive of trench digging and backfilling. The following points needs to be taken care of while making the trenches.
The trench shall be of widths necessary for the proper execution of the work. Grade bottom of the trenches accurately to provide uniform bearing and support the work on undisturbed soil at every point along its entire length. Except where rock is encountered, do not excavate below the depths indicated. Wherever unstable soil that is incapable of properly supporting the work is encountered in the bottom of the trench, remove soil to a depth required and backfill the trench to the proper grade with coarse sand, fine gravel or other suitable material.
Excavate trenches for utilities that will provide the following minimum depths of cover from existing grade or from indicated finished grade as required by local authorities. Trenches should not be placed within 3meters of foundation or soil surfaces which must be resist horizontal forces.

Do not backfill until all required tests have been performed and installation observed by the Engineer. Comply with the requirements of other sections of the specifications. Backfill shall consist of non-expansive soil with limited porosity. Deposit in 15 cm layers and thoroughly and carefully tamp until the work has a cover of not less than 30 cm. Backfill and tamp remainder of trench at 30 cm intervals until complete. Uniformly grade the finished surface.

**3.10** **Cutting and Patching:** All kinds of cutting and repairing of brick Walls or Partitions, etc. for the proper routing of pipe, cutting and repairing of RCC wall, or ceiling shall be in the scope of the ELECTRICAL contractor.

Where cutting, channeling, chasing or drilling of floors, walls, partitions, ceilings or other surfaces is necessary for the proper installation, support or anchorage of conduit or other equipment, layout the work carefully in advance. Repair any damage to the building, piping, equipment or defaced finish plaster, woodwork, metalwork, etc., using skilled trade people of the trades required at no additional cost to the Contract.

Provide slots, chases, openings and recesses through floors, walls, ceilings, and roofs as required. Where these openings are not provided, provide cutting and patching to accommodate penetrations at no additional cost to the Contract.

**Holes in Roof**

- Roof penetrations for passage of conduits or circular PVC and PVC Cables shall be sealed watertight using a flexible polypropylene conical sleeve manufacturer to seal the cable to the roof structure, regardless of the roof profile.
- All sharp metal edges, which may come in contact with the cable, shall be suitably bushed.
- Fire Rated Penetrations
- Where services penetrate any fire rated barrier, the ELECTRICAL Contractor shall seal the penetration with the use of an appropriate material to ensure the integrity of the fire barrier.
- The ELECTRICAL Contractor shall seal the cable enclosures through fire rated barriers to ensure the integrity and rating of the fire barrier.
- Acoustic Penetrations
- Where services penetrate acoustic barriers, sealant shall be supplied and installed to maintain the acoustic separation at least equal to the barrier penetration.

3.11 **Mounting Heights:** Verify exact locations and mounting heights with the Engineer before installation.

**3.12 Supports:** Support work in accordance with the best industry practice. Provide supports, hangers, auxiliary structural members and supplemental hardware required for support of the work.

Provide supporting frames or racks extending from floor slab to ceiling slab for work indicated as being supported from walls where the walls are incapable of supporting the weight. In particular, provide such frames or racks in electric closets and equipment rooms.

Provide supporting frames or racks for equipment which is installed in a free-standing position.

Supporting frames or racks shall be of standard angle, standard channel or specialty support system steel members, rigidly bolted or welded together and adequately braced to form a substantial structure. Racks shall be of ample size to assure a workman-like arrangement of all equipment mounted on them.

Adequate support of equipment (including outlet, pull and junction boxes and fittings) shall not depend on ducts, pipe, electric conduits, raceways, or cables for support.

Equipment shall not rest on or depend for support on suspended ceiling media (tiles, lath, plaster, as well as splinters, runners, bars and the like in the plane of the ceiling). Provide independent support of equipment. Do not attach to supports provided for ductwork, piping or work of other trades.

Provide required supports and hangers for equipment so that loading will not exceed allowable loading of structure. Equipment and supports shall not come in contact with work of other trades.

**3.13 Fastenings: Fasten equipment to building in accordance with the best industry practice.**

Where weight applied to the attachment points is 45kg or less, conform to the following as a minimum:

| | |
|---|---|
| Wood | : Wood screws |
| Concrete and solid masonry | : Dash Fastener of appropriate ratings HILTI/FISHER |
| Solid metal | : Machine screws in tapped holes or with welded studs |

Where weight applied to the building attachment point exceeds 45 kg, but is 135 kg or less, conform to the following as a minimum:

- At concrete slabs provide 60cm x 60cm x 13cm steel fishplates on top with through bolts. Fishplate assemblies shall be chased in and grouted flush with the top slabs screed line, where no fill is to be applied.
- At steel decking or sub-floor for all fastenings, provide through bolts and threaded rods. The tops of bolts and rods shall be set at least one inch below the top fill screed line and grouted in. Suitable washers shall be used under bolt heads or nuts. In cases where the decking or sub-floor manufacturer produces specialty hangers to work with his decking or sub-floor such hangers shall be provided.
- Where weight applied to building attachment points exceeds 135 kg, coordinate with and obtain the approval of consultant and conform to the following as a minimum:
- Provide suitable auxiliary channel or angle iron bridging between building structural steel elements to establish fastening points. Bridging members shall suitably weld or clamped to building steel. Provide threaded rods or bolts to attach to bridging members.
- For items which are shown as being ceiling mounted at locations where fastening to the building construction element above is not possible, provide suitable auxiliary channel or angle iron bridging tying to the building structural elements.
- Wall mounted equipment may be directly secured to wall by means of steel bolts. Groups or arrays of equipment may be mounted on adequately sized steel angles, channels, or bars.

**3.14 Miscellaneous:** A site order book will be maintained at site, which will be in the custody of the Institute, or his representative, and all instructions given to the ELECTRICAL contractor will be recorded in the site order book and the same has to be signed by the ELECTRICAL contractor to comply with the instructions given therein.

After completion of the work the whole installation shall be tested by the ELECTRICAL contractor. The tests shall comply the following I.E.E. Regulations and shall be submitted along with the final bill:

The work will not be considered as complete and taken over by the Institute till all the components of the work after being completed at site in all respects have been inspected/ tested by the Consultant/Institute to his entire satisfaction and a completion certificate issued by the Institute/Consultant to this effect.

Shop drawing for electrical work e.g. equipment, cable earthing and conduit layout for all systems shall be prepared by the contractor and got approved before starting of the work.

At the completion of the work and before issuance of certificate of virtual completion, the ELECTRICAL contractor shall submit 6 sets of drawing and two tracing of each drawing to Institute of each layout drawings drawn at approved.

**3.15 ELECTRICAL Contractor's Superintendence:**

- The contractor shall provide all necessary superintendence during the execution of the works and as long as there is necessity. The contractor or his competent and authorized agent or representative approved of in writing by the Institute (which approval may at any time be

withdrawn) is to be constantly on the works and shall give his whole time to the superintendence of the same. Such authorized agent or representative shall receive on behalf of the contractor, directions and instructions from the Engineer-in-charge or his representative.

- The contractor shall provide detailed organization of the execution team deployed for the works with names and CV's, of all key staff before the commencement of work and get it approved of in writing by the Institute/ Consultant. Contact telephone or pager numbers for emergency and/or twenty-four (24) hour call shall also be included.
- If in any case of withdrawal of any worker/ technician/ Engineer from the execution team, the replacement of the same shall be done with equivalent qualification, and shall be approved in writing by the Institute/ Consultant.

**3.16 Drawings**

The Tender drawings are enclosed along with this specification. These drawings are meant to give general idea to the ELECTRICAL contractor regarding the nature of work covered by these specifications.

Any information/data shown/not shown in these drawings shall not relieve the ELECTRICAL contractor of his responsibility to carry out the work as per the specifications. Additional information required by the bidder for successfully completing the work shall be obtained by him.

**3.17 Shop Drawings:** The ELECTRICAL contractor shall prepare detailed coordinated electrical shop drawing indicating Panel layout, with other relevant services. The shop drawings shall indicate all setting out details and physical dimensions of all components with wiring and cable details including system operating write up in the system i.e. Control and Relay Panel and fixing details for the above-mentioned work. All work shall be carried out on the approval of these drawings. However, approval of these drawings do not relieve the contractor of his responsibility for providing maintenance free and full proof system including any missing component/accessories to meet with the intent of the specifications. Contractor will submit 2 (two) prints for preliminary approval and finally 6 (six) prints for distribution.

**3.18 Manufacturer's Instructions:** Where manufacturers have furnished specific instructions, relating to the material/equipments to be used on this job, covering points not specifically mentioned in this document, manufacturer's instructions should be followed.

**3.19 Completion Documents and Drawings:**

Three copies of operation manuals/catalogues of all standard equipment are to be furnished by the contractor immediately after commissioning of plant.

Three copies of write up on preventive maintenance, trouble shooting and operating instructions of the system along with as-built drawings are to be supplied by the Contractor at the time of commissioning.

On completion of the work in all respects, the Contractor shall supply five portfolios (300x450 mm), each containing complete set of drawings on approved scale, clearly indicating complete layouts, location; wiring and sequencing of automatic controls, location of all concealed wiring and other services. Each portfolio shall also contain consolidated control diagrams and technical literature on all controls. The Contractor shall frame under glass, in the Panel rooms, one set of these consolidated control diagrams.

for approval.

**3.20 Tests Charging (Pre-commissioning tests):**

On completion of erection of the equipment and before charging, each item of the equipment shall be thoroughly cleaned and then inspected jointly by the Institute/Consultant and the Contractor for correctness and completeness of installation and acceptability for charging, leading to initial pre- commissioning tests at Site. The pre-commissioning tests to be performed as per relevant I.S. / vendor/ bidder submittal and as included in the Contractor's quality assurance programme.

**Commissioning Tests:**

The available instrumentation and control equipment will be used during such tests and the Contractor will calibrate all such measuring equipment and devices as far as practicable. However, immeasurable parameters shall be taken into account in a reasonable manner by the Contractor for the requirement of these tests. The tests will be conducted at the specified load points and as near the specified cycle condition as practicable. The Contractor will apply proper corrections in calculation, to take into account conditions which do not correspond to the specified conditions.

All instruments, tools and tackles required for the successful completion of the Commissioning Tests shall be provided by the Contractor, free of cost.

Pre-commissioning test shall be carried out as per relevant IS and/or as specified in the relevant clause.

3.21 The Contractor shall be responsible for obtaining statutory clearances from the concerned authorities for commissioning of the equipment. However necessary fee shall be reimburse by Institute on production of requisite documents.

3.22 The Contractor shall submit to the Engineer-in-charge every week, a report detailing all the receipts during the weeks. However, the Contractor shall be solely responsible for any shortages or damages in transit, handling and/or in storage and erection of the equipment at Site. Any demurrage, wharf age and other such charges claimed by the transporters, railways etc. shall be to the account of the Contractor.

3.23 The Contractor shall be fully responsible for the equipment/material until the same is handed over to the Engineer-in-charge in an operating condition after commissioning. Contractor shall be responsible for the maintenance of the equipment/material while in storage as well as after erection until taken over by Engineer-in-charge, as well as protection of the same against theft, element of nature, corrosion, damages etc.

- The Contractor shall be responsible for making suitable indoor storage facilities, to store all equipment, which require indoor storage.
- The words 'erection' and 'installation' used in the specification are synonymous.
- Exposed live parts shall be placed high enough above ground to meet the requirements of electrical and other statutory safety codes.
- The minimum phase to earth, phase to phase and section clearance along with other technical parameters for the various voltage levels shall be maintained as per relevant IS.

3.24 Protective Guards: Suitable guards shall be provided for protection of personnel on all exposed rotating and / or moving machine parts. All such guards with necessary spares and accessories shall be designed for easy installation and removal for maintenance purpose. The Contractor shall also conform to the general regulations governing personnel on the site and must keep to the working space allocated for their use. The contractor shall be responsible for any kind of mishap, etc. happened with personnel. The Engineer-in-charge shall not take the responsibility for any of such kind.

3.25 Tools and Tackles: The Contractor shall supply with the equipment one complete set of all special tools and tackles for the erection, assembly, dismantling and maintenance of the equipment.

# SECTION - 4

# TECHNICAL SPECIFICATION OF CONTRACT

## 4.1 SPECIFICATIONS OF VCB PANELS

**TECHNICAL Specification OF VCB**

| Sr. No. | DESCRIPTION | I/C | O/G | O/G | O/G |
|---|---|---|---|---|---|
| A | **Basic Unit** | | | | |
| | 11KV Indoor 4VCB (extensible type), 25KA, 800Amp, horizontal isolation, horizontal draw out | P | P | P | P |
| | PVC Insulated aluminum bus bars | P | P | P | P |
| | Motor operated (230V AC) with anti-pumping device | P | P | P | P |
| | Closing & tripping Coil 24V DC | P | P | p | p |
| B | **1 No. 3-Phase, withdrawable type P.T epoxy** resin cast | | | | |
| | 11/rt3kV /110/rt3 V, Cl-1.0, 100 VA with HT/LT HRC fuses | P | NP | NP | NP |
| C | **CT, 3 Nos. 1 Phase, 11kV, 25KA,** Epoxy Resin Cast | | | | |
| | Ratio 300/150/5+5A, 15 VA burden, cl-1.0, 5P10 | P | NP | NP | NP |
| | Ratio 150/75/5+5A, 15 VA burden, cl-1.0, 5P10 | NP | P | P | P |
| D | **Meters** | | | | |
| | Digital Ammeter with selector switch | P | P | P | P |
| | Digital Voltmeter with selector switch | P | NP | NP | NP |
| E | **LED Indicating Lamps** | | | | |
| | Breaker On Red | | | | |
| | Breaker Off Green | P | P | P | P |
| | Spring charged Blue | P | P | P | P |
| | Trip circuit healthy White with Push Button | P | P | P | P |
| | Auto trip indication Amber | P | P | P | P |
| | R/Y/B Phase Indication | P | P | P | P |
| F | **Accessories** | | | | |
| | TNC Switch | P | P | P | P |
| | Heater with Thermostat & Switch | P | P | P | P |
| | Illumination Lamp with Switch | P | P | P | P |
| | 3 Pin Plug Socket with Switch | P | P | P | P |
| | Emergency push button | P | P | P | P |
| | Power pack | P | NP | NP | NP |
| G | **Protection Relay (CG/Avana make)** | | | | |
| | 1 No., 4-pole, numerical microprocessor, IDMT relay having 3-over current & 1-earth fault protection high set instantaneous with short circuit protection | P | P | P | P |
| | 1 No. Master trip relay | P | P | P | P |
| | 1 No. Trip circuit supervision relay (Avana make) | P | P | P | P |
| | 2 Nos. Auxiliary relays, VAA33 | NP | P | P | P |

**Note: P for provided, NP for not provided**

**Note:** Contractor shall make measurements and correctly assess the quantity of cables before procurement.

## 4.2 TECHNICAL SPECIFICATION OF LT PANEL

**SCOPE:**

This specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing, forwarding supply of LT Panels as per attached BOQ and data sheets.

**APPLICABLE STANDARDS**

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian/International standards and shall conform to the regulations of the local statutory authorities.

| | |
|---|---|
| IS 8623 | : Specification for Low voltage switchgear and control gear assemblies |
| IS: 4237 | : General Requirements for Switchgear and Control gear for voltages not exceeding 1000V A.C or 1200V D.C. |
| IS: 13947 / IEC: 947/ BS: 60529 | Degree of Protection |
| IS: 2544 / BS: 3297 / IEC: 273 | Bus-Bars support Insulators. |
| IS: 375-1963 and IS: 5578-1970 | Marking and arrangement for Switchgear Main connections, Auxiliary Wiring and Insulated Conductors |

**CLIMATIC CONDITIONS OF THE INSTALLATIONS**

| | | |
|---|---|---|
| 1 | Location | Haryana |
| 2 | Maximum ambient air temperature | 50 deg C |
| 3 | Minimum ambient air temperature | (-)5 deg C |
| 4 | Average daily maximum ambient temperature | 40 deg C |
| 5 | Max yearly weighted average ambient temperature | 32 deg C |
| 6 | Maximum altitude above mean sea level | 1000 meters |
| 7 | Minimum relative humidity | 26% |
| 8 | Max. relative humidity | 100% |
| 9 | Average no of rainy days/ year | 120 |
| 10 | Basic Wind Speed | 47m/s |
| 11 | Avg. Annual rainfall | 900 mm |
| 12 | Pollution | Moderate |
| 13 | Maximum wind pressure | 195 kg/ msq |

The atmosphere is generally laden with mild acid and dust suspended during dry months and subjected to fog in cold months.

**GENERAL REQUIREMENT**

**Enclosure & Protection**

The switchboard shall be metal clad and shall comprise standard prefabricated, cold rolled, Cold Annealed sheet steel units, assembled to form a rigid, free standing dead front structure. Vertical units shall be assembled to form a continuous line up of uniform height and depth.

The switchboard shall be totally enclosed dust and vermin proof. If necessary, openings for natural ventilation shall be provided. Theses shall be louvers with fine wire mesh. Doors and openings shall be provided with neoprene gaskets on a fixed portion. Switchboard shall be suitable for operation in tropical climate and under the ambient conditions specified in the data sheet.

Door interlocking shall be provided on all feeders to prevent opening of door, when main isolating device is in `ON' position.

The assembly of the panels shall be suitable for easy removal and refitting of the components. The panel shall have a high degree of reliability and safety of the operating personnel. The components of identical feeders should be fully compatible to each other

Suitable eyebolts for lifting of panel shall be provided. Removal of the eyebolts after installation of the panel shall be permitted and additional bolts of eyebolt size shall be supplied.

**Accessibility**

Checking and removal of components shall be possible without disturbing adjacent equipment. All auxiliary equipment shall be easily accessible. All mounted equipment shall have 'identification' tags of self-sticking PVC tapes at the rear also. In addition, identification numbers shall be painted on the panel wall to give permanent identification mark.

**Bus-Bars connections, supports and bus-bars sizing**

The switchboard shall comprise 3 Phase bus-bars which shall extend through all units of the switchboard line up. All phase bus-bars shall be of uniform cross-section throughout the switchboard and shall be sized to suit continuous and short circuit currents specified on the data sheet. Bus bars shall be housed in a separate chamber and shall be accessible for inspection only with special tools.

Bus-bars shall be made of electrolytic grade (E91E) Aluminium and shall be sleeved and joints shall be taped / shrouded. No Joints are permitted in the vertical bus-bar drops to the breakers and horizontal joints in the main bus-bars shall be only in the shipping sections.

Bus-bars shall be supported at regular intervals and both bus-bars and the supports shall be adequately sized and braced to withstand the specified short circuit level without permanent deformation. Dynamic stresses shall be calculated on the basis of the specified peak short circuit currents. All bus supports shall be of non-carbonizing material resistant to acids and alkalis and shall have non-hygroscopic characteristics.

Bus-Bars in Switchboard shall be insulated with heat Shrunk PVC sleeves colour coded red, yellow, blue and bus-bar joints pressed with plastic mould, rated suitably.

Thermal design of the bus-bars shall be based on installation of the switchboard in poorly ventilated conditions. The cooling air volume shall take into account only the bus enclosure. All hardware used in bus-bar connections shall be zinc passivated.

**Power Connections**

The incoming and outgoing power connection shall be through XLPE cables. Ample space for connection of these cables shall be provided in cable allays. Suitable shrouds shall be provided to avoid accidental contact in the cable compartment. Falling tool shrouds shall be provided in cable allay. Removable un-drilled gland plate shall be provided for cable entry. The switchboard shall be supplied complete with supports for clamping outgoing and incoming cables.

**Auxiliary Wiring & Terminals**

Inside the cubicles, the wiring for control, signaling, protection and instrument circuits shall be done with PVC insulated, flexible, stranded, single core, 1.5 sq.mm copper conductor wires. The insulation grade shall be 650V. The wiring shall preferably be enclosed in plastic channels or neatly bunched together.

20 % spare terminals shall be provided on each terminal block. Conductor shall be terminated with adequately sized crimping-type lugs for connection to equipment terminal and strips. Stranded conductors shall be soldered at the ends before connections are made to the terminal block.

Terminal strips shall preferably be separated from power circuits by metal barriers or enclosures. All spare contacts of Auxiliary relays, timers etc. shall be wired up to the terminal block. Each wire shall be identified at both the ends by PVC ferrules. Shorting links shall be provided for all CT terminals. All wiring for CT Circuits, controls and instruments shall be carried out with 2.5 mm sq. copper conductors.

Unused CT secondary terminals must be shorted. All terminals shall be shrouded with plastic covers to prevent accidental contact.

Control cables shall enter the switchboard from the bottom or top as specified in the data sheet. All inter-panel control wiring shall be done by the switchboard vendor. The inter-panel wiring shall be taken through PVC sleeves or suitable rubber grommets

**Earthing Connections**

All cubicles shall be connected to an earth bus bar running throughout the length of the switchboard. All doors and movable parts shall be connected to the earth bus with flexible copper connections. Provision shall be made to connect the earthing busbar to the plant earthing grid at two ends. All non-current carrying metallic parts of the equipment shall be earthed.

**Nameplates**

A nameplate with the switchboard designation shall be fixed at the top of the switchboard. A separate nameplate giving feeder details shall be provided at front and rear for each feeder of panel. Engraved nameplates shall preferably be of 3-ply (Red – White – Red or Black – White – Black) lamicold sheets or anodized aluminium. However, back engraved perplex sheet nameplates will also be acceptable. Engraving shall be done with square groove cutters. Nameplates shall be fastened by 'Screws' and not by adhesives. It shall be possible to change name plates after installation of panel. Preferably there shall be two name plates, one for rating and type of feeder and other for drive name.

**Steel Construction & Paintings**

All metal surfaces shall be thoroughly cleaned and degreased to remove mill scale, rust, grease and dirt. The under surface shall be prepared by applying a coat of phosphate paint, and a coat of yellow zinc chromate primer. The under surface shall be made free from all imperfections before

undertaking the finishing coat.
After preparation of the under surface, the switchboard shall be spray painted with two final coats of synthetic enamel OR powder coat paint as specified in data sheet. The finished panels shall be dried heating in ovens in dust-free atmosphere. Panel finish shall be free from imperfections like pin holes, orange peels, runoff paint, etc.
All unpainted steel parts shall be cadmium plated or suitably treated to prevent rust corrosion. If these parts are moving elements, then these shall be greased.

**Space Heater**

The cable allays shall be provided with space heaters to prevent moisture condensation. The space heaters shall be located at the bottom of the switchboards and shall be controlled through a thermostat with an adjustable setting and a manually operated switch.

**SWITCHBOARD COMPONENTS:**

**Air circuit breaker (ACB)**

ACB shall be air break and draw-out type conforming to IS 13947 (1993) and symmetrical breaking capacity not less than 50 kA for 1 second shall be provided. Service short circuit breaking capacity (Ics) shall be 100% of rated ultimate short circuit breaking capacity (Icu).
Motor operated mechanism shall be applicable with air circuit breakers. Spring charged stored energy mechanism shall be there to ensure high speed closing and tripping independent of the operating forces. Electrical anti pumping and trip free feature shall also be provided.

The circuit breaker shall be provided with emergency manual trip device, mechanical 'ON', 'OFF', and 'ISOLATED' position indicator and operation counter.

| | | | |
|---|---|---|---|
| 1. | Service | : | Indoor |
| 2. | Type | : | Air – break |
| 3. | Utilization Category | : | B |
| 4. | Operating mechanism | : | Stored energy type |
| I. | Closing | : | Motor wound spring operated |
| II. | Opening | : | Shunt trip coil |
| III. | Latching arrangement | : | Mechanically and electrically trip free |
| 5. | No. of poles of C.B | : | ¾ |

**Molded case circuit breaker (MCCB)**

The circuit breaker shall conform to IS: 13118 and shall be of P2 category having rupturing capacity as bus bar fault level as mentioned in the single line diagram. The circuit breaker shall be provided with spring assisted quick make quick break type manually operated trip free mechanism, mechanical ON OFF position indicators, thermal tripping devices of inverse characteristics, instantaneous short circuit tripping devices and necessary auxiliary and alarm switches.

All MCCBs shall be provided with rotary operating handles. Overload release shall be settable at least up to 80% of rated capacity.

**Change Over Switch**

The Changeover switches shall have four poles with off position suitable for on load operation. The handle of switch shall have door interlock. It shall conform to IEC 60947-2 and IEC 60947-3 and IS

13974 part 2& 3. It shall have robust and rugged construction makes it suitable for tropical condition.

**Fuse:**

Fuses shall be HRC, link type, with a minimum interrupting capacity equal to the listed Short Circuit Current. Fuses shall be furnished complete with fuse bases and fittings of such design as to permit easy and safe replacement of fuse element. Visible indication shall be provided on blowing of the fuse. Motor fuse characteristics and ratings shall be chosen to ride over starting period without blowing. The fuse on incoming feeder, if specified, shall be chosen to provide discrimination with motor/feeder fuses.

**Current transformers**

The current transformer shall conform to IS: 2705. CTs shall be class F insulated and vacuum impregnated or resin cast. The CTs shall be rigidly mounted and shall be easily accessible for maintenance and testing. The short time thermal withstand rating shall be the same as the thermal withstand rating of the breakers.

The C.T.s output shall be minimum 15VA for breaker feeders and 7.5VA for the other feeders per phase and in any case, the output shall be adequate for the protection and metering duties involved in sufficient margin. The CTs shall be adequate for the protection and metering duties involved with sufficient margin. CTs shall be the following accuracies for various applications:

| | **Application** | **Class of accuracy as per IS: 2705** |
|---|---|---|
| i) | For metering service | 1 |
| ii) | For protective relay | 5 P |
| iii) | For use with restrictive earth fault and differential relays | PS |

The CT core for metering and protection shall be separate. The ratio of CTs shall be specified in feeder details. The CTs shall be provided with terminals and shorting links. One of the terminals of the CT shall be earthen. The polarity of CT shall be clearly marked. The CTs shall be capable of withstanding momentary open circuit on the secondary side without injurious effects.

**Instruments and meters**

All instruments shall be Digital, flush mounting type with square or round face and shall be dust tight. The size of the instruments shall be 96mm x 96mm or higher for incomer and bus coupler. Smaller size instrument can be provided in small size modules.

Display shall be LED- Super Bright / LCD backlit type. Meters for multiple parameter display shall have user selectable auto/manual scrolling feature. CTR shall be user programmable. Accuracy for Ammeter and Voltmeter shall be ±0.5% and for Power / Energy shall be
class – 1.

**Push buttons and control switches**

The switches and push buttons conform to utilization category AC11/DC11 as per IS: 6875. The contact shall be rated to make, break and carry inductive current of 5 amp at 415 V AC and 1 amp at 220 V DC.

The selector switches shall be stay put rotary type and provided with oval shaped handles.

The push buttons shall be momentary contact spring loaded type with a set of normally close and open contact. The push button for start shall be shrouded type and colored green, stop button shall be un-shrouded type and colored red and other push buttons shall be un-shrouded type and colored black.

**Miniature circuit breakers (MCB)**

The miniature circuit breakers shall conform to IS: 8828. It shall be provided with overload and short circuit protective devices in a heat resistant housing.

**Signal lamps**

Signal lamps shall be provided to indicate various circuit conditions as per BOQ. The color of lamps for various functions shall be as mentioned in the drawings. All lamps shall be clustered LED type.

**TEST AND INSPECTION**

Tests shall be carried out at manufacturer's works under his care and expense. All routine tests as specified by the applicable standard code shall be conducted. Type Test Certificates for the Switchboard and Circuit Breaker from a recognized testing organization shall be furnished

In addition, specific tests shall be conducted to check mechanical and electrical operation and switchboard wiring to specification and approved schematic diagram.

These tests shall be provisionally conducted at manufacturer's works by providing temporary connection to switchboard units in order to simulate the actual conditions.

Tests shall be finally performed at site, in presence of the manufacturer's specialist, once the external cable connections have been completed.

Shop tests shall be witnessed by an inspector of Engineer-in-charge or of any agency authorized by Engineer-in-charge.

**Acceptance tests shall be as follows: -**

A general visual check shall be carried out. This shall cover measurement of overall dimensions, location number and type of devices, terminal boxes, location and connection of terminals etc.

Dry insulation test with power frequency voltage shall be conducted for the main and auxiliary circuits.

Insulation resistance of the main and auxiliary circuits shall be checked.

Operation checks shall be carried out for every control function as per the schematic diagram, by manually simulating fault conditions and operation of control switches/ relays etc.

For equipment bought from other sub-suppliers, certified tests report of tests carried out at the manufacturer's works shall be submitted. Normally, all routine tests as specified in the relevant standards shall be conducted by the sub-supplier at his works.

**DRAWINGS**

The feeder nos. shall be indicated on the single line diagram and general arrangement drawings. Schematic diagrams shall also be supplied to specify the control requirements for each feeder. These Schematic diagrams shall also show any inter tripping which has to be provided.

Engineer-in-charge's schematic diagrams are intended as a guide and the manufacturer shall develop his own general arrangement and schematic drawing adding necessary auxiliary devices, accessories components etc. which are required for safe, convenient, efficient and proper operation of HT switchboard.

Manufacturer shall submit for Engineer-in-charge's approval 3 sets of the single line diagrams, general arrangement drawings, flooring and mounting detail drawings and schematic diagrams. Engineer-in-charge's approval of G.A drawing is required before the fabrication of cubicles is started. Approval of schematic drawings is required before the manufacturer proceeds with the cubicle wiring. The Engineer-in-charge's approval of the manufacturer's drawings shall not relieve the manufacturer of his responsibility for supplying equipment conforming with the relevant specifications and standards or for any mistakes, errors or omissions in manufacturer's drawings.

Manufacturer shall submit three sets of final "As Built" drawings, two sets of Erection & Maintenance

manuals and two sets of Test Certificates to Purchaser after inspection but before dispatch.

**GUARANTEE**

The switchboard shall be guaranteed for trouble-free operation for a period of 12 months from the date of commissioning or 18 months from the date of arrival at site whichever is earlier. Any defects discovered during this period shall be rectified by vendor free of cost to purchaser.

**PACKING**

Equipment shall be dispatched to site packed in wooden box packing. It shall be wrapped in polyethylene sheets before putting in wooden cases and it shall be ensured that damage to the equipment does not occur, during handling/ transportation.

**DRAWING TO BE SUBMITTED FOR APPROVAL**

- General arrangement drawing of panel including front and rear elevation, side view, sectional detail showing bus bar arrangement and cable alley and other relevant details
- Single line diagram of panel showing details of each feeder with ratings of components, feeder no. as referenced in GA drawing and other relevant details.
- Bill of material for each typical feeder/panel giving details of all component with make and catalogue no. reference.
- Detailed schematic drawing for each type of feeder showing terminal details, wire numbering, spare contacts details. Scheme drawings shall be referred in single line diagram.
- Overall estimated length of each switchboard line-up and maximum depth/ weight/ shock loading on foundation of panel.

**DATASHEET FOR TERMINATION PANEL**

| | | | |
|---|---|---|---|
| 1.00 | **PRODUCT** | : | TERMINATION Panel |
| 2.00 | **CONSTRUCTION** | : | Foundation Mounting, Modular, Fixed Type, Outdoor Installation with double door and Canopy at top. Front Accessible. |
| 3.00 | **CABLE ENTRY** | : | Bottom |
| 4.00 | **DEGREE OF PROTECTION** | : | IP-65 (as per is:13947 for enclosure only) |
| 5.00 | **SUPPLY VOLTAGE** | | |
| | POWER VOLTAGE | : | 415V, +10% To -10%, 3 Ph. 4 Wire Frequency 50hz +5% To -5% |
| 6.00 | **FABRICATION (Enclosure)** | | |
| 6.01 | MAIN FRAME | : | 2 mm, CRCA |
| 6.02 | LOAD BEARING MEMBERS | : | 2 mm, CRCA |
| 6.03 | SMALL DOOR/COVERS & PARTITIONS | : | 1.6mm, CRCA |
| 6.04 | GLAND PLATE | : | 3mm HRCA |
| 6.05 | BASE CHANNEL | : | Channel, Fabricated, 3mm Thick |
| 6.06 | TYPE OF GLAND PLATE | : | Undrilled, Removable |
| 6.06 | HARDWARE | : | Hot Dipped Galvanized / Zinc Passivated |
| 7.00 | **BUS BAR** | | |
| 7.01 | MATERIAL | : | E91E AL. Grade |
| 7.02 | CURRENT RATING | : | (as per BOQ) |
| 7.03 | SLEEVE | : | Heat Shrinkable PVC Sleeves With R,Y,B Colour For Phases & Black For Neutral |

| | | | |
|---|---|---|---|
| 7.04 | FAULT LEVEL | : | 50KA for 1 Second |
| 8.00 | **PAINTING** | | |
| 8.01 | PRETREATMENT | : | 7 Tank Process / Sand Blasting |
| 8.02 | PAINT TYPE | : | POWDER COATED |
| 8.03 | PAINT SHADE | : | As per Site |
| 9.00 | **EARTH BUS BAR** | : | 6x50 mm AL. |

**Special Requirement**

- Minimum operating height shall be 300mm and maximum operating height shall be 1800mm.
- Base frame to be provide as per site requirement
- Sloping canopy to be provided at the top of panel.
- Padlocking arrangement shall be provided in addition to key-locks.

## 4.3 SPECIFICATIONS FOR 11KV XLPE CABLE

### ➢ STANDARDS

**Unless otherwise specified, the cable shall conform in all respects to IS: 7098 (Part-II)-1985 with the latest amendment thereof.**

### ➢ SCOPE

This Section of the Specification covers the design, manufacturing, testing, packing, supply & delivery of 11 kV XLPE Dry gas-cured insulated power cable for an effectively earthed specification system.

### ➢ PRINCIPAL PARAMETERS

- 11 kV (E) Grade XLPE, 3-Core, power cable shall be of high conductivity, stranded compacted, H.D. aluminum circular shaped conductor with XLPE (cross-linked Poly Ethylene) insulation provided with shielding of extruded semi-conducting materials over the conductor and XLPE insulation. Each insulated core shall have a copper tape screen, laid together and provided with a common covering of PVC Inner Sheath (Extruded). Overall galvanized steel strip armor and PVC outer sheath shall be provided. The specification for the manufacture of the cable shall be conforming to IS: 7098(Part-II) 1985 (latest edition) for 11KV (E), 3-phase, 50 Hz. earthed systems.

- The outer sheath shall be designed to afford a high degree of mechanical protection and shall also be heat, oil, chemical and weather resistant, Common acids, alkalis and sealing solutions shall not have adverse effects on the material of the PVC sheath.
- Cable shall be suitable for laying in covered trenches and/or buried underground outdoors.

### ➢ Cable Parameters

| | | |
|---|---|---|
| (i) | Voltage grade (Uo / U) kV | : 6.35 / 11 |
| (ii) | Cores (Nos) | : 3 |
| (iii) | Nominal system voltage | : 11 |

| | | |
|---|---|---|
| (iv) | Highest system voltage kV | : 12 |
| (v) | System frequency Hz | : 50 |
| (vi) | Variation in frequency % | : 3% |
| (vii) | (a) Maximum allowable temp of conductor during continuous normal operation at rated full load current. | : 90oC |
| | (b) Maximum allowable temp. under short short condition | : 250oC |
| (viii) | 1.2/50 microsecond lightning impulse withstand voltage wave value. kVp | : 75 |
| (ix) | 5 Min, Power frequency withstand voltage kV rms | : 17 |
| (x) | System earthling | : Effectively earthed. |

- **GENERAL TECHNICAL REQUIREMENTS**

**Conductor:**

The cable conductor shall be made from high conductivity stranded High-Density aluminum to form a compacted circular-shaped conductor having resistance within limits specified in IS: 8130/1984 and any latest amendment to it.

**Conductor shield:**

The conductor having a semi-conducting screen shall ensure a perfectly smooth profile & avoid concentration of stress. The conductor screen shall be extruded in the same operation as the insulation. The semi-conducting polymer shall be cross-linked.

**Insulation:**

The XLPE insulation shall be suitable for 11 kV system voltage and should be manufactured with a Dry / Gas curing process. The bidder shall submit the description of the dry / gas curing process, with a clear inclusion of equipment/parameters involved. The manufacturing process shall ensure that the insulation shall be free of voids. The insulation shall withstand mechanical and thermal stress under steady state and transient operating conditions. The extrusion method should give a very smooth interface between the semi-conducting screen and insulation. The cable's insulation shall be of high standard quality generally conforming to IS: 7098 (Part – II) – 1985 and any latest amendment to it.

**Insulation shield:**

Non-metallic semi-conducting shield shall be provided over the insulation to on fine electrical field to the insulation. The insulation shield shall be extruded in the same operation as the conductor shield and the insulation by a suitable extrusion process. The XLPE insulation shield shall be of tended type. The copper metallic overlapped tape shield shall be provided.

**Filler and Inner-Sheath:**

The sheath shall be suitable to withstand the site conditions and the desired temperature. It shall be of adequate thickness, consistent quality and free from all defects. The PVC sheath shall be extruded. The material of fillers and inner-sheath shall be compatible with the temperature ratings of the cable and shall have no deleterious effect on any other component of the cable. Central PVC filler shall also, be provided with other peripheral PVC fillers to have proper circular shape.

**Armor:** Armouring of galvanized steel strips shall be provided. The dimensions of steel strips shall be as per the latest edition of IS: 3975 – 1979.

**Outer-Sheath:** Extruded type ST-2 PVC outer-sheath, conforming to IS: 5831-(1984) (latest edition) over armouring with suitable additives (to prevent attack by rodents & termites), shall be provided.

**Construction:**
The cable shall have suitable PVC fillers laid up with insulation cores to have a subsequently circular cross-section before the inner sheath is applied. The fillers shall be suitable for the operating temperature of the cable.
All materials used in the manufacturing of cable shall be new, unused and of the finest quality. All materials should comply with the requirements/tests as per applicable IS / IEC specifications, Indian Electricity Rules and any other statutory provision of rules& regulations.
The PVC material used in the manufacture of the cable shall be of a reputed manufacturer. No recycling of PVC is permitted. The purchaser reserves the right to ask for documentary evidence of the purchase of various materials, (to be used for the manufacture of cable) as per checking of quality control. Quality Assurance plans shall be submitted.

**Identification Mark:**
(i) The cable drum shall be printed with information as per cl.21;2 of IS and ISI Certification marks. Bidder shall submit Xerox copy of valid ISI Licenses with technical bid.
(ii) For identification of cores, colored strips of Red, Yellow and Blue colors shall be used for identification of phases. The following details of identification shall be embossed at intervals of length of one meter of cable outer sheath.
(iii) (a) Name of the manufacturer (b) year of manufacture (c) voltage grade (d) Name of the purchaser “MDI”.

**TESTS:**
**Type Tests:**
All the cable sizes i.e. items offered should have been fully type tested as per the relevant standards at any Govt. recognized Laboratory. The bidder shall furnish three sets of type test reports along with the offer. The Type test reports shall not be older than FIVE years and shall be valid up to the expiry of the validity of an offer. For any change in design/type, already type tested and the design/type offered against this specification, the purchaser reserves the right to demand the reputation of type tests without any extra cost. The purchaser also reserves the right to have tests carried out at his own cost by an independent agency, whenever there is a dispute regarding the quality of supply.

**Acceptance Test:**
The following acceptance tests shall be carried out on the selected samples as per IS: 7098 (Part-II) – 1985.
(a) Annealing test (for copper)
(b) Tensile test (for aluminum)
(c) Wrapping test (for aluminum)
(d) Conductor resistance test.
(e) Test for thickness of insulation and sheath
(f) Hot set test for insulation
(g) Tensile strength and elongation at break test for insulation and sheath.
(h) Partial discharge test (for screened cables only)

(i) High voltage test for 4 hours (as per cl. No. 19.7.1)
(j) Insulation resistance (volume resistivity) test.

All the acceptance tests shall be carried out by the firm, in the presence of the purchaser's representative at their works. The firm shall give at least 15 days advance notice to the purchaser to enable him to depute the engineer to witness the tests. The test certificates for acceptance tests witnessed by the inspecting officer/ engineer shall be submitted for approval before the dispatch of the material.

**6.0 PACKING AND FORWARDING:**

The cable shall be wound on wooden drums as per IS: 10418 –1972 and packed in drums suitable for vertical/horizontal transport, as the case may be and shall be suitable to withstand rough handling during transport and outer storage. The outer surface of the drum shall be painted with white aluminum paint. Similarly, the inside surface of the drum shall have a protective layer of varnish/paint to protect it from white ants.

The wooden drums shall be reinforced with steel bends and strips for better protection. The ends of the cable shall be sealed employing non-hygroscopic sealing materials.

**4.4 <u>SPECIFICATION FOR LT CABLES</u>**

**SCOPE:**

The specification covers the supply of 1100 Volts grade, Aluminum / Copper conductor PVC / XLPE insulated multi-core power cables.

**STANDARDS:**

Unless otherwise specified elsewhere in this specification, the rating as well as performance and testing of the LT PVC / XLPE cables shall conform to the latest revisions available at the time of placement of order of all the relevant standards as listed in, but not limited to Annexure-I.

**LT Cables**

1100 Volts Grade L.T. cable with stranded aluminum/copper conductor, XLPE / PVC insulated, color coded, laid up, with fillers and/or binder tape where necessary, provided with extruded FR PVC inner sheath, galvanized round / flat steel wire armored and provided with FR PVC outer sheath. Both inner and outer sheaths shall be of Type ST-1/2 as per IS: 5831-1984 and cable shall be conforming to IS:7098 Part-II. (Amended up to date) and bearing ISI mark

**DOCUMENTATION:**

The bidder shall furnish the following documents along with his offer.

- Sectional view showing the General constructional feature with conductor/conductor screen/insulation/armouring / inner and outer sheath etc.
- Drawing of cable drums with details of material dimension and paint etc. shall be submitted.
- All required type test reports for offered

**TESTING:**

**TYPE TESTS:**

Type test certificates shall be submitted.

**ROUTINE TESTS:**

All Routine tests as per IS:

**ACCEPTANCE TESTS:**

All Acceptance tests as per IS shall be carried out on samples taken from the delivery lot.

**INSPECTION:**

The inspection may be carried out by the purchaser/Consultant or his authorized representative at any stage of manufacture. The successful bidder shall grant free access to the purchaser's representative at a reasonable time when the work is in progress. No separate charge shall be paid for this.

Inspection and acceptance, of any cables under this specification by the purchaser, shall not relieve the supplier of his obligation of supplying cable following the specification and shall not prevent subsequent rejection, if the cables are found defective.

The supplier shall keep the purchaser informed in advance about the programmed manufacturing of cables so that arrangements can be made for inspection.

The purchaser reserves the right to insist on witnessing the acceptance/routing tests of the bought-out items.

**PACKING AND MARKING: -**

**The following particulars shall be properly legible and embossed on the cable sheath at intervals exceeding one meter throughout the length of the cable.**

a) Manufactures name
b) Voltage grade.
c) Successive Length
d) Size of cable

**ANNEXURE-I**

**(List of Standards)**

| Sr. N | STANDARD NO. | TITLE |
|---|---|---|
| 1. | IS: 1554 (Part 1)-1988 | Specification for PVC insulated (Heavy Duty) Electric cables for working voltages up to and including 1100 Volts. |
| 2 | IS: 7098 (Part II) | Specification for XLPE insulated electric cables |
| 3. | IS: 5831-1984 | Specification for PVC insulation and sheath of electric cables. |
| 4. | IS: 8130-1984 | Specification for conductors for insulated electric cables and flexible cords. |
| 5. | IS: 3975-1988 | Specification for Mild Steel wires, formed wires and tapes for armouring of cables. |
| 6. | IS: 3961 (Part-II)-1967 | Recommended current ratings for PVC insulated and PVC sheathed Heavy Duty Cables. |
| 7. | IS: 10462 (Part-I) / 1983 | Fictitious calculation method for determination of dimensions of the protective covering of cables. |

## 4.5 CONDUIT SYSTEM, CABLE TRAY, CABLE LADDER AND TRUNKING INSTALLATION

### 4.5.1 GENERAL

**Work Description**

This section describes the supply and installation of wiring facilities systems include conduits, cable trays, cable ladder and Trucking system, c/w associated fittings and

accessories.
All cables running above the suspended false ceiling, columns, or on surface shall be supported byproper clamps, on cable tray or cable ladder system. No free hanging of cable is allowed.
The cable routes shown in the drawings shall be used as a guide only. The cable routes may be physically examined and coordinated with other services before undertaking the installation work inhand.
Uncoordinated and inaccessible routes after other services are installed, shall be relocated at the expense of the Contractor.
All conduits, trucking, cable trays and cable ladders shall be earthed in accordance to IS: 4043.

**4.5.2 Standards**

The complete wiring facilities system shall be manufactured, supplied, installed and tested in accordance with the latest revision of the Indian standards and the appropriate BS / IEC include:

1. Steel Conduit and Fitting Accessories IS:9537 (Part-II)/ BS4568 & BS731
2. PVC Conduit and Fitting Accessories IS-9537/1983 (Part-III)/BS6099 & BS4607
3. Cable Tray BS729
4. Cable Ladder BS729
5. Cable Trunking BS4678

The complete wiring facility system shall conform to the requirements of all relevant local codes, as applicable, together with the additional requirements referred to in the approved specification and drawings.

**4.5.3 Submissions**

All technical submissions shall be approved by the ELECTRICAL contractor prior to the respective stages of construction with respect to the approved design and development documents. In caseof major deviations, it shall be brought under the notice of consultant for its review and approval.
Routing of installation

Sample of proprietary factory-made accessories, elbows, risers, reducers, tees, crosses, etc.

**4.5.4 PRODUCTS**

- Steel Conduit and Accessories

**Steel Conduit:**

All conduits shall be of heavy gauge solid drawn ERW welded manufactured out of 16 (1.6mm) gauge MS Sheet up to 32mm dia and 14 (2 mm) gauge for sizes above 32mm.
Both inner and outer surfaces shall be smooth without burrs, dents and kinks.
Conduits shall be black stove enameled inside and outside. The cross section of conduit shall be uniform throughout.
The welding shall be uniform such that welded joints do not yield when subjected toflattening test.

Welded joint shall not break when threaded or bent at an angle.
Conduit shall conform to specifications of IS: 9537 (Part-II) and the capacity of conduits shall be by the standards
The minimum size of the conduit shall be 19/20mm diameter.
Care shall be taken to ensure that all conduits are adequately protected while stored at site prior to erection and no damaged conduit is used.

**Fittings**

1. Samples of conduit fittings shall be submitted for approval prior to use on work.

2. Fittings shall be those intended for use with screwed conduits and shall comply with IS 9537. However, bends, elbows and tees shall not be installed.
3. Boxes and cover plates installed outdoors shall have fixing lugs exterior to the box so thatfixing screws do not enter the box interior.
4. Adaptors used with flexible conduits shall conform to IS: 9537.

**Circular Boxes:**

Circular boxes shall be of malleable cast iron, galvanized and of standard pattern with spout(s). When used for connecting lengths of conduits, circular boxes shall be provided with cover plates of similar make that are complete with brass fixing screws.

**Rectangular Boxes:**

Rectangular boxes (adaptable boxes) shall be of mild steel not less than 2.4 mm gauge and galvanized. When used as junction boxes, lids of the same gauge with brass fixing screws shall be used.

**Boxes for Accessories:**

Boxes for accessories shall be suitable for surface mounting or recessed mounting according to the requirements. Surface mounted boxes and accessories shall be metal clad pattern. Recessed boxes and accessories shall be complete with insulated molded type cover plates conforming to IS: 5133 Part I-1969.

**Covers**

All covers for boxes, etc shall be made of galvanized steel of 1.2mm thickness.

PVC Conduit and Accessories

**PVC Conduit**

1. All conduits shall be high impact rigid 2mm thickness PVC heavy duty type and shall complywith I.E.E. regulations for non-metallic conduit as per IS-9537/1983 (Part-III).
2. All sections of conduit and relevant boxes shall be properly cleaned and glued by using epoxy resin glue and the proper connecting pieces.
3. Inspection type conduit fittings such as inspection boxes, drawn boxes, fan boxes and outletboxes shall be of M.S. or otherwise mentioned.
4. Conduit shall be terminated with adopter/PVC glands as required.

**PVC CONDUIT ACCESSORIES**

1. Accessories used for conduit wiring shall be of an approved type conforming to IS: 3837-1966.
2. All accessories used shall be of standard white or black color, identical to conduit used.

3. Plain conduits should be joined by slip type of couplers with manufacturer's standard sealing cement.
4. All conduit entries to outlet boxes, trunking and switchgear are to be made with adaptorsfemale thread and male bushes screwed.
5. PVC-switch and socket boxes with round knockouts are to be used. The colors of these boxes and the conduits shall be the same.
6. Standard PVC circular junction boxes are to be used with conduits for intersection, Tee-junction, angle-junction and terminal. For the drawing-in of cables, standard circular through boxes shall be used.
7. Samples of accessories shall be submitted for approval prior to installation.

8. All jointing of PVC conduits shall be by means of adhesive jointing. Adequate expansion joints shall be allowed to take up the expansion of PVC conduits.

**Conduit Installation**

**Layout**

5. The conduit layout and conduit routes shall be submitted for approval. Allowance for adjustments due to site conditions shall be made at no extra cost.

6. Conduit routes shall be chosen for easy, straight runs with minimum bends and crossings. Generally, they shall follow the structure of building, running at right angles or in parallel to floors and ceilings. Conduits shall be kept within 300 mm of floors and ceilings when runningparallel to them.
7. Outlet boxes for housing accessories shall be used as draw boxes. The total number of drawboxes shall be kept to a minimum and shall be provided so that conduit runs do not exceed 12 m or have more than two right angle bends.
8. All conduits shall be kept clear of gas and water pipes. In particular, conduits shall be at least 150 mm away from gas pipes. Where proximity to these pipes is unavoidable, they shall be effectively segregated e.g. using rubber or other insulating material to prevent appreciable voltage differences at possible points of contact. Segregation from extra low voltage circuits and telecommunication circuits shall also apply unless these are wired to thesame voltage requirements as lighting and power circuits.
9. Conduits from different distribution boards shall not be connected to the same junction box.Each run of conduit shall be assembled complete with draw-in-wires.

**Joints and Terminations**

1. Electrical and mechanical continuity shall be maintained throughout all conduit joints and terminations. Conduit threads shall be thoroughly cleaned and tightly screwed. The conduit system shall be watertight after installation.
2. Conduits shall be connected using couples or via boxes. With a coupler, the ends of the conduit shall butt close together and the running coupler is screwed tightly on and tightened by a locknut.
3. Conduits terminating into boxes provided with spouts shall be threaded so that there are no exposed threads. For boxes with no spouts, the termination shall be made using a brass bush and a coupler. The conduit is pushed through the knockout or drilled entry and the bush is screwed tightly onto its end. The coupler is screwed to butt firmly

against the exteriorwall of the box.

4. Where conduits are not jointed or terminated in boxes, they shall be terminated in a screwedbrass bush.
5. In all joints and terminations, conduit threads shall not be exposed. Where this cannot be avoided as in a running coupler, the exposed threads shall be coated with red lead paint to seal against the ingress of water.

**Bends:**

1. Conduits shall only be bent cold with an approved type of bending block or bending machine,without altering the dimensions of their sections.
2. All conduit bends shall be such as to permit compliance to the requirements for bends in cables to as stated in the BS 7671.
3. Bends shall be made with as large a radius as the position of the conduit within the building permits. Where the bend is more than 90 degree, circular or rectangular junction boxes are to be used for connecting conduits.

**Cabling:**

1. The conduit system must be installed free of obstructions and sharp corners before any cables are drawn in. Conduits shall be thoroughly swabbed to remove moisture and dirt immediately prior to the drawing in of cables.
2. Cables shall be drawn without crossing each other and shall not be pulled against the wallsof the draw boxes. Slack cables shall left in all draw boxes.
3. Cables shall be continuous throughout conduit lengths and no joints are permitted. Thereshall be no kink in cables, neither any cut, abrasion or chink in the cable insulation.
4. The same conduit shall carry the lead and return conductors bunched together. However,the same conduit shall not house cables from different distribution boards.
5. Cables for power and lighting circuits and extra low voltage systems shall not be drawn into the same conduit. Lighting and power circuits shall run in separate conduits except, where an adopter box is employed as final distribution point, a number of final circuits are grouped together in larger conduits between the distribution board and the adopter box provided that all final circuits in one conduit are of the same phase. In the case of three phase circuits, all three phases including neutral, if any, shall be drawn into the same conduit.
6. Conduits shall not constitute the earth continuity path for the electrical circuit. A separate circuit protective conductor shall be installed within the conduit. The whole conduit system shall be effectively earthed.
7. Flexible conduits shall have a separate earthing conductor installed within the tubing and connected at conduit ends. Flexible conduits in general shall not be used for more than 3m length.
8. Maximum number of PVC insulated 650/1100V grade/copper conductor cable conforming toIS:694-1990

| Nominal | 20mm | | 25mm | | 32mm | | 38mm | | 51mm | | 64mm | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| Cross-Sectional area of Conductor in Sq.mm | | | | | | | | | | | | |
| | S | B | S | B | S | B | S | B | S | B | S | B |
| 1.0 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 1.5 | 5 | 4 | 10 | 8 | 18 | 12 | - | - | - | - | - | - |
| 2.5 | 5 | 3 | 8 | 6 | 12 | 10 | - | - | - | - | - | - |
| 4.0 | 3 | 2 | 6 | 5 | 10 | 8 | - | - | - | - | - | - |
| 6.0 | 2 | - | 5 | 4 | 8 | 7 | - | - | - | - | - | - |
| 10 | 2 | - | 4 | 3 | 6 | 5 | 8 | 6 | - | - | - | - |
| 16 | - | - | 2 | 2 | 3 | 3 | 5 | 5 | 10 | 7 | 12 | 8 |
| 25 | - | - | - | - | 3 | 2 | 5 | 3 | 8 | 6 | 9 | 7 |
| 35 | - | - | - | - | - | - | 3 | 2 | 6 | 5 | 8 | 6 |
| 50 | - | - | - | - | - | - | - | - | 5 | 3 | 6 | 5 |
| 70 | - | - | - | - | - | - | - | - | 4 | 3 | 5 | 4 |

**Notes:**

i. The above table shows the maximum capacity of drawing in of cables in conduits
ii. The columns Head 'S' apply to runs of conduits which have distance not exceeding 4.25 m between draw in boxes and which do not deflect from the straight run by an angle of more than 15 degrees. The columns heads 'B' apply to runs of conduit which deflect from the straight by an angle of more than 15 degrees.
iii. Conduit sizes are the nominal external diameters.

**Access and Drainage:**

1. The conduit system shall be rewirable, that is, draw boxes must be accessible for the purpose. Where boxes are concealed, their covers shall be flushed with the finished surface.
2. The need for accessibility notwithstanding, the conduit system shall be protected against theingress of water and impurities. When installed, conduits shall be kept dry and free of debris with approved pipe plugs or caps. Such plugging is especially essential prior to pouring concrete for concealed installation. As for boxes, they shall be covered by steel plates prior to concreting.
3. When installed outdoor, and in situations liable to condensation of moisture, conduits shall be arranged to be self-draining, so that water may drain to low points which are fitted with a drain plug. Conduits laid under concrete floors shall have watertight floor-traps of approved detail for access of these drainage points.
4. Conduits run on surfaces other than structural steel members shall be secured using galvanized space bar saddles and brass fixing screws. Spacing of saddles shall not exceed 1.2 m for conduit sizes up to and including 25 mm and 1.8 m for sizes 32 mm and above.
5. Conduits run on structural steel shall be secured using girder clips or an approved clamp. These conduits and those run in the vicinity of structural steel shall be bonded to the steel work using an efficient and permanent metallic connection. The conduits shall not in any way be under mechanical stress.
6. All conduit boxes except loop-in patterns shall be fixed direct to the building structure inaddition to the support provided by the conduits.
7. Conduits terminating into surface boxes shall be secured by a minimum of 3 saddles at notless than 32 mm, 150 mm and 300 mm respectively from the box.
8. Conduits shall be painted with an approved paint to blend with visual environment. A zincrich undercoat shall be provided before painting the final coat.

**Cable Tray/ Cable Ladder:** Cable Tray and Cable Ladder systems are intended for the support and accommodation of cables and possibly other Electrical equipment in Electrical/Instrumentation/Communicationsystems. The cable trays / ladders shall be fabricated according to the design specified by IEC 61537 and should be tested for Safe Working Load (SWL). The relevant details of SWL and the loadchart with respect to SWL, supporting distance and the deflection should be according to the following chart.

| Safe Working Load (SWL) with a span length up to 5 meters | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Description | Side Height (in mm) | Width (in mm) | Span length (in meters) | | | | | |
| | | | 1.5m | 2m | 2.5m | 3m | 4m | 5m |
| | | | Permitted Load (in kg/meter) | | | | | |
| Perforated tray | 60 | 100-500 | 150 | 100 | 50 | - | - | - |
| | 85 | 100-500 | 175 | 110 | 50 | - | - | - |
| | 100 | 150-500 | 185 | 130 | 75 | 60 | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Cable Ladder | 60 | 200- 600 | | 225 | 150 | 110 | 45 | - |
| | 110 | 200 -600 | | 310 | - | 140 | 65 | 50 |

Safe Working Load (SWL) with a span length up to 10 meters

| Description | Side Height (in mm) | Width (inmm) | Span length (in meters) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 4m | 5m | 6m | 7m | 8m | 9m | 10m |
| | | | Permitted Load (in kg/meter) | | | | | | |
| Perforated Cable Trayfor long span distance | 110 | 200- 300 | 160 | 110 | 75 | - | 20 | - | - |
| | | 400 - 600 | 20 | 150 | 100 | - | 40 | - | - |
| | 160 | 200 - 300 | 230 | 180 | 140 | 100 | 70 | - | - |
| | | 400 - 600 | 250 | 200 | 160 | 130 | 100 | - | - |
| Cable Ladder for longspan distance | 110 | 200 - 300 | 160 | 110 | 80 | 40 | - | - | - |
| | | 400 - 600 | 210 | 150 | 100 | 70 | - | - | - |
| | 160 | 200 - 300 | 230 | 180 | 140 | 100 | 70 | - | - |
| | | 400 - 600 | 250 | 200 | 160 | 130 | 100 | - | - |
| | 200 | 200 - 600 | - | - | 300 | 250 | 200 | 140 | 100 |

Fabrication of Tray / Ladder and accessories at site and welding is not permitted. In unavoidable circumstances, if any cut or holes are made in the trays/Ladder/ accessories, zinc spray need to be applied over the surface. The metal edge has to be protected by edge protection sleeves to avoid cable damage. Edge of the supports has to be protected with plastic END caps.

Screwed connections and internal fixing Devices should not create any damage
To the cable when correctlyfixed. Sudden or jerky motions shall not be used to tighten reusable screw connections.

**Cable:**

The cable tray and all accessories shall be fabricated from sheet steel and has to be galvanized against corrosion confirming to EN10346 / ISO1461-1999 for installations in indoor and outdoor applications respectively. The cable trays shall be supplied in standard lengths of 3000 mm and the width of the tray shall be as follows.
Width: 100, 150, 200, 300, 450, 600.

All the cable tray accessories like Bend's, TEES's, Cross overs etc. should be designed in accordance with IEC 61537 and shall be factory fabricated. The accessories shall be from the same material as of the tray and modular type, it should be connected with the trays by using fasteners. Typical details of trays, fittings and accessories. Etc. are shown in the enclosed drawings.
For Cable trays designed, tested and confirming to IEC 61537, thickness of cable tray should be according to the manufacturer's catalogue. For locally fabricated and non-tested tray, thickness should be 2 mm up to span length of 1.5-meter, 2.5 mm for span length between 2 to 3 meter and3 to 4 mm for span length between 4 and 10 meters.

**Cable ladder: -**

The cable Ladder and all accessories shall be fabricated from sheet steel and has to be galvanized against corrosion confirming to EN10346 / ISO 1461-1999 for installations in indoor

and outdoor applications respectively. The cable ladders shall be supplied in standard lengths of 3000 mm and the width of the ladder shall be as follows.
Width: 200 to 600 mm in multiples of 100 mm

Maximum rung spacing in the ladder shall be 300mm. The rungs should be made of C profiles suitable to fix cables by special metal clamps according to the drawing. The ladder shall be of riveted and foldable type for easy transportation and to avoid damage during transportation andstorage.
All the ladder accessories like Bend's, TEES's, Cross overs etc. should be designed inaccordance with IEC 61537 and shall be factory fabricated.
The accessories shall be made from the same material as of the ladder and modular type, it should be connected with the ladder by using fasteners.
For Cable Ladders designed, tested and confirming to IEC 61537, thickness of cable Ladder should be according to the manufacturer's catalogue. For locally fabricated and non-tested Ladder,thickness should be 2.5 mm up to span length of 1.5-to-2-meter, 3 mm for span length between 2.5to 4 meter and 3 to 4 mm for span length between 5 and 10 meters.

**Mounting Accessories (supports and Brackets):-**
The mounting accessories shall be fabricated from steel and has to be hot dip galvanized against corrosion confirming to ISO 1461-1999 for installations in both indoor and outdoor applications andshould be of completely modular type.
All supports and Brackets should be factory made, hot dip galvanized after completing welding, cutting, drilling, other machining operations and tested according to IEC 61537 according to thearrangements in the enclosed drawing. The system shall be designed such that it allows easy assembly at site by using Bolts and Nuts. The main support and brackets shall be fixed at site using necessary brackets, clamps, fittings, bolts, nuts and other hard ware etc. to form various arrangements required to support the cable trays.
Welding of the components at the site shall not be allowed.
**Corrosion Protection: -**

The cable tray / ladder/accessories shall be galvanized according to EN10346 / ISO 1461-1999 for installations indoor and corrosive outdoor applications respectively. Sample tray / ladder / accessories / mounting accessories and supports should be salt spray tested according to ISO 9227 for > 150 hours & 500 hours.
(*155 hours according to class 3 for pre-galvanized surface and550 hours according to class 6 for Hot dip Galvanized surface as per ISO)
**Testing and Certification: -**
Cable tray / Ladder, bend, T Bend, cross, and all supports are to be tested for Safe Working Load (SWL), deflections, Impact resistance, Salt Spray & Electrical continuity test according to IEC 61537. The cable tray/ladder should not deflect more than 1/100th of the span length at SWL in Mid span and the transverse deflection of all mounting accessories at SWL shall not exceed 1/20th of the length. The cable tray / cable ladder should be tested up to 1.7 times SWL at minimum and maximum room temperature. The temperature classification of cable tray system should be - 5 to + 150°C.
2.0.1. **Cable Trunking**
Cable trunking shall be manufactured from 1.6 mm minimum electro-galvanized mild sheet steel to BS4678 finished in oven-baked electro statically coated epoxy powder coating with color.
All trunking shall have removable lids extending over their entire lengths. Lids shall be fixed at interval not exceeding 1 meter by means of brass steel screws which and protected against corrosion by a finish of zinc coating or equivalent to zinc coating.

Factory-made bends, joints, elbow, riser, tee, reducer and accessories with same material shall beprovided throughout the installation for trunking. Trunking space factor shall be in compliance with latest IS standards. Copper earth link bar shall be fixed at every joint of the cable trunking run.

**Note:** All items mentioned in this section shall be manufactured to comply with the specificationsof National Electrical Code (NEC) and National Electrical Manufacturer's Association (NEMA).

**GENERAL SPECIFICATIONS OF CCMS PANEL:**

- SYSTEM : 415V, 40 AMPS CCMS PANEL
- TYPE : OUTDOOR TYPE, STAND MOUNTING DUST & VERMIN PROOF, IP-55
- CONSTRUCTION : FABRICATED OUT OF 14 SWG C RCA SHEET
- SURFACE FINISH : 7 TANK PROCESS
- PAINT : RAL 7035
- CABLE ENTRY : BOTTOM (DETACHABLE GLAND PLATE)
- CABLE SIZE : FOR INCOMER POWER - 10 SQ
  : FOR CONTROL CIRCUIT - 1 SQ MM
- LAMINATED CIRCUIT DIAGRAM SHALL BE PASTED ON INNER SIDE OF THE DOOR.
- POWER CIRCUIT SHALL HAVE COLOUR SLEEVES AND FERRULE ON CU LUGS AND CONTROL CIRCUIT SHALL HAVE FERRULE AND INSULATED LUGS.
- ARRANGEMENT OF COMPONENTS SHOWN ARE INDICATIVE AND RELOCATION OF PARTS & COMPONENTS IS POSSIBLE AT THE TIME OF ACTUAL MANUFACTURING.
- NAME PLATE DETAILS SHALL BE GIVEN IN THE PO.
- TOLERANCE ON DIMENSIONS IS +/- 5MM.
- FEEDER PILLAR SHALL HAVE PAD-LOCKING ARRANGEMENT.
- 2 NOS EARTH TERMINALS BY 10MM DIA BOLT SHALL BE PROVIDED.

| Sr. No | Component | Specification | Maker's name | Qty/Panel |
|---|---|---|---|---|
| 1 | I/P MCB | 63A 4P | L&T | 1 |
| 2 | Mcb Aux | | L&T | 1 |
| 3 | Energy Meter | 3phase, DLMS, Class 1 | L&T | 1 |
| 4 | Surge protection Device | 40kv, 4P | CITEL | 1 |
| 5 | Latch Relay | 90A | TARA | 3 |
| 6 | Device mcb | 6A, SP | L&T | 3 |
| 7 | RTU | GW12A2 | Surya/Jio | 1 |
| 8 | Power Supply | PS-5V2A DC | Surya/Jio | 1 |
| 9 | Rotary switch | 3P, 3W + OFF | salzer | 1 |
| 10 | O/P mcb | 40A, SP | L&T | 4 |
| 11 | GSM antenna | roof mount | | 1 |
| 12 | PG gland | PG 29 | Power connect | 2 |
| 13 | Power Wires | 10 sq mm. | | |
| 14 | Control wires | 1 sq mm | | |
| 15 | Tamper switch | push to off | ESSVEE | 1 |
| 16 | Enclosure + Stand | | STD | 1 |
| 17 | Terminal Block | 100A-120A | Connect Well | 14 |

| | | | | |
|---|---|---|---|---|
| 18 | Transformer | | | 1 |
| 19 | TIMER | 110-240VAC,50/60z | GIC | 1 |
| 20 | Latch Relay driver | 5V/3W Coil | Surya/Jio | 1 |

**4.8 LIST OF APPROVED MAKES**

| Sr. No. | Description of Items | Approved Makes and Types |
|---|---|---|
| 1 | Electrical Panels | Legrand, L&T, Siemens, ABB, Schneider, Tricolite, Gemtech |
| 2 | ACB | Schneider, L&T, Siemens, ABB |
| 3 | Current Transformer | C&S, Precise, Pragati, Kappa, AE, Rishabh |
| 4 | MCCB | Legrand, Schneider, L&T, Siemens, ABB |
| 5 | MCB, RCCB | Legrand, Schneider, Hager, Siemens |
| 6 | Digital Meters | Schneider, Meco, Rishab, Elmeasure |
| 7 | Indicating Lamps, Push buttons, Timers | Siemens, Teknic, BCH, Schneider |
| 8 | Change-over Switch | Schneider, L&T, Siemens, ABB, Socomec |
| 9 | Terminals | Elmex, Wago, Phoenix |
| 10 | CCMS Panel | Surya/Havells |
| 11 | Cable | Polycab, Finolex, Gloster, Nicco, Havells, Universal |

# SECTION_05

# BOQ FOR ERECTION OF ELECTRICAL EQUIPMENT

# SECTION -5

# PART -1:

# DEVELOPING AND UPGRADAGING
# THE EXISTING ELECTRICAL HT DISTRIBUTION SYSTEM

**SUBJECT: BOQ of HT Electrical Material Supply & Installation work for MDI Project**

| S.No. | Description | Unit | BOQ Qty | Rate | Amount (Rs.) |
|---|---|---|---|---|---|
| | **SECTION - 1 : H.T SUB-STATION** | | | | |
| 1 | Supply, Installation, Testing & Commissioning of **11 KV Metering cubical box** with C.T, PT & TTB, with I/E Meter. **(Without energy meter)** | Set | 1 | | |
| 2 | Supplying, installation, testing & commissioning of indoor type floor mounted metal clad, 11 KV VCB incoming-outgoing panel Air Insulated VCBs roll on floor type totally enclosed & fully interlocked, horizontal draw out, horizontal isolation type breaker as per IEC62271-100 & 200, as amended up to date and additional specifications, having capacities as mentioned below, single break, trip free mechanism, manually charged and closing breaker suitable for use on 11 KV, 3 Phase, 50 Hz A.C. supply with short circuit fault level of 25 KA for 3 second, complete with self-contained, Internal arc tested AFLR 25 kA for 1 sec @ 13KV, fully interlocked, copper bus bars of 800 Amps capacity, breaker featured with mechanical ON/OFF indicator with hand trip device, spring release coil, shunt trip coil and auxiliary switch of 4 NO + 4 NC and equipped with inbuilt Anti pumping feature & following switchgears and accessories i/c connecting suitable for 2R - 3 x 400 sq.mm XLPE 11 KV cable with cable boot (cable entry from Top/Bottom and front operated, complete as required (Note - Cost of end termination not included in this item) - All Incoming and outgoing feeders shall have fault trip auxiliary contacts for wiring to annunciation fault trip indication panel. There Should be arc Flash Protection in cable, busbar, and breaker chamber. | Set | 1 | | |
| 3 | Supply & Erection of the following Safety and testing equipment Including miscellaneous items like clamps, nuts & bolts, rawl plugs etc. at suitable places in the substation building as required | LS | 1 | | |
| 4 | H.T. (11 KV) DANGER NOTICE PLATE of 250 mm x200mm size made of mild steel at least 2mm thick and vitreous enameled white on both sides and with inscription in signal red colour on front side as required | LS | 1 | | |
| 5 | Supply and fixing in position the best quality L.T. Danger Notice plate of 200mm x 150mm, made of mild steel atleast 2mm thick and vitreous enameled, white on both sides and with inscription in signal red color on front side written in English & Hindi as required | LS | 1 | | |
| 6 | Supply and fixing in position the approved shock treatment / restoration charts written in Hindi and English duly framed in teak wood frame and covered with 2.8mm glass as required. | LS | 1 | | |

| | | | | | |
|---|---|---|---|---|---|
| 7 | Dry chemical powder type fire Extinguishers with cylinders duly charged of capacity 5 kg confirming to IS 2878 including fixing of M.S. Clamps, Brackets etc. complete as required. | LS | 1 | | |
| 8 | **H.T. CABLE:** | | | | |
| 8.1 | **Supply, Installation, Testing, and Commission of Double circuit of 11 KV Cables as per attached specifications in existing trenches, pipes, and structure as per instruction of Engineer-in-charge (MAKE- Polycab/KEI/Havells)** | RM | | | |
| 8.2 | Excavation and backfilling of earth for underground cable laying for trench width and depth as mentioned below. Work involves levelling the bed, providing sand cushion, brick protection and back filling after laying the cables, earth strip etc. finishing the top after consolidation and removing the surplus soil from the site of erection as per specification, drawing and directing of the site in-charge. Supply of fine river sand and class-B bricks of approximate size 10"x5"x3" are included the scope of contractor. | | | | |
| | 3Cx400sqmm | RM | (2*25)50 | | |
| 9 | **END TERMINATION:** | | | | |
| | **Supplying and making indoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for the following size of 3 core, XLPE aluminum conductor cable of 11 KV grade as required Only termination from Meter cubical to incoming termination of VCB) (Make: - RAYCHEM/3M)** | | | | |
| 9.1 | 3 core 400 sq.mm. cable (Indoor type) | Nos. | 4 | | |
| 9.2 | 50 x 6 mm GI Tape | RM | 200 | | |
| | **SECTION - 2: EARTHING WORK** | | | | |
| 1 | **EARTH STATIONS:** | | | | |
| 1.1 | **Supply & Installation G.I Plate Earthing 600 x 600 x 6 mm Supplying the necessary materials and making earth station with 600 x 600 x 6 mm thick G.I. plate with one Nos 50 x 6mm G.I strip buried at a level of 13 Feet (For HT Meter-2nos, Near HT Meter VCB-2Nos & Near Transformer VCB-2Nos)** | Nos. | 13 | | |
| 1.2 | **Supplying, receiving, laying, fixing, jointing, and terminating of the following tapes/wires in masonry treches/on walls/on cable tray/along the cable with suitable G.I./Copper Clamps, screws etc.** | | | | |
| | **50 x 6 mm GI Tape** | RM | 100 | | |
| | **Total Amount (Rs.)** | | | | |

Note: - Please include the following in the above BOQ items: -

* **All Civil platforms required for Panels are included in above scope of work**.
* **Any Dismantling-related work is inclusive.**
* **All outgoing and Further Underground Laying of HT cable is in this tender Scope of the Consultant.**

**PART-2-A**

**SUBJECT: BOQ of LT Electrical Material Supply & Installation work for MDI Project.**

| S.NO. | Description | Unit | BOQ Qty. | Rate | Amount (Rs.) |
|---|---|---|---|---|---|
| | **SECTION -2 L.T SECTION** | | | | |
| 1 | **LT TERMINATION PANEL** | | | | |
| 1.1 | **Out Door type Feeder Pillar Cable Junction Box for 9 Nos. Cable Joint** | | | | |
| 1.2 | Supply Installation, testing & commissioning of Out Door Type Feeder Pilar Cable Junction Box with provision of Six incoming and six outgoing cables transporting to the exact location, erecting, including creating jointing of panels shipping section & bus bar fish plate, checking of all interconnections, small wiring, testing & commissioning of panels including Hardware& Legends. This also include the dismantling the existing Hazard laying of cable in a trench and to relayed on Two Tier Cable Tray on the top of existing Cable complete in all aspects.<br>**The details Specifications are as: -**<br>**(a) CUBICAL BOX :** box made out from 16/14 SWG CRCA sheet steel duly powder coated In Siemens Grey Color. Approximated size of panel 1000 mm (W) x 1750 mm (H) X 1300 mm (D) Angle Frame mounted. Front Operated. Double Front (Outdoor Type).<br>**(b) BUS BAR:** Electrolytic Grade Aluminium Bus bar with PVC Heat Shrinkable Color Coated Sleeve Suitable for Incoming & Outgoing Feeders (Main Bus bar 400A TP+N Aluminium | | | | |
| 1.3 | Cable Junction Box for Cable Joint | Nos | 9 | | |
| 1.4 | 3.5 C X 300 to 3.5C X 185 Sq. mm AL.AR cable End Termination | R.M | 35 | | |
| 1.5 | 3.5 C X 150 to 3.5C X 95 Sq. mm AL.AR cable End Termination | R.M | 20 | | |
| 2 | **MEDIUM VOLTAGE PANEL BOARDS** | | | | |
| | Supply and installation of the following cubical type panels (Partial Type tested) made of 14-gauge CRCA structure, base channel, doors & partitions complete with, Air Circuit Breaker, moulded case circuit breakers, meters, indicating lamps, current transformer etc. Complete in all respects, insulated bus bars with heat shrinkable PVC sleeve in suitable bus chambers, interconnection, small wiring, name plate, danger plate, earth bus etc. & comprising of compartments with hinged door for each feeder & its accessories, cable alley with hinged doors, bus chamber with bolted door etc. The panel being of dust & vermin proof construction with rubber gasket, attractively powder coated with Siemens grey shade and having orange peel - finish. The panel shall be free standing type/ wall mounted | | | | |

| S.NO. | Description | Unit | BOQ Qty. | Rate | Amount (Rs.) |
|---|---|---|---|---|---|
| | type as per relevant drawing, Equipment schedule, specifications including all materials, accessories, loose supplied items, etc. required for completeness of the project majorly comprising of following | | | | |
| 2 | **SUB-PANEL-1(Front)-GURUKUL** | Nos. | 1 | | |
| | **Main Incomer with Metering & Indications** | | | | |
| 2.1 | 320A TP+N MCCB 36kA With Thermal Magnetic Release having S/C & O/L Protection - 1 Nos | | | | |
| 2.2 | Spreader Link-3P - 1 Nos | | | | |
| 2.3 | Door Operating Handle - 1 Nos | | | | |
| 2.4 | Digital Multifunction Meter Class-1.0-With RS-485 Port- 1 Nos | | | | |
| 2.5 | CT 300/5A, Class 1.0 for Metering- 3 Nos | | | | |
| 2.6 | Phase Indication Light LED Red 220V AC - 1 Nos | | | | |
| 2.7 | Phase Indication Light LED Yellow 220V AC - 1 Nos | | | | |
| 2.8 | Phase Indication Light LED Blue 220V AC - 1 Nos | | | | |
| 2.9 | Control MCB 6A SP 10 kA - 3 Nos | | | | |
| 2.10 | Isolating Neutral Link 32A- 1 Nos | | | | |
| | **Outgoing Feeders** | | | | |
| 2.11 | 100A TP+N MCCB 25kA Thermal Magnetic Release having O/L, S/C Protection. - - 5 Nos | | | | |
| 2.12 | Spreader Links-3P-5 Nos | | | | |
| 2.13 | Door Operating Handle - 5 Nos | | | | |
| | **CUBICAL PANEL** | | | | |
| 2.14 | Cubical Panel made out from 14/16 SWG CRCA Sheet Steel Duly Power Coated in Siemens grey colour, Approx. Size of panel 1150mm (W) X 1800 (H) X 450mm (D), Floor Mounted, Front Operated. Back Closed. **Indoor Type** - 1 Nos | | | | |
| | **BUS BAR** | | | | |
| 2.15 | Electrolytic Grade Aluminium all Insulated Colour Coated Bus bar Accordingly Suitable For Incoming & Outgoing Feeders **(Main Bus bar 320A TP+N Aluminium With Al Earthing)** - 1 Nos | | | | |
| | **WIRING** | | | | |
| 2.16 | Wiring & Fixing material PVC Insulated Single Core Industrial Flexible Copper Wire- 1 Nos | | | | |
| | **MISC. ITEMS** | | | | |
| 2.17 | Hardware & Legends - 1 Nos | | | | |
| 3 | **Sub-Panel-2(Front)-Gurukula** | Nos | 1 | | |
| 3.1 | **Main Incomer with Metering & Indications** | | | | |
| 3.2 | 400A TP+N MCCB 36kA With Thermal Magnetic Release having S/C & O/L Protection. | | | | |
| 3.3 | Spreader Link-3P - 1 Nos | | | | |
| 3.4 | Door Operating Handle - 1 Nos | | | | |
| 3.5 | Digital Multifunction Meter Class-1.0-With RS-485 Port - 1 Nos | | | | |
| 3.6 | CT 400/5A, Class 1.0 for Metering - 3 Nos | | | | |

| S.NO. | Description | Unit | BOQ Qty. | Rate | Amount (Rs.) |
|---|---|---|---|---|---|
| 3.7 | Phase Indication Light LED Red 220V AC - 1 Nos | | | | |
| 3.8 | Phase Indication Light LED Yellow 220V AC - 1 Nos | | | | |
| 3.9 | Phase Indication Light LED Blue 220V AC - 1 Nos | | | | |
| 3.10 | Control MCB 6A SP 10 kA - 3 Nos | | | | |
| 3.11 | Isolating Neutral Link 32A- 1 Nos | | | | |
| | **Outgoing Feeders** | | | | |
| 3.12 | 63A TP+N MCCB 18kA Thermal Magnetic Release having O/L, S/C Protection - - 6 Nos | | | | |
| 3.13 | Door Operating Handle - 6 Nos | | | | |
| | **CUBICAL PANEL** | | | | |
| 3.14 | Cubical Panel made out from 14/16 SWG CRCA Sheet Steel Duly Power Coated in Siemens grey colour, Approx Size of panel 1150mm (W) X 2000 (H) X 450mm (D), Floor Mounted, Front Operated. Back Closed. **Indoor Type** - 1 Nos | | | | |
| | **BUS BAR** | | | | |
| 3.15 | Electrolytic Grade Aluminium all Insulated Colour Coated Busbar Accordingly Suitable For Incoming & Outgoing Feeders **(Main Busbar 400A TP+N Aluminium With Al Earthing) - 1 Nos** | | | | |
| | **WIRING** | | | | |
| 3.16 | Wiring & Fixing material PVC Insulated Single Core Industrial Flexible Copper Wire - 1 Nos | | | | |
| | **MISC. ITEMS** | | | | |
| 3.17 | Hardware & Legends - 1 Nos | | | | |
| 4 | **New Panel Gurukul (Renisence) Buildings** | Nos | 1 | | |
| 4.1 | **Main Incomer with Metering & Indications** | | | | |
| 4.2 | 250A TP+N MCCB 25kA With Thermal Magnetic Release having S/C & O/L Protection. | | | | |
| 4.3 | Spreader Link-3P - 1 Nos | | | | |
| 4.4 | Door Operating Handle - 1 Nos | | | | |
| 4.5 | Digital Multifunction Meter Class-1.0-With RS-485 Port - 1 Nos | | | | |
| 4.6 | CT 250/5A, Class 1.0 for Metering- 3 Nos | | | | |
| 4.7 | Phase Indication Light LED Red 220V AC - 1 Nos | | | | |
| 4.8 | Phase Indication Light LED Yellow 220V AC - 1 Nos | | | | |
| 4.9 | Phase Indication Light LED Blue 220V AC - 1 Nos | | | | |
| 4.10 | Control MCB 6A SP 10 kA - 3 Nos | | | | |
| 4.11 | Isolating Neutral Link 32A- 1 Nos | | | | |
| | **Outgoing Feeders** | | | | |
| 4.12 | 250A TP+N MCCB 25kA Thermal Magnetic Release having O/L, S/C Protection - 3 Nos | | | | |
| 4.13 | Spreader Links-3P - 2 Nos | | | | |
| 4.14 | Door Operating Handle - 2 Nos | | | | |
| 4.15 | 100A TP+N MCCB 25kA Thermal Magnetic Release having O/L, S/C Protection - 6 Nos | | | | |
| 4.16 | Spreader Links-3P - 6 Nos | | | | |
| 4.17 | Door Operating Handle - 6 Nos | | | | |

| S.NO. | Description | Unit | BOQ Qty. | Rate | Amount (Rs.) |
|---|---|---|---|---|---|
| | **CUBICAL PANEL** | | | | |
| 4.18 | Cubical Panel made out from 14/16 SWG CRCA Sheet Steel Duly Power Coated in Siemens grey colour, Approx Size of panel 2000mm (W) X 1700(H) X 400mm (D), Floor Mounted, Front Operated. Back Closed. **Indoor Type** - 1 Nos | | | | |
| | **BUS BAR** | | | | |
| 4.19 | Electrolytic Grade Aluminium all Insulated Colour Coated Busbar Accordingly Suitable For Incoming & Outgoing Feeders **(Main Busbar 250A TP+N Aluminium With Al Earthing)- 1 Nos** | | | | |
| | **WIRING** | | | | |
| 4.20 | Wiring & Fixing material PVC Insulated Single Core Industrial Flexible Copper Wire - 1 Nos | | | | |
| | **MISC. ITEMS** | | | | |
| | Hardware & Legends - 1 Nos | | | | |
| 5 | **Taksha Shila -01 Block-E Sub - Panel** | Nos | 1 | | |
| | **Main Incomer with Metering & Indications** | | | | |
| 5.1 | 630A TP+N MCCB 36kA With Thermal Magnetic Release having S/C & O/L Protection. | | | | |
| 5.2 | Spreader Link-3P - 1 Nos | | | | |
| 5.3 | Door Operating Handle - 1 Nos | | | | |
| 5.4 | Digital Multifunction Meter Class-1.0-With RS-485 Port - 1 Nos | | | | |
| 5.5 | CT 600/5A, Class 1.0 for Metering - 3 Nos | | | | |
| 5.6 | Phase Indication Light LED Red 220V AC - 1 Nos | | | | |
| 5.7 | Phase Indication Light LED Yellow 220V AC - 1 Nos | | | | |
| 5.8 | Phase Indication Light LED Blue 220V AC - 1 Nos | | | | |
| 5.9 | Control MCB 6A SP 10 kA - 3 Nos | | | | |
| 5.10 | Isolating Neutral Link 32A- 1 Nos | | | | |
| | **Outgoing Feeders** | | | | |
| 5.11 | 100A TP+N MCCB 25kA Thermal Magnetic Release having O/L, S/C Protection - 9 Nos | | | | |
| 5.12 | Spreader Links-3P - 9 Nos | | | | |
| 5.13 | Door Operating Handle - 9 Nos | | | | |
| | **CUBICAL PANEL** | | | | |
| 5.14 | Cubical Panel made out from 14/16 SWG CRCA Sheet Steel Duly Power Coated in Siemens grey colour, Approx Size of panel 2000mm (W) X 1800 (H) X 450mm (D), Floor Mounted, Front Operated. Back Closed. **Indoor Type - 1 Nos** | | | | |
| | **BUS BAR** | | | | |
| 5.15 | Electrolytic Grade Aluminium all Insulated Colour Coated Busbar Accordingly Suitable For Incoming & Outgoing Feeders **(Main Busbar 630A TP+N Aluminium With Al Earthing) - 1 Nos** | | | | |
| | **WIRING** | | | | |
| 5.16 | Wiring & Fixing material Pvc Insulated Single Core Industrial Flexible Copper Wire - 1 Nos | | | | |

| S.NO. | Description | Unit | BOQ Qty. | Rate | Amount (Rs.) |
|---|---|---|---|---|---|
| | **MISC. ITEMS** | | | | |
| 5.17 | Hardware & Legends - 1 Nos | | | | |
| 6 | **Sub-Panel (Ground Floor & First Floor)** | Nos | 2 | | |
| 6.1 | **Main Incomer with Metering & Indications** | | | | |
| 6.1 | 100A TP+N MCCB 25kA With Thermal Magnetic Release having S/C & O/L Protection. | | | | |
| 6.2 | Spreader Link-3P - 1 Nos | | | | |
| 6.3 | Door Operating Handle - 1 Nos | | | | |
| 6.4 | Digital Multifunction Meter Class-1.0-With RS-485 Port- 1 Nos | | | | |
| 6.5 | CT 100/5A, Class 1.0 for Metering - 3 Nos | | | | |
| 6.6 | Phase Indication Light LED Red 220V AC - 1 Nos | | | | |
| 6.7 | Phase Indication Light LED Yellow 220V AC - 1 Nos | | | | |
| 6.8 | Phase Indication Light LED Blue 220V AC - 1 Nos | | | | |
| 6.9 | Control MCB 6A SP 10 kA - 3 Nos | | | | |
| 6.10 | Isolating Neutral Link 32A- 1 Nos | | | | |
| | **Outgoing Feeders** | | | | |
| 6.11 | 63A TP+N MCCB 18kA Thermal Magnetic Release having O/L, S/C Protection - 7 Nos | | | | |
| 6.12 | Door Operating Handle - 7 Nos | | | | |
| | **CUBICAL PANEL** | | | | |
| 6.13 | Cubical Panel made out from 14/16 SWG CRCA Sheet Steel Duly Power Coated in Siemens grey colour, Approx Size of panel 1900mm (W) X 1300 (H) X 400mm (D), Angle Mounted, Front Operated.Back Closed. **Indoor Type - 1 Nos** | | | | |
| | **BUS BAR** | | | | |
| 6.14 | Electrolytic Grade Aluminium all Insulated Colour Coated Busbar Accordingly Suitable For Incoming & Outgoing Feeders **(Main Busbar 100A TP+N Aluminium With Al Earthing)**- 1 Nos | | | | |
| | **WIRING** | | | | |
| 6.15 | Wiring & Fixing material Pvc Insulated Single Core Industrial Flexible Copper Wire- 1 Nos | | | | |
| | **MISC. ITEMS** | | | | |
| 6.16 | Hardware & Legends - 1 Nos | | | | |
| 7 | **Sub-Panel (Second Floor)** | Nos | 1 | | |
| 7.1 | **Main Incomer with Metering & Indications** | | | | |
| 7.2 | 100A TP+N MCCB 25kA With Thermal Magnetic Release having S/C & O/L Protection. | | | | |
| 7.3 | Spreader Link-3P - 1 Nos | | | | |
| 7.4 | Door Operating Handle - 1 Nos | | | | |
| 7.5 | Digital Multifunction Meter Class-1.0-With RS-485 Port - 1 Nos | | | | |
| 7.6 | CT 100/5A, Class 1.0 for Metering - 3 Nos | | | | |
| 7.7 | Phase Indication Light LED Red 220V AC - 1 Nos | | | | |
| 7.8 | Phase Indication Light LED Yellow 220V AC - 1 Nos | | | | |
| 7.9 | Phase Indication Light LED Blue 220V AC - 1 Nos | | | | |

| S.NO. | Description | Unit | BOQ Qty. | Rate | Amount (Rs.) |
|---|---|---|---|---|---|
| 7.10 | Control MCB 6A SP 10 kA - 3 Nos | | | | |
| 7.11 | Isolating Neutral Link 32A- 1 Nos | | | | |
| | **Outgoing Feeders** | | | | |
| 7.12 | 63A TP+N MCCB 18kA Thermal Magnetic Release having O/L, S/C Protection - 5 Nos | | | | |
| 7.13 | Door Operating Handle - 5 Nos | | | | |
| | **CUBICAL PANEL** | | | | |
| 7.14 | Cubical Panel made out from 14/16 SWG CRCA Sheet Steel Duly Power Coated in Siemens grey colour, Approx Size of panel 1150mm (W) X 1700 (H) X 400mm (D), Floor Mounted, Front Operated. Back Closed. **Indoor Type - 1 Nos** | | | | |
| | **BUS BAR** | | | | |
| 7.15 | Electrolytic Grade Aluminium all Insulated Colour Coated Busbar Accordingly Suitable For Incoming & Outgoing Feeders **(Main Busbar 100A TP+N Aluminium With Al Earthing)- 1 Nos** | | | | |
| | **WIRING** | | | | |
| 7.16 | Wiring & Fixing material Pvc Insulated Single Core Industrial Flexible Copper Wire- 1 Nos | | | | |
| | **MISC. ITEMS** | | | | |
| 7.17 | Hardware & Legends - 1 Nos | | | | |
| 8 | **Sub-Panel SS-II Scholar/Library** | Nos | 1 | | |
| | **Main Incomer with Metering & Indications** | | | | |
| 8.1 | 250A TP+N MCCB 25kA With Thermal Magnetic Release having S/C & O/L Protection. | | | | |
| 8.2 | Spreader Link-3P - 1 Nos | | | | |
| 8.3 | Door Operating Handle - 1 Nos | | | | |
| 8.4 | Digital Multifunction Meter Class-1.0-With RS-485 Port - 1 Nos | | | | |
| 8.5 | CT 250/5A, Class 1.0 for Metering - 3 Nos | | | | |
| 8.6 | Phase Indication Light LED Red 220V AC - 1 Nos | | | | |
| 8.7 | Phase Indication Light LED Yellow 220V AC - 1 Nos | | | | |
| 8.8 | Phase Indication Light LED Blue 220V AC - 1 Nos | | | | |
| 8.9 | Control MCB 6A SP 10 kA - 3 Nos | | | | |
| 8.10 | Isolating Neutral Link 32A- 1 Nos | | | | |
| | **Outgoing Feeders** | | | | |
| 8.11 | 135A TP+N MCCB 25kA Thermal Magnetic Release having O/L, S/C Protection- 2 Nos | | | | |
| 8.12 | Spreader Links-3P - 2 Nos | | | | |
| 8.13 | Door Operating Handle - 2 Nos | | | | |
| 8.14 | 100A TP+N MCCB 25kA Thermal Magnetic Release having O/L, S/C Protection - 4 Nos | | | | |
| 8.15 | Spreader Links-3P - 4 Nos | | | | |
| 8.16 | Door Operating Handle - 4 Nos | | | | |
| | **CUBICAL PANEL** | | | | |
| 8.17 | Cubical Panel made out from 14/16 SWG CRCA Sheet Steel Duly Power Coated in Siemens grey colour, Approx. Size of | | | | |

| S.NO. | Description | Unit | BOQ Qty. | Rate | Amount (Rs.) |
|---|---|---|---|---|---|
| | panel 2000mm (W) X 1400 (H) X 400mm (D), Angle Mounted, Front Operated. Back Closed. **Indoor Type - 1 Nos** | | | | |
| | **BUS BAR** | | | | |
| 8.18 | Electrolytic Grade Aluminium all Insulated Colour Coated Busbar Accordingly Suitable For Incoming & Outgoing Feeders **(Main Busbar 250A TP+N Aluminium With Al Earthing)- 1 Nos** | | | | |
| | **WIRING** | | | | |
| 8.19 | Wiring & Fixing material Pvc Insulated Single Core Industrial Flexible Copper Wire - 1 Nos | | | | |
| | **MISC. ITEMS** | | | | |
| 8.20 | Hardware & Legends - 1 Nos | | | | |
| 9 | **Sub-Panel FM-01/03 SS-II Scholar/Block A** | Nos | 1 | | |
| | **Main Incomer with Metering & Indications** | | | | |
| 9.1 | 400A TP+N MCCB 36kA With Thermal Magnetic Release having S/C & O/L Protection. | | | | |
| 9.2 | Spreader Link-3P - 1 Nos | | | | |
| 9.3 | Door Operating Handle - 1 Nos | | | | |
| 9.4 | Digital Multifunction Meter Class-1.0-With RS-485 Port- 1 Nos | | | | |
| 9.5 | CT 400/5A, Class 1.0 for Metering - 3 Nos | | | | |
| 9.6 | Phase Indication Light LED Red 220V AC - 1 Nos | | | | |
| 9.7 | Phase Indication Light LED Yellow 220V AC - 1 Nos | | | | |
| 9.8 | Phase Indication Light LED Blue 220V AC - 1 Nos | | | | |
| 9.9 | Control MCB 6A SP 10 kA - 3 Nos | | | | |
| 9.10 | Isolating Neutral Link 32A- 1 Nos | | | | |
| | **Outgoing Feeders** | | | | |
| 9.11 | 100A TP+N MCCB 25kA Thermal Magnetic Release having O/L, S/C Protection - 6 Nos | | | | |
| 9.12 | Spreader Links-3P- 6 Nos | | | | |
| 9.13 | Door Operating Handle - 6 Nos | | | | |
| | **CUBICAL PANEL** | | | | |
| 9.14 | Cubical Panel made out from 14/16 SWG CRCA Sheet Steel Duly Power Coated in Siemens grey colour, Approx. Size of panel 1150mm (W) X 2000 (H) X 450mm (D), Floor Mounted, Front Operated. Back Closed. **Indoor Type** - 1 Nos | | | | |
| | **BUS BAR** | | | | |
| 9.15 | Electrolytic Grade Aluminium all Insulated Colour Coated Busbar Accordingly Suitable For Incoming & Outgoing Feeders **(Main Busbar 400A TP+N Aluminium With Al Earthing)**- 1 Nos | | | | |
| | **WIRING** | | | | |
| 9.16 | Wiring & Fixing material Pvc Insulated Single Core Industrial Flexible Copper Wire- 1 Nos | | | | |
| | **MISC. ITEMS** | | | | |
| 9.17 | Hardware & Legends- 1 Nos | | | | |
| 10 | **Sub-Panel SS-II Scholar/Block D** | Nos | 1 | | |

| S.NO. | Description | Unit | BOQ Qty. | Rate | Amount (Rs.) |
|---|---|---|---|---|---|
| | **Main Incomer with Metering & Indications** | | | | |
| 10.1 | 320A TP+N MCCB 36kA With Thermal Magnetic Release having S/C & O/L Protection. | | | | |
| 10.2 | Spreader Link-3P- 1 Nos | | | | |
| 10.3 | Door Operating Handle - 1 Nos | | | | |
| 10.4 | Digital Multifunction Meter Class-1.0-With RS-485 Port- 1 Nos | | | | |
| 10.5 | CT 300/5A, Class 1.0 for Metering- 3 Nos | | | | |
| 10.6 | Phase Indication Light LED Red 220V AC - 1 Nos | | | | |
| 10.7 | Phase Indication Light LED Yellow 220V AC - 1 Nos | | | | |
| 10.8 | Phase Indication Light LED Blue 220V AC - 1 Nos | | | | |
| 10.9 | Control MCB 6A SP 10 kA - 3 Nos | | | | |
| 10.10 | Isolating Neutral Link 32A - 1 Nos | | | | |
| | **Outgoing Feeders** | | | | |
| 10.11 | 250A TP+N MCCB 25kA Thermal Magnetic Release having O/L, S/C Protection - 1 Nos | | | | |
| 10.12 | Spreader Links-3P - 1 Nos | | | | |
| 10.13 | Door Operating Handle - 1 Nos | | | | |
| 10.14 | 100A TP+N MCCB 25kA Thermal Magnetic Release having O/L, S/C Protection - 6 Nos | | | | |
| 10.15 | Spreader Links-3P- 6 Nos | | | | |
| 10.16 | Door Operating Handle - 6 Nos | | | | |
| | **CUBICAL PANEL** | | | | |
| 10.17 | Cubical Panel made out from 14/16 SWG CRCA Sheet Steel Duly Power Coated in Siemens grey colour, Approx. Size of panel 2000mm (W) X 1400 (H) X 400mm (D), Angle Mounted, Front Operated. Back Closed. **Indoor Type** - 1 Nos | | | | |
| | **BUS BAR** | | | | |
| 10.18 | Electrolytic Grade Aluminium all Insulated Colour Coated Busbar Accordingly Suitable For Incoming & Outgoing Feeders **(Main Busbar 320A TP+N Aluminium With Al Earthing)**- 1 Nos | | | | |
| | **WIRING** | | | | |
| 10.19 | Wiring & Fixing material Pvc Insulated Single Core Industrial Flexible Copper Wire - 1 Nos | | | | |
| | **MISC. ITEMS** | | | | |
| 10.20 | Hardware & Legends - 1 Nos | | | | |
| 11 | **Sub-Panel SS-II Scholar/Block D** | Nos | 1 | | |
| | **Main Incomer with Metering & Indications** | | | | |
| 11.1 | 630A TP+N MCCB 36kA With Thermal Magnetic Release having S/C & O/L Protection. | | | | |
| 11.2 | Spreader Link-3P - 1 Nos | | | | |
| 11.3 | Door Operating Handle - 1 Nos | | | | |
| 11.4 | Digital Multifunction Meter Class-1.0-With RS-485 Port- 1 Nos | | | | |
| 11.5 | CT 600/5A, Class 1.0 for Metering - 3 Nos | | | | |
| 11.6 | Phase Indication Light LED Red 220V AC - 1 Nos | | | | |

| S.NO. | Description | Unit | BOQ Qty. | Rate | Amount (Rs.) |
|---|---|---|---|---|---|
| 11.7 | Phase Indication Light LED Yellow 220V AC - 1 Nos | | | | |
| 11.8 | Phase Indication Light LED Blue 220V AC - 1 Nos | | | | |
| 11.9 | Control MCB 6A SP 10 kA - 3 Nos | | | | |
| 11.10 | Isolating Neutral Link 32A- 1 Nos | | | | |
| | **Outgoing Feeders** | | | | |
| 11.11 | 200A TP+N MCCB 25kA Thermal Magnetic Release having O/L, S/C Protection - 2 Nos | | | | |
| 11.12 | Spreader Links-3P - 2 Nos | | | | |
| 11.13 | Door Operating Handle - 2 Nos | | | | |
| 11.14 | 100A TP+N MCCB 25kA Thermal Magnetic Release having O/L, S/C Protection - 13 Nos | | | | |
| 11.15 | Spreader Links-3P - 13 Nos | | | | |
| 11.16 | Door Operating Handle - 13 Nos | | | | |
| | **CUBICAL PANEL** | | | | |
| 11.17 | Cubical Panel made out from 14/16 SWG CRCA Sheet Steel Duly Power Coated in Siemens grey colour, Approx Size of panel 2850mm (W) X 1900 (H) X 450mm (D), Floor Mounted, Front Operated.Back Closed. **Indoor Type** - 1 Nos | | | | |
| | **BUS BAR** | | | | |
| 11.18 | Electrolytic Grade Aluminium all Insulated Colour Coated Busbar Accordingly Suitable For Incoming & Outgoing Feeders **(Main Busbar 630A TP+N Aluminium With Al Earthing)- 1 Nos** | | | | |
| | **WIRING** | | | | |
| 11.19 | Wiring & Fixing material Pvc Insulated Single Core Industrial Flexible Copper Wire - 1 Nos | | | | |
| | **MISC. ITEMS** | | | | |
| 11.20 | Hardware & Legends - 1 Nos | | | | |
| **12.** | **Electrical Control Panel (Location: - D block Basement AC system) (Qty-1 Nos.)** | **1** | Nos. | | |
| | **Main Incomer-With Metering & Indication- (With Cable Connection)** | | | | |
| 12.1 | 500A (450A) TP+N MCCB 36KA With Thermal Magnetic Release having S/C & O/L protection - 1 Nos. | | | | |
| 12.2 | Spreader Link Terminal (500A TP) - 1 Nos. | | | | |
| 12.3 | Door Operating Handle - 1 Nos. | | | | |
| 12.4 | Digital VAF Meter, Class-1.0 96 Sq. mm - 1 Nos. | | | | |
| 12.5 | CT 600/5A Class 1.0 For Metering - 3 Nos. | | | | |
| 12.6 | Phase Indication Light LED Red 220V AC - 1 Nos. | | | | |
| 12.7 | Phase Indication Light LED Yellow 220V AC - 1 Nos. | | | | |
| 12.8 | Phase Indication Light LED Blue 220V AC - 1 Nos. | | | | |
| 12.9 | Control MCB 6A SP 10 KA - 3 Nos. | | | | |
| 12.10 | Isolating of Neutral Link - 1 Nos. | | | | |
| | **Outgoing Feeders** | | | | |
| **12.11** | **5 HP To 7.5 HP DOL Starter x 5 Nos.** - 5 Nos. | | | | |
| 12.12 | 32A TP MCB 10KA - 5 Nos. | | | | |
| 12.13 | 32A TP Contactor 220 V AC - 5 Nos. | | | | |
| 12.14 | Add On Block 2NO - 5 Nos. | | | | |

| S.NO. | Description | Unit | BOQ Qty. | Rate | Amount (Rs.) |
|---|---|---|---|---|---|
| 12.15 | Over load relay 8.5-13.5A - 5 Nos. | | | | |
| 12.16 | Control MCB 6A SP 10KA - 5 Nos. | | | | |
| 12.17 | On & Trip Ind. Light Red, Amber 220V AC - 10 Nos. | | | | |
| 12.18 | Start & Stop Push Button - 10 Nos. | | | | |
| 12.19 | Terminal Block 10 Sq. mm - 15 Nos. | | | | |
| 12.20 | Terminal Block 4 Sq. mm - 15 Nos. | | | | |
| 12.21 | Wiring & fixing Material - 5 Nos. | | | | |
| 12.22 | 160A TP+N MCCB 25KA With Thermal Magnetic release having S/C & O/L Protection. - 2 Nos. | | | | |
| 12.23 | Spreader Link Terminal (160A TP) - 2 Nos. | | | | |
| 12.24 | Door Operating Handle for 630A MCCB - 2 Nos. | | | | |
| 12.25 | 100A TP+N MCCB 25KA With Thermal Magnetic release having S/C & O/L Protection. - 2 Nos. | | | | |
| 12.26 | Spreader Link Terminal (100A TP) - 2 Nos. | | | | |
| 12.27 | Door Operating Handle for 250A MCCB - 2 Nos. | | | | |
| | **CUBICAL PANEL** | | | | |
| 12.28 | Cubical Panel made out from 14/16 SWG (2 mm /1.6 mm thick) CRCA Sheet Steel Duly Power Coated in Siemens grey colour, Approx Size of panel 1950mm (W) X 1600 (H) X 450mm (D), Angle Frame Mounted. Front Opreated **-Indoor Type** - 1 Nos. | | | | |
| | **BUS BAR** | | | | |
| 12.29 | Electrolytic Grade Aluminum bus -bar with PVC Heat Shrinkable Sleeve Suitable for Incoming & Outgoing Feeder (**Main Busbar: 500 Amp. TP+N Aluminum with Al Earthing**) - 1 Nos. | | | | |
| | **WIRING** | | | | |
| 12.30 | Wiring & Fixing material Pvc Insulated Single Core Industrial Flexible Copper Wire. - 1 Nos. | | | | |
| | **MISC. ITEMS** | | | | |
| 12.31 | Hardware & Legends - 1 Nos. | | | | |
| 13 | **Sub-Panel Change Master Second Sub Panel** | Nos | 1 | | |
| | **Main Incomer With Metering & Indications** | | | | |
| 13.1 | 320A TP+N MCCB 36kA With Thermal Magnetic Release having S/C & O/L Protection. | | | | |
| 13.2 | Spreader Link-3P - 1 Nos | | | | |
| 13.3 | Door Operating Handle - 1 Nos | | | | |
| 13.4 | Digital Multifunction Meter Class-1.0-With RS-485 Port-1 No | | | | |
| 13.5 | CT 300/5A, Class 1.0 for Metering - 3 Nos | | | | |
| 13.6 | Phase Indication Light LED Red 220V AC - 1 Nos | | | | |
| 13.7 | Phase Indication Light LED Yellow 220V AC - 1 Nos | | | | |
| 13.8 | Phase Indication Light LED Blue 220V AC - 1 Nos | | | | |
| 13.9 | Control MCB 6A SP 10 kA - 3 Nos | | | | |
| 13.10 | Isolating Neutral Link 32A- 1 Nos | | | | |
| | **Outgoing Feeders** | | | | |
| 13.11 | 100A TP+N MCCB 25kA Thermal Magnetic Release having O/L, S/C Protection- 6 Nos | | | | |

| S.NO. | Description | Unit | BOQ Qty. | Rate | Amount (Rs.) |
|---|---|---|---|---|---|
| 13.12 | Spreader Links-3P - 6 Nos | | | | |
| 13.13 | Door Operating Handle - 6 Nos | | | | |
| 13.14 | 50A TP+N MCCB 18kA Thermal Magnetic Release having O/L, S/C Protection- 1 Nos | | | | |
| 13.15 | Door Operating Handle - 1 Nos | | | | |
| | **CUBICAL PANEL** | | | | |
| 13.16 | Cubical Panel made out from 14/16 SWG CRCA Sheet Steel Duly Power Coated in Siemens grey colour, Approx Size of panel 2000mm (W) X 1400 (H) X 400mm (D), Angle Mounted, Front Operated.Back Closed. Indoor Type - 1 Nos | | | | |
| | **BUS BAR** | | | | |
| 13.17 | Electrolytic Grade Aluminium all Insulated Colour Coated Busbar Accordingly Suitable For Incoming & Outgoing Feeders **(Main Busbar 320A TP+N Aluminium With Al Earthing)** - 1 Nos | | | | |
| | **WIRING** | | | | |
| 13.18 | Wiring & Fixing material PVC Insulated Single Core Industrial Flexible Copper Wire - 1 Nos | | | | |

**NOTE: Consider Following Scope of work also consider**

*** The work is replacement of Sub-panel with upgraded Sub Panel, the dismantling of existing panel is included**

*** All reconnection and restoring of Power supply are inclusive in above scope of work**.

*** All old panel to be deposit with Client**

**PART-2-B**

**SUBJECT: BOQ of MISC. Material Supply & Installation work for MDI Project.**

| S.No. | Description | Unit | BOQ Qty. | Rate | Amount |
|---|---|---|---|---|---|
| **I** | **POINT WIRING** | | | | |
| **1** | Wiring for the following light points with 1.5 sq. mm PVC insulated copper conductor wires of 1100 Volt's grade in Surface/Embedded PVC conduit including providing and fixing 6-amp flush type switches, approved modular cover plate for switch boxes & earthing with 1 sq. mm PVC insulated copper conductor earth wire. (item including the rate of circuit wiring). | | | | |
| a. | One point controlled by one 6-amp switch. | Nos | 200 | | |
| 2 | Same as item No.1 above but Loop Point i.e. wiring of point looped from first point with 1.5 sq. mm PVC insulated copper conductor wire (controlling switch in item no.1). | Nos | 75 | | |
| 3 | Wiring for the following light points with 1.5 sq. mm. PVC insulated wires of 1100 Volts grade in Surface /EMBEDED PVC conduit and controlled by 10 amp MCB complete and earthing with 1 sq.mm PVC insulated Copper Conductor earth wire. (The cost of MCB has been taken elsewhere in the tender). | | | | |
| a. | One point controlled by 10 amp MCB. | Nos | 150 | | |
| 4 | Same as item No. 3 (a) above but loop point i.e. wiring of point looped from first point with 1.5 sq. mm PVC insulated copper conductor wire. | Nos | 50 | | |
| 5 | Wiring for 6 amp light plug outlet / Exhaust Fan socket with 2.5 sq. mm PVC insulated copper conductor wires in Surface/EMBEDED PVC conduits including providing and fixing 6 amp switch, MS box for housing switches sockets, modular cover to outlet boxes and earthing with 1.5 sq. mm PVC insulated copper conductor earth wire. | Nos | 100 | | |
| 6 | Same as item No. 5 (a) above but loop point i.e. wiring of point looped from first point with 2.5 sq. mm PVC insulated copper conductor wire. | Nos | 30 | | |
| 7 | Wiring for 2 Nos. 6 amp light plug outlet with 1.5 sq. mm PVC insulated copper conductor wires in Surface MS conduits including providing and fixing 2 Nos. 6 amp switch, MS box for housing switches sockets, modular cover to outlet boxes and earthing with 1 sq. mm PVC insulated copper conductor earth wire. | Nos | 100 | | |
| 8 | Same as item No. 5 (a) above but loop point i.e. wiring of point looped from first point with 1.5 sq. mm PVC insulated copper conductor wire. | Nos | 30 | | |

| S.No. | Description | Unit | BOQ Qty. | Rate | Amount |
|---|---|---|---|---|---|
| 9 | Wiring for 6/16 amp power outlet points with 6 sq. mm PVC insulated copper conductor wires of 1100 Volts grade in Surface MS conduits as called for including providing and fixing 16 amp flush type 6 pin socket and switch, MS outlet box for power outlet. Approved modular cover to outlet box and earthing. with 4.0 sq. mm PVC insulated copper conductor earth wire. | Nos | 75 | | |
| 10 | Same as item No. 5 above but Loop Point i.e. wiring of 6/16 amp looped from first point with 4 sq. mm PVC insulated copper conductor wire. | Nos | 25 | | |
| 11 | Wiring for 6/16 amp power outlet point with 4 sq. mm PVC insulated copper conductor wire of 1100 Volts grade in Surface/EMBEDED PVC conduits including providing and fixing 16 amp flush type combined 6 pin sockets and switch, MS box for 16 amp socket and switch, approved modular cover to outlet box and earthing with 2.5 sq. mm PVC insulated copper conductor earth wire. (Only one outlet shall be connected to each circuit). (INCLUDING HAIR DRYER POINTS) | Nos | 75 | | |
| 13 | Wiring for 16 AMP power outlet point with 6 sq.mm PVC insulated copper conductor wire of 1100 volts grade in Surface PVC conduits including providing and fixing 15 AMP 3 pin socket and switch, MS Box for 16 AMP Socket and switch, approved modular cover to outlet boxes and earthing with 4 sq mm PVC insulated copper conductor earth wire. | Nos. | 50 | | |
| 13 | Supplying and fixing of 20 amp 3-pin (phase, neutral and earth) for 1-phase industrial socket outlet including 16 gauge MS outlet boxes of suitable size, with 2C x 4 sq. mm wire and earthing of 2.5sqmm. 20 amp DP MCB, and a plug top, complete as required and as per specifications. | Nos | 25 | | |
| 14 | Supplying and fixing of 32 amp 3-pin (phase, neutral and earth) for 1-phase industrial socket outlet including 16 gauge MS outlet boxes of suitable size, 32 amp DP MCB, and a plug top, complete as required and as per specifications. | Nos | 25 | | |
| 15 | Supplying and fixing of 32 amp 6-pin (phase, neutral and earth) for 3-phase industrial socket outlet including 16-gauge MS outlet boxes of suitable size, 32 amp TPN MCB, and a plug top, complete as required and as per specifications. | Nos | 25 | | |
| 16 | Wiring for 16 amp power outlet points with 6 sq. mm PVC insulated copper conductor wires for the first socket outlet and 4 sq. mm PVC insulated copper conductor wires for the second outlet of 1100 Volts grade in Surface PVC conduit as called for | Nos | 25 | | |

| S.No. | Description | Unit | BOQ Qty. | Rate | Amount |
|---|---|---|---|---|---|
| | including providing and fixing 16 amp flush type 6 pin socket and switch, MS outlet boxes for power outlets. Approved modular cover to outlet boxes and earthing. with 4.0 sq. mm PVC insulated copper conductor earth wire. (Only two outlets shall be connected to each circuit for Hand Drier). | | | | |
| 17 | Supply and fixing, Wiring for 6 Amp Fan Point with 1.5 sq mm PVC copper conductor wire in recess conduit. with plate and G.I Fan Box Providing and Fixing 6 Amp Switch and Fan regulator with Earthing 1 sq mm copper conductor wire. | Nos | 200 | | |
| **II** | **LIGHTING & POWER WIRING** | | | | |
| 1 | Wiring for the following light points with 1.5 sq. mm. PVC insulated wires of 1100 Volts grade in exposed MS conduit controlled by 10 amp MCB complete and earthing with 1 sq.mm PVC insulated Copper conductor earth wire. (The cost of MCB has been taken elsewhere in the tender). | | | | |
| a. | One point controlled by 10 amp MCB | Nos | 25 | | |
| 2 | Same as item No. 1 (a) above but loop point i.e. wiring of point looped from first point with 1.5 sq. mm PVC insulated copper conductor wire and earthing with 1 sq. mm PVC insulated copper conductor earth wire. | Nos | 10 | | |
| 3 | Wiring for 16 amp power outlet points with 6 sq. mm pvc insulated copper conductor wires for the first socket outlet and 4 sq. mm PVC insulated copper conductor wires for the balance 5 outlets of 1100 Volts grade in exposed 16 gauge MS conduit as called for including providing and fixing 16 amp flush type 6 pin socket and switch, MS outlet boxes for power outlets. Approved modular cover to outlet boxes and earthing. (One shaft will have One circuit in which all the 6 sockets are powered by the same circuit which are provided at every floor). | Nos | 25 | | |
| 4 | Wiring for 16 amp power outlet points with 6 sq. mm pvc insulated copper conductor wires for the first socket outlet and 4 sq. mm PVC insulated copper conductor wires for the balance 1 outlets of 1100 Volts grade in exposed 16 gauge MS conduit as called for including providing and fixing 16 amp flush type 6 pin socket and switch, MS outlet boxes for power outlets. Approved modular cover to outlet boxes and earthing. (One shaft will have One circuit in which all the 2 sockets are powered by the same circuit which are provided at every floor). | Nos | 25 | | |
| 5 | Supplying and installation of following sizes of black PVC conduit /G.I. pipe in recess/on surface including all accessories, M.S. junction/ pull boxes, G.I. fish | | | | |

| S.No. | Description | Unit | BOQ Qty. | Rate | Amount |
|---|---|---|---|---|---|
| | wire, fixing hardware etc including chasing the wall/floor and plastering the chased portion and making good the damages etc., complete as required. (for data; telephone /speaker/s.d) | | | | |
| a. | 25 mm dia PVC Conduit | RM | 500 | | |
| b. | 32 mm dia PVC Conduit | RM | 250 | | |
| c. | 40 mm dia PVC Conduit | RM | 100 | | |
| **III** | **SUPPLY & INSTALLATION OF DB'S, CABLES & SUBMAIN WIRING.** | - | | | |
| | The rates shall include testing, commissioning and coordination and the following: | | | | |
| i. | 2 mm thick MS boxes with dust proof, vermin proof covers and lockable arrangements, mounted flush with surface of wall. | Nos | 20 | | |
| ii. | Earthing all components, frame etc. | Nos | 15 | | |
| iii. | Painting of all metal parts with approved enamel paint. | Nos | 20 | | |
| iv. | Effecting, adequate and proper connections at terminations. | Nos | 50 | | |
| v. | Providing lugs, solder etc. at joints and terminations as called for. | Nos | 20 | | |
| vi. | All fixing accessories such as brass saddles, brass screws rawl plugs etc. | Nos | 10 | | |
| vii. | Jointing by rivieting and soldering. | Nos | 20 | | |
| viii. | Cutting chases, holes and making good the same wherever required. | Nos | 10 | | |
| ix. | Use of Copper / Aluminium Lugs. | Nos | 20 | | |
| x. | Oil-resistant ferrules shall be provided at both ends of wire terminations. | Nos | 25 | | |
| xi. | Laminated DB circuit chart shall be fixed at back side of DB cover in permanent fashion. | Nos | 20 | | |
| xii. | Cable number tags shall be provided as approved. | Nos | | | |
| **IV** | **DISTRIBUTION BOARD** | | | | |
| 1 | Design, manufacture, supplying, fixing in position, testing and commissioning of the following sheet metal fabricated, wall mounting type / fully recessed in wall, indoor, cubical type with IP 42 degree of protection double shutter complete with interconnections with single core PVC insulated copper wires, tapes, bonding to earth &d powder coating etc. as required. ***(Standard thickness is consider in our rates)*** | | | | |
| **a.** | **10 WAY TPN DB (FOR NORMAL LIGHTING/POWER)** | | | | |
| | **Incoming:** | | | | |
| | 63 Amp TPN MCB of 10 KA breaking capacity. | | | | |
| | 3 Nos. 40 Amp DP ELCB of 100 mA sensitivity (one in each phase). | | | | |
| | **Outgoing:** | | | | |

| S.No. | Description | Unit | BOQ Qty. | Rate | Amount |
|---|---|---|---|---|---|
| | 30 Nos. of 10/20 Amp SP MCB's of 10 KA breaking capacity arranged in three rows. | | | | |
| | 10-way TPN DB described as above. | Nos | 4 | | |
| **b.** | **13 WAY TPN DB (FOR NORMAL LIGHTING/POWER)** | | | | |
| | **Incoming:** | | | | |
| | 63 Amp TPN MCB of 10 KA breaking capacity. | | | | |
| | 3 Nos. 40 Amp DP ELCB of 100 mA sensitivity (one in each phase). | | | | |
| | **Outgoing:** | | | | |
| | 36 Nos. of 10/20 Amp SP MCB's of 10 KA breaking capacity arranged in three rows. | | | | |
| | 13-way TPN DB described as above. | Nos | 4 | | |
| **c.** | **6 WAY TPN DB (FOR LIFT M/C ROOM)** | | | | |
| | **Incoming:** | | | | |
| | 63 Amp TPN MCB of 10 KA breaking capacity. | | | | |
| | 3 Nos. 40 Amp DP ELCB of 100 mA sensitivity (one in each phase). | | | | |
| | **Outgoing:** | | | | |
| | 18 Nos. of 10/20 Amp SP MCB's of 10 KA breaking capacity arranged in three rows. | | | | |
| | 6 way TPN DB described as above. | Nos | 4 | | |
| **d.** | **6 WAY TPN DB** | | | | |
| | **Incoming:** | | | | |
| | 63 Amp TPN MCB of 10 KA breaking capacity. | | | | |
| | 3 Nos. 40 Amp DP ELCB of 100 mA sensitivity (one in each phase). | | | | |
| | **Outgoing:** | | | | |
| | 18 Nos. of 10/20 Amp SP MCB's of 10 KA breaking capacity arranged in three rows. | | | | |
| | 6-way TPN DB described as above. | Nos | 8 | | |
| **e.** | **4 WAY SPN DB (EMERGENCY LIGHTING)** | | | | |
| | **Incoming:** | | | | |
| | 63 Amp DP RCBO of 100 mA sensitivity. | | | | |
| | **Outgoing:** | | | | |
| | 4 Nos. of 10/20 Amp SP MCB's of 10 KA breaking capacity. | | | | |
| | 4-way SPN DB described as above. | Nos | 1 | | |
| **f.** | **8 WAYTPN DB (FOR INVERTOR DISTRIBUTION** | | | | |
| | **Incoming:** | | | | |
| | 63 Amp Four Pole MCB of 100 mA sensitivity. | | | | |
| | **Outgoing:** | | | | |
| | 24 Nos. of 10/20 Amp SP MCB's of 10 KA breaking capacity. | | | | |
| | 8-way TPN DB described as above. | Nos | 4 | | |
| 2 | Supply and fixing in position GI Wire for earthing including all fixing accessories. | | | | |
| a. | 8 SWG | RM | 640 | | |

| S.No. | Description | Unit | BOQ Qty. | Rate | Amount |
|---|---|---|---|---|---|
| **V** | **FIXING OF LIGHTING FIXTURES** | | | | |
| 1 | The rates for fixing of lighting fixtures and fans shall include all fixing accessories that may be required to make the installation complete in all respects such : | | | | |
| 2 | Providing connecting wires and channel support wherever required. | Nos | RO | | |
| 3 | Internal wiring between accessories. | Nos | RO | | |
| 4 | Self-interlocking connector blocks for connecting the wires from fixtures to the points. | Nos | RO | | |
| 5 | Earthing of fixtures with 1.5 sq. mm. PVC insulated copper conductor wire. | Nos | RO | | |
| 6 | Approved colour powder coated down rods, clamps and other components and fixing accessories. | Nos | RO | | |
| 7 | Testing of fixtures before Installation. | Nos | RO | | |
| 8 | Installation of 1 x 20 watt LED fixtures fixed on ceiling / wall with all fixing accessories including connections etc. as required | Nos | RO | | |
| 9 | Installation of 2 x 20-watt LED fixtures fixed on ceiling / wall with all fixing accessories including connections etc. as required. | Nos | RO | | |
| 10 | Installation of 1x10W Bulk Head LED lighting fixture | Nos | RO | | |
| 11 | Installation of Surface mounted 1 x 18 W LED light as approved & all other accessories including connections etc. as required. **(Approved by Architect)** | Nos | RO | | |
| 12 | Installation of Recessed type 2X2 LED light as approved all other accessories including connections etc. as required. | Nos | RO | | |
| 13 | Installation of Surface Mounted type 2X2 LED light as approved all other accessories including connections etc. as required. | Nos | 97 | | |
| 14 | Installation of Recessed type 1 x 18 W LED Mirror light as approved & all other accessories including connections etc. as required. | Nos | RO | | |
| 15 | Installation of 1300mm Ceiling Fan including Step Type regulator complete as required with all accessories. | Nos. | 137 | | |
| 16 | Installation of Wall mounted complete as required with all accessories. | Nos. | RO | | |
| 17 | Installation of 450mm Exhaust Fan complete as required with all accessories. **(Approved by Architect)** | Nos. | 18 | | |
| VI | **SUPPLY & INSTALLATION OF LT CABLES** | | | | |
| 2. | **LTB609:B751 CABLES** | | | | |
| 2.1. | Supplying, receiving, unloading, storing laying, effecting proper connections, testing and commissioning of following sizes of 1.1 KV XLPE insulated, Aluminum conductor armoured cables laid on overhead cable trays including termination | | | | |

| S.No. | Description | Unit | BOQ Qty. | Rate | Amount |
|---|---|---|---|---|---|
| | and providing the MS supports and clamps for fixing to supports in an approved manner along with cable tags complete as required and as per specifications. | | | | |
| a. | 3.5 C x 300 Sqmm Al Ar Xlpe Cable | RM | RO | | |
| b. | 3.5 C x 240 Sqmm Al Ar Xlpe Cable | RM | RO | | |
| c. | 3.5 C x 185 Sqmm Al Ar Xlpe Cable | RM | RO | | |
| d. | 3.5 C x 150 Sqmm Al Ar Xlpe Cable | RM | RO | | |
| e. | 3.5 C x 130 Sqmm Al Ar Xlpe Cable | RM | 40 | | |
| f. | 3.5 C x 95 Sqmm Al Ar Xlpe Cable | RM | 50 | | |
| g. | 3.5 C x 70 Sqmm Al Ar Xlpe Cable | RM | 30 | | |
| h. | 3.5 C x 50 Sqmm Al Ar Xlpe Cable | RM | 100 | | |
| i. | 3.5 C x 35 Sqmm Al Ar Xlpe Cable | RM | 100 | | |
| j. | 4 C x 25 Sqmm Al Ar Xlpe Cable | RM | 70 | | |
| 2.2 | **Copper Flexible Cables:** | | | | |
| | **Supply, laying including termination as per site** | | | | |
| a. | 4 C x 25 Sqmm Cu Flexible Cable | RM | 200 | | |
| b. | 4 C x 16 Sqmm Cu Flexible Cable | RM | 100 | | |
| c. | 4 C x 10 Sqmm Cu Flexible Cable | RM | 100 | | |
| d. | 4 C x 6 Sqmm Cu Flexible Cable | RM | 200 | | |
| e. | 2 C x 6 Sqmm Cu Flexible Cable | RM | 200 | | |
| 3. | **CONTROL CABLES** | | | | |
| 3.1. | Supply, receiving, storing, laying, including termination making proper connections, testing & commissioning of the following sizes of 1.1 KV grade copper conductor PVC insulated armoured stranded control cables in the perforated type cable trays etc. complete as required and as per specifications. | | | | |
| a. | 2 core x 2.5 sq. mm cable | RM | 200 | | |
| b. | 4 core x 2.5 sq. mm cable | RM | 150 | | |
| c. | 10 core x 2.5 sq. mm cable | RM | 50 | | |
| d. | 24 core x 2.5 sq. mm cable | RM | 35 | | |
| 4. | **Ladder Type Cable Tray** | | | | |
| | Supply and installation of following sizes of ladder type MS powder coated cable trays including angle supports, bends, elbows and GI threated, suspension rods etc. including 25 x 6 mm GI tape on either side of cable trays throughout the length complete as required. with 2mm thick | | | | |
| a. | 750 mm wide, 100 mm high, 2.6 mm thick. | RM | RO | | |
| b. | 600 mm wide, 100 mm high, 2.6 mm thick. | RM | 50 | | |
| c. | 300 mm wide, 100 mm high, 2.6 mm thick. | RM | 50 | | |
| 5. | **Perforated Type Cable Tray** | | | | |
| | Supply and installation of following sizes of perforated type MS powder coated cable trays including angle supports, bends, elbows and GI threated suspension rods etc. including 25 x 6 mm GI tape on either side of cable trays throughout the length complete as required. with 1.6mm thickness | | | | |

| S.No. | Description | Unit | BOQ Qty. | Rate | Amount |
|---|---|---|---|---|---|
| a. | 600 mm wide 40mm high. | RM | 45 | | |
| b. | 300 mm wide 40mm high. | RM | 30 | | |
| c. | 150 mm wide 40mm high. | RM | 20 | | |
| 6. | **Submain Wiring (Copper wire in Conduits):** | | | | |
| | Supply, Laying, Testing, Rectification and Commissioning of wiring with all the required materials for following sub-mains with PVC insulated copper conductor 1100 Volts grade stranded flexible wires of approved maked in concealed/surface mounted **heavy duty MS conduit**, terminating the wires in respective panels, DBs, Switch Boxes with suitable size earth wires and associated hardwares etc. as required. | | | | |
| a. | 4 x 6 + 2 x 2.5 Sqmm PVC Insulated Copper Condutor 1100 Volts grade stranded flexible wires with 40mm dia conduit | RM | RO | | |
| b. | 2 x 6 + 1 x 2.5 Sqmm PVC Insulated Copper Condutor 1100 Volts grade stranded flexible wires with 32mm dia conduit | RM | RO | | |
| **VII** | **EARTHING** | | | | |
| 1. | Supply and Installing earthing stations at locations as called for with 600 x 600 x 3.14 mm. thick tinned Copper electrode 25 mm. dia medium class GI pipe, GI funnel with 20-gauge GI wire mesh masonry chamber with concrete base, RCC manhole cover with frame (300 mm. x 300 mm.) and packing the mixture of Charcoal and salt around plate electrode complete as per IS: 3043 ammended till date. | Nos | 10 | | |
| 2. | Same as item no. 1 above but with 600 x 600 x 6.3 mm GI plate electrode. | Nos | 20 | | |
| 3. | Supplying and laying of the following earthing strips clamped to wall with suitable clamps saddles and fixing bolts / in ground including the cost of digging and back filling as required and complete as required to comply with IS 3043:1987 | | | | |
| a. | 50 x 6 mm G.I. tape | RM | 70 | | |
| b. | 25 x 6 mm G.I. tape | RM | 400 | | |
| c. | 50 x 6 mm Cu. tape | RM | 150 | | |
| 4. | Providing and laying in position the following size of Hume Pipes in road crossing and paved area, including collars, joints filled with cement mortar 1:4 (1 cement: 3 coarse sands: 6 crushed stone aggregate 20 mm and down gauge) all round the pipes laid compact and finished smooth complete including sand cushioning at cable entry, etc. | | | | |
| a. | 300 mm dia. | RM | 50 | | |
| b. | 200 mm dia. | RM | 100 | | |
| c. | 150 mm dia. | RM | 100 | | |
| 5. | Supply & installation of following sizes of 'A' class GI | | | | |

| S.No. | Description | Unit | BOQ Qty. | Rate | Amount |
|---|---|---|---|---|---|
| | pipe sleeve for cable run on the structure/entry to the building including providing water tight sealant | | | | |
| a. | 150 mm dia. | RM | RO | | |
| b. | 200 mm dia. | RM | RO | | |
| c. | 300 mm dia. | RM | RO | | |
| | Note: Quantity in running meters (RM) for cables / cable trays / conduits are tentative. Contractor shall measure the (RM) before the procurement of material. Quantity shall be confirmed before start of work to the Engineer-in-charge. The cable quantities given are approximate. The contractor shall measure the cables required at site and procurement order shall be place accordingly. | | | | |
| | **Total carried over to Summary** | | | | |

**PART-2-C**

**SUBJECT: BOQ of Supply & Installation, Testing of External Street Lighting & Cabling System work for MDI Project**

| Sr .No. | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (Rs). |
|---|---|---|---|---|---|
| **1** | Supply Handing. laying effecting proper connections, testing and commissioning of the following sizes of 1.1 KV XLPE insulated Aluminum conductor armored cables laid in trenches over a bed of sand, excavation of trenches, covering with bricks and back filling included Termination complete in all aspects as required. | | | | |
| a) | 4 Core 16 sq mm XLPE/PVCA | Per mtr | 50 | | |
| b) | 4X10 Sq mm XLPE/PVCA | Per mtr | 200 | | |
| c) | 4 Core 6 sq mm XLPE/PVCA | Per mtr | 450 | | |
| d) | Supply and fixing of 80mm G.I. Pipe B-Class as per ISI Mark | Per mtr | RO | | |
| e) | Road cutting and RCC cutting & Filling | Per mtr | RO | | |
| 2 | Supply and installation of 2 nos. suitable length 32 mm GI pipe bend to shape for cable entry with all fixing arrangement to the pole etc. including primer & 2 coats of Aluminum paint of approved make, all complete | Per set | 150 | | |
| 3 | Making of cement concrete muff of overall size 450 mm dia., 60cm long with 1:2:4 cement concrete mixture. The muff is to be made around the steel tubular pole/ GI pipe pole. The outer surface of the muff shall be finished with pure cement and two coats of white snow paint complete in all respect as approved and desired by the Engineer In-Charge at site. | No | 150 | | |
| 4 | CMS Panel including 5 years maintenance Complete in all respect | No | 6 | | |
| 5 | Supply and Erection of earth rod 20 mm dia for providing earth connections upto line earth with G.I. Wire No. 8SWG. The rod shall be tapered at one end and flatted on another end. The hole size 10mm dia shall be drilled on the flattened side for facilitating connection with G.I. wire and thimble etc. The road shall be grouted upto complete length vertically. GI Earth rod 20 mm dia., 3 mtr. Long | NO | 150 | | |
| 6 | Supply, erection, testing and commissioning of embedded terminal box of size made of 2 mm thick MS CRCA sheet epoxy painted, complete with front openable cover with water proof gasket terminal block for incoming/outgoing cables and 10 amp 10 kA SP MCB with neutral link etc. – shock proof as per approved make SHI | Per set | 150 | | |
| 7 | Supply, laying and connecting 2 nos. 2.5 sq.mm copper conductor PVC insulated 1100-volt grade wires from terminal block to light fixture along with end terminations including the cost of 2.5 sq mm PVC insulated stranded copper wire for earthing of the light fixture complete | Per pole | 150 | | |
| 8 | Earthing with performed earth pipe made out from GI pipe 40 mm dia 3.0 m long including all accessories and providing | Each | 35 | | |

| Sr .No. | DESCRIPTION | UNIT | QTY | RATE | AMOUNT (Rs). |
|---|---|---|---|---|---|
| | masonry enclosure with cover plate and watering pipe with funnel complete with alternate layers of salt and charcoal as per IS :3043 complete as required | | | | |
| 9 | Supply and laying 8 SWG GI wire earth conductor from electrode to source in ground/pip as required including making connections duly soldered and crimped complete as required | Per m | 100 | | |
| | | | **TOTAL** | | |