METHOD STATEMENT FOR INSTALLATION OF EARTHING & BONDING

RED LINE NORTH ELEVATED AND AT GRADE

QATAR RAIL

Revision and Issue Records

Document No.	Revision	Title
M002-RLR-ELE-MES-00006	1	Method Statement for Installation of Earthing & Bonding

Review History

Rev. No	Date	Description	Prepared	Reviewed	Approved
1	5/1/2017	For SONO	SHA	MAG	PSE

Document Review and Approval

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Contents

1 Definitions and Abbreviations

Table 1: Definitions and Abbreviations

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Abbreviation	Definition
BS	British Standard
PPE	Personal Protective Equipment
HS	Health, and Safety
ITP	Inspection and Test Plan
PMC	Project Management Consultant
QA/QC	Quality Assurance / Quality Control
QCS	Qatar Construction Specification
SONO	Statement of No Objection
PPE	Personal Protective Equipment
RLN-EAG	Red Line North Elevated and At Grade
RLR JV	Rizzani de Eccher, Lotte and Redco - Joint Venture
MS	Method Statement
SWA	Steel Wire Armoured
LV	Low Voltage
LSOH	Low smoke zero Halogen
XLPE	Cross-linked polyethylene
OSHA	Occupational Safety and Health Administration
SLD	Single Line Diagram
QCS-2014	Qatar Construction Specification
BOH	Back of House
NEC	National Electrical Code ®

2 Purpose:

The purpose of the method statement is to describe the procedure for material delivery inspection, installation and inspection of Earthing & Bonding at Stations. The Intent of this report is to explain, the methods to be adopted to ensure works conducted on site are in compliance with approved design, material approvals and as per project requirement.

3 Scope of Method Statement:

The scope of application of this method statement is the Installation and inspection of Earthing & Bonding for Red Line North Elevated & At Grade. (Chainage: 25+285 to Chainage: 31+950, Section of the RLN-EAG Project.

4 Work Execution:

4.1 General Supplied Items:

4.1.1 Personnel:

Ref.	Trade & Despines	Responsibility
1	MEP Construction Manager	• Delivering the overall works in a safe and timely manner, ensuring conformance with the approved design. • Leading the team of engineers and surveyors, guiding them in the delivery of the works. • Verifying that work done is in accordance with requirements of contract. • Ensuring the quality standards set for the work are achieved and the work team adhere to the QA/QC and HS requirements of the contract.
2	Systems Assurance Engineer	• Establish the system assurance process. • Manage the RAMS team and EMC team in delivering the system assurance submissions. Liaise with the System Assurance Manager for all safety and RAM related activities respectively.
3	Project/Site Engineer	• Ensuring that the works are being carried out in accordance with contract requirements and this Method Statement. • Management onsite to ensure that the team carries out the works in time with the delivery schedule. • Implementation of and adherence of the team to the QA/QC and H&S policies and procedure.
3	QA/QC Manager	• The preparation of the company's QA manual control and supervision of all amendments and revisions • Monitor all quality related activities on the project • Perform all internal and external audits on behalf of the company's management • Preparation, monitoring, training of project staff on method statements, and control of material on site.
4	QA/QC Engineer	• The QA/QC Engineer is the overall responsible for the implementations of this procedure and will carry out the material inspection to ensure that materials received on site are approved materials. • He will be conducting surveillance and inspection duties at various stages of the project delivery to ensure compliance to contract requirements and to QA / QC requirements. • He will monitor the installation works according to the approved drawing & method statement. • He will coordinate with the Supervisory Consultant to carry out inspection/testing of the completed works.

		• The QA/QC Engineer is responsible for the detail application of this procedure for the inspection and testing, to coordinate with the Construction Manager and Site Engineer for the inspection of on-going work.
5	Surveyor	• Setting out all planned works. • Monitoring the works being carried out to ensure they are at the correct levels and measurements. • Maintaining documents relevant to alignment and height control.
6	Document Controller	• Documenting, distributing and maintaining data in the prescribed format. • Making the necessary data available as requested by the team or the client.
7	HS Inspector	• **Identify** HS requirements, non-compliance or otherwise by conducting both formal and informal audits and communicate said to relevant site management • **Advise** site management on HS substandard acts and HS substandard conditions on a continuous basis and record said. • **Coordinate** and record action by site management as identified and advised. • **Verify** actions taken by site management , record and report accordingly • **Conduct** relevant HS administrative functions and additional tasks as directed by HS Management.
8	Supervision Engineer	• Checking the compliance of works to the design. • Carrying out comprehensive supervision of all construction works. • Confirming that the work executed complies with the approved design and be responsible for checking the construction works.

All of the above will individually be responsible for a safe and healthy operational environment consideration of all the workers in their team related to the execution of their duties and any other personnel.

Workers

One group of workers is planned for execution of Installation of Earthing & Bonding. This group will provide all activities. The group will have following labour profile:

Sr. No.	Description

1	Electrical Supervisor
2	Electrical Foreman
3	Electrician
4	Labour (skilled and unskilled)

4.1.2 Equipment and tools :

The typical construction equipment requirements is as listed below, and will be used for Installation activities at site.

Plants

No.	Type	Use
1	Man Lift	For Installation of Tags and Markers
1	Scaffolding	For the Installation
2	Lights	For use during night operations
3	Generator	For Power Generation for Lights

Small Tools and Equipment

- PPE for all staff and labour
- Measuring tapes and setting out markers
- Electrician Tool Box with all tools
- Earth Resistance Tester with valid Calibration Certificates
- Torque wrench
- Thermo weld fixing tools
- Electrician Tool Box with all tools
- Fitter Tool Box with all tools
- Cad weld accessories
- Cable Rollers
- Earth Link Bars
- Step Ladder, Barrier Warning Tape & Portable Emergency Lamp
- Earthing Cables As per Approved Shop Drawings
- Cable Lugs (with bronze nuts and washers only) and Lugs Punch
- PVC Sleeve (Heat Shrinkable)
- Chalk line
- Ladders
- Nylon Rope
- Marker/Whitener
- Identification Tags

Note: All the powered tools shall be suitable for use of 220V - 240V power Supply.
The above tools and equipment shall be checked for operational suitability before each shift of commencement of works including, but not limited, to safety and operational compliance. The same shall be executed for all small tools and miscellaneous items.

4.1.3 Material

The material shall be used according to project specifications and shall be approved by the Engineer

All the materials should be as per Material Submittal and to be inspected before installation.

4.1.4 Handling and Storing of Materials

On receipt of the Earthing material at site necessary precautions shall be taken for unloading, shifting as follows:-

1. Material shall be stored in a covered / dry space at all the time to avoid corrosion.

2. All materials received at site shall be inspected and ensured that the materials are as per approved material submittal.
3. Any discrepancies, damage etc., found will be notified and reported QA/QC Engineer and Project Engineer for further action.
4. Material found not suitable for site use will be removed from site immediately.
5. 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.
6. 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. While unloading, shifting and storage, it should be ensured that there are no damages.
8. The stacks will be protected from direct sunlight.
9. Where manual handling is to be utilized it is imperative that a proper load assessment is undertaken and correct manual handling techniques are used to avoid injury. Safety and careful handling should be top priorities when handling materials.
10. Materials shall be stacked on shelves or a flat surface free form any sharp edges and shall be adequately supported. Electrical materials shall be stored in covered area having protection from the elements.
11. Store all fittings and loose shipped materials indoors in a dry area.
12. Keep the materials in their original shipping containers where possible and store correctly in warehouse facility.
13. For mechanical lifting, support each unit with nylon / canvas slings during all phases of handling. When off-loading, materials shall be lowered and not dropped to the ground.

4.2 Site Execution

4.2.1 Program

Installation of Earthing & Bonding is expected to be performed starting Dec - 2017. Detail schedule of Installation activity will be provided in the weekly update of the 3-weeks look ahead construction schedule.

4.2.2 Pre-Installed Earthing System

1. Underneath each station and each cross passage, there is a buried grid of interconnecting earth tapes, designed to withstand a fault current of as per contract with Sub contractor.
2. These systems shall be fully bonded to the existing earth mat network. The equipotential bonding schematic drawings provide details of the Earthing and bonding arrangement for the installation.
3. TN-S system – with separate neutral and protective conductors throughout the system shall be provided.

4.2.3 Earthing and Bonding System Requirements

1. The main earth source shall be obtained through an Earthing grid of bare copper conductors laid under the blinding concrete, connected and bonded to the raft foundation.
2. The Earthing system shall be provided through earth pits to be connected for Earthing of neutrals and enclosures of electrical equipment, and equipotential Earthing of exposed non-electric metallic structures.
3. All non-current carrying metal parts of equipment, pumps, water pipes, conductive flooring in the telecommunication rooms etc., shall be bonded to the Earthing system.
4. The Earthing source shall be brought to each main switchboards through cable using approved containment system to connect main switchboards neutral and enclosures of the electrical equipment to the main Earthing source.
5. All technical rooms shall be provided with earth bar to connect the exposed nonelectric metallic structures (e.g. racks, cases, raised floor supporting system, raceways, etc.)
6. An independent Earthing system (clean earth) shall be provided for SCADA, telecom and signaling systems and shall be terminated to the main earth source of the power system. Earth bars shall be provided, for equipment final connection, within each systems room and all other technical rooms
7. The design and installation of the Earthing system shall be such as to keep 'step voltage' and 'touch voltage' within the safe limits defined by code.
8. The value of earthing termination system resistance measured at any point shall not exceed 1 Ohm.
9. Earthing cables shall be of copper, (Green/Yellow, Type shall be as approved material by the Engineer). Where connections are inaccessible, thermo-welding shall be applied.

4.2.4 LV system Earthing

1. The building Earthing installation shall be as detailed in the equipotential bonding schematic drawings.
2. The size of phase and circuit protective conductors as indicated on the schedules and drawings, sizes shall be checked by QA/QC Engineer.
3. The following items, as a minimum, shall be connected to the main earth bar to the following:
    a. Neutral of the source of energy
    b. Main earth under slab Earthing system
    c. Main LV distribution panel(s)
    d. Lightning protection system/structural steelwork
    e. Cable tray/ladder system

4.2.5 Secondary earth bar(s)

Connect to the secondary earth bars, hard drawn copper cables, LSOH insulated, to the Following local items:

a. All electrical distribution equipment
b. All building structural steelwork

c. All mechanical plant including ductwork and pipework.

4.2.6 Circuit Protective Conductors (CPCs)

1. SWA of the XLPE/SWA/LSOH sub-main distribution cabling with additional CPCs where Indicated on the drawings/cable schedule shall be provided.
2. Dedicated earth conductor's material to be approved by the Engineer and it should as per project specification.
3. Separate CPC for all final circuits (Approved Material) installed in conduit and trunking Distribution systems
4. Separate CPCs for final circuits to be of the same cross-sectional area as that of the phase conductor.

4.2.7 Bonding Extraneous Conductive Parts

It shall be ensured that all building incoming main metallic services and building structure are securely connected to the main earth bar. Including the following

Services are bonded:

a. Main water pipes
b. Chilled water pipework
c. Exposed metallic parts of building structure
d. Thermal insulation metallic cladding
e. Metallic cable sheaths of all cables
f. All simultaneously accessible conductive parts shall be connected the protective Conductor system using supplementary equipotential bonds.

4.2.8 Bonding Exposed Conductive Parts

It shall be ensure the exposed metallic parts of the building structure are securely connected to the LV earth system.

All conduit and Trunking distribution services shall be connected with equipotential and supplementary bonding systems throughout the installation, to ensure in conjunction with the separate CPC requirements that maximum earth continuity is provided for all such services.

Bond each distribution board and switch panel, in addition to the CPC reference provided by the supply cable armouring, by a separate cable to the cable containment system.

Other Bonding Requirements

1. All LV socket outlets shall be provided a green/yellow insulated 2.5mm² stranded copper conductor as a 'fly lead', connected between earth terminals secured to both socket assembly and socket box.
2. Each lighting switch grid shall be provided with an earth terminal and a green/ yellow 2.5mm² stranded copper conductor as a 'fly lead', connected between earth terminal and grid assembly.
3. A green/yellow fly leads (6.0mm² minimum) stranded copper conductor shall be provided for all hinged panels of switches, switchgear, control cubicles, distribution boards, etc.,
4. Minimum Size of Earth Continuity Conductors and Bonding Leads as per KAHRAMMA is listed in the Table-1

1. Table – 1 (KAHRAMMA- Minimum Size of Earth Continuity Conductors and Bonding Leads)

Minimum Size of Earth Continuity Conductors and Bonding Leads

Cross Sectional Area Of Largest Associated Circuit	Cross Sectional Area Of Earth Continuity Conductor mm^2	Cross Sectional Area Of Bonding Lead mm^2
1.5	1.5	1.5
2.5	2.5	1.5
4	4 ©	2.5
6	6	2.5
10	10	2.5
16	16	2.5
25	16	6
35	16	6
50	25	6
70	35	16
95	50	16
120	70	16
150	95	16
185	95	50
240	120	50
300	150	70
400	240	70

© For ring main installation only associated with 13 Ampere socket outlet distribution the earth continuity conductor shall be 2.5 mm^2.

4.2.9 Pre-Installation Procedures

Before the commencement of installation, the following are required to be carries out.

1. Check the design of the Earthing system shop drawings is approved.
2. Check the work area for installation is safe.
3. Check that Earthing and bonding material is approved and available in store to start the work.
4. The Earthing system Inspection Test Reports (previously the conducted) are checked and should be approved by the Engineer.
5. A current Test Report shall be checked and resistance should be less than 1 Ohm or equal to 1 Ohm as per the project requirement. If not found notify the Project Engineer and Engineering Manager
6. Coordination with Architectural, Civil and other MEP services shall be carried out.
7. A written approval has been taken from Supervisor Engineer to start the work.

4.2.10 Installation Procedures

1. Single core Earthing cables of adequate sizes shall be laid between the earth pits and the earth bar inside the electrical & technical rooms and shall be terminated with proper compression type lugs / clamps as per the approved shop drawings and as per specifications.
2. All Earthing connections shall be made after cleaning the surface thoroughly and tightness checks for each connection shall be performed.

3. The down-stream Earthing connections from earth-bars shall be made to the panel boards, frames and other equipment as per the approved shop drawings and project specification.
4. The metallic frame of all electrical equipment shall be connected to the nearest earth bar with insulated copper earth cable.
5. The earth continuity for cable trays and trunking shall be maintained with earth links and end of the same (i.e.; cable trays & trunking) shall be connected to earth bar with flexible Earthing bonding link.
6. Flexible tinned copper Earthing braids shall be used for the Earthing connections where there is possibility of expansion / contraction and also where vibrating equipment is installed of approved size.
7. The metallic water lines shall be bonded with tinned copper flat bonding strip wound tight on it and earthed by an Earthing cable according to specification.
8. All Earthing connections shall be checked for correct tightness and cleanliness.
9. The earth wire size shall be equal to the phase wire if the conductor cross section is less than 16 sq.mm and shall be half of the phase conductor size for sizes higher than 16sq.mm or otherwise detailed in the Shop Drawing.
10. All exposed non-current carrying metal parts of equipment and other sizable metallic objects such as Electrical Panels, Switchgears, AHU's, ACCU's shall be potentially bonded to the Earthing grid accordingly.
11. All medium voltage service entrance, main service switchgear and distribution switchboard equipment, motors, panel boards and all related metallic equipment shall be effectively earthed in an approved manner.
12. Circuit wiring shall have green/yellow coloured insulated earth continuity cable connecting earth bus or earth terminal of equipment with approved terminal lugs.
13. Hand rails, and other metal structures of potentially live surfaces shall be earthed.
14. The earth conductor installation shall not conflict with other installations.
15. All lightning/earthing joints and connections to equipment shall be as per manufacturer's recommendation, approved drawings, specification and code.
16. Exposed earth cables shall be installed in such locations as to provide the maximum protection, such as ceiling corners, beam webs, etc.
17. Earth links shall be located in accessible locations and fixed using removable earth links to allow for removal during testing.
18. Equipment's of all non-current carrying metallic parts of electrical and mechanical installation shall be connected to the Earthing system. This includes metal conduits, cable armour, raceways, outlet boxes, cabinets, enclosures, doors, grills, barriers, etc. Each item shall be individually connected to the Earthing system. Series earthing of one equipment to another shall not be done.
19. Fire fighting equipment shall be earthed on a separate earth ring.
20. Motor terminal box shall be earthed to the relative earth loop. The terminal shall be mechanically connected to the frame; if not feasible the earth conductor shall be extended through an insulated bushed opening and connected to the frame.
21. HV switchgear, MV panels, MCCs and Generators Earthing shall be connected by special Earthing lug or busbars inside the cabinet to the main Earthing system and all parts other than live parts shall be connected to the earth bar.

22. Distribution boards earthing shall be connected to an Earthing conductor from the main distribution board earth busbar to an earth connector welded to the cabinet and earthing bushing on the incoming and outgoing feeder conduits.
23. Busduct feeder earth busbar shall be connected directly to the earth busbar in the main switchboard.
24. All cable armours shall be connected to the Earthing system.
25. SCADA & PLC system shall be connected to clean earth system and isolated from power earthing system as per vender's recommendation.
26. Data and Communication system buses earthing shall be done as per the vender's recommendation.
27. All Lightning/Earthing installations shall be left exposed until inspections have been completed to ensure installations are properly secured and fastened.
28. Onsite changes/modifications shall be advised to engineer for approval and "REDLINED" in approved shop drawing and changes shall be reflected in "AS BUILT".

4.2.11 Testing Commissioning of Earthing & Bonding System

The entire LV Cable and wire installation shall be tested for:

1. Visual inspection of Installed work in all sections of station.
2. Earth continuity Test in accordance with KAHRAMAA wiring regulation
3. Earthing Resistance Test
4. All test result shall be submitted in standard Performa as directed by the Supervising Engineer
5. Certification of Satisfactory Commissioning shall be obtained for these tests from Supervisor Engineer.

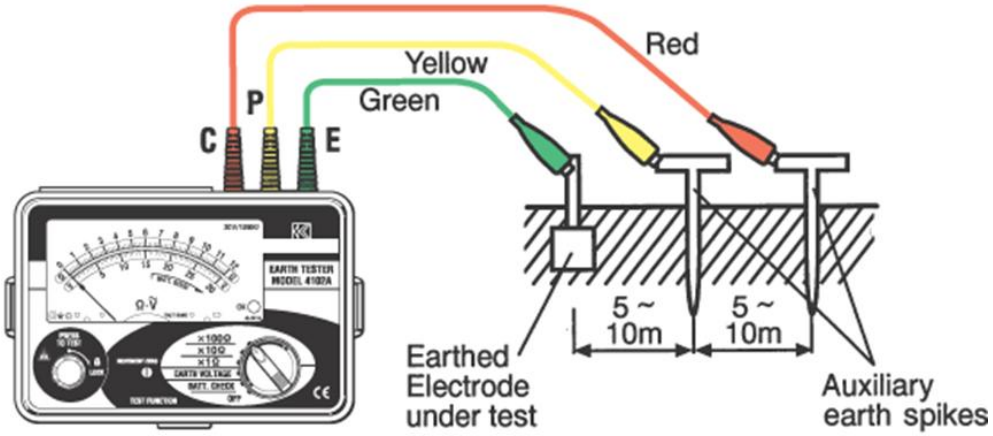

Figure – 1 (Sample Picture) **Earthing Tester**

5 Quality

The Inspection and Test Plan (ITP) for this Method Statement summarizes various characteristics to be checked. The concerned Site Engineer or Site Supervisor will be responsible to ensure compliance for these operations and the site QA/QC Engineer will carry out quality control checks and report the inspection results.

5.1 Quality Records:

ITP reference No: M002-RLR-ELE-ITP-00006.
Quality records shall be provided as identified in the ITP and maintained as per ISO 9001/QCS 2014 part section 2 QR Quality Guidelines.
Required form of records and reports are defined in the Inspection and Test Plans. Refer to Doc. No: M002-RLR-ELE-ITP-00006.

6 Health and Safety Plan:

a) The Health and Safety Plan: M002-RLR-HMS-PLN-00001 will be strictly adhered to at all times.

b) Compulsory RLR HSE induction is required before access to workplace is permitted. PPE relevant to the scope of work risks as identified must be utilized.

c) Compliance with the HS Summer working plan is compulsory Ref: M002-RLR-HMS-00003.

d) Expose to direct sunlight; including Installation of Earthing & Bonding shall be avoided 11.30 AM to 3.00PM hours during Hot seasons. Prcaustion shall be taken on heat strokes, dusty winds and other unsuitable weather conditions.

e) Workplace HS communication ie Toolbox talks, task briefings and HS non compliant notices / closeouts are compulsory.

f) The health and safety Department shall create and approve tool box talks which the safety office shall conduct such meetings shall cover, at various times and before use of equipment, the respective matters consisting of, but not limited, to:

i. Use of tools including specialised equipment;
ii. Personal protective equipment;
iii. Smoking;
iv. Handling of waste material;
v. Use of ablution facilities;
vi. Barricades, signs and warning tape;

Rev 0012: July: 2016

RLR **EMERGENCY CONTACT NUMBERS** In case of emergency, accident, sickness	
QATARI EMERGENCY **CALL – FIRST AID, FIREFIGHTING BRIGADE, POLICE**	**999**
RLR Emergency Number	**74783299**
QATAR RAIL DUTY MANAGER	**44331777**
KAHRAMAA CALL CENTER **ELECTRICITY & WATER**	**991**
FIRST AIDER	**74798190**
DEPUTY RESCUE MANAGER: Mr. Joseph Linehan	**30481706**
HS Manager: Mr.Johann Brink	**30461333**
HS Deputy Manager : Mr.Varghese Chattukulam	**30986153**
Water Team	**74798184**
Environmental Assistant: Mr.Chaitanya Veruva	**74795948**

Management Office: _____	44719853

Contacts for Traffic issues:

Security Manager	Mr. Arif Khan	74795950
Traffic Manager	Mr. Eur Ing Miguel	50050399

6.1 Specific Measures:

Specific measures related to span erection are as follow:

1. Working at height: all measures described in M002-RLR-HMS-PRO-00005 shall be in place during erection activities.
2. Load shifting Machinery
   i. Do not operate any load shifting machinery without training and approval.
   ii. Operators of forklift trucks, bulldozers, loaders, excavators, trucks should possess appropriate certificates/ Passes.
3. Manual Handling
   Avoid manual handling operations as far as possible to minimize the risk of injury. Estimate the weight of the load. Lift an object with a correct posture. Wear suitable protective equipment. Put on gloves as far as possible to protect your hands from any cut, scratch or puncture, and wear safety boots or shoes to prevent injury to toes by heavy falling objects .Seek assistance from someone in lifting a load if necessary.
4. Portable Power Tool
   i. Do not use a portable power tool (such as saw, grinder and drill) unless its dangerous parts have been effectively guarded.
   ii. Place the electric cable and hose of a tool at an appropriate position to avoid tripping hazards.
   iii. Do not operate a cartridge operated fixing tool unless you have possessed a valid
   iv. certificate.
   v. Wear suitable eye and ear protectors while operating a cartridge-operated fixing tool.
   vi. Use a cartridge-operated fixing tool with great care.
5. Scaffold (Mobile)
   i. Do not use scaffolds unless they have been erected by trained workmen and under the supervision of a Supervisor.
   ii. Do not use a scaffold unless it has been inspected and certified safe (A Green Tag to visibly hoist on the scaffolds) by a Certified Supervisor before use.
   iii. Strictly follow the instructions of a Supervisor. Do not alter the scaffold unless authorized to do so.
   iv. Do not work on an unfinished scaffold.
   v. When it is necessary to work on a mobile scaffold, lock the wheels of the scaffold before you start working.
   vi. Do not work on a scaffold unless it has been provided with a suitable working platform.
   vii. Ladders shall be used where no other means of access is possible.

6. Safety Requirements.

i. First Aid Kit to be provided at Station working areas in consultation with HSE officer.

ii. Clean up work area immediately after each task; never leave an area that is cluttered

iii. with tools or supplies that could present tripping hazard.

iv. Barriers as required shall be in place wherever necessary.

v. Visible “Safety sign” shall be provided where necessary as per HSE requirements.

vi. Good quality gloves are to be worn to protect your hands when using the equipment or handling materials.

vii. The basic Personal Protective Equipment for this particular job are:

a. Hard Hats (Hat Colours as specified by HS Department)
b. Gloves (Must Be Task Specific)
c. Goggles (Clear Shades/Glass for underground areas and Black shades/Glass for work in Sun Light)
d. Reflective Vest
e. Safety Boots (High Ankle as Qatar Rail)

7. Electricity

Before using an electric tool, check the tool and its plug and connecting cable.

1. Do not use a damaged tool.
2. Do not use an electric tool unless its connecting cable is well protected.
3. Do not use an electric tool unless its metal casing is earthed and its power supply is provided with an earth leakage circuit breaker.
4. Regular monthly inspection and regular inspection (prior to commence work) of equipment and tools shall be conducted as required. Tag must be put to tools and equipment that have damaged to prevent using.
5. Ensure that it has the correct inspection report for the month and report immediately any defects or damage to your supervisor. If faulty DO NOT USE!
6. Do not repair or alter any electrical installation unless competent to do so.
7. If you meet any fault or problem, report it to your supervisor immediately.
8. Make sure that the power cables have good insulation and properly connected not causing a tripping hazard and that they are not laid in water, working area of moving equipment, materials and areas where they are walked on.
9. Keep cables off the ground suspend from structures where possible. It must be ensured that live cables are not in contact with metallic surfaces.
10. Do not stand in water while using the equipment and do not allow the equipment to get wet.
11. Check the power supply connections and make sure that the equipment is properly earthed.
12. Only Trained technicians who have full knowledge on how to operate the equipment are allowed to use.
13. Only qualified electrician must install and maintain the live electrical equipment.
14. Make sure that all equipment (If any used), cutting machine, bending machine and all other appliances (As Specified in MS Tool & Equipment Section) brought to the Site have relevant Test Certificates I Training.

8. Fire Risk

There is always a fire risk. However, the chances of fire can be reduced, and you will know what to do when a fire breaks out if you:

1. Always keep the workplace clean and tidy.
2. Handle machinery and tools that may generate sparks or heat carefully .
3. Do not smoke or use naked flames in any area where flammable and explosive substances are stored.
4. Know where fire extinguishers are
5. Located and how they are used.
6. Know the place of assembly for fire evacuation.
7. Provide portable fire extinguishers nearby the working area and all persons involved must be familiar how to operate the fire extinguisher (If Necessary or Advised by the HS officer)

Note: Always wear safety spectacles when using the equipment.
Other specific risks & measures are addressed in the Risk assessment attached in Appendix B.

7 Environmental:

The site team including subcontractors shall implement the following environmental controls measures:

a) The waste material from the installation of Earthing & Bonding are to be placed in waste skips provided at site.

b) Unused materials shall be returned to the stores for appropriate storage according to manufactures' instructions for potential reuse;

c) Colour coded skips with signage shall be provided for waste segregation (general waste, metals, and plastics). Separate colour coded storage skips to be used for hazardous material.

d) Good housekeeping shall be maintained regularly at job site.

8 Interfaces and Permits

8.1 Interfaces

- Not Applicable

8.2 Permits

- Not Applicable

9 Appendices / References:

9.1 Appendices:

- Appendix A – Inspection and Test plan;
- Appendix B – Risk Assessment;
- Appendix C – Test Report;

9.2 References:

This Method Statement shall be read in conjunction with the following documents:

Material Submittal:

Material submittal for Earthing & Bonding.
Material submittal for Lighting Fixture & Accessories - BOH.
Material submittal for Lighting Fixture & Accessories - FOH.
Material submittal for Tags & Markers.
Material submittal for Fire Resistance Multicore Armoured Cables
Material submittal for Low voltage LSOH Cables & Wires
Material submittal for Cable lugs.
Material Submittal for Cable Tray, Trunking ladder & Accessories.
Material submittal for GI Conduit, Flexible Metallic Conduit & Fittings, GI Back boxes.
Material submittal for Cable Glands.

Method Statement For:

Document No.	Document Title
M002-RLR-ELE-MES-00001	Installation of Cable Containment System
M002-RLR-ELE-MES-00002	Installation of GI Conduit, Flexible Metallic Conduits & Accessories
M002-RLR-ELE-MES-00006	Installation of Earthing & Bonding System
M002-RLR-ELE-MES-00005	Installation of Fire Alarm Cables
M002-RLR-ELE-MES-00007	Installation of Lightning Protection System
M002-RLR-ELE-MES-00008	Installation of Light Fixtures & Accessories-Back of House
M002-RLR-ELE-MES-00009	Installation of Light Fixtures & Accessories - Front of House Area
M002-RLR-ELE-MES-00010	Installation of Wiring Accessories & General Power
M002-RLR-ELE-MES-00011	Installation of LV Cables & Wires
M002-RLR-ELE-MES-00012	Installation of Automatic Transfer Switches (ATS)
M002-RLR-ELE-MES-00013	Installation of Isolating Switches
M002-RLR-ELE-MES-00014	Installation of MCC Panels & Accessories
M002-RLR-ELE-MES-00015	Installation of Distribution Boards & Accessories
M002-RLR-ELE-MES-00016	Installation of Sub main Distribution Boards (SDB)
M002-RLR-ELE-MES-00017	Installation of Control Cables
M002-RLR-ELE-MES-00021	Installation of PVC Conduits & Accessories

Specifications:

Document No.	Document Title
M002-RLR-MEP-TEN-00008	Material and Workshop Specifications Volume 7
M002-RLR-MEP-SPE-27005	DD2 –Qatar University Station-WP11.2 MEP Specifications
M002-RLR-ELE-SPE-36013	Lusail Station - WP18.2 - DD2 - Earthing and Bonding. Specifications
QCS 2014	QCS 2014 Section 21 Part 21
M002-RLR-MEP-SPE-36303	Lusail Station - WP18.2 - DD2 – MEP Specifications
KAHRAMAA	Electrical and Water Design and Installation Regulations
BS 6651	Code of practice for protection of structures against lightning
BS 7430	Code of practice for earthing.
NEC	National Electrical Code ®

Reports:

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Document No.	Document Title
M002-RLR-MEP-RPT-27003	DD2- Qatar University Station Earthling & Bonding Report
M002-RLR-ELE-RPT-26000	DD2- Qatar University Station WP11.2 – MEP Design Report

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