TENDER FOR ELECTRIFICATION WORK OF UNIVERSITY SECOND FLOOR TERMS – CONDITIONS

LAST DATE OF SUBMITTING TENDER : 03-07-2014 Upto 2 : 00 PM
TENDER OPENING DATE : 03-07-2014
TENDER OPENING TIME & PLACE : 03.00 PM (At University Building, Syndicate Hall)

TENDER DOCUMENT INDEX

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UNIVERSITY ENGINEER
Mr. PARAG VAIDYA
ESTATE SECTION
SARDAR PATEL UNIVERSITY
VALLABH VIDYANAGAR 388 120
PH: 02692 – 226813 /16
Email : pvaidya1965@yahoo.co.in
NOTE:

Those who have downloaded the Tender from URL _www.spuvvn.edu/tenders/ are requested to deposit specified tender fee along with all other related documents on or before **03-07-2014** without fail. Otherwise the tenders without tender fee and required documents shall be rejected.

ELECTRICAL CONSULTANT
Mrs AVNI SIKKA
M/s ARTECH ENGINEERING SOLUTIONS.
A-2, UTSAV RESIDANCY,
NEW C.G.ROAD, CHANDKHEDA
AHMEDABAD – 382 424

PHONE : 079- 26562576
MOBILE : 9723433295 9723433296
Email: artech.eng@gmail.com
NOTICE FOR TENDER INVITING

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description of work</th>
<th>Fees for Tender Document (To be paid by cash - Non Refundable)</th>
<th>Earnest money (Rs. In lacs)</th>
<th>Time of completion</th>
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<tr>
<td>1</td>
<td>ELECTRIFICATION WORK (SURFACE WIRING) OF UNIVERSITY SECOND FLOOR</td>
<td>Rs.600/-</td>
<td>9800/-</td>
<td>60 Days from the date of work order</td>
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</table>

2. Each tender must be accompanied by a deposit of earnest Money as specified above in the form of Demand Draft drawn in favour of “Registrar, Sardar Patel University, V.V.Nagar” (Payable At Vallabh Vidyanagar). The Demand Draft shall be of any Nationalised Bank.

3. The work must be completed to the satisfaction of the client within the specified time.

4. The tenders are to be submitted on **03-07-2014** by 2:30 PM at the Office of Registrar, Sardar Patel University, V.V.Nagar. The tenders should be submitted in two separate parts viz. (1) Technical bid (2) Priced bid in two separate envelopes.

5. The tenderer should quote rates both in figures as well as in words. In case of variation of rates written in words and figures, the lower of the two will be treated as correct.

6. Registrar, Sardar Patel University, reserves the right to reject any or all tender or accept any tender or part thereof or to split or divide or distribute the work in any manner among more than one Contractors without assigning any reason or within explanation thereof. Power is also reserved to engage any or all tenderers without assigning any reason.

7. Rates quoted in the tender shall remain firm till the end of the contract period including all forced extension(s) of time for completing the work as may be sanctioned by the client from time to time.

8. Any tender not accompany with earnest money will be rejected.

9. Tenderers are advised to see the site of work and be acquainted with the position of material, condition of contract, indicated drawings, modifications etc, if any, before tendering.

10. All works shall be carried out in accordance with the enclosed specifications, general conditions, Special conditions, indicative Tender drawings and may have modification or changes in Actual Construction Drawings issued after award of contract (enclosed with the tender of the contract or those supplied during execution from time to time), bills of quantities and other contract documents. Specifications for works not covered in the documents shall be as per the latest IEC / Indian Standard specifications pertaining to such item of works. In case of any disputes, contradictions and ambiguities anywhere in the contract, the decision of Sardar Patel University, shall be final, binding and conclusive.

11. Quantities as indicated in the bill of quantities are liable to variations without entitling the Contractor to any increase in rate or compensation on any account whatsoever.

12. The Contractor must right their correct and complete address in the tender and arrange to take delivery of all communications.

13. Stamp duty as required in the contract deed will be borne by the Contractor.

14. Sardar Patel University, may at its sole discretion either during the currency of the contract or during defect liability period get any additional item(s) executed through any other agency or agencies or delete any item from the contract and get it executed through any other agency without entitling the Contractor to any claims whatsoever on this account.

15. Sales Tax, Excise duty, Octroi, royalty or any other tax, duty or levy on materials and works contract tax or any other taxes in any form payable in respect of this contract shall be paid by the Contractor, will not entertain or be liable to any claim in this respect whatsoever.

16. The tendered price shall include the cost of suitable storage facilities for contractor’s equipment and materials including the permission of covered sheds for storage of materials, labour hutments etc. The rates shall also include all quarrying charges, royalty, testing, screens, tools and plants, carriage of material to site, stacking and removal charges of any rejected materials, all taxes, duties and octroi chargeable to contractor, water and electrical arrangements, etc. for the full and satisfactory completion of the work.

17. The drawings attached to the tender give a general idea about the nature of the work and one meant for tender purpose only. The execution will be done as per detailed execution drawings to be supplied from time to time during execution.
# TENDER NOTICE

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<th>SR NO.</th>
<th>DETAILS OF CONDITIONS</th>
<th>CLARIFICATION FOR CONDITIONS</th>
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<tr>
<td>1.</td>
<td>Name of Work</td>
<td>ELECTRIFICATION WORK (SURFACE WIRING) OF UNIVERSITY SECOND FLOOR AT SARDAR PATEL UNIVERSITY, VALLABH VIDYANAGAR</td>
</tr>
<tr>
<td>2.</td>
<td>Owner</td>
<td>Vice Chancellor, Sardar Patel University, Vallabh Vidyaganr-288 120.</td>
</tr>
<tr>
<td>3.</td>
<td>Electrical Consultant</td>
<td>M/s ARTECH ENGINEERING SOLUTIONS. A-2, UTSAV RESIDANCY, NEW C.G.ROAD, CHANDKHEDA AHMEDABAD – 382 424 PHONE : 079- 26562576 MOBILE : 9723433295/ 9723433296/ Email: <a href="mailto:artech.eng@gmail.com">artech.eng@gmail.com</a></td>
</tr>
<tr>
<td>4.</td>
<td>Time Limit</td>
<td>60 Days from the date of Work Order.</td>
</tr>
<tr>
<td>5.</td>
<td>Date Of Commencement</td>
<td>7 Days after Issue of Work Order</td>
</tr>
<tr>
<td>6.</td>
<td>Tender Fee</td>
<td>Rs. 600/- (Non Refundable)</td>
</tr>
<tr>
<td>7.</td>
<td>Estimated Cost</td>
<td>Rs. 9,77,500=00</td>
</tr>
<tr>
<td>8.</td>
<td>Earnest Money Deposit.</td>
<td>Rs.9800/- to be paid by cross Demand draft / Pay Order from any nationalize Bank in favors of Registrar, Sardar Patel University, V.V.Nagar. which will be refundable after 15 Days on deposition of Security Deposit for Selected Contractor and after 35 days from the last date of tender opening for unselected contractor. No interest shall be paid</td>
</tr>
<tr>
<td>9.</td>
<td>Security Deposit.</td>
<td>2.50 % of the accepted Tender Amount which will be return on virtual completion of work. (Refundable) No interest shall be paid</td>
</tr>
<tr>
<td>10.</td>
<td>Retention Money Deposit</td>
<td>2.50 % of the Bill Amount, which will be refundable after the expiry of Defect Liability Period.</td>
</tr>
<tr>
<td>11.</td>
<td>Income Tax</td>
<td>Will be Deduct as per Govt. Rules</td>
</tr>
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<td>12.</td>
<td>Liquidated Damages</td>
<td>1 % of contract value per week up to maximum of 5 % thereafter the employer may get work done at contractor’s risk and cost i.e., delayed beyond five weeks.</td>
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<td>13.</td>
<td>Validity Of The Tender</td>
<td>Three Months from the last date of Opening of the Tender.</td>
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<td>14.</td>
<td>Terms of Rates.</td>
<td>The rate shall be at the site of the work and shall included all taxes, Octroi, Labor, transportation, sales tax, if any etc., No rate escalation at any circumstances shall be given.</td>
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<td>15.</td>
<td>Period for Honouring Interim Certificate.</td>
<td>20 working days after submission of the interim Certificate.</td>
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<tr>
<td>16.</td>
<td>Period For Honouring Final Certificate.</td>
<td>30 Working days after submission of the final certificate.</td>
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<td>17.</td>
<td>Validity Of Rates.</td>
<td>The quoted rates in the tender shall remain valid till the completion of the work. No escalation in the rates shall be allowed.</td>
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<td>18.</td>
<td>Extra Item.</td>
<td>The contractor shall not executed the item for which the rate cannot be derived from the tender. He shall submitted the rates analysis for such items and get it approved by Architect/ Employer Consultant before starting the work.</td>
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<td>19.</td>
<td>Payment</td>
<td>Whole payment will made after completion of work in form of RUNNING BILL. The minimum value of Running Bill should be Rs. 4.5 Lakhs and above.</td>
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<tr>
<td>20.</td>
<td>Defect Liability Period.</td>
<td>12 Months from the date of Certificate Of Payment of Final Bill</td>
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**NOTE :**

TENDER WILL ACCEPT IN ONE SEPARATE COVERS SUPERSCRIPTED AS PRICE BID TO BE KEPT IN A COMMON COVER BETWEEN 10:30 AM TO 2:30 PM ON ALL WORKIN DAYS.
AGREEMENT PERFORMA

ARTICLES OF AGREEMENT MADE

This day of -------------------------------------- 2014-----------------------------------------------

Between ---------------------------------------------------

(Hereinafter called the “Employer” of the one part and

(Hereinafter called the “contractor of the other part,

WHEREAS THE employer is desirous of constructing: And caused drawing and specification describing the work to be done to be prepared by M/s ARTECH ENGINEERING SOLUTIONS. A-3/UTSAV RESIDANCY, NEW C.G. ROAD, CHANDKHEDA, AHMEDABAD – 382 424. Its consultants ANDWHEREAS the said drawings have been seen, the specification and/or the schedule of quantities and conditions of contract (all of which are collectively herein after referred to as "the drawings and/or described in the said specifications and included in the said schedule of Quantities at the respective rates therein set forth amounting to the sum as therein arrived at or such other sum as shall become payable the tender (here in after referred to “the said Contract Amount”)

NOTE IT IS HEREBY AGGRED AS FOLLOWS:

1. In consideration of the said contract amount to be paid at the time and in the manner set fourth in the said conditions the contractor shall upon and subject to the said conditions execute and complete the work shown upon the said drawings and described in the said specification and the Schedule of Quantities.

2. The employer shall pay the Contractor the sale contract amount or such other sum as shall become payable at the time and in the manner herein after specified in the said conditions.

3. The term “The consultant” in the said conditions shall mean the said ___________________________ or in the event. Of their death or ceasing to be the Consultant for the purpose of this contract, such other person or persons as shall be nominated for that purpose by the Employer not being person to whom the Contractor shall object for reasons considered to be sufficient by the employer PROVIDED ALWAYS that no person or persons subsequently appointed to be consultant under this contract shall be entitled to disregard or over rule any previous decision Or approval or direction give or expressed in writing by the consultant for the time being.

4. The said conditions and appendix hereto shall be read and construed as forming part of this Agreement, and the parties hereto shall respectively abide by submit themselves to the Conditions and perform the agreements on their part respectively in such conditions contained.

5. The plans agreements and documents mentioned herein shall from the basis of this contract and the decision of the said Consultant as mentioned in the conditions of contract in reference to all matters of dispute as to material workmanship, or account and as to the intended interpretation of the clauses of this Agreement of any other document attached there to shall be final and binding on both parties, any may made a rule of the court.

6. The contract is neither a fixed Lump sump contract nor a piece Work Contract, but is a contact to carry out work in respect of the entire building to be paid for according to actual measured quantities at the rates contained in the Schedule of Rates and Probable Quantities or as provided in the said conditions.

7. The employer thorough the consultants reserves to himself the right of altering the drawings and nature of the work of adding to or omitting any item of work or having portions of the same carried without prejudice to this contract.

8. The said conditions shall be read and construed as forming part of this Agreement and the parties here to will respectively abide by the submit themselves to the conditions and stipulations and perform the agreements on their parts, respectively in such conditions contained.

9. Time shall be considered as the essence of this Agreements and the Contractor hereby agrees to commence the work soon after the site is handed over to him as provided for in the conditions and to complete the entire work within 6 weeks nevertheless to the provisions for extension of time.

10. All disputes arising out of or in any way connected with this agreements shall be deemed to have arisen in Vallabhb Vidyanagar and only the court in Anand have jurisdiction to determine the same.

AS WITNESS our hand this -------------------------------day of-----------------------------------------------

Signed by the said in the presence of

Stamp & signature

1 REGISTRAR, SARDAR PATEL UNIVERSITY,
VALLABH VIDYANAGAR

2 UNIVERSITY ENGINEER, ESTATE SECTION,
SARDAR PATEL UNIVERSITY, VALLABH VIDYANAGAR

EMPLOYER

CONTRACTOR
Tenders are hereby invited by Sardar Patel University for electrification works University Second floor, Vallabh Vidyanagar.

Contract documents consisting of the plans, complete specifications, the schedule of quantities of the various classes of work to be done and the set of conditions of contract to be compiled with by the tendered, which will also be found in the form of tenders, can be seen/purchased at the office of the Sardar Patel University, Vallabh Vidyanagar, as mentioned in the tender notice.

Tenders, which should always be placed in sealed cover, with the name of the project written on the envelopes, will be received by the "Sardar Patel University (Main Office), Vallabh Vidyanagar-388120 up to 2:00 pm ON THE DATE 03-07-2014.

Tenders are to be on the prescribed from which can be obtained from the office of the Sardar Patel University, Estate Section, Vallabh Vidyanagar-388120, Dist: Anand, Gujarat. The time allowed for the carrying out of the work will be Two months- from the date of written orders to commence work.

1. The contractor should quote in figures as well as in words the rate and amount tendered by them. The amount for each item should be worked out and the requisite totals given.

2. The tender submitted on behalf of a firm shall be signed by all the partners of the firm/by a partner who has the necessary authority on behalf of the firm to enter in to the proposed contract otherwise the tender may be rejected by the owners.

3. When a contractor signs tender in Indian language the percentage above or below the tendered amount and the total amount tendered should also be written in the same language. In the case of illiterate contractor the rates or the amounts tendered should be attested by a witness.

4. Earnest money, amounting Rs. 9,800/- In the form of Demand draft in favors of Registrar, Sardar Patel University, Vallabh Vidyanagar. Must accompany each tender in a sealed cover super scribed tender for the Electrification works for Department Of Computer Science, Sardar Patel University, Vallabh Vidyanagr, addressed to the Registrar, Sardar Patel University, VallabhVidyanagar-388 120.

5. The contractor, whose tender is accepted will be required to furnish by way of Security Deposit for the due fulfilment of his contract, a sum equal to 2.50 % of the accepted tender value.

6. The security deposit shall be collected as detailed in relative clause of the general condition of the contract.

7. The EMD of the contractor whose tender is accepted, shall be forfeited in full in case he dose not remit the initial security deposit within the stipulated period or start the work by the stipulated date mentioned in the award Letter.

8. All compensation or other sums of money payable by the contractor to the employer under the term of this contract may be deducted from his earnest money and the security deposit if the deposit has become otherwise payable, within ten days.

9. The Contract shall not assign the contractor, or he shall not sublet any portion of the contract except with the written consent of the employer. In case of breach of these conditions, the employer may cause the architect/consultant to serve a notice in writing on the contractor rescinding the contract where upon the security deposit shall stand forfeited to the employer, without prejudice to his other against the contractor.

10. The acceptance of a tender will rest with the Sardar Patel University which does not bind it self to accept the lowest tender, received without the assignment of a reason. All tenders in which any of the prescribed condition are not fulfilled or are incomplete in any respect are liable to be rejected. No conditional tender will be accepted. University reserves the right to accept or reject any or all tenders without assigning any reasons.

11. Canvassing in connection with tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection.

12. All rates shall be quoted on the proper form of the tender alone.

13. All item rate tender containing percentage below/above will be summarily rejected. However, where a tendered voluntarily offers a rebate for payment within a stipulated period, this may be considered.

14. On acceptance of the tender, the name of the accredited representative(s) of the contractor who would be responsible for taking instructions from the employer / consultant shall be communicated to the employer.

15. Special care should be taken to write the rates in figures as well as in wards and the amounts in figures only, in such a way that interpolation is not possible. The total amount should be written both in figures and in words. In case of figures the words ‘Rs.’ Should be written before the figure of rupees and words ‘P’ after the Paise and in case of words the word “Rupees” should precede and the word who paise “should be written at the end, unless the rate is in whole rupees and followed by the words ‘Only’ should invariably up to two decimal places. While quoting the rate is in schedule of quantities, the word ‘only’ should be written in the next line.
16. Sales tax or any other tax on material on finished works like work’s contract tax, turn-over tax, etc., in respect of this contract shall be payable by the contractor and the university will not entertain any claim whatsoever in the respect.

17. The contractor shall give a list of his relatives working with the university along with their designations and addresses.

18. No employee of the university is allowed to work as a contractor for a period of two years of his retirement from university service, without the previous permission of the university. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such.

19. The tender and the rates quoted for work shall remain open for acceptance for a period of 3 months from the date of opening of tenders. If any tendered withdraw his tender before the said period, then the university shall be at the liberty to forfeit earnest money paid along with the tender.

20. The tender of the work shall not be witnessed by a contractor or contractors who himself/herself has/have tendered or who may and have tendered for the same work. Failure to observe this condition would render tenders of the contractors tendering as well as witnessing the tender liable to summary rejection.

21. It will be obligatory on the part of the tenderer to tender and sign and tender documents for all the component parts and that after the work is awarded, he will have to enter into and agreement for each component with the competent authority in the university.

22. The tenderer apart from being a competent contractor must associate himself with agencies of the appropriate class who are eligible to tender for (I) Electrical (II) Sanitary & water supply (III) Horticulture (IV) Air-conditioning.

23. The contractor shall carry the work strictly in accordance with drawings, details and instructions of the architect/consultant/civil engineer and the structural consultant, if in the opinion of the architect/consultants or the civil engineer or the structural consultant changes have to be made in the design and with the prior approval in writing of the employer, that they desire the contractor to carry out the same, the contractor shall carry out the same with out any extra charges. The decision of architect/consultants/employers in such cases shall be final and shall not be open to arbitration.

24. A schedule of probable quantities in respect of each work and specifications accompany these special conditions. The schedule of probable quantities is liable to alteration by omissions, deductions or additions at the discretion of the employer/architect/consultants. Each tender should contain not only the rates but also the value of each items and should be totaled in order to show the aggregate value of the entire tender.

25. The tender must obtain for himself on his responsibility and at his own expenses all the information which may be necessary for the contract and must examine the drawing and must inspect the site of the work and acquaint himself with all local conditions, means access to the work, nature of the work and all matters appertain thereto.

26. The rates quoted in the tender shall include all charges for cleaning of site before commencement as well as after completion, water, electric consumption, meters, double scaffoldings, centering including bailing, fencing, hoarding plant equipment storage sheds, watching and lighting by night as well as day including Sunday and holiday temporary plumbing and electric supply, protection of cellars, vaults, other matters of things and the centering scaffoldings, staging, planking, timbering, strutting, shorting etc., as occasion shall require or when ordered to disturbed during the executing of the work and to the satisfaction of the architect/consultants. The rate shall be firm. The rates variation, labor conditions, fluctuations in railway freights of any conditions, whatsoever tenders must include in their rates sales tax, tax on works contract, excise duty, octroi and any other tax and duty or other levy levied by the central Government or any state government of local authority, if applicable No claim in respect of sales tax, excise duty, octroi or other tax, duty or levy whether existing or future shall be entertained by the employer.

27. The contractor should note that unless otherwise state the tender is strictly on items rate basis and each and every item should be correct workable and self-supporting. The quantity in the schedule of quantities approximately indicates the total in extent of work which may vary to any extent and may even be omitted thus altering the aggregating value of the contract. No claim shall be entertained on this amount.

28. The contractor shall not be entitled to any compensation & price escalation for any loss suffered by him on account of delays commencing or executing the work, whatever the cause of delays may be including delays arising out of modification to the work entrusted to him or in any sub-contract connected therewith or delays in awarding contract for other trades of the practice or commencement or completion of such work or in producing Government controlled or other building material or in obtaining water and power connections for construction purpose or for any other reason what so ever and the employer shall not be liable for any claim in respect thereof. The employer does not accept liability for any sum besides the tender amount. Subject to such variations as are provided for herein.

29. The successful tenderer must co-operative with the other contractors appointed by the employer so the work shall proceed smoothly with the least possible delay and to the satisfaction of the consultant.

30. The contractors must bear in mind that all the work shall be carried out strictly in accordance with the specifications and drawings made by the consultants and also in compliance of the requirements of the authority concerned and no deviation on any account will be permitted.
31. The successful tenderer should make his own arrangement to obtain all materials required for the work including cement.

32. The rate quoted by the contractor shall include expenditure for providing all the water required for the work curing, etc. for which the contractor shall make his own arrangements for the supply of good quality of water including obtaining municipal connection for his labor as well as for construction purpose, and all charge for water shall become by him. If water from local supply is not available and should it become necessary for the contractor to bore well for obtaining water for construction purpose or to bring water from outside by tankers, the employer shall not be liable to pay any charges in connection there with.

33. The rates quoted in the tender shall also include electric consumption charges of power. The contractor shall have to make his own arrangement to obtain power connection and maintain at his expense an efficient service of electric light and power and shall pay for the electricity consumed. The employer as well as the consultant shall give all possible assistance to the contractor to obtain the same.

34. All local authorities body fees for drainage, electricity and water connection for construction purpose shall be borne by the contractor and the fees if any payable for permanent connections shall be paid by the employer. However the responsibility of getting such connection by liaising with the local, authority lies with the contractor.

35. The contractor shall strictly comply with the provision of a safety code annexed here to.

36. The contractor shall be responsible for the observance of all central and state government rules and regulations framed by the concerned government under the contract labour (Regulation & Arbitration) Act. 1970 the owners shall be entitled to deduct all losses, damages, which they might suffer on account of non observance of these rules by the contractor, from the amount payable to the contractor.

37. Contractors under no circumstances are allowed to remove materials bought at site and advance paid against the same.

38. The proposed covered under this tender during its progress can also be inspected by the CHIEF TECHNICAL EXAMINER/ TECHNICAL EXAMINER or by an officer, of the vigilance cell of the authority on behalf of the engineer in charge university's representative for which the contractor shall extend all co-operation and assistance.

39. It is expressly understood that besides all taxes, levies etc now in force and that may be effective in later stage, with or without retrospective effect, the present sales tax on works contract is to borne by the contractor. I/We here by declare that I /We read and understood the above instruction for the guidance tenderers.

40. Work shall be executed during the day & night, if required, for which no extra charge shall be paid. The work shall be carried out in such a way, that minimum disturbance is caused to the functioning of the University. The necessary arrangements requires from the University will be provides for such working. The contractor shall make all arrangements to clean the premises everyday to ensure the safety of the furniture's, machineries, computers etc and also against dust etc.

WITNESS:

DATE : (SIGNATURE OF TENDERER)

PLACE : ADDRESS:
SAFETY CODE

Scaffolds

1. Suitable scaffolds shall be provided for workmen for all works that can not safely be done from the ground except in the case of short duration work which can be done safely from ladders. When a ladders is used. It shall be rigid construction made either of good quality wood or steel. The step shall have a minimum width of 450 mm and maximum rise of 330 mm. Suitable hand holds of good quality wood or steel shall be provided and the ladder shall be given an inclination not steeper than ¼ to 1 (1/4 horizontal and 1 vertical).

2. Scaffolding or staging more than 4 m above the ground floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly bolted braced or otherwise secured at least 1m above the floor or platform such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

3. Working or platforms, gangways and stairways shall be so constructed that they do not sag unduly or unequally and if the height of the platform, gangway or stairway is more than 4m above ground level and floor level, they shall be closely boarded and have adequate width and be suitably fenced as described in (ii) above.

4. Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall 1 m. Wherever there are open excavations in ground, they shall be fenced off by suitable railing and danger signal installed at night so as to prevent persons slipping into the excavations.

5. Safe means of access shall be provided to all working places. Every ladder shall be security fixed. No portable single ladder shall be over 9 m. in length while the width between side rails in rung ladder shall in no case, be less than 290 mm. for ladder upto and including 3m. in length for longer ladders this width shall be increased at least 20 mm for each additional meter of length.

6. A sketch if the ladders and scaffolds proposed to be used shall be prepared and approval of the engineer obtained prior to construction.

Other safety Measures

1. All personnel of the contractor working within the plant site shall be provided with safety helmets. All welders shall wear welding goggles while doing welding work and all metal workers shall be provided with safety gloves. Persons employed on metal cutting and grinding shall wear safety glasses.

2. Adequate precautions shall be taken to prevent danger form electrical equipment. No materials any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public.

Excavation and trenching

1. All trenches, 1.0 mt. Or more in the depth shall at all times be supplied with at least one ladder for each 30 mt. In length or fraction there of. The ladder shall be extended from bottoms of the trench to at least 1.0 mt. Above the surface of the ground. Sides of trenches, which are 1.5 mt. Or more in depth shall be stepped back to give suitable slope or securely held by timber bracing so as to avoid the danger of side collapsing . The excavated materials shall not placed within 1.5 mt. Of the edges of trench or half of the depth of the trench which ever is more. Cutting shall be done from top to bottom under no circumstances undermining or undercutting shall be done.

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

Demolition

1. Before any demolition work is commenced and also during the process of the work:

   a. All roads open areas adjacent to the work site shall be closed or suitable protected.

   b. No electric cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall electrically charged.

   c. All practical steps shall be taken to prevent danger to persons employed from the risk or fire or explosion or flooring. No floor, roof or other part of the building shall be so over loaded with debris or material as to render it unsafe.
Personal Safety Equipment's

1. All necessary personal safety equipment as considered adequate by the engineer should be kept available for the use of the person employed on the site and maintained in a condition suitable for immediate use, and the contractor should take adequate steps to ensure proper use of equipment by those concerned.

2. Workers employed on mixing asphalted materials, cement and lime mortars shall be provided with protective goggles.

3. Those engaged in white washing and mixing or stacking of cement bags or any material, which is injurious to the eyes, shall be provided with protective goggles.

4. Those engaged in welding works shall be provided with welder's protective eyesight lids.

5. Stonebreakers shall be provided with goggles and protective clothing and seated at sufficiently safe intervals.

6. When workers are employed in sewers and manholes, which are in use, the contractor shall ensure that the manhole covers are opened and are ventilated at least for an hour before the works are allowed to get in to manholes and the manholes so opened shall be condoned off with suitable railing and provided with warning signals or boards to prevent accident to the public.

7. The contractor shall not employ men bellow the edge of 18 years and women on the work of painting with products containing lead in any form. Wherever men above the age of 18 are employed on the work of lead painting the following precautions should be taken.

8. No paint containing lead or lead products shall be used except in the form of paste or ready-made paint.

9. The workers should supply suitable facemasks for use when paint is applied in the form of spray or surface having lead paint dry rubbed and scraped.

10. Overall shall be supplied by the contractor to the workmen and adequate facilities shall be provided to enable the working painter to wash during the cessation of work.

11. When the work is done near any public place where there is risk of drawings all necessary equipment's should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision should be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

12. **Hoisting Machines**

   1. Use of hosting machine and tackle including their attachments anchorage and supports shall confirm to the following standards or conditions:

   a. These shall be good mechanical constructions sound material and adequate strength and free from patent defect and shall be kept good repair and in good working order.

   b. Every rope used in hoisting or lowering materials or as means or suspension shall be of durable quality and adequate strength and free from patent defects, no wear any rings, watches and carry keys or other materials which are good conductors of electricity.

   2. All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition and scaffolds, ladder or equipment shall be altered or removed while it is in use adequate washing facilities should be provided at or near place or work.

   3. These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at work spot. The person responsible for complains of the safety code shall be named therein by the contractor.

   4. To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangement made by the contractor shall be open to inspection by the labor officer. Engineer of the department or their representatives.

   5. Now withstanding the above clause from (1) to (17) there is nothing in these to exempt the contractors from the operarions of any other act or rule in force in the republic of India.
1.0 The Contractor shall provide necessary Insurance in terms approved by the Employer, to cover the following in the joint names of the Employer and the Contractor and a copy/copies of the policy/policies shall be furnished to the Employer before commencement of his work on site.

a) CONTRACTORS ALL RISK INSURANCE POLICY covering loss or damage due to fire, lighting, collapse, defective workmanship and/or materials, flood, storm, theft, burglary, malicious damage, subsidence, riots, etc.

(b) Third Party Liability

(c) Workmen’s Compensation in accordance with latest, revised statutory provision.

(d) Contractors plant, tools and machinery

(e) All risks to material during transit

(f) Adjoining property insurance (if applicable)

(g) Any other Insurance required for fully indemnifying the Employer from any claim that may arise on account of the Contractors’ operations at site.

(h) Clients representative / employees / visitors.

2.0 If within a reasonable time from the commencement of the works the Contractor shall fail to effect and keep in force the Insurance referred to above clause or any other Insurance he may be required to effect under the terms of the contract, then the Employer may effect and keep in force any such Insurance and pay such premiums as may be necessary for that purpose and deduct the same from time to time from the monies due or which may become due to the Contractor.
1.0 GENERAL

These special conditions are meant to amplify the specifications and General Conditions of Contract. If any discrepancy is noticed between General Conditions of contract, specification, Bill of Quantity and Drawings, the most stringent of the above shall apply.

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

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

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

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

2.0 ACCOMPANIMENT TO TENDER

The tenderer will attach to the Tender, at the time of submission, a statement containing information on the following points on separate proforma:

List of all the confirmation of materials to be used as per specification along with manufacturer’s name, catalogue and other technical details. Any deviation from the specifications shall be separately pointed out.

3.0 TENDER RATES

The rates shall be quoted for each item for units mentioned in Bill of quantity against each item. The rates quoted by the Tenderer shall include charges for bringing in transport, hoisting, loading and unloading at the and from the site of works. The tender rate quoted for each item for units/quantities in BOQ shall allow for sales tax on works contract, octroi, Excise, S.T. and any other government levies/duties etc. as specified in the general conditions of contract.

The rate shall be inclusive of all taxes, costs, levies, duties, octroi, labor charges, or any other duties, levied by the Government or to be paid to the local authorities. The rate shall also be inclusive of scaffolding, hire of tools and plants, drilling and chiseling holes, grooves in wall, concrete, masonry etc. and making them good.

4.0 INTENT

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

5.0 INTERPRETATION OF PROJECT DOCUMENTS

5.1 The Specification, Drawings, and Bill of quantity shall be interpreted in accordance with good installation practice defined in the appropriate regulations and standards whether specifically referred to or not. If there is any discrepancy or shortfall in the application of the regulations to any aspect of this contract or the contractor considers there is anything detrimental to the standards or inconsistent with his obligations and guarantees, OWNER shall be informed prior to signing the contract and shall thereafter inform the contractor in writing the course to be followed. Where the drawings are to a small scale or are expressed in symbolic terms or are in the form of a diagram, then exact location of items shall not be inferred and in all cases, the work shall be fully integrated with the work of other trades and with the fabric of the building. The contractor shall appraise the duties of all plants and equipments taking account of any additions or variations and shall inform the OWNER of any matters which may affect the design. In all cases the equipment installed shall be of appropriate rating for the duty it performs.

5.2 The Specifications and Bill of quantity shall be considered as part of this contract and any work or material shown on BOQ and not called for in the specification or vice versa, shall be executed as if specifically called for in both. The Drawings indicate the extent and general arrangement of the H.T. panel, Transformer, L.T. panel, H.T. & L.T. cable route layout, etc. and are essentially diagrammatic.
The work shall be installed as indicated on the drawings, however, any minor changes found essential to coordinate the installations of this work with other services shall be made without any additional cost to the owner. The drawings are for the guidance of the contractor, exact locations, distances and levels will be governed by the building. The contractor shall examine all structural and electrical drawings before starting the work, and report to OWNER or its representative, any discrepancies which in his opinion appear on them, and get them clarified.

6.0 SCOPE OF WORK

6.1 The work to be carried out under this contract comprises of the Electrical Installation work for the proposed project called for in the documents. The work covered under this contract comprises of supply (wherever called for), installation, connection, testing and commissioning the Electrical installation commencing from point of electric power supply within the project site as per specifications, relevant Indian standards, Code of practice. The contractor shall carry out and complete the said work under this contract in every respect in conformity with the current rules and regulations of the local Electricity Authority, the Indian Standards and with the directions of and to the satisfaction of the Consultant and owner. The Contractor shall furnish all labor and install all materials, appliances, equipment (except those items which will be supplied by the Owner to the contractor at site), necessary for complete provision and testing of the whole electrical installation as specified herein and shown on the drawings. This also includes any material, appliances, equipment not specifically mentioned herein or noted on the drawing as being furnished or installed but which are necessary and customary to make complete installation with all outlets for power, light, telephone conduits, all other conduits and other electrical systems shown in the schedule or described herein, properly connected and in working order.

The work shall include all incidental jobs connected with electrical installation such as excavation for trenches and back filing, cutting/drilling holes through walls/floors and grouting for fixing of fixtures, equipment etc. Chiseling in the wall or principal structure is not permitted. In general, the work to be performed under this contract shall comprise of the following:

6.2 Substation comprising of:

6.2.1 H.T. Switchgear & H.T.Cable
6.2.2 Transformer
6.2.3 D. G. set
6.2.4 Substation accessories
6.2.5 Earthing
6.2.6 Power Control Centre & Motor Control Centre
6.2.7 Main L.T panel
6.2.8 A/C plant panel
6.2.9 Lighting distribution board (LDB)
6.1.10 Earthing and lightning protection system installation
6.1.11 Plate / Pipe electrode type earth station
6.1.12 Earth continuity conductor
6.1.13 Internal and external lighting with fixtures
6.1.14 Stabilizer

6.3 All qualities mentioned in the Bill of quantity are approximate and the contractor shall not be eligible for any claim due to any variation in / or omission of any item.

6.4 Any extra item shall be calculated on the rate analysis basis approved by OWNER.

6.5 It is the responsibility of the contractor to co-ordinate with A.E.Co / Electrical Inspector and fulfil all the requirements of A.E.Co at no extra cost and arrange for the power connection.

7.0 ABBREVIATIONS

The following abbreviations have been used in the accompanying specifications, drawings and Bill of quantity:

HRC : High Rupturing Capacity.
GI : Galvanized Iron.
8.0 REGULATIONS AND STANDARDS

The installation shall conform in all respects to Indian standard code of Practice for Electrical Wiring installation IS : 732-1963 and IS : 2214-1963 (Silver Nitrate Pure and analytical reagent). It shall also be in conformity with the current Indian Electricity, Rules, Indian Electricity Act, National Electrical Code and Regulations of the Local Electrical supply Authority in so far as these become applicable to the installation. Wherever this specification calls for a higher standard of material and/or workmanship than those required by any of the above regulations then this specification shall take precedence over the said regulations and standard. In general, the materials equipment and workmanship not covered by the above shall conform to the relevant Indian Standards.

The electrical installation work shall follow Codes, Indian standard specifications and rules (Within the best meaning of the same) under this contract.
The following list is given for general guidance only in addition to list given in each individual section, however all other latest editions of Codes, Indian standard specifications and Rules shall also be followed when it is required.

8.1 I.S. : 8623 Low voltage switchgear & control gear assemblies.
8.2 I.S. : 10118 Code of practice for selection, installation and maintenance of switchgear and control gear.
8.3 I.S. : 4237 General requirement for switch gear and control gear for voltage not exceeding 1000 Volt a.c. or 1200 volts d.c.
8.4 I.S. : 13947 Low voltage switchgear and control gear.
8.5 I.S. : 9224 Low voltage fuses.
8.6 I.S. : 8828 Circuit breakers for out protection for household and similar installations.
8.7 I.S. : 12640 Earth leakage circuit breaker.
8.8 I.S. : 1248 Direct acting indicating analog electrical measuring instruments
8.9 I.S. : 2705 Current transformers.
8.10 I.S. : 4201 Application guide for voltage transformers.
8.11 I.S. : 6875 Control switches for voltage upto and indicating 1000V a.c. 1200 V d.c.
8.15 I.S. : 694 Specifications for PVC insulated cables for working voltages up to and including 1100 volts.
8.16 I.S. : 2551 Danger notice plates.
8.18 I.S. : 5216 Guide for safety procedures and practices in electrical work.
8.20 Indian Electricity Act as amended up to date.
8.21 Indian Electricity Rules as amended up to date.

9.0 FEES, PERMITS AND TESTS

The Contractor shall pay for any and all fees and obtain permits required for the installation work. On completion of the work the contractor shall obtain and deliver to the OWNER, certificates of final inspection and approval by the local electric supply authority and the electrical inspector.

10.0 UTILITY SUPPLY:

The location of receipt of incoming utilities supply (Hook up Points) like HT supply shall be verified with various concerned authorities. It is the responsibility of the contractor to co-ordinate with various utility agencies, the exact location of such Hook Up Point and mode of connection. Further the contractor shall co-ordinate with such utility agencies to provide necessary drawings, documents, get their approval, make the necessary arrangement for the payments and arrange the utilities supply at no extra cost.

11.0 ACTUAL ROUTE OF CABLE

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

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

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

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

The make of electrical equipments, components, accessories, etc. has been mentioned in order of priorities. The tenderer has to quote for the first priority as mentioned above after ascertaining that the first preference materials are available. If at a later stage during executing the work, material of the first preference make are not available, the contractor has to get approval from the OWNER to use other make of material prior to procurement. Any rate difference for the first preference make and the one approved will be passed on to the owner.

13.0 MANUFACTURERS

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

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

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

14.0 RATING

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

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

15.0 INSPECTION AND TESTING

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

15.1 That the equipment installed complies with specification in all particulars and is of the correct rating for the duty and site conditions.

15.2 That all items operate efficiently and quietly to meet the specified requirements.

15.3 That all circuits are correctly fused and protected and that protective devices are properly coordinated.

15.4 That all non current carrying metal work is properly and safely grounded in accordance with the specifications.

The contractor shall provide all necessary instruments and labor for testing, shall make adequate records of test procedures and readings, shall repeat any tests requested by the OWNER and shall provide test certificates signed by a properly authorized person. Such test certificates shall cover all works.

If tests fail to demonstrate the satisfactory nature of the installation or any part thereof then no claims for the extra cost of modifications, replacements or re testing will be considered. OWNER's decision as to what constitutes a satisfactory test shall be final.

The above general requirements as to testing shall be read in conjunction with any particular requirements specified elsewhere.
16.0 PRICE DETAILS
At anytime and at the request of OWNER, the contract shall provide details or breakdown of costs and prices of any part or parts of the works.

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

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

19.0 SAMPLES AND CATALOGUES
Before ordering the material necessary for these installations, the contractor shall submit to OWNER for approval, a sample of every kind of material such as cables, conductors, conduits, switches, socket outlets, circuit breakers, lighting fixtures, boxes etc., along with the catalogues.

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

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

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

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

21.1 Location and details of distribution boards, main switches, switchgear and other particulars.
21.2 Location of all earthing stations, route and size of all earthing conductors, manholes etc.
21.3 Route and particulars of all cables.
21.4 Lighting layout plan for all the floors along with circuit distribution details.
21.5 External Area Lighting Plan.

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

22.1 Any defective work or material supplied by the contractor.
22.2 Any material or equipment supplied by OWNER which is damaged or destroyed as a result of defective workmanship by the contractor.
22.3 Any material or equipment damaged or destroyed as a result of defective workmanship by the contractor.
23.0 SAFETY OF MATERIALS
The contractor shall provide proper and adequate, storage facilities to protect all the materials and equipment including those issued by OWNER against damage from any cause whatsoever.

24.0 COMPLETION CERTIFICATE
On completion of the electrical installation (or an extension to an installation) a certificate shall be furnished by the contractor countersigned by the licensed supervisor, under whose direct supervision the installation was carried out. This certificate shall be in the prescribed form as required by the local supply authority. The contractor shall be responsible for getting the electrical installation inspected and approved by the local concerned authorities.

25.0 DEFECTS LIABILITY
Defects liability period shall mean 12 calendar months after OWNER have issued certificate of completion of the whole work. The certificate of completion shall be issued after the necessary tests have been carried out to the satisfaction of OWNER and the required drawings are submitted.

The contractor shall make good at his own cost and to the satisfaction of OWNER, all defects or other faults arising in the opinion of OWNER out of bad workmanship or faulty materials not in accordance with the drawings, I.S.S. or I.E. Act and the Rules and Regulations under which it may appear within twelve months after completion of the work.

26.0 STAFF
The contractor shall employ a competent fully licensed qualified, full time electrical engineer to direct the work of electrical installation in accordance with the drawings and specifications. The engineer shall be available all times at site to receive instructions from OWNER, in the day to day activities throughout the duration of contract. The engineer shall correlate the progress of the work in conjunction with all the relevant requirements of the supply authority.

27.0 RESTATING & FINISHING OF CIVIL DAMAGES
For erection of equipment / cables etc., if any civil structure is required to be broken, the same shall be done, restated and finished as original by the tenderer without any extra cost.
PART-A ELECTRICAL SPECIFICATIONS

1.0 GENERAL:
General scope of work covers execution & completion of the electrification work for the proposed of UNIVERSITY SECOND FLOOR, SARDAAR PATEL UNIVERSITY, V.V.NAGAR. In accordance with drawings and specifications and getting necessary approvals and power supply from the appropriate authorities. Scope includes wiring and supply, installation, connection, testing and commissioning of point wiring for light points, ceiling fan points, exhaust fan points, convenience socket outlet points, power socket outlet points, bell outlet points etc. including fixing of light fixtures, ceiling fan, exhaust fan, wall fan, bell etc.

2.0 RULES & REGULATIONS:
- IS : 732 Code of practice for electrical wiring installation (System voltage not exceeding 650 V)
- IS : 1646 Code of practice for fire safety of buildings (General) Electrical installation.
- IS : 9537 (Part - 2) Rigid steel conduits for electrical wiring.
- IS : 2687 Fittings for rigid steel conduits for electrical wiring.
- IS : 3480 Flexible steel conduits for Electrical wiring.
- IS : 3837 Accessories for rigid steel conduit for electrical wiring.
- IS : 694 PVC insulated cables.
- IS : 9537 (Part - 3) Rigid non-metallic conduits for electrical wiring.
- IS : 6946 Flexible (Pliable) non-metallic conduits for electrical installation.
- IS : 3837 (Part - 2) Rigid steel conduits for electrical wiring.
- IS : 1293 3 pin plugs and sockets.
- IS : 3419 Fittings for rigid non-metallic conduits.

The installations generally be carried out in confirmatory with the requirements of Indian Electricity Act 1010 as amended up to date and the latest Indian Electricity Rules and Supplementary Regulations of the State Electricity Department and Electricity undertaking and where the installation is subject to inspection & approval of fire insurance and explosives authorities such installation shall be planned and executed to confirm their special rules.

3.0 POINT WIRING:
SUPPLY SCOPE: The following material shall be induced in point wiring and accessories.

A. PVC rigid conduit: PVC Conduits shall be rigid unplasticised heavy gauge 2.0mm wall thickness up to 20mm diameter conduit and 2.5 mm. wall thickness for all sizes above 20mm. diameter. All shall be ISI & FIA Approved and as per IS: 9537 (Part - 3).

B. Wires: PVC insulated copper conductor wire multi stranded conductor ISI marked of 1.0, 1.5, 2.5, 4.0, 6.0, 10.0, 16.0 Sq mm (As shown in Material Specification Sheet)

<table>
<thead>
<tr>
<th>Nominal cross-section area of largest associated copper circuit conductor in sq.mm</th>
<th>Nominal cross-sectional area of earth continuity conductor in sq.mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>2.5</td>
<td>1.5</td>
</tr>
<tr>
<td>4.0</td>
<td>2.5</td>
</tr>
</tbody>
</table>

- In case of circuit wiring for lights, exhaust fans, ceiling fans, bell, convenience socket outlet points (P+N+E):
  - 2.5 sq.mm. - From D.B. to switch boards.
  - 1.5 sq.mm. - From switch boards to outlet points

- In case of power socket outlet circuit having not more than two 15 A power outlet (P+N+E):
  - 4.0 sq.mm. - From D.B. to first power outlet
  - 2.5 sq.mm. - From first power outlet to second power outlet

- In case of power socket outlet circuit having single 15 A power outlet (like water heater) (P+N+E):
  - 4.0 sq.mm. - From D.B. to power outlet.

- In case of 15 A. power outlet for window Air conditioner or other likewise appliances (P+N+E):
  - 4.0 sq.mm. - From D.B. to power outlet.
The insulation shall be FRLS compound complying with the requirements of IS : 694. It shall be applied by an extrusion process and shall form a compact homogenous body.

The thickness of FRLS insulation shall be as set out in the relevant standards

The cores of all cables shall be identified by colours in accordance with the following sequence.

- Single phase - Red
- Three phase - Red, Yellow, Blue
- Neutral - Black
- Earth - Green or Green/Yellow

C. **Switches & Accessories:** As shown in Material Specification Sheet. Switches shall conform to IS: 3854, IS: 1293 and IS: 4615. The switches shall be Modular type single pole, single or two ways as shown on the drawings or as specified. They shall be of moulded type rated for 250 volt, and of full 5 / 15 A capacities.

D. **Cover Plates:** 3 mm thick as shown in Material Specification Sheet. The cover of the boxes to receive outlet points shall be of best anodized sheet cut to shape and size or plate of approved manufacturers of switches.

E. **Sockets:** The sockets shall conform to IS: 1293. Each socket shall be provided with control switch of appropriate rating. The sockets shall be moulded type, rated for 250 volts, and either of full 5 A or 15 A capacity, as mentioned on the drawings.

F. **Hardware:** As shown in Material Specification Sheet

G. **Switch Boards & Outlet Boxes:** As shown in Material Specification Sheet

### 4.0 INSTALLATION WIRE:

All conduits shall be concealed in wall, slabs or erected on surface etc., (According to type of wiring)

Necessary changes shall be made in walls to conceal the conduits and then refilling of the zaris with cement mortar. All switch boards shall be concealed in wall and should be kept in line and level with help of the Spirit Level & also outlet boxes placed for bracket wall points. Fan boxes shall be provided with nut welded on top with threaded hook and check wire drawing should be done with the help of draw wire. Before inserting the wires in the conduit shall be cleaned of all foreign material. Drawing of wire should be done such that insulation of wire is not damaged.

All work shall be done as per instruction and satisfaction of Engineer-in-charge. For surface conduit wiring, the conduit fitting, switch/Ceiling fan regulator boxes etc., shall be installed surface exposed flexible conduit shall not be used earth continuity conductors. Separate earth wire shall be provided rather inside or outside the flexible conduit which shall be connected by means of earth clips to the earth system at one end & to the equipment at the other end as per IS 3043-1987.

Size of wires shall be chosen to limit voltage drop within 5 % minimum area of conductor shall be 3/20 SWG copper unless otherwise stated & density not to exceed 3 /20 SWG. Generally not more than 8 to10 points shall be wired in one conduit for the purpose of calculated connected loads of various circuits a multiply factor of 1.25 will be assumed to the rated lamp wattage for a mercury and 200 Watts & 500 Watt will be assured for single 5 Amp and 15 Amp receptacles respectively.

All cost of material, labor, shall be included while Quoting and no extra payment shall be co titled.

**NOTE:** No joints shall be allowed in any wires in the conduits; all wires shall be joined or connected at termination points. All circuits to have individual neutrals and one neutral shall not complete while the wiring system.

Circuit’s mains shall starts from distribution board to switch board or from meter board to Distribution board. The circuit mains include:
**MAXIMUM CAPACITY OF CONDUCTOR FOR THE DRAWING – IN OF 1100 VOLTD GRADE PVC INSULATED COPPER/ALUMINIUM WIRES.**

<table>
<thead>
<tr>
<th>SIZE OF CONDUIT (IN MM)</th>
<th>19</th>
<th>25.4</th>
<th>31.8</th>
<th>38</th>
<th>51</th>
<th>63.5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NOMINAL CROSS SECTIONAL AREA (SQ. MM)</strong></td>
<td>▼</td>
<td>S</td>
<td>B</td>
<td>S</td>
<td>B</td>
<td>S</td>
</tr>
<tr>
<td>1.5 / 2.5</td>
<td>5</td>
<td>4</td>
<td>8</td>
<td>6</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>4.00</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>4</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>6.00</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>10.00</td>
<td>2</td>
<td>--</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>16.00</td>
<td>--</td>
<td>--</td>
<td>2</td>
<td>--</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>25.00</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
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<td>--</td>
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<td>--</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>50.00</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

**NOTE:**

This table shows the maximum capacity of the conduit for the simultaneous drawing in the Cables. The table applies to 1100 V grade wires/cables. The columns headed ‘S’ applies to “runs of conduits which have distance not exceeding 4.25 m between draw-in boxes and which do not deflect from the straight by an angle more than 15 Degree. The Columnsheaded ‘B’ apply to runs of conduit which deflect from the straight by an angle more than 15 Degree.

5.0 **SUPPLY CONDUIT:**

(a) PVC rigid conduit – 1.5 mm thick, 20/25 mm diameter and accessories.
(b) Wires – PVC insulated, multi-stranded, copper conductor ISI marked of 1.00 to 16.00 Sq. mm
(c) All cost of material, labor included when quoting, no extra payment shall be entitled.

5.1 **INSTALLTION CONDUIT:**

(a) Conduit should be laid in slab before casting of slam and embedded in walls by making zaris in wall s and refilling the same before the final plaster of wall is done. Also all the switch boards, outlet boxes to be installed.
(b) Wires to be drawn in conduit after cleaning of all conduits and drawn with the help of draw wires. No damage to the insulation of wires should be done while drawing.

**CONCEALED INSTALLATION WITH RIGID PVC CONDUIT**

- All the rigid PVC conduit used for concealed installation shall be as per IS ; 9537 and its accessories shall be as per IS : 3419 ( Small Wire Ropes ).
- Whenever necessary bends or diversion may be achieved by bending the conduits with the help of bending spring. No other method of bending is allowed.
- Conduit pipes shall be joined with the help of plain coupler fixed at the end with the help of vinyl solvent cement. No other method of joining is permissible.
- All other methods, no wires through conduit, bunching, etc. Shall be as specified in the concealed installation.
- Prior to fixing the conduits, the complete route shall be marked on site for the approval of consultant.

**CONCEALED WIRING SYSTEM WITH RIGID PVC CONDUIT**

The rigid PVC conduits shall be used for concealed wiring system. The conduits shall be concealed in the concrete slab, floor, walls, beams, columns etc.

**FIXING OF CONDUIT**

Conduits embedded in concrete shall be installed in the frame work before pouring concrete. The conduits shall be installed above the bottom reinforcing bars, and shall provide positive wire fastening of the conduit to the reinforcing rods at an interval of not more than one meter, but on either side of couplers or bends or putlet / pull / junction boxes or similar fittings, proper hold fast shall be fixed at a distance of 30 cm from the centre of such fittings. Conduits embedded in the wall shall be fixed inside the chase. The chase in the wall shall be neatly made and be fixed in the manner desired. In the case of building under construction, chase shall be provided in the wall at the time of their construction and shall be filled up neatly with cement mortar 1:4 after erection of conduit and brought to the original finish of the wall. Cutting of horizontal chases in walls is prohibited. The conduits shall be fixed inside the chase by means of staples or by means of saddles not more than 60 cm apart.

Conduits shall be so arranged as to facilitate easy drawing of wires through them. Entire conduit layout shall be done in such a way as to avoid additional junction boxes other than light points. The wiring shall be done in a looping manner. All the looping shall be done in either switch boxes or outlet boxes. Looping in junction or pull boxes are strictly not allowed. Where conduits cross building expansion joints, adequate expansion fittings or other approved devices shall be used to take care of any relative movement.

All conduits shall be installed so as to avoid steam and hot water pipes.

Conduits shall be installed in such a way that the junction, derivation and pull boxes shall always be accessible for repairs and maintenance work. The location of junction / pull boxes shall be marked on the shop drawings and approved by the client.

A separation of 200 mm shall be maintained between electrical conduits and hot water lines in the building.

No run of conduit shall exceed ten mtr. between adjacent draw in points nor shall it contain more than two right angle bends, or other derivation from the straight line.

Caution shall be exercised in using the PVC conduits in location where ambient temperature is 50 degree cel. Or above. Use of PVC conduits in places where ambient temperature is more than 60 deg, cel. Is prohibited. The entire conduit system including boxes shall be thoroughly cleaned after completion of installations and before drawing of wires. Conduit system shall be erect and straight as far as possible. Traps where water may accumulate from condensation are to be avoided and if unavoidable, suitable provision for draining the water shall be made.

All jointing method shall be subject to the approval of the client.

Separate conduits shall be provided for the following system.

- (c) 15 A power outlets.
- (d) 5 A outlets and lighting system.
- (e) Low voltage system.
- (f) Telephone / intercom system.
- (g) C.C.T.V. system
- (h) Sound system
- (i) Computer data cabling system
- (j) Equipment wiring
6.0 DISTRIBUTION BOARD:

6.1 SUPPLY:

Distribution board shall be of sheet metal with rated bus-bars, factory made. They shall be for 3-Phase or 1-Phase distribution system.

6.2 INSTALLATION:

The distribution shall be concealed in wall, flush mounted and should be in line and level. These shall be only factory tested.

6.3 TEST:

After installation of MCB's shall be tested.

7 MCB:

7.1 SUPPLY:

These shall be SP, SPN, TP, or TPN as specified in B.O.Q. Rating of MCB 2 Amp to 63 Amp having 9 KA fault level as per IS-8828-1978, BS 3871-Part-1.

7.2 INSTALLATION:

All MCB shall be installed in the DB on din rail provided in the DB. Spares shall be blocked by blank Plate.

7.3 TESTING:

All MCB shall be tested for Over loading and short-circuit tripping.

8 MATERIAL:

All materials, fittings, and appliances used in the electrical installation shall be of the best quality and brand new of approved manufacturer and shall confirm to latest Indian Standard Specification where ever this exist. Where Indian Standard must submit along with the tender the names of manufacturers, categories, technical features etc., of material and fixtures, which they proposed to be used.

9 WORKMANSHIP:

Good workmanship and eat appearance are the prerequisite for compliance with the various section of these specifications. The work shall be carried out under direct supervision of a person-holding certificate of a competency issued by the state Government and in accordance with the statutory rules and regulations in force. The prevalent ISI code of practice shall be followed wherever applicable.

10 DRAWING:

Two copies of conduit laying and wiring (Wiring Diagram & Lay out Plans), the schedule of quantities and specification shall be furnished by the Employer to the Contractor for his own use until the completion of the contract which shall be accessible in all reasonable times to the Engineer-in-Charge or their representatives. The tender drawings shall be indicate only the general scheme of requirements. Exact position of all points, controls, switch boxes and inspection boxes, main and sub-distribution boards etc., shall be got approved by the Engineer-in-Charge before the commencement of the work where ever required, detailed drawing shall be prepared and got approved.

On completion of the work, completion drawing shall be prepared and two copies of the same should be submitted to the Employer. The completion drawing shall indicate clearly the main switch board, the runs of various mains and sub-mains, position of points and there controls. All circuits shall be clearly indicated and numbered in the wiring diagrams and all points shall be given the same number at the circuit to which ther are electrically connected.

11 MARKING AND APPARATUS:

When a board is connected to voltage higher than the volt the terminal or leads of the apparatus mounted on it shall be marked in the following color for indicate the different poles or phases to which the apparatus or its different terminals may have been connected.

- Three Phases ----- Red, Blue and Yellow
- Neutral ----- Black
- Off wires ----- White or Grey
- Earth Wire ----- Green

Where four wire –three phase wiring is done, the neutral shall be in Black color and the other three wires in another color. Whereas more than one switch, each such switch shall be marked to indicate which section of the installation it controls. The main which shall be marked as such and where there is more than one main switch is the building. Each such switch shall be marked to indicate which section of the installation it controls.
All marking required under this clause shall be clear and permanent.

12. **MATERIALS:**

All material used in the construction of fitting shall be such quality, design and construction that will provide adequate protection in normal use again mechanical & electrical failures and exposures to the risk of injury or electric shock and shall withstand and the effects of exposures to atmosphere.

13. **CEILING ROSE:**

Ceiling rose and similar attachment – A ceiling rose or any other similar attachments shall not be used on a circuit, the voltage of which normally exceeds 250 Volts. Normally only one flexible cord shall be attached a ceiling rose. Specially designed ceiling rose shall be used for multiple pendants.

14. **SOCKET OUTLETS AND PLUGS:**

A socket out let shall not embody fuse terminal as an integral part of it. But the fuse may be embodied in plug in which case the plug shall be non reversible and shall be so arranged and connected that the fuse is connected to an outer or phase conductor or the non earthed conductor of the circuit. Every socket out let shall be controlled by switch will be on the live side of the line. In an earthed system of supply, the out let and plug shall be 3-pin type and the third terminal connected to earth.

(a) Every lighting fitting shall be controlled by a switch and where control at more than point is necessary by as many as two ways and intermediate switches as there are control points. Lights, fans, and socket out lets shall be so located as to provide maximum comfort to the occupant and to enable him to utilize the electricity in the most economical manner.

(b) Where conductor are required to be drawn through tube or channel leading to the fittings, the tube or channel must be free from sharp angles or protecting edges and of such size as will enable them to be wired with the conductors used for the final sub circuit without removing the braiding or taping. As far as possible all tube or channels should be of sufficient size to permit looping back.

(c) Where a light fitting is supported by one or more flexible cords, the maximum weight to which the twin flexible cords can be subjected shall be as followed.

**SIZE OF TWIN FLEXIBLE CORDS:**

<table>
<thead>
<tr>
<th>NOMINAL CROSS SECTION</th>
<th>Nos. &amp; DIAMETER, AREA OF WIRES IN</th>
<th>MAXIMUM PERMISSIBLE WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sq. Inch</td>
<td>Sq. mm</td>
<td>Sq. Inch</td>
</tr>
<tr>
<td>0.0006</td>
<td>0.50</td>
<td>14/0.0076</td>
</tr>
<tr>
<td>0.0010</td>
<td>-----</td>
<td>23/0.0076</td>
</tr>
<tr>
<td>0.0017</td>
<td>1.50</td>
<td>40/0.0076</td>
</tr>
</tbody>
</table>

Where a weight is greater than 4.5 Kgs (10 Lbs) than it has to be supported, two or three twin flexible cords shall be used so that the maximum weight to which any cord is subjected does not exceeds the above values or alternatively other support viz., suitable metal pipe or suitable support shall be provided.

(d) No inflammable shade shall be form a part of light fitting unless such shade is well protected against all risk of fire. Celluloid shade or light fitting shall be not be used under any circumstances.

(e) Enclosure shall be provided with a removable glass receptacles, arranged to enclosed the lamp Completely and of such size or connection as to prevent undue hearing of the lamp or if the position of Fitting be such that the glass receptacle is liable to mechanical damage the glass shall be protected by a suitable wire guard.

15. **FITTINGS WIRE:**

The use of fitting wire shall be restricted to the internal wiring of the lighting fittings. Where fitting wire is used for wiring fittings, the sub circuits leads shall terminate in ceiling rose or connec ter from which that shall be carry into the fitting.

16. **LAMP HOLDER:**

The lamp holder for use on brackets and the like shall have not less than 1.3 CM (1/2 Inch) nipple and all those for use with flexible pendent shall be provided with cord grips. All lamp holders shall be provided with shade carriers. Where center contact Edison screw lamp holders are used the outer of screw. Contact shall be connected o the middle wire or the neutral or to the earthed conductor of the circuit.
17. **WATER TIGHT FITTINGS:**

External and road lamp shall have weather proof fitting of approved design so as to effectively prevent the admission of moisture. An insulating distance piece of moisture material shall be inserted between the lamp holder nipple and fitting flexible core conductors and cord grip lamp holders must not be used where exposed to weather.

18. **LAMPS:**

All incandescent lamps, unless otherwise required shall be hung at height of 2.5 Mtr (8 feet) above the floor level. They shall be provided with caps of the following patterns.

<table>
<thead>
<tr>
<th>Description</th>
<th>Cap Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to and including 200 Watts</td>
<td>Standard Bayonet (B)</td>
</tr>
<tr>
<td>Above 200 Watts &amp; not exceeding 300 Watts</td>
<td>Edison Screw (E.S)</td>
</tr>
<tr>
<td>Above 300 Watts</td>
<td>Golliath Screw (G.S)</td>
</tr>
</tbody>
</table>

19. **FANS, REGULATORS, AND CLAMPS:**

(1) Ceiling Fans: Ceiling fans including their suspension shall conform to IS: 374-1951 and to the following requirements:

a) All ceiling fans shall be wired to ceiling roses or to special connector boxes and suspended from hook or shackles with insulator between hooks and suspension rods. There shall be no joint in the suspension rod but if joint are unavoidable then such joints(2inch) minimum length and both ends of the pipes shall touch together within couplers and shall in addition to be secured by means of split pins: alternatively the two pipes may be welded.

b) Canopies on top of suspension rod shall effectively hide the suspension.

c) The leading-in-wire shall be of nominal cross section area not less than 0.002 sq inch (3.00.029) and shall be protected from abrasion.

(2) Exhaust fans shall be erected at the places indicated by the Architects. For fixing an exhaust fan, a circular hole shall be provided in the wall to suit the size of the frame. Which shall be fixed by means of rag bolt embedded in the wall? The exhaust fan shall be aired as near to the hole as possible by means of a flexible cord, care being taken that the blades rotates in the proper direction.

**TESTING OF INSTALLATION**

20. **INSULATION RESISTANCE:**

a) The insulation resistance shall be measured by applying between earth and the whole system of conductors or any section thereof with all fuses in place and all switches closed and except in earthed concentric wiring all lamps in position or both poles of the installations otherwise electrically connected together, a direct current; pressure of not less than twice the working pressure provided that it need not exceed 500 volts for medium voltage circuits. Where the supply is derived from the three wire (AC or DC) or a poly phase system , the neutral pole of which is connected to earth either direct or through added resistance. The working pressure shall be deemed to be that which is maintained between the outer and phase conductor and the neutral.

b) The insulation resistance measured as above shall not less than 50, divided by the number of points on the circuits provided that the whole installation shall be required to have an insulation resistance greater than one mega ohm.

c) Control rheostats, heating and power appliances and electrical signs may, if required be disconnected form the circuit during the test, but in that event the insulation resistance between the case of frame work and all live parts and each rehostate appliance and sign shall not be less than that the specified in the relevant IS specifications shall not be less than half a mega ohm.

d) The insulation resistance shall also be measured between all conductors all connected to one or phase conductor of the supply and all the conductors connected to the middle wire or the neutral to the other pole or phase conductor of the supply and its value shall not less than that the specified in sub clause

e) On completion of an electric installation (or an extension to an installation) a certificate shall be furnish by the contractor counter signed by the qualify supervisor , the installation was carried out. The certificate shall be in the prescribed form as required by the Local Electric Supply Authorities. One such recommended from is given in APPEDIX –B.
21. **TESTING OF EARTH CONTINUITY PATH:**

The earth continuity conductor including metal conduits and metallic envelopes of cable in all cases shall be tested for electric continuity and the electrical resistance of the same along with the earthing lead but excluded any added resistance or earth leakage circuit breaker measured from the connection with the earth electrode to any point in the earth continuity conductor in the completed installation shall not exceed one ohm.

22. **TESTING OF POLARITY OF NON-LINKED SINGLE POLE SWITCHES:**

a) In a two wire installation, a test shall be made to verify that all non-linked single pole switches have been fitted in the same conductor throughout and such conductor shall be labelled or marked for connection to an outer of phase conductor or to the non-earthed conductor of the supply.

b) In a three wire or a four wire installation, a test shall be made to verify that every non-linked single pole switches is fitted on a conductor which is labelled or mark for connection to the one of the outer or phase conductor of the supply.

23. **CABLES:**

23.1 Cable shall be supplied by the electrical contractor or as per clarification regarding supply of cable made in B.O.Q.

**CABLE SPECIFICATION:**

- All cable shall be as per latest IS 1554 PART - I , PVC insulated heavy duty electric cables PART-I for working voltage up to and including 1100 Volts.
- All power cable shall be PVC insulated, armoured, inner sheathed Aluminium/copper conductor. Control cable shall be of copper conductor.
- The core insulation and inner sheath shall confirm to the requirement of Type A IS 5831 STI IS respectively. Similar for outer sheath.
- Cable shall have armour of steel wire up to OD of 18 mm and flat steel trip for higher OD.
- Cable shall be supplied in drums of 1000 mts. For and up to 6.00 Sq mm and 10.00 Sq mm and above in 500 mts.

**CABLING:**

Cabling shall be done with the help of jack and rollers. Cable shall be passed through RCC Hume pipe where ever road crossing and path way crossing is there. All cable shall rise from cable trenches in GI pipes. Cable shall be tagged as per cable scheduled at every 30 mts. By aluminum 2 mm thick securely fastened. They shall also be identified near the termination.

Above the cable trenches, cable route marker shall be installed as per rules and regulations at every 30 mts. and at every turning of the cable or branches of cables.

All cables shall be laid in trenches at a depth of 750 mm and shown in drawings. Before laying of cable sand shall be spread then the cable shall be laid which shall again be covered with sand minimum 150 mm from the top of the largest dia. Of the cable. The second bricks shall be laid across the trench completely covering the trench , lastly excavated soil shall be back filled and compacted by watering intermittently.

All cables after laid shall checked for insulation level and meggered before back filling. Cable entries in GI pipe or Hume pipe shall be sealed by cable compound or putty from smaller Dia. Of pipe. If required for the cable to run on cable trays than the clamped by 16 SWG GI saddles and clamps. All work should be done to the satisfaction of Engineer-In-Charge.

**TERMINATIONS:**

Cable shall be terminated by means of single compression glands and terminated by solder less crimped type lugs. All should be done to the satisfaction of Engineer-In-Charge. If the cores do not have any color identification, then they should be identify by insulation tape of various phases. Cable shall enter any termination point by means of double compression glands using reducers if required or drilled of holes in gland plates. If panel installed on a cable trench which does not have any bottom excess than holes shall be drilled in one line for the cable then the glands plates is cut into two halves from the center of the hole. Cable inserted and sealed and the armour in the bottom should open and earthed to the earth bush. Crimping of lugs shall be done by hand crimping tool or hydraulic crimping tool with
conducting jelly applied to conductors. Insulation shall be cut immediately after the lugs and care should be carried out by licensed and experienced jointers approved E.I.C and termination and straight joint shall be of “Tapex” or heat shrinkable type as specified.

**TESTING:**

Before energizing, the megger test shall be carried for insulation resistance between phase to phase and phase to earth.

For cable up to 1.1 KV grade, 1000 KV megger shall be used.

D.C high voltage test shall be conducted after installation on the following and test results are recorded as per format furnish by the Engineer –In-Charge.

a) All 1000 Volts grade cable in which straight through joints have been made.
b) All cables above 100 grades.

For record purpose test data shall be include the measured values of leakage current verses time.

The D.C. High voltage test shall be performed as detailed below in the presence of the EIC or his authorized representative only.

Cable shall be installed in final position with all the straight through joints complete. Termination shall be kept on unfinished so that the motors, switch gears, transformers etc., are not subjected to test voltages.

The test voltage shall be as under.

i) For cable 3.3 KV grade  5.40 KV DC
ii) For cable 6.6 Kv grade 10.80 KVDC
iii) For cable 11.1 KV grade 18.00 KVDC

Cable schedule and lay out drawings must be marked for **AS BUILT** conditions during the installation work and shall be approved by the Site Engineer.

**APPENDIX-AA**

Identification of earthed and earthed neutral conductors and position of switches cut outs there in: Where the conductors include an earthed conductor of two wire system or an earthed neutral conductor of a multi wire system or a conductor which is to be connected there to, the following condition shall be complied.

1. An indication of permanent nature shall be provided by the owner of the earthed or earthed neutral conductor, or the conductor which is to be connected there to, to enable such conductor to be distinguished from any live conductor. Such indication shall be provided.

a) Where the earthed and earthed neutral conductor is the property of the supplier, at or near the point of commencement of the supplier.
b) Where a conductor form a part of a consumer’s system is to be connected to the supplier’s earthed or earthed neutral conductor, at the point where such connection is to made.
c) In all other cases, at a point corresponding to the point of commencement of supply or at such other point as may be approved by an inspector.

2. No cut out, link, or switch, other than a linked switch arranged to operate simultaneously on the earthed or earthed neutral conductor and live conductor shall be inserted or remain inserted in any earthed or earthed neutral conductor of a two wire system or any earthed or earthed neutral conductor of a multi wire system or in any conductor connected there to with following exceptions.

a) A link for testing purpose —OR—
b) A switch for use in controlling a generator or transformer.
EARTHED TERMINAL ON CONSUMER’S PREMISES:

1. The supplier shall provide and maintain on the consumer’s premises for the consumer’s use a suitable earthed terminal in an accessible position at or near the point of commencement of supply as defined as under Rule No: 58. Provided in that case of medium, high or extra high voltage installation, the consumer shall, in addition to the above-mentioned earthing arrangement, provide his own earthing system with an independent electrode connected to his system on or before the date to be specified by the State Government in his behalf, if he is satisfied that the consumer’s earthing arrangement is sufficient.

2. The consumer shall take all reasonable precautions to prevent mechanical damage to earthed terminal and its lead belonging to the supplier.

3. The supplier may recover from the consumer the cost of installation of such earthed terminal on the basis laid down in Sub Rule (2) of Rule No: 82.

SUPPLY TO CONSUMER:

1. The supplier shall not commence or continue to give supply of energy to any consumer unless:

(a) A suitable linked-switch or a circuit breaker or requisite capacity to carry and break the current is placed as near as possible to, but after the point of commencement as supply as defined under Rule No: 58, so as to be ready accessible and capable being easily operated to completely isolated the supply to the installation, such equipment being in addition to any equipment installed for controlling individual circuits or apparatus.

Provided that where the point of commencement of supply and the consumer’s apparatus are near each other one linked-switch or circuit breaker near the point of commencement of supply shall be considered sufficient for the purpose of this rule. Workmanship, the guarantee commencing from the date on which the installation is taken over by the owner and during the period of guarantee. I/We shall rectify or replace defects in material or workmanship free of cost to the owner.

3. I/We submit herewith three sets of drawings showing the installation and conduit lay out as actually executed.

4.  

--------------------------------------------------------------------------  
SIGNATURE OF SUPERVISOR                        SIGNATURE OF CONTRACTOR.
SPECIFICATION FOR MAIN PANEL:

- Panel shall be fabricated from CRCA sheet, main frame with 14 SWG sheet and compartment with 16 SWG sheet.
- Bus-bars should be of copper and coated with PVC sleeved.
- Panel should be Dust and vermin proof.
- Cable entries shall be bottom and top with necessary gland plate shall be made.
- MCCB/ MCB to be provided shall be use as shown in MATERIAL SPECIFICATION SHEET.
- Change over switch shall be of HPL /L&T make.
- Switch Fuse Unit shall be of HPL, L&T Seimens make
- Indicating Lamps Should be of Seimens or percifine make.
- Volt- Meter, A-Meter shall be of L&T make (Digital Type) with selector Switch.
- Control fuses shall be of English Electric/ L&T make with fuse base or fuse holder.
- Control wiring shall be done with minimum 2.5 Sq mm multi core PVC insulated copper conductor wires.
- Back-up HRC fuses with fuse base shall be of English Electric make.
- All compartments door shall be provided with natural rubber gasket and shall have door interlocking arrangements such that the compartments do not open when the switch is in “ON” position.
- Bus-bar alleys can be open only with castle panel key while the cable alleys may have screw type knob arrangement.
- A suitable base frame of with ISMC channel shall be provided.
- Panel should be rated 415 Volts/ 3-Phase/ 4-Wires/ 50 Hz/ AC supply system having a fault level of 40 KA (SYS) for 1 Second. Ambient temperature 45 degree centigrade and temp. rise of Bus bar is to be limited so that end temperature does not exceed 85 degree Centigrade. Bus-bar will be mounted on Epoxy insulator of adequate strength, Copper earth bus bar of appropriate cross arm section should be provided continually at the bottom of the panel.

24. AUXILLLLARY ITEMS:

CABLE TRAY

The scope covers design and manufacture, inspection, testing and delivery of cable trays, necessary hardware, fittings & accessories.

24.1 GENERAL REQUIREMENTS

24.1.1 The cable trays shall be prefabricated hot dip galvanised ladder type. The ladder type trays shall consist of side runners and horizontal rungs.

24.1.2 The ladder type trays and its accessories shall have rigid welded construction and shall be fabricated out of 2mm thick Hot rolled sheet steel. The rungs shall be welded to the side runners.

24.1.3 Side runners shall be 75 x 15mm channel with the flange facing inside. Rungs shall be 35 x 15mm slotted channel type construction and shall be spaced 250mm apart. All perforated channel type tray shall be 30mm high one piece channel made out of 2 mm thick sheet steel and hot dip galvanised.

24.1.4 Cable trays shall be suitable for a cable weight of 100kg/mtr. running length of tray and it shall be supported @ 2m intervals.

24.1.5 The side runner channel and all accessories will have two holes on each end for fixing splice plates. Two splice plated (one on inside face and one on outside face) will be provided for each side runner. The side runner will also have suitable holes at every metre for cleating earthing strip. Suitable tapped holes shall be provided on the runner top and bottom for supporting and fixing tray covers at every metre.

24.1.6 Hot dip galvanising shall be done after fabrication as per relevant Indian Standards Specification. The amount of galvanising shall be 816 gm/m2.

24.1.7 The type of construction shall be such as to facilitate easy handling, assembly and installation at site. The straight length of cable tray shall be min. 2.5 metres (without splice plate).
24.1.8 The workmanship shall be such as to ensure easy laying of cables without causing damage to cables. All surfaces shall be free from defects such as burrs, sharp edges etc.

24.1.9 The hardware shall conform to relevant Indian Standard specifications and shall be able to withstand the maximum loading conditions as required. All hardware fittings shall be hard chrome cadmium plated/zinc passivated. All hardwares shall include bolts, nuts and washers etc. The bends, tees, reducers and droppers shall have bending radius of 750mm for L.T. & 1250mm for HT cables respectively.

25. **FLOOR TRUNKING (RACEWAY)**
- The floor trunking shall be made from 2 mm thick from mild steel sheet.
- The depth of the trunk shall be 30mm and width shall be 300 mm when measured from inside. The standard length shall be 2 meter.
- The straight length of the trunking shall be joined using plates and using countersunk nut and bolts. The joining plates shall be fixed on outside of the trunking.
- There shall not be any sharp edge inside the trunking, which can damage the cable while pulling. Such sharp edge, if any shall be grinded and made smooth.

25. **PAINTING**
- The painting process shall be of seven tank process.
- The primer shall be bromite based red oxide. Two coat of red oxide shall be applied.
- The outer surface shall be coated using two coat of black coal tar compound.

27. **EARTHING:**

**STANDARDS**

27.1 The following standards and rules shall be applicable:

- Indian Electricity Act and Rules

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

**TYPE OF EARTHING STATION :**

**EARTHING STATIONS**

- The equipment neutral earthing shall be with copper plate earthing station and equipment earthing grid shall be Cu. earthing station.
- The pipe type copper electrode shall be 59 OD mm Pipe in-pipe technology for neutral earthing.
- The earth resistance shall be maintained with suitable soil treatment.
- The resistance of each earth station should not exceed 1 ohm.
- The earth lead shall be connected to the earth plate through Hot Dip G.I. bolts.
- The earthing conductors shall be of copper strip in case of copper earthing.
- G.I. pipe with funnel of approved quality shall be used for watering the earthing electrodes / stations.
- The block masonry chamber with chequered plate shall be provided for housing the funnel and the pipe for watering the earthing electrodes / stations.
- The hardware and other consumables for earthing installation shall be of copper/bras in case of copper earth plate and shall be hot dip galvanised iron material in case of G.I. earth plate.
- Test link / test pit cover through chequered plate.

**PIPE ELECTRODE EARTH STATION**

- The earth station shall be as shown on the drawing and shall be used for equipment earth grid and/or street light pole earthing.
- The earth electrode shall be 3 M long 50 mm dia class “A”, Galvanised steel pipe.
- The earth resistance shall be maintained with a suitable soil treatment as shown on the drawing.
- The resistance of each earth station should not exceed 1 ohm.
• The earth lead shall be fixed to the pipe with a nut and safety set screws. The clamp shall be permanently accessible.

• The earthing grid and the earthing conductor shall be hot dip Galvanised iron strips of the size as shown in the drawing.

• G.I. pipe with funnel of approved quality shall be used for watering the earth electrode station.

• The block masonry chamber with chequered plate shall be provided for housing the above referred funnel and pipe.

• The hardware and other consumables for earthing installation shall be hot dip Galvanised iron material as shown on the drawing.
<table>
<thead>
<tr>
<th>SR.NO</th>
<th>LIST OF MATERIAL</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Switches and Accessories</td>
<td>ANCHOR (Deluxe OR Penta Series)</td>
</tr>
<tr>
<td>2.</td>
<td>Wires</td>
<td>R.R.Kable (FRLS Series) / Finolex (FRLSSeries) / Havelles (FRLS series)</td>
</tr>
<tr>
<td>3.</td>
<td>Wooden boards</td>
<td># Frame : From teak wood having 1.5” Height &amp; 1” Width</td>
</tr>
<tr>
<td></td>
<td></td>
<td># Sheet : 3 mm thick (Anchor,Hylam,Formica)</td>
</tr>
<tr>
<td>4.</td>
<td>Screws</td>
<td>N.F. make OR ANY ISI Marked</td>
</tr>
<tr>
<td>5.</td>
<td>G.I. Saddles (Simple)</td>
<td>Zaral</td>
</tr>
<tr>
<td>6.</td>
<td>Cables</td>
<td>R.R.KABLE, Finolex, Havelles</td>
</tr>
<tr>
<td>7.</td>
<td>PVC Pipes (Rigid) Having 1.5 mm Wall</td>
<td>Medium Quality in Precision Plastic, Medium Quality in Nihir</td>
</tr>
<tr>
<td></td>
<td>Thickness</td>
<td>or Suggested in Tender Item</td>
</tr>
<tr>
<td>8.</td>
<td>PVC Trunking/ Casing Caping/ Oval Trunking</td>
<td>Precision Plastic /Suggested in Tender Item</td>
</tr>
<tr>
<td>9.</td>
<td>Distribution Boards</td>
<td>MDS (Lexic Series)</td>
</tr>
<tr>
<td>10.</td>
<td>MCB’s/ ELCB/ MCCB/ RCCB</td>
<td>MDS (Lexic Series)</td>
</tr>
<tr>
<td>11.</td>
<td>Change over Switch</td>
<td>L&amp; T, HPL</td>
</tr>
<tr>
<td>12.</td>
<td>Cable Gland</td>
<td>HMI, Comet</td>
</tr>
<tr>
<td>13.</td>
<td>Cable Lugs</td>
<td>Dowells</td>
</tr>
<tr>
<td>14.</td>
<td>MS Boxes (FOR CONCEALED WIRING)</td>
<td>16 SWG GI Sheet (Painted with Red Oxide)</td>
</tr>
<tr>
<td>15.</td>
<td>Fluorescent Tubes, CFL,PL, MetalHelage Lamp, LED Fixture</td>
<td>AS per suggested in Tender Item</td>
</tr>
<tr>
<td>16.</td>
<td>Telephone Cable</td>
<td>R.R. Kable, finolex, Delton</td>
</tr>
<tr>
<td>17.</td>
<td>Networking Cable</td>
<td>R.R. Kable, finolex, Delton</td>
</tr>
<tr>
<td>18.</td>
<td>Ceiling Fan /Exhaust Fan</td>
<td>Crompton, Havells</td>
</tr>
<tr>
<td>19.</td>
<td>Tube Fixtures, Other Lumaniries</td>
<td>AS per suggested in Tender Item</td>
</tr>
<tr>
<td>Item No.</td>
<td>Sor 12-13</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>1</td>
<td>1-1-1.</td>
<td>Point wiring in Copper</td>
</tr>
</tbody>
</table>

Point wiring for Light/ Fan/ Bell/ Primary Point with 2-1.5 sq. mm & earthwire of 1.5 sq. mm (green) both are of ISI marked 1.1 kv grade FRLS PVC insulated multistrand copper wires, in following type of pipe to be erected concealed in / flushed on wall/ceiling, complete with 6A Tissino Type ISI marked flush type switch / bell push and accessories erected on Metal / PVC Box covered with 3 mm thick PC(Polycarbonet) / Acrylic sheet. with necessary Lamp holder/ceiling rose / H.D. Connector as directed. **"Rates for this item should be consider including the cost of wooden framing switch board & 4" x 4" point board for LP/FP/Bell point with 3 mm thick Hylam Cover Plate"**  
Note:- Maximum up to 6 mtrs length, excess will be considered as Mains (e) in existing pipe.

**1.1 NON SOR**

(b) As Above but For open Wiring (Fan Point) with surface mounted step type electronics hum free regulator (Gelco)

$32$ pt.

**1.2 NON SOR**

(c) As Above but For open Wiring. (bell point)

$4$ pt.

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Sor 12-13</th>
<th>Description</th>
<th>Qty.</th>
<th>Unit</th>
<th>Total Rate</th>
<th>Total Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1-2-11.</td>
<td>Call bell gong type suitable for 230 volts, 50 c/s. AC supply complete Erected (with wooden board)</td>
<td>$4$ nos</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item No.</th>
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<th>Total Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1-2-6.</td>
<td>Decorative call bell Ting-tong box type 250 volts complete erected (with wooden board)</td>
<td>$4$ nos</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Sor 12-13</th>
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<th>Qty.</th>
<th>Unit</th>
<th>Total Rate</th>
<th>Total Amount</th>
</tr>
</thead>
</table>
| 4       | 1-1-3.    | Point wiring for looped PLUG with tissino type single pole ISI marked Switch and Socket erected with necessary connections erected on wooden / Metal/ PVC Box covered with 3 mm thick PC(Polycarbonet) / Acrylic sheet for open / concealed wiring for following size. **"Rates for this item should be consider including the cost of wooden framing board switch board & 4" x 4" point board for LP/FP/Bell point with 3 mm thick Hylam Cover Plate"** (e) in existing pipe  
Note:- Maximum up to 6 mtrs length, excess will be considered as Mains

$35$ Pt.

**5**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Sor 12-13</th>
<th>Description</th>
<th>Qty.</th>
<th>Unit</th>
<th>Total Rate</th>
<th>Total Amount</th>
</tr>
</thead>
</table>
| 5       | 1-1-4.    | Point wiring for secondary light point with 2-1.5 sq.mm & earthwire of 1.5 sq.mm (green) both are of ISI marked 1.1 KV grade FRLS PVC insulated multistrand copper wires, in following type of pipe to be erected concealed in / flushed on wall/ceiling, complete with earth continuity and necessary connection with primary light with accessories erected on Metal / PVC box covered with 3 mm thick PC(Polycarbonet) / Acrylic sheet for open/ concealed wiring with necessary Lamp holder / ceiling rose / H.D. Connector as directed. **"Rates for this item should be consider including the cost of wooden framing board switch board & 4" x 4" point board for LP/FP/Bell point with 3 mm thick Hylam Cover Plate"** (e) in existing pipe  
Note:- Maximum up to 3 mtrs length, excess will be considered as Mains for Secondary Point.  
**5**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Sor 12-13</th>
<th>Description</th>
<th>Qty.</th>
<th>Unit</th>
<th>Total Rate</th>
<th>Total Amount</th>
</tr>
</thead>
</table>
| 6       | 1-1-5.    | Point wiring for Two Way Controlled Light Point with 2-1.5 sq.mm & earth wire of 1.5 sq.mm (green) both are of ISI marked 1.1 KV grade FRLS PVC insulated multistrand copper wires, in following type of pipe to be erected concealed in / flushed on wall / ceiling complete with 6A Tissino Type ISI marked accessories with earth continuity erected on Metal/PVC box covered with 3 mm thick PC(Polycarbonet) / Acrylic sheet. with necessary Lamp holder/ceiling rose / H.D. Connector as directed. **"Rates for this item should be consider including the cost of wooden framing board switch board & 4" x 4" point board for LP/FP/Bell point with 3 mm thick Hylam Cover Plate"** (e) in existing pipe  
Note:- Maximum up to 6 mtrs length, excess will be considered as Mains for Secondary Point.  
$2$ Pt.
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Sor 12-13</th>
<th>Item Description</th>
<th>Qty.</th>
<th>Unit</th>
<th>Total Rate</th>
<th>Total Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>1-6-1</td>
<td>Providing &amp; Erecting following Shockproof tissino type accessories erected on 3 mm thick laminated sheet in wooden erected on wall / ceiling.(with wooden board) (2) 1 No 5 pin 6 A Socket + 1 No 1-way Tissino type switch</td>
<td>10</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1-6-1</td>
<td>(4) One no 6/16 A Universal Socket (with wooden board) For AC</td>
<td>21</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.1</td>
<td>1-6-1</td>
<td>(4) One No Single pole 16 A Switch (with wooden board) For AC</td>
<td>21</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>1-6-1</td>
<td>(6) 1 No Single pole 16 A Switch + 1 No 6A/16 A. Universal Socket + 2 Nos 6A 5-pin socket for computer (with wooden board)</td>
<td>25</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.1</td>
<td></td>
<td>Do as above but with D Link computer outlet RJ 45 with necessary connection A &amp; B side at both the end. (with wooden board)</td>
<td>25</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>1-6-1</td>
<td>Providing &amp; Erecting following Shockproof tissino type accessories erected on 3 mm thick laminated sheet in wooden erected on wall / ceiling.(with wooden board) (10) Jack type tissino Telephone outlet.</td>
<td>20</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>1-3-2</td>
<td>Conduits &amp; Pipes Providing and erecting ISI mark Medium class RIGID PVC PIPES of following size complete to be erected on/in wall or ceiling erected with necessary PVC fittings &amp; Junction boxes fixed with adhesive solution &amp; Clamps with following dia of pipes, in approved manner as directed (make for PVC fitting &amp; junction Box Nihir / precision plastic)</td>
<td>500</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>1-3-4</td>
<td>Providing &amp; erecting PVC Corrugated Flexible Conduit with required nos. of coupling, PVC bushes, Check-nuts etc. complete of following sizes. (3) 25 mm</td>
<td>20</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>1-3-4</td>
<td>(4) 32 mm</td>
<td>20</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>1-3-6</td>
<td>(A) Supplying and laying UPVC cable trunking system comprising unplasticised polyvinyl, chloride rigid material with ignition free &amp; flame proof confirming BS. All necessary accessories and measuring of following sizes.(Make - Precision)(3) 100 mm x 50 mm trunking with twin compartment.</td>
<td>190</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>1-3-6</td>
<td>(B) UPVC COUPLER (Make - Precision) (2) For100 mm x 50 mm trunking</td>
<td>8</td>
<td>Ea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>1-3-6</td>
<td>(C) UPVC ELBOW (Make - Precision) (2) For100 mm x 50 mm trunking</td>
<td>6</td>
<td>Ea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>1-3-6</td>
<td>(D) UPVC TEE (Make - Precision) (2) For100 mm x 50 mm trunking</td>
<td>6</td>
<td>Ea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>1-3-6</td>
<td>(G) UPVC END CAP (Make - Precision) (2) For100 mm x 50 mm trunking</td>
<td>6</td>
<td>Ea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>NON SOR</td>
<td>Supplying &amp; erecting PVC trunking (PVC casing-n-Capping) having double-locking arrangement with grooves, trunking of size not below 12.5mm in height as per IS 14927 Part-I of 2001 and with accessories of PVC / Resin polypropylene not below 1.8 mm thick duly sealed in joint &amp; erected on wall / ceiling of following size. (Precision plastic) (1) 25x12 mm</td>
<td>100</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>NON SOR</td>
<td>(2) 25x16 mm</td>
<td>20</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>NON SOR</td>
<td>(3) 38x25 mm</td>
<td>20</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>1-4-1</td>
<td>Mains &amp; Wires Mains with 1.1 KV grade FRLS PVC insulated ISI marked stranded Copper conductor wire in following type of pipe to be erected concealed in /flushed on wall/ceiling, with copper conductor FRLS PVC insulated stranded wire of green colour for earth continuity of following size. (Make of wire:- FRLS series from RR, Finolex, Havelles) (e) in existing pipe (a) 2 wire 1.5 sq. mm + 1 No 1.5 Sqmm Earth Wire</td>
<td>300</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.1</td>
<td>1-4-1</td>
<td>(b) 2 wire 2.5 sq. mm + 1 No 1.5 Sqmm Earth Wire (Make of wire:- FRLS series from RR Kabel/Finolex/Havelles)</td>
<td>700</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item No.</td>
<td>Sor 12-13</td>
<td>Item Description</td>
<td>Qty.</td>
<td>Unit</td>
<td>Total Rate</td>
<td>Total Amount</td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
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</tr>
<tr>
<td>22.2</td>
<td></td>
<td>Mains with 1.1 KV grade FRLS PVC insulated ISI marked stranded Copper conductor wire in following type of pipe to be erected in / on wall / ceiling with 2.5 sq. mm copper conductor FRLS PVC insulated stranded wire of green colour for earth continuity of following size <em>(Make of wire:- FRLS series from RR Kabel/Finolex/Havelles)</em> (e) in existing pipe (a) 2 wire 4 sq. mm</td>
<td>375</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>1-4-7.</td>
<td>Supplying &amp; erecting Delton or approved make Telephone Cable electrolytic copper conductor PE insulation twisted in two pairs, &amp; wrapped with FRLS PVC tape &amp; sheathed with FRLS PVC or HFFR outer Jacket suitable for telephone wiring &amp; confirming to C-DOT erected in existing pipe. of following size of conductors &amp; nos.of pairs. With necessary connections. <em>(make finolex / polycab/RR-Suprex)</em> (a) Unarmoured B. Conductor Size 0.5 mm- Two Pair</td>
<td>320</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>1-4-7.</td>
<td><em>(a) Unarmored - . Conductor Size 0.5 mm -Twenty Pairs</em></td>
<td>30</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>5-1-1.</td>
<td>FANS &amp; ACCESSORIS. CEILING FANS AND ACCESSORIS. Providing &amp; erecting Approved make Power Saving 50 Watt Ceiling Fan with double ball bearing ISI mark with Condenser 230 volt A.C. 50 Hz 1200 mm sweep complete having 3blades with aluminium blades with canopy &amp; 30 cms. down rod erected with 24/0.2, 3 core flexible wire with earthing. <em>(Crompto-High Speed Plus or equivalent model from Havelles,)</em></td>
<td>32</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>5-2-1.</td>
<td>FAN ACCESSORIES. Supplying and erecting 19 / 20 mm. nominal bore Medium Class M.S. Pipe down rod erected duly painted for fan complete with necessary 24/ 0.2, 3 core flexible wire with earthing.</td>
<td>55</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>5-2-4.</td>
<td>Providing &amp; Erecting Double Fastners type Ceiling fan hook duly fix by using Re-baring Chemical solutions complete</td>
<td>32</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>5-3-3.</td>
<td>TABLE FANS, EXHAUST FANS &amp; ACCESSORIES. Supplying &amp; erecting approved make low noise decorative exhaust fan having size 200mm with 1350 RPM with square frame ABS body with inbuilt lowers &amp; square frame. <em>(make:- crompton/havells/almonard)</em></td>
<td>16</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>3-14-5.</td>
<td>Earthing Providing and erecting HOT deep Galvanised iron strip wire 8 to 16 S.W.G.</td>
<td>100</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>3-10-1.</td>
<td>MINIATURE CIRCUIT BREAKERS. Miniature circuit breaker single pole 6A to 32A suitable to operate on 240 V A.C. system and having breaking capacity 10 KA to be erected in existing box. confirming to IS 8828/1996 with ISI Mark Cat-III</td>
<td>144</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>3-10-4.</td>
<td>Providing &amp; erecting 415V MCB Four Pole Switch for Lighting Load (B curve) having 10KA breaking capacity &amp; confirms to IS :8828 in existing box having following capacity (b) 40 Amp. Cat.III</td>
<td>6</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>3-10-5.</td>
<td>Providing &amp; erecting 415 V MCB Four Pole for Motor &amp; Inductive Load (C Curve) having 10KA breaking capacity &amp; confirms to IS :8828 in existing box having following capacity (C) 63 Amp. Cat-II</td>
<td>1</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>3-11-5.</td>
<td>Providing and erecting Sheet Steel powder coated MCB distribution board - flush / surface mounted fitted with busbar, neutral link, earth bar and DIN rail, confirming to IS 13032 and BS 5486-1986 without MCB to house appropriate nos. of MCBs. <em>(The DBs should be used of same company of MCB to be used)</em> (N) Three phase 8 way SS Double door for horizontal single phase outgoing</td>
<td>6</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>NON SOR</td>
<td>LIGHT FIXTURES AND ACCESSORIES Providing &amp; erecting decorative integrated Energy efficient 1 x 18 watt LED with Superior brightness and advance thermal management with including all accessories. <em>(e) 18W LED Tube Light Fixture(E) EQUIVALENT GETCI 1X18W LED or philips TMC501 / 1X20 W LED or equivalent from wipro</em></td>
<td>30</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item No.</td>
<td>Sor 12-13</td>
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<td>Qty.</td>
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<td>Total Amount</td>
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<tr>
<td>35</td>
<td>NON SOR</td>
<td>Providing and erecting 30 watt led recessed/surface mounting light fitting with lamp and all accessories. Equivalent to GE-GDR 018.56 S2 or Philips-DN1 x18 LED or equivalent From wipro</td>
<td>96</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>NON SOR</td>
<td>Providing and erecting approved make With 12 watt LED decorative recess/Surface mounted Down lighter luminaire with powder coated pressure diacast aluminium housing with extended heat sink and complete with all accessories Equivalent to GE-GDR 012.56 S2 or Philips-DBS145P 1X D LED 6000 PSEAC or Equivalent from wipro</td>
<td>12</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>NON SOR</td>
<td>Supplying of factory assembled surface mounting mirror lighting fixture with powder coated reflector, similar to Crompton Greaves (or equivalent from approved makes) Mini Mirrorlite with TLN 11W housing made of ABS Grade PLASTIC, textured methacrylate sheet diffuser with 1 x 11 watt CFL fluorescent lamp, capacitor, copper bound low loss polyester filled ballast, rotor holders, housing made of single piece powder coated white CRCA sheet steel etc. as required. (On mirror ) Equivalent to GE-GECFL 1X11 AEW or Philips-FMS 100/1X11 or Wipro-WRP 21111</td>
<td>4</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>NON SOR</td>
<td>Supplying &amp; erecting approved make LAN cable of following size in existing pipe as per direction (Make: Finlolex/Delton/RR) [B] CAT - 6</td>
<td>320</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>1-4-9</td>
<td>Providing &amp; erecting main Distribution (MDF) indoor type, back mounted frame (b) Suitable for 20 pair</td>
<td>1</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>4-3-3. CABLES &amp; ACCESSORIES</td>
<td>Providing and erecting XLPE(IS:7098)(I)-88 ISI armoured cable multistrand Aluminium conductor for 1.1 KV. to be laid on wall with necessary clamps or in existing trench / pipe of following size of cables (B) 3 1/2 core 35 Sq. mm ( 16 Sq. mm 1/2 core)</td>
<td>10</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>4-4-4.</td>
<td>Providing and erecting XLPE(IS:7098)(I)-88 ISI armoured cable multistrand Copper conductor for 1.1 KV. to be laid on wall with necessary clamps or in existing trench / pipe at road crossing or floor of following size of cables. (C) 4 core 10 Sq. mm</td>
<td>100</td>
<td>Mtr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>4-6-1. CABLE GLANDS.</td>
<td>Providing and, fixing heavy duty flange type brass cable gland with rubber ring for PVC insulated armoured cable complete with out going tails, insulating tape etc for following size of cables. d) 2 to 4 Core 10 Sq.mm</td>
<td>12</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>4-6-3.</td>
<td>Providing and, fixing heavy duty flange type brass cable gland with rubber ring for PVC insulated armoured cable complete with out going tails, insulating tape etc for following size of cables. (B) 3 &amp; 1/2 core 35/50 Sq. mm</td>
<td>2</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>4-7-2. CABLE LUGS.</td>
<td>Solderless crimping type Copper lugs conforming to IS suitable for cable of following size evenly crimped with high pressure tool &amp; connected to switchgear terminals with brass/cadmium plated nut bolts in an approved manner. (B) 1.5 Sq mm to 6.00 Sqmm</td>
<td>438</td>
<td>Nos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>44.1</td>
<td>4-7-3. (B) 10 Sq mm</td>
<td>48</td>
<td>Nos</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44.2</td>
<td>4-7-2. (E) 35/50 Sq.mm.</td>
<td>8</td>
<td>Nos</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Non Sor</td>
<td>Only Installation of 4 core 10 to 16 Sq mm copper Armored cable with necessary hardware &amp; accessories complete as per client's direction</td>
<td>60</td>
<td>Mtr</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(A) TOTAL

Rebate if any Rs.

Grand Total

Round off figure