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METHOD STATEMENT FOR

Installation of Lightning protection system

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REVISION RECORD

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 All previous cover pages are hereby superseded and are to be destroyed.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

This method statement is applicable for Installation Lightning protection system and its accessories in all applicable areas for the Project.

2.0 SCOPE

Supply , installation & Testing of the Lightning protection system for all applications in line with project requirements.

3.0 REFERENCE

- Latest Approved shop drawings for the Lightning protection system.
- Specifications
- BS EN 62305, Parts 1 to 4, Protection Against Lightning
- Project Quality Plan
- Material Approval

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.
WIR	: Inspection and Test Request
MIR	: Material Verification Record.

5.0 RESPONSIBILITIES:

5.1 Project Manager

- Responsible for the implementation and maintenance of the requirements of this procedure.

5.2 Construction Manager

- Responsible to supervise and control the work on site.

5.3 Project Engineer

- Shall be overall responsible for arranging the materials as per specification.

5.4 Site supervisor/foreman

- Ensure workmanship and also ensure that all the work is done by the experienced manpower.

5.5 QA/QC Engineer

- Shall ensure that all work is done as per approved drawings and material used is approved and coordinate with AlJaber MEP Coordinator/ QA/QC Engineer for internal checking prior to final inspection to consultant.

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6.0 EQUIPMENT:

A. Tools:

- Drilling Machine
- Tool Box
- Sprit Level
- Measuring Tape
- Ladders / Scaffoldings
- Hammer
- Hacksaw Frame and Blade
- Earth Resister Tester.

B. Materials

- 25X3mm Bare Copper Tape TC030
- DC Tape Clips CP210
- Square clamps CT105
- U bolt rod clamp Type A, Type E (CR105, CR320)
- Air Terminal RA250
- Earth Pits.
- Cutter.

- 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 required.

7.0 PROCEDURE

7.1 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, Lightning Protection System 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.

7.2 Handling and Storage

- On receipt of the Lightning Protection System materials at site necessary precautions shall be taken for unloading, shifting and storage, as follows:
- Material shall be stored in a covered / dry space at all the time to avoid being damaged.
- All materials received at site shall be inspected and ensured that the materials are as per approved material

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submittal.

- Any discrepancies, damage etc., found will be notified and reported for further action.
- Material found not suitable for site use will be removed from site immediately.

7.3 Installation of Lightning Protection System

- Civil clearance for the working area prior to start the work of the system.
- The correct materials shall be ascertained from approved shop drawings and material submittals before installation.
- The installation of the lightning protection will be as per approved shop drawings and as per manufacturer recommendation and project specification as shown in Figure #.1.

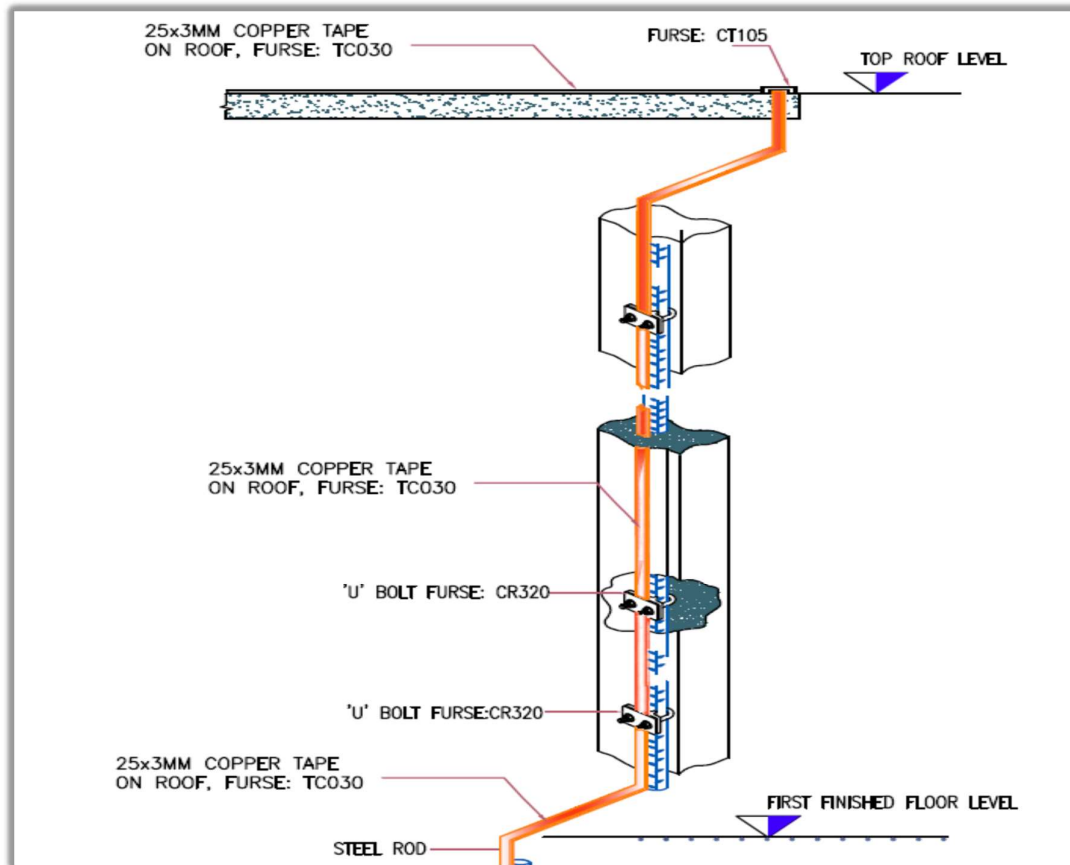


Figure #1

- Connections between ground rods and structural steel columns shall be made with heavy duty Class II copper conductor.
- Connection of the Earth pits will as per agreed with Consultant and as per manufacturer recommendation and project specification. See below Figure #2. For the Earth pit connection details.

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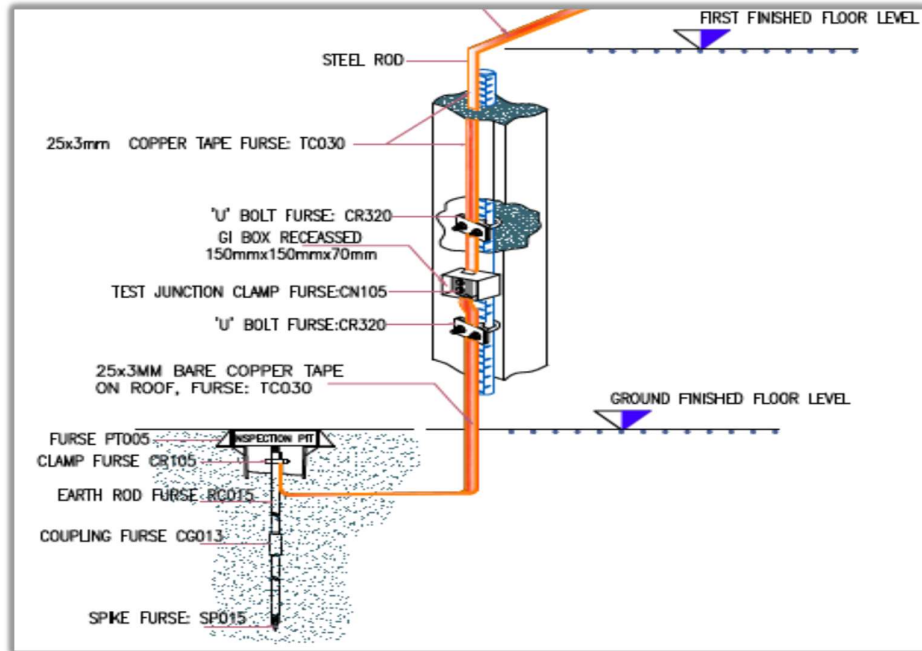


Figure #.2

- All earth pits for the lighting protection has to be tested by checking the continuity of the earth pits and the final Air terminal connected in the roof and all the results has to be recorded in the attached testing sheet.
- In the roof make sure to Mark the location of the tape as per approved layout drawing.
- Check the distance between clips in horizontal route shall not be more than 1000mm and in vertical route shall be 500mm if applicable as shown in **figure #. 3**.

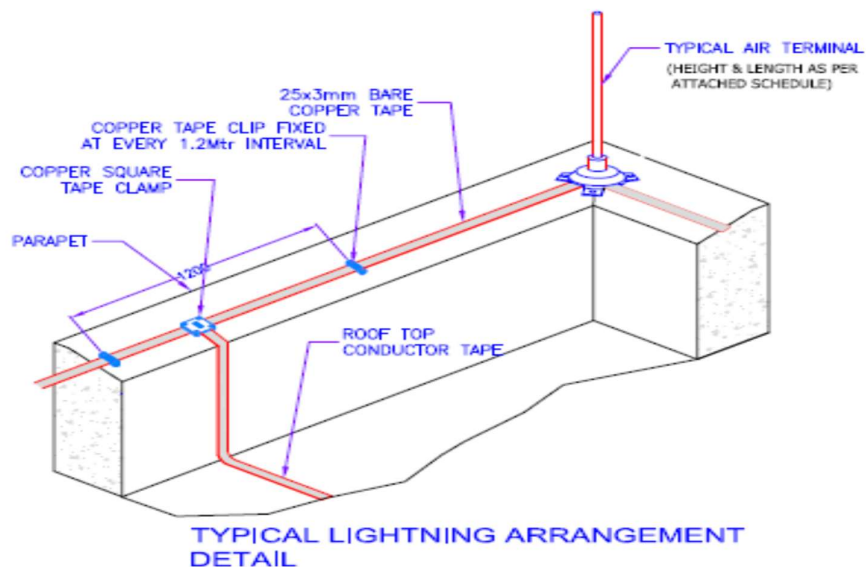


Figure #3

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- All mechanical and electrical equipment on the roof shall be bonded to the lightning protection system as required.
- The earthing shall be done as per local authorities requirements.
- A minimum of 2400 mm copper electrode shall be provided with each down conductor separately. However, the Specialist Lightning Protection Installer shall submit the calculation for deciding the number of earth rods in each earth pit. Wherever the soil resistivity is low (typically below $<20 \Omega /m$), the Specialist Lightning Protection Installer must use either copper rods or stainless steel rods to ensure the longitivity of the earth termination network.
- Measure the resistance of the complete installation and submit for review to the CONSULTANT.
- The complete Lightning Protection System measured at any point, should not exceed **10** ohms. With the test clamp disconnected, the resistance of each individual earth should be no more than ten times the number of down conductors in the complete system. as per Specifications.
- The terminated head of each electrode shall be located in a light weight inspection pit. If clear earth is not available, then the Specialist Lightning Protection Installer has to install the earth pit inside the building using double flange earth electrode seals.
- Test clamps shall be provided in each inspection pit to allow for testing and commissioning.
- Concrete inspection pits with cover shall be installed flush with finished floor level and be fully accessible.
- All metallic parts protruding outside the extended air termination network shall be connected to the air termination using suitable clamps at every floor wherever the horizontal conductor is applied.
- Make sure that the air terminal network layout to be coordinated with the mechanical equipment on the roof.
-
- This air terminal shall be installed at a suitable separation distance so that the partial lightning current doesn't flow through the equipment as per manufacturer recommendation, project specification and approved shop drawing. Refer to Figure #3 & Table #.1 for the length/height of the Air terminal.

Height of Air Rod	Angle (Deg.)	radius (m)	LPS
1	73.2	3.2	Class II
3	70.1	8.2	Class II
6	62.0	11.4	Class II

Schedule #1

- Submit WIR when the installation of Lightning Protection System is completed to the Consultant.

8.0 ATTACHMENTS

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8.1 Quality Control Procedure
8.2 Inspection & Test Plan
8.3 Check List
8.4 Check List
8.5 Risk Assessment