

Our Services:

Quality for various site activities will be achieved for the following :

Conduit Laying :

Conduiting – Recessed Conduit System.

- **M.S. Conduits :**

The inside surface and ends of M.S. Conduits and threads and fittings will be cleaned and made smooth by removing the burrs arising out of threading at the Site. After the Conduits, Junction Boxes, Out-let Boxes, etc. are fixed in position, their outlets will be properly plugged with PVC bushings or with any other suitable materials so that water, cement, mortar, vermin or any other foreign material do not enter into the Conduits. To facilitate the easy drawing of wire in the Conduit, necessary GI pull wires will be inserted into the Conduit immediately after shuttering is removed.

- **PVC Conduits :**

PVC Conduits of approved makes and specifications along-with accessories like bends, collars, M.S. junction boxes, etc. are sent to the Site. The materials will be checked physically and stored in stacks properly size-wise.

PVC Conduit pipes are laid in straight length or curved length. For straight length, the pipes will be coupled using PVC collars and PVC sealant, so that the joints are sealed properly. Similarly, for curved lengths, the pipe will be joined using PVC bends and sealed by PVC solvent. After the conduits, junction boxes, etc are fixed in position, their out-lets will be properly plugged

with PVC bushings or with any other suitable materials so that water, cement mortar, vermin or any other foreign material do not enter into the conduit. To facilitate the easy drawing of wires in the conduit, necessary GI pull wires will be inserted into the conduit immediately after the shuttering is removed.

- **Surface Conduit System for M.S. And PVC :**

In this system, the conduit will be run in square & SYMMETRICAL LINES. Before the conduits are installed, the conduit routes shall be marked at Site and approval of the Architect/Client's representative will be obtained. The conduit shall be fixed by GI spacer saddle secured by suitable wall plugs/teakwood plugs at an interval of not more than 1 mtr. The conduit shall be joined by means of screwed couplers and screwed accessories. For long distance straight run of conduits, inspection type bends or pull boxes will be provided. Adapter Boxes will be used at junction/crossings of surface conduits.

- **Wiring :**

Wiring will be carried out as per the final AFC drawings. After the wiring following Tests will be carried out on all types of wiring before energizing the installation:

1) Insulation Resistance Test : Insulation Resistance Test will be measured using 500 Volts Megger on the following points :

a) Phase and Neutral Conductors with all Fuses in position and all Switches in closed condition and main switch in OFF position; lamps and other devices removed.

b) Between the earth and the whole system of conductors with all Fuses in place, all Switches closed and all lamps in position.

2) Electrical Continuity Test :

Each and every circuit will be tested for electrical continuity using Multimeter.

3) Earth Continuity Test :

Earth continuity conductor including metal conduit will be tested for electrical continuity and the Resistance of the same along with the earthing grid measured from the connection. With the earth Electrode to any point in the earth continuity conductor and the complete installation shall not Exceed 1 Ohm.

4) Method of Light Fixtures Installation & Testing :

The Light Fixtures and Fittings shall be assembled and installed in position complete and ready for service, in accordance with detail drawings, manufacturer's instructions and to the satisfaction of the Consultants/Clients. All suspended Fixtures shall be mounted rigid and fixed in position in accordance with drawings, instructions and the approval of the Consultants/Clients. Fixtures will be suspended true to alignment, plumb, level and capable of resisting all lateral and vertical forces and shall be fixed as required. Before fixing the Light Fixture, each Fitting will be checked for physical damages. Each Fittings will be provided with lamps and tubes and it will be physically checked for its correctness by giving the power supply to

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make sure that the Light Fittings are in working condition , and then it will be taken up for erection. Before erecting the Light Fittings, thread line will be marked for its straight line and correctness. After the Fittings are erected, the same will be covered with plastic covers till it is energized to prevent dust accumulation or damage. Before energizing, all the covers will be removed and the Fittings will be cleaned for any dust collection.

- **HT & LT Cables :**

The Cables supplied will be wound on drums in convenient lengths the length, size, type, etc. marked on the drum.

Loading and un-loading of Cable drums will be done using Derrick or the drum, will be rolled carefully down on a suitable ramp of rails. The drum will be rolled as per the direction indicated by the arrow on the drum in order to prevent the turns of the cable from loosening on the drum. Under any circumstances, the cable drum will not be dropped to the ground, as the shock may cause serious damage to the inner layer of cables.

The cable drum will be slung by a bar or spindle through the centre of the drum.

Cable jacks will be used for rolling down the cable from the drum. While the cable is removed from the drum, the drum will be properly mounted on cable jacks, making sure that the spindle is strong enough to carry the weight without bending. The drum will be mounted such that when the drum is turned against the direction of the arrow, the cable is laid out from the top of the drum to avoid any danger of binding and breaking the cable if un-reeled

from the bottom.

Whenever a cable crosses a temperature expansion joint in the structure, sufficient sag will be provided at that point.

Cables normally shall be laid in a continuous length, so that joints are avoided. Cable joints, wherever necessary and approved by the Consultants, will be done as per the recommendations of the Cable manufacturer and the same will be carried out by a qualified and experienced cable jointer and the cable jointing shall be weather proof.

Wherever number of cables are running together, the cables will be separated by a distance indicated in installation drawings or as per standard gap of the O.D. of the cable laid. Each run of the cable will be measured before cutting the cable from the drum. To avoid wastage, cable drum schedule would be prepared at the site and followed. Cable will be neatly dressed, clamped on fully/partly horizontal run and vertical run.

Bending radius of LT. Cables will not be less than 12 times the overall diameter of cable, while that of HT cable will not be less than 15 times the overall diameter of cable. This will also be taken into account while arriving at the cable cutting length.

- **Cable Laid Underground : 1**

L.t.Cables laid underground (directly buried) shall be laid min. 600mm below finished ground level for L.T. and 900 m for HT cable unless otherwise

specified. Layer of 50 mm fine sand shall be prepared at the bottom of trench and cable laid over it. Brick protection will be given as per the specification. Trenches will be back- filled and made good as necessary.

Cable markers will be provided at every 30 mtr. Run and at bends.

Cable numbering tags will be provided at entry, 30 mtr. run and at bends.

- **Cable On Trays :**

Cables will be laid neatly on trays avoiding crisscrossing of the cables. They will be dressed neatly with the help of necessary cleats and clamps. The cables will be clamped at every 750mm to 1000mm in horizontal plane, 500mm to 700mm in vertical plane.

- **Cable Cleating On Walls / Structure :**

Cable or group cables not exceeding four numbers when run on structure etc will be provided with saddles and clamps. Clamps will be spaced at 750mm to 1000mm.

Insulation resistance test will be carried out on each cable before and after laying.

- **Cable Termination :**

Termination of all L.T. cables shall be done by using brass cable glands with copper cable lugs of proper size and type. Bi-metallic paste will be used whenever copper lugs are being used for terminating aluminium conductors. The opening of the cable glands will be done by using required dia knock-out punches, which will avoid deformation of the gland plates. The cable sizes

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upto 70 sq.mm. will be terminated using hydraulic type crimping tools. The crimped surface and the adjoining cable surface will be taped with insulation tape of colour representing the phase.

All H.T. cables shall be terminated using RAYCHEM or equivalent 11 kV cable jointing kits by experienced cable jointers as per the manufacturer's instructions.

- **Transformer :**

The Transformer will be installed and Accessories will be connected in accordance with Installation Manual provided by the Vendor.

The Transformer will be installed on ready-made foundation constructed by civil contractor. Marshalling box wiring, other connections and terminations will be checked. All clearances will be verified as per the last revisions of standards. Silica gel Breather, Thermometers and Buchholz Relay will be checked for proper function and operation. In case of neutrals, it will be earthed separately to pits. Body will be earthed from the nearest earth grid.

- **Busducts :**

- The Bus Ducts will be installed in horizontal/vertical formation as shown on the Drawings. Proper flange alignment shall be carried out at both Transformer and Switchgear ends.

All the sections should be erected as per lay-out drawing and section Nos. Flexible connectors will be used at Switchgear and Transformer ends. In case of copper to Aluminium connection, bimetallic plate should be used.

All bus with fresh plate joints shall be checked and nut-bolts will be tightened

if found loose. Before joining the bus-bar section, surface should be cleaned and a light film petroleum, jelly will be used.

Insulation resistance test will be carried out on each bus duct before it is switched on.

- **Erection Of Switch Boards :**

As and when Boards arrive at the Site, it will be un-loaded by professional un-loaders and the same will be stored in a safe place. When the building is ready for erection, these Boards will be shifted to the individual locations on rollers or using derricks and the shipping sections will be assembled by experienced workmen with necessary supervision by our Engineers. The Panel Boards will be assembled placing in location all the necessary coupler plates and checked for its correctness. After the Panels are fully erected, it will be meggered and the values recorded. Before energizing the Panel, the Boards will be opened and cleaned with air blowers to remove all dust. All the bolt-nuts and hardware will be again checked for its tightness and the feeders will be physically checked for the proper connection of all out-going and in-coming cables.

- **Erection of UPS:**

Required rating of UPS as per Tender will be supplied and installed at the UPS room. Maintenance free Batteries are stacked neatly and kept near the UPS System and will be connected to the UPS wiring.

- **DG Installation:**

DG Set will be placed on the DG platform made out of RCC pedestal and firmly grouted to the foundation using anti-vibration pads and grouting bolts to hold firmly so that there is no vibration during DG operation. The exhaust pipe is firmly connected to the DG exhaust and the same is taken out to the required height for emitting the smoke as per the Manufacturer's drawings, height of chimney depends on the rating of DG.

- **Steel Items:**

All fabricated angle iron length will be made straight. The trays and other physical supports will be fabricated as per the drawings and will be erected at Site at individual locations using necessary platforms, tower ladders, safety belts, safety goggles, etc. All steel items will be painted with 2 coats of Red oxide Primer and 2 coats of approved colour enamel paint. Prior to painting, wire brush will be used to clean then surface.

- **Earthing :**

Earthing Materials: Earthing conductor will be checked physically for its proper size and galvanizing. The G.I. flats will be straightened stored in proper place. Or the earthing conductor buried inside the ground, the joints will be welded and painted. The earthing stations will be fabricated as per the relevant L.S drawings. Earthing materials can be either copper or galvanized iron materials.

Earthing conductor laid open will be straight and it will be joined through hardware/welding to have proper continuity.

Earth pits shall be installed as per the installation details. Earth resistance at

every earth pit and plant building shall be checked by opening the test link provided and with the help of a good quality earth Tester/Megger. The value of earth resistance at each pit shall be approximately four (4) Ohms maximum and the combined earth resistance of the whole system shall be not more than one (1) Ohm. If this value is not achieved, then the number of earth pits shall be increased after consulting Client/Consultant.

Lightning Protection:

Generally, a common earthing system will be provided for equipment and static earthing. The earthing system for lightning protection will be separate and will not be inter-connected with the former unless specifically called for in the Drawing/specific requirements. Installation will be carried out as per earthing and lightning protection lay-out drawings and in accordance with IS: 2309.

Lightning protection system shall generally comprise of lightning finals (air terminals), roof conductors, down conductors, test links and earth electrodes complete with supporting and anchoring material. The number, type, materials and size shall be in accordance with the details shown in Earthing and Lightning protection lay-out drawings and installation standard drawings. Air terminals will be mounted on top of structures as shown in the drawings. All air terminals will be inter-connected with roof conductors. Chimneys, vent pipes, hand-rails or any other metallic protection above the roof will also be

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bound to the roof conductors. Down conductors from air terminals or from roof conductors will be routed as directly as possible to the test links or earth buses, with minimum bends. Air termination will be firmly secured so that they remain in installed position under worst weather conditions.

- Every down conductor will be provided with a test joint at 1500 mm above ground level. The test joint will be directly connected to the earthing system as far as possible without sharp bends, turns, links, etc. The run of down conductor will be as short as possible.

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