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PROJECT NAME & DETAILS

METHOD STATEMENT FOR Installation of LV Power Cables and Wires

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REVISION RECORD

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This cover page is a record of all revisions of the document identified above by number and title. All previous cover pages are hereby superseded and are to be destroyed.

Rev. No.	Date	By	Chkd.	Approvals	Description and Page Numbers of Revisions

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1.0 PURPOSE

The purpose of generating this method statement is to define the procedure step by step to implement the correct practices for Installation of Indoor and outdoor LV Power Cables and Indoor Wires through the guidelines contained herein so as to ensure that the job execution complies with the requirements where applicable in the building.

2.0 SCOPE

This method statement covers all processes related to Installation of Indoor and outdoor LV power Cables and Indoor Wires as the following:

Installation of Low Voltage Electrical Power Cables & Wires (Indoor and outdoor).

This procedure is to be read in conjunction with the relevant ITP, outlining the responsibility and the quality verification to be performed by various parties.

3.0 REFERENCE

- 3.1 Approved Shop drawings for the power distribution and load shedule.
- 3.2 Specifications
- 3.3 Project Quality Plan
- 3.4 Electricity Wiring Regulations

4.0 DEFINITIONS:

- PQP : Project Quality Plan
- PSP : Project Safety Plan
- QCP : Quality Control Procedure
- HSE : Health, Safety and Environment
- MS : Method Statement
- ITP : Inspection Test Plan
- QA/QC : Quality Assurance / Quality Control Engineer.
- SK : Store Keeper.
- WIR : Inspection and Test Request
- MIR : Material Verification Record.

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5.0 RESPONSIBILITIES:

- Responsibilities for ensuring that the steps in this procedure shall be carried out are specified at relevant steps in the procedure:
- Project Manager
- Construction manager
- QA/QC Engineer
- Site Engineer
- HSE officer
- SK
- Project Manager is the overall responsible for the project in terms of work execution, safety, planning & quality. The Project Manager will maintain the planning progress and coordination of works with the main contractor.
- The work progress shall be carried out as per planned program and all the equipment's required to execute the works shall be available and in good condition as per project planned.
- Specific attention is paid to all safety measures and quality control in coordination with Safety Engineer and QA/QC Engineer and in line with PSP and PQP.

5.2 Construction Manager

- Construction Manager is responsible to supervise and control the work on site.
- Coordinating with QA/QC Engineer and site Team and foremen for all activities on site.
- Control and sign all WIR's before issuing to Consultant approval.

5.3 Site Engineer

- The method of statement to the system shall be implemented according to the Consultant project specifications and approved shop drawings.
- Provision of all necessary information and distribution of responsibilities to his Construction team.
- The work progress shall be monitored in accordance with the planned work program and he will provide reports to his superiors.
- The constant coordination with the Safety Engineer to ensure that the works are carried out in safe working atmosphere.
- The constant coordination with the QA/QC Engineer for any works to be carried out and initiate for the Inspection for the finished works.
- He will ensure the implementation of any request that might be raised by the Consultant.
- Efficient daily progress shall be obtained for all the equipment and manpower.
- He will engage in the work and check the same against the daily report received from the Foremen.
- The passage of all the revised information to the Foremen and ensure that it's being carried out properly.

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5.4 QA/QC Engineer (MEP):

- The monitoring of executions of works at site and should be as per the approved shop drawings and project specifications.
- Ensure WIRs and MIRs are being raised for activities in timely manner and inspected by the Consultant.
- Check and insure that all activities / work done / completed prior to offer for consultant inspection.
- He will follow and carried out all the relevant tests as per project specifications.
- Obtain the required clearance prior to Consultant's inspections.
- Should acquire any necessary civil works clearances and coordination.
- Coordinate with site construction team.
- One who will assist the Consultant Engineer / Inspector during inspection.

5.5 Site Foreman

- The carrying-out of work and the proper distribution of all the available resources in coordination with the Site Engineer on a daily basis.
- Daily reports of the works are achieved and coordinated for the future planning with the Site Engineer.
- Incorporate all the QA/QC and Safety requirements as requested by the concerned Engineer.
- Meeting with any type of unforeseen incident or requirement and reporting the same to the Site Engineer immediately.

5.6 Safety Officer

- The implementation of all safety measures in accordance with the HSE plan and that the whole work force is aware of its proper implementation.
- The implementation of safety measures is adequate to maintain a safe working environment on the work activity.
- Inspection of all the site activities and training personnel in accident prevention and its proper reporting to the Construction Manager and the Project Manager.
- The site is maintained in a clean and tidy manner.
- Ensure only trained persons shall operate the power tools.
- Ensure all concerned personals shall use PPE and all other items as required.
- Ensure adequate lighting is provided in the working area at night time.
- Ensure high risk elevated areas are provided are barricade, tape, safety nets and provided with ladders.
- Ensure service area/inspection area openings are provided with barricade, tape, and safety nets.
- Ensure safe access to site work at all times.

5.8 Store Keeper (SK)

- Responsible for overall Store operations in making sure to store the material delivery to the site and

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keep it in suitable area that will keep the material in safe from rusty and damage.

- One who will acknowledge the receiving of materials at site in coordination with QA/QC and concerned Engineer.

6.0 EQUIPMENTS

- 6.1 Cable pull springs
- 6.2 Cable drum
- 6.3 Continuity Tester.
- 6.4 Automatic Compression Crimping Type Tool
- 6.5 Crimping tools.
- 6.6 Ladder / Scaffolding.
- 6.7 Measuring Tape
- 6.8 Cable pulling compound.
- 6.9 Safety requirements tools such as safety shoes, safety helmet, safety glasses, fluorescent vest, and safety gloves to ensure maximum ability of safe work and dust mask when require.

7.0 PROCEDURE

7.1 Safety

- Ensure only trained persons shall operate the power tools.
- Ensure all concerned personals shall use PPE and all other items as required.
- Ensure adequate lighting is provided in the working area at night time.
- Ensure service area/work area openings are provided with barricade, tape, and safety nets.

7.2 Work Sequence And Methodology

- Check all material delivered to site is inspected properly by QA/QC Engineer and check if it is stored properly as per manufacturer's recommendations.
- MIR shall be raised for the inspection of materials received at site to the Consultant Engineer.
- Work shall be carried out by the site staff under strict supervision and guidance of the concerned Supervisors / Foremen / Engineers.
- The QA/QC Engineer shall check all the installations as per the Installation Check list.
- WIR shall be prepared by QA/QC Engineer and will be submitted to Consultant for their inspection and approval.
- QA/QC Engineer shall coordinate with other contractors and arrange inspection for installation to the Consultant Engineer.
- QA/QC Engineer is responsible for all installation activities for getting the work inspected and approved by Consultant Engineer.

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7.3 Handling and storage:

- The site chosen for storage of cable drums should well-drained and should preferably have a concrete surface which will not cause the drums to sink so lead to flange rot and cause extreme difficulty in moving the drums as per manufacture recommendation.
- The drums should be stored in such a manner as to leave sufficient space between them. It is desirable for the drums to stand on battens place directly under the flanges.
- For drums, overhead shade is not essential except in areas where the rainfall is heavy. The cables should however be protected from direct rays of sun by leaving the battens on or by providing some form of sun-shielding.
- Cable ends must be sealed against water ingress at all times.
- The drum should be rolled only in the direction of the arrow, indicated on them.
- No cable drums shall be slung except by a bar through the centre bore. Also the cable drums shall be stored away from boilers or fumaces
- When unloading the drums from truck, crane should be used if available and drums carefully lifted and deposited on the ground. If crane is not available then the drums should be carefully rolled down a suitably arranged ramp or rail. Under no circumstances should the drums be dropped to the ground, as the shock may cause serious damage to the inner layers of the cables.
- Transportation over long distance, from storage site to work spots- the drums should be mounted o cable drum wheels strong enough to carry the weight of the drums, which are pulled by means of rope, or alternatively they may be mounted on trailer or vehicle with low loading platform for transportation to the destination.

7.4 Pre-installation of LV Cables and Wires

- Ensure that the work area is ready and safe to start the installation.
- While issuing from the site store, ensure that the materials are free of any damage or deformity of any kind; damaged material to be rejected for replacement.
- Ensure that Cable/ wire sizes shall be as per approved shop drawings.
- Ensure that cable tray / ladder sizes should be as per approved shop drawings.
- Ensure that spacing between two adjacent cables shall be as per approved shop drawings, further space shall be mentioned as per shop drawings approval.

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- The cables installed on the cable trays/trunking/ladder shall be securely fastened using approved cable ties.
- Type of the size of cables shall be as indicated in the electrical schematic diagrams; electrical load schedules & other related approved shop drawings. Clean cable trays & trunking thoroughly before laying.
- Ensure the installation of LV cables & wires are carried out in accordance with the manufacturer's installation recommendations, requirements of applicable standards and in accordance with recognized industrial practices and specified in project specification to ensure that the installation complies with requirements.
- Prior to start the installation, refer to the approved shop drawings related to the area of installation and ensure that required materials are available at site as per approved material submittals.
- Ensure the materials are stored properly and there is no mark of damage or deformity of any kind before issuing the material from site store. All materials and accessories should also be free of dust, scale, or oil.
- Ensure that the issued materials are of approved specifications / submittals and as per the requirement of the area shop drawings. (I.e. Make Size, Model /Type etc.).

7.5 Installation of Indoor and outdoor LV Cables

7.5.1 Installation of Indoor LV power cables.

- The total cable route shall be inspected to ensure that the routing is complete, either on ground or on cable trays, as per approved layout and free from any sharp edges & sharp objects.
- Site Engineer will ensure that the cable drums are shifted to the correct location, where cabling has to be started for any particular feeder.
- The trays shall be curved enough at the right angles to allow laying the cable with correct bending radius, without any sharp bends, knits.
- Where more power cables are run together, adequate cable tray should be provided considering the spacing as per specification. Spaced apart by at least one cable diameter (of larger cable) throughout the length of the cable run.
- Cable rollers shall be placed on the cable tray inline and angle-rollers will be used at all the turnings of cable tray.
- Cable laying shall be started by rotating the drum in a direction recommended by manufacturer and as

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indicated on drums. The site supervision team will ensure that the undue stress on pull is not applied to cable, while laying the same.

- Cables shall be identified at the both ends and in between convenient interval on riser, identification band as per approved material and approved cable schedule.
- Cables shall be dressed properly, secure cables to cable tray using straps /heavy duty ties where the cables are fixed to a vertical cable tray or ties where the cable tray surface is horizontal, without any overlapping. Ensure that the cable distance is maintained as per approved shop drawing & as per manufacturer's recommendations.
- Where cables passes through a floor or drain, sealing material should be provided and that area should be sealed properly (from both side).
- On completion of cable laying and dressing, continuity and insulation resistance tests with (1000V insulation tester) shall be carried out and shall be recorded. Cable ends shall be sealed properly, till the glanding and termination.
- All conductors requiring bolted connection shall be terminated with compression lugs using an automatic compression crimping type tool.
- Cable lugs shall be tinned copper compression.
- Termination to be carried out as per standard and approved procedure.
- Cable gland to be used of approved and quality as per manufacturer's recommendations.
- Issue WIR for consultant approval after making sure that all installation done as per approved shop drawings, manufacturer recommendations and approved load schedules.
- Insulation test should be carried out after installation and before termination of cables internally.
- After approval by consultant for the cable laying and meggering, test results shall be submitted, the method statement for testing the wires and cables submitted separately.
- LV cables termination and connections shall be done by experienced electrical technician under the supervision of Site Engineer.

7.5.2 Installation of Outdoor LV power cables

- Mark the route of the cable as per approved shop drawings.
- Check the size of the cables going from the DB to the light pole.
- Excavate the external route of the cable till the light pole point as per approved shop drawings and local regulation 800 mm from the ground level.

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- Apply Soft sand 100mm provided in the extreme bottom.
- Lay the cable into the route and make sure that the cables not damaged in pulling stage as per the method mentioned above in item 7.5.
- Raise WIR for Consultant approval before backfilling.
- Apply 100mm soft sand above the cable.
- Put the cable tiles above the soft sand along with the warning tape.
- Then Complete backfilling in the witnessed of Main contractor & Consultant Engineer.

Note: MV cables Installation and testing will be submitted separately in different MS.

7.6 Installation of single core Wires

- Ensure that the wiring is being installed as per approved shop drawings and approved load schedule.
- All the containment system is check for thoroughness and cleanliness all along the circuit.
- All the routing/wiring is to be drawn from respective distribution boards to point of utilization and is loop from live and neutral terminals of accessories for circuit continuation as per approved shop drawings.
- Final connection in luminaires and heat producing / emitting equipment shall be made using heat resistant flexible cables.
- The specified wire sizes to be followed as per approved load schedule / shop drawings.
- Ensure that the proper color coding is followed for phase, neutral, earth wires as per standard electrical codes and respective approved shop drawings and specifications.
- Ensure that each circuit is being neatly dressed / bunched at intervals. After dressing of wires, provide the respective circuit ferrules at the ends at phase, neutral and earth bar ends.
- The cables or wires should not be jointed. Those should be continuous.
- Wires shall not exceed the capacity of the conduit or trunking. The installation shall comply strictly by following the standard rules and regulations.
- Wires of one circuit shall run in the same conduit.
- Each wires of a circuit running in trunking shall be grouped together with cable ties.
- Do not install wiring of more than one phase in an outlet box or switch box, other than one designated for multi-phase use.
- The cable coding of cables/wires shall be followed till the termination within distribution boards and

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equipment's.

- WIR to be submitted to the Engineer after the completion of each section of installation.

8.0 ATTACHMENTS

- 8.1 Quality Control Procedure
- 8.2 Inspection and Testing Plan
- 8.3 Check List
- 8.4 Check List
- 8.5 Risk Assessment
- 8.6 Manufacturer recommendation for installation