

**Product Name :**  
Electrical Turnkey Projects**Product Code :**  
Electrical-Projects-001**Description :**

Electrical Turnkey Projects - We specialize in turn-key projects and undertake all types of electrical contracts in industries, substations, residential and commercial complexes, banks, IT Parks, shopping malls, educational institutes, hotels and government organizations.

**Technical Specification :**

we undertake pertain to Substation Work, Electric Panels, Internal and External Electrification, LT & HT Cabling and Termination, Overhead Transmission Lines, Overhead Transmission Towers, Main and Sub-main Switch Boards, Earthing, Street Lighting, Flood Lighting, Lighting in Parks, Instrumentation System, Communication System, Fire Fighting System, Cable Design and Routing, Cable Tray and Trunking, Installation & Commissioning of Diesel Sets, Transformers and UPS Systems, Air-conditioning, Networking, Data Center Infrastructure, and Energy Auditing, Monitoring and Conservation etc. Apart from these we also undertake Operation and Maintenance Works for Long Term

Performance. We have all measuring and test equipments required for inspection, calibration and testing of installations at site. Most important is that we also liaison with Electricity Board from beginning to end stage for satisfactory work completion.

**Main Features of Our Services :**

- Design and conceptualization based on customer's conceptual design and specifications
- Preparation of bill of quantities, tendering
- Preparation of detailed drawings, site set out
- Sourcing of material
- Marking and execution in accordance with design
- Obtaining finished levels
- Evaluation and submission of progress report
- Execution of planting schemes
- Total commissioning

**Procedure For Laying Down LT & HT Cables :**

Given below is a brief outline of approach and precautions we normally take for laying down LT/HT cables.

**Storage of Cable Drums :**

- We store the cable drums on a well drained and hard surface.
- For long terms storage these drums are covered with tarpaulin, and both ends of cable are sealed.
- If required, we also roll these through 90°.

**Selection of Cables :**

- In general we prefer to use PVC/XLPE insulated and PVC sheathed cables.

- For very high voltage (from 11KV to 33KV) we prefer cables with solid or stranded Aluminum conductor; Copper conductor can be used only in special applications where use of Aluminum conductor is not technically acceptable.
- We prefer only those multi-core cables that are properly armoured to prevent any kind of mechanical damage.

**Safety Precautions :**

- Where necessary, we display a caution board indicating 'CAUTION – CABLE JOINTING WORK IN PROGRESS' to warn the public and traffic.
- Before starting jointing, we take all safety precautions like isolation, discharging, earthing, display of caution board on the controlling switchgear etc. to ensure that the cable would not be inadvertently charged from live supply.

**Cable Handling and Laying :**

- We ensure that both ends of cable are properly sealed to prevent ingress / absorption of moisture.
- Even for short distances we roll the cable drums in the direction of arrow marked.
- Before we remove cable from the drum, we mount the latter properly on jacks or cable wheels.
- Our cabling does not have sharp bends. Instead we make the bends rounded at corners to a radius not lesser than 12 times the overall diameter of the cable, thereby avoiding any damage to cables.
- We avoid taking risk and discard defective cables like those with sharp bends and defective armoring etc.
- We dig separate trenches for power and control cables. But if that be not possible for any reason, we lay first HV cables and over that the LV cables with adequate separation.
- We lay down power and communication cables at right angles or give clearance of minimum 60 cm.
- We always try to avoid waterlogged locations, carriage-ways, payments, areas in proximity to telephone cables, gas and water mains, inaccessible places etc.

- In areas where there is a chance of damage to wiring/cables, we always provide a proper metallic protective covering.
- While cutting and stripping outer sheathing of the cable, we always take utmost care not to allow the sharp edge of the cutting instrument touch the inner insulation of the conductor.

**Cable Jointing & Termination :**

- Prior to laying down cables, we decide about ideal locations for proposed joints. As far as possible, we try to avoid water logged locations, carriage ways, pavements, proximity to telephone cables, gas or water mains, inaccessible places, ducts, pipes and racks etc.
- When joints are to be done for two or more cables laid together in the same trench, we stagger these by 2m to 3m.
- We keep the cable joints in suitable and approved cable joint boxes, making sure that these do not allow entry of moisture. We also try to leave about 3m long surplus cable on each side of joints.
- We give preference to heat shrinkable joints that have high insulation at jointing ends. In any case we always ensure that there is a solid connection between the metal conductor and terminating clip.
- Our cables are terminated on to the terminals of switchgear through heavy duty crimping lugs of proper size.
- In order to maintain continuity of cable armouring, we use double compression glands and proper crimping tools.
- In Aluminum cables exposed to outside atmosphere, we remove the oxide film before jointing.

**Trenching & Cable Laying :**

- Our trenches for cable laying are straight or with suitable curvatures and with changes in depth gradient being gradual. These have a minimum width of 45 cm and depth of 75 cm. Bottom of the trench is always kept free of stones and bricks.
- When there is more than one cable in a single trench, we ensure that these are kept at a distance.
- We give a minimum 9 cm dry sand cushion below and above the cables. Over the topmost layer of sand cushion we put one layer of bricks as an extra protective covering, and over that put back the excavated soil free from stones and debris. In order to avoid chances of any water

logging, our trenches have about 10 cm hump on top with tapering on sides.

- At entry/exit cable points into the building we pass the cables through pipe sleeves, which are properly sealed to prevent entry of any seepage water.
- Our manholes are large enough to have sufficient working space and for feeding/drawing of cables.
- We always leave sufficient cable loop length that is a must.

**Manholes :**

Our manholes are water tight, made with first class bricks, having top slab of RCC, concrete foundation and with cement plastering both inside and outside and neatly finished.

**Cable Trays :**

We use MS cable trays that are strong enough and rust/corrosion free. Whether these should be hot dip galvanized or painted is decided based on location. Likewise whether to use perforated or ladder type cable trays would depend on cable load. These cable trays are then joined together using bends, joints, coupler plates and other accessories as may be required to have a complete and fully functional cable tray system. Where necessary, we give an additional coat of zinc rich paint.

**Testing of Cables :**

In normal dry weather we keep the Megger value at 50 Mega Ohm. Apart from this we also conduct following tests.

- Insulation resistance test
- Continuity resistance test
- Sheathing continuity test
- Earth test (in armoured cables)
- Hi Pot test

E also test on site for insulation between phases and between phase and earth for each length of cable, before and after jointing. After cable laying down has been completed, we carry out following tests in presence of

owner's representative.

- Insulation resistance test (sectional and overall)
- Continuity resistance test
- Sheathing continuity test
- Earth test
- High voltage test (only in case of HT cables)

#### **Cable Tags :**

We give proper marking to each cable in all critical places using Aluminum cable tags of sufficient thickness and size.

#### **Earthing :**

- **Earthing of non-current carrying metal parts :** We bind together and provide proper earthing to all non-current carrying metal parts like metal conduits, trunking, cable armoured switchgear, distribution fuse boards, light fittings etc. We ensure that earthing is in conformity with relevant Indian Electricity Rules and Indian Standard Specifications.
- **Earthing Conductor :** Our earthing conductors are of high conductivity Copper and protected against mechanical injury or corrosion.
- **Size of Earthing Conductor :** We use 1.5 sq mm PVC insulated copper wire for earthing all fixtures, fans, outlet boxes and junction boxes. All single phase metal clad switches and distribution boards are earthed with a 4 mm dia (6 SWG) bare Copper wire. All 3-phase switches and distribution boards up to 60 A rating shall be earthed with 2 Nos. distinct and independent 4 mm dia (8 SWG) bare GI wire. All switches, bus bars, ducts and distribution boards of rating 200 A and above shall be earthed with separate and independent 25 mm x 3 mm GI strip.
- **Connection of Earthing Conductors :** We take the main earthing conductor from the earth connection at the main distribution panel to the earth electrode with which the connection is to be made. For distribution boards, earthing conductors are made to run from main distribution board.
- **Artificial Treatment of Soil :** If the earth resistance is too high and the multiple electrode earthing does not give adequate earthing, we reduce and adjust the resistance of the soil immediately

surrounding the earth electrode by adding sodium chloride, calcium chloride, sodium carbonate, copper sulphate, salt and soft coke or charcoal in suitable proportions. We make sure that the earth resistance does not exceed 1.0 ohm.

- **Inter-connection of All Earths** : We inter-connect all earths, including transformer neutrals, transformer body, LT & HT Panels, lightning protection system earths, UPS earths etc.
- **Prohibited Connections** : We never use water pipes, sprinkler pipes, gas pipes, structural steel work, metallic conduits and lightning protection system conductors as an earthing conductor.

#### **Maintenance Free Chemical Earthing :**

Maintenance free chemical earthing is done strictly as per manufacturer's recommendations. However, we try to ensure that it is of good quality, completely maintenance free, have long life close to 25years, environmentally safe, non-corrosive and electrically conductive. The earth resistance should not be less than one ohm.

## **Electrical and Electronics**

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