

METHOD STATEMENT FOR INSTALLATION OF FIRE ALARM CABLES

RED LINE NORTH ELEVATED AND AT GRADE

Revision and Issue Records

Review History

Document No.	Revision	Title
M002-RLR-ELE-MES-00019	1	Method Statement for Installation of Fire Alarm Cables

1	27/12/16	For SONO	SHA	MAG	PSE
Rev. No	Date	Description	Prepared	Reviewed	Approved

Document Review and Approval

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1 Definitions and Abbreviations

Table 1: Definitions and Abbreviations

Abbreviation	Definition
BS	British Standard
PPE	Personal Protective Equipment
HS	Health, and Safety
ITP	Inspection and Test Plan

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Abbreviation	Definition
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
FOH	Front of House
LV	Low Voltage
LSOH	Low smoke zero Halogen
BOH	Back of House
OSHA	Occupational Safety and Health Administration
SLD	Single Line Diagram
QCS-2014	Qatar Construction Specification
MCP	Manual Call point
QCDD	Qatar Civil Defence Department

2 Purpose:

The purpose of the method statement is to describe the procedure for material delivery inspection, installation and inspection of Fire Alarm Cables 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 Fire Alarm Cables 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

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1	MEP Construction Manager	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Establish the system assurance process. Manage the RAMS team and EMC team in delivering the system assurance submissions. <p>Liaise with the System Assurance Manager for all safety and RAM related activities respectively.</p>
3	Project/Site Engineer	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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.

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5	Surveyor	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 Fire Alarm Cables. 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 :

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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
- Measuring Tape
- Megger Meter
- Cable Ties
- Wire Cutter
- Steel Wire (Pulling Wire)
- Wire Stripper
- Side-Cutting Pliers
- Round files
- Marker/whitener
- Ladders

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

Works shall not commence until a Statement of No Objection (SONO) has been issued by the Engineer for Material and Workmanship Specifications.

All Fire Alarm cable shall be as per approved material submittal.

4.1.4 HANDLING AND STORAGE MATERIAL

On receipt of the Fire Alarm material & accessories at site, necessary precautions shall be taken for unloading, shifting & storage, as follows

1. All material for the fire alarm system, reaching to site shall be identified as per package list.
2. Electrical Engineer has to ensure that the issued material is of approved specification / submittal (i.e., make, size, model / type etc.,) and as per the requirement of area shop drawing. Any deviation if noticed shall be notified and reported for further action.
3. Electrical Engineer has to ensure the Low Current Systems and accessories are stored properly.
4. No mark of any damage or deformity of any kind before issuing the material from site stores.
5. Material shall be stored in a covered ventilated space at all the time.
6. All the Fire Alarm System Outstations, Modules & Control Panels etc. shall be stored in an air conditioned place.
7. Any discrepancies, damage etc., found will be notified and reported for further action.

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8. Material found not suitable for site use will be removed from site immediately.

4.1.5 Material Sampling and Testing

The minimum frequency of QA sampling and testing shall be consistent with requirements in the Codes and Contract Specifications.

4.2 Site Execution

4.2.1 Program

Installation of Fire alarm cables is expected to be performed starting in 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 - Installation Procedure

1. All materials and documentation relevant to this particular section of works will be checked and verified ensuring that these are correct and approved type.
2. Prior to the commencement of works, ensure that the areas for permanent installation are ready, accessible and in suitable condition.
3. Make sure that the necessary coordination is completed.
4. Check all wiring routes are clear for installation.

4.2.3 Installation

1. Prior to start the installation, refer the approved shop drawings and coordination drawing of latest revision related to the area of installation and ensure the required material is available at site as per approved material.
2. All shop drawings, single line diagram must be approved by supplier for all installation methods and details.
3. Ensure that work area is ready and safe to start the installation of Fire Alarm systems.
4. All the related documents like latest approved shop drawings and schematic etc. should be available with installation team.
5. Ensure the required termination materials that suits the cable used like lugs glands and ferrules and identifications.
6. Ensure the installation of Low Current Systems & accessories which are to be interfaced FAS and are carried out in accordance with manufacturer's installation recommendations.
7. Ensure that requirements of applicable standards and in accordance with recognized rail project, and specified in project specification to ensure that installation complies.
8. 25 mm PVC Conduiting for concealed installation. FP200 fire rated cables in concealed PVC conduits. FP200 fire rated cables in GI conduits, for all plant room, substation Roof etc. wherever it is exposed to view.
9. FP200 with clips, for all surface installation. But above false ceiling where it is not directly exposed to view.
10. The containment system for Fire Alarm system is being used wherever required and also near the Fire Alarm control panels.
11. Correct type of back-boxes for all the outstations should be installed as per approved shop drawings / material submittals. The mounting heights for the Junction boxes should be verified with approved shop drawings or otherwise advised by the Engineer.

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12. Containment System should be offered for Engineer inspection prior to cabling works.
13. The required amount of cable should be transferred from Stores to Site access point by pick-up and to the particular floor with wheelbarrow as required to the work place.
14. The correct size and type of cable should be identified and cut to the required length.
15. Proper identifications to be provided for loop in / loop out of fire Alarm Cables.
16. The junction boxes and back boxes to the outstations such as smoke detectors, manual call points and modules should be installed as per the approved shop drawings.
17. Installation of system outstation should be offered for QC Verification.
18. Adequate additional cable lengths to be provided during cabling for the detectors, which are coming in False Ceiling using flexible pipe for the installation.
19. All the cables to be terminated in the outstations with proper screw driver and as per the identifications provided in the cables. No joints are allowed in between two outstations.
20. All the Fire Alarm control Panels such as Main Control Panels, Mimic Panels, Repeater Panels should be installed as per approved shop drawing.
21. All Smoke Detectors to have cover on it after installation and before handing over of the area, in order to avoid any physical damages / accumulation of dust within the Smoke Detectors.
22. All cables to be properly identified in Fire Alarm control panel before termination.
23. Installation of sensors to be as per the approved drawings / Manufacturer's recommendations.
24. Installation of Duct detectors/ Fire Damper to be as shown in the approved shop Drawings.

4.2.4 Insulation Resistance Test

1. Set the resistance test device for cable and 500 Volts for wires.
2. Take reading between phase, phase and neutral , phase and earth, neutral and earth
3. Note the resistance reading must not exceed 2 mega-ohms (MΩ)
4. Check and record the resistance reading as per specification on approved insulation resistance test forms.

4.2.5 Cables Identifications

1. Install the tags/labels are as per project specification and as per approved material submittals.
2. Cables shall be identified at sending and receiving ends about 50mm below the termination point.
3. Identification labels shall be provided at all position where cable changes direction and each side of the wall or floor slab and where cables are in multiple runs.

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.

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Contacts for Traffic issues:

Security Manager		
Traffic Manager		

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.

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- 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 glass for underground areas and Black 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.

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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 Fire Alarm Cables 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 Fire Alarm Cables.

Material submittal for Fire Alarm Devices & Accessories.

Material submittal for Control Cables.

Material submittal for Tags & Markers.

Material submittal for Cable lugs.

Material Submittal for Cable Tray, Trunking ladder & Accessories.

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Material submittal for GI Conduit, Flexible Metallic Conduit & Fittings, GI Back boxes.

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-00013	Installation of Isolating Switches
M002-RLR-ELE-MES-00017	Installation of Control Cables

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	Qatar Construction Standards 2014 Section 23 Part 2 Clause 2.2
M002-RLR-MEP-SPE-36303	Lusail Station - WP18.2 - DD2 – MEP Specifications
KAHRAMAA	Electrical and Water Design and Installation Regulations
BS EN 50174	Information technology — Cabling installation
NFPA 130 (2014)	Standard for Fixed Guide way Transit and Passenger Rail Systems
NFPA 72	National Fire Alarm and Signaling Code
QCDFSH	Qatar Civil Defence Fire Safety Handbook
QCDFSS	Qatar Civil Defence Fire Safety Standard
NFPA 101 (2012)	Life Safety Code

Reports:

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

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