PR-NET-OSM-012

# SCAFFOLD AND CONDUCTOR SUPPORT SYSTEMS FOR LIVE OVERHEAD LINE CROSSINGS

## OPERATIONAL SAFETY MANUAL – SECTION 7.5



Scottish & Southern Electricity Networks

| | Name | Title |
|---|---|---|
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# 1 Introduction

This **Approved** procedure defines the requirements for the design, installation and use of **Scaffold**, and **Conductor Support Systems** for the protection of overhead lines that will remain **Live** whilst **Conductor Displacement Works** are completed on an **Over-Running Line**. When used effectively in conjunction with other existing arrangements (e.g. the **OSR**), the requirements set out within this **Approved** procedure will help ensure any associated risk to people, animals, the environment, property and **System** security is mitigated to tolerable levels.

# 2 Scope

2.1 The requirements of this **Approved** procedure are applicable when the **Under-Running Line** and **Over-Running Line** are assets owned and operated by **SSEN-D**. In addition, this **Approved** Procedure **Shall** be used as the minimum standard for situations where the **Under-Running Line** is owned and operated by **SSEN-D** and a third party is responsible for the **Over-Running Line**.

2.2 This **Approved** procedure applies to all Distribution overhead lines owned and operated by **SSEN-D**.

2.3 This **Approved** procedure does not apply to:

- railway crossings
- road crossings
- overhead line crossings where a third party owns and operates the **Under-Running Line**
- substation crossings
- waterway crossings

Note: Crossing situations the same or similar to those listed in 2.3 above, **Shall** be managed in line with an **Approved** procedure (if available), or alternatively via a 'crossing specific' risk assessment and associated safe design and work method. All information relating to such works **Shall** be kept in the pre-construction and construction files and made readily available to persons at all times.

2.4 Instances where the requirements of this **Approved** procedure cannot be applied, or where deviations from the requirements of this **Approved** procedure are required, **Shall** be referred to the **Designated Engineer**.

# 3 References

The documents detailed in Table 3.1 - Scottish and Southern Electricity Networks Documents, and Table 3.2 - External Documents, should be used in conjunction with this document.

**Table 3.1 - Scottish and Southern Electricity Networks Documents**

| Reference | Title |
|---|---|
| PR-NET-OSM-006 | SSEN Distribution Operational Safety Rules – Operational Safety Manual – Section 1.1 |
| PR-NET-OSM-028 | Switching Terminology and Approved Abbreviations - Operational Safety Manual - Section 4.4 |
| PR-NET-OSM-101 | Management of induced voltages on steel tower lines operating at 33kV and above including pole lines operating at 132kV and above |
| WI-NET-OSM-002 | Personal Protective equipment and Workwear for Live Environments |
| N/A | SSEN SHE Handbook (Held in Safety, Health and Wellbeing SharePoint Site) |

**Table 3.2 - External Documents**

| Reference | Title |
|---|---|
| ESQCR | Electricity Safety Quality and Continuity Regulations |
| BS EN 12811-1 | Temporary Works Equipment. Part 1: Scaffolds - Performance requirements and general design |
| BS EN 1991-1 | Eurocode 1 |
| EAWR | Electricity At Work Regulations 1989 – specifically, but not restricted to Regulation 14 |
| ENA TS 43-119 | Design and use of temporary scaffold guards and conductor support systems |
| ENA TS 43-90 | Anti-Climbing Measures and Safety Signs for Overhead Lines |

# 4 Definitions

4.1 The words printed in bold text within this document are either headings or definitions. Definitions used within this **Approved** procedure are defined within the list presented immediately below, or within Section 2 of the **Operational Safety Rules (OSR).**

4.2 **Scaffold**

A structure (i.e. a rigid structure constructed from **Scaffold** poles, clips, fittings, boards, catenary wires/bonds, netting, stay wires, ground anchors, rubbing boards, security fencing, anti-climbing guards, Danger of Death Notices, etc) positioned, at the point which the **Under-Running Line** and the **Over-Running Line** cross, to protect the **Under-Running Line** in the event the **Over-Running Line** fails.

4.3 **Over-Running Line**

The overhead line which crosses over the respective **Under-Running Line**.

4.4 **Under-Running Line**

The overhead line which crosses under the respective **Over-Running Line**.

4.5 **Conductor Displacement Works**

Any works involving the stringing or manipulation of **Conductors** on the **Over-Running Line** where the normal **Conductor** fixings are disconnected/ removed and an increased risk of a **Conductor** dropping onto the **Under-Running Line** is introduced.

4.6 **Conductor Support System**

A system designed specifically for the purpose of containing **Conductors** during **Conductor Displacement Works** which has been **Approved** for use within **SSEN-D** by the **Designated Engineer**.

4.7 **Operational Safety Rules (OSR)**

The **SSEN-D** Distribution set of rules, as read with related documents and procedures, that provide generic safe systems of work on the **System** therefore ensuring the health and safety of all who are liable to be affected by any **Danger** that might arise from the **System**.

# 5 General Responsibilities

Information relating to the various roles and responsibilities for all works completed under this **Approved** procedure, **Shall** be defined in the planning stage of the works and documented within the pre-construction and construction files related to the works and as such made readily available throughout the works. This requirement ensures alignment with the requirements set out within the **SSEN-D** Safe Management of Work procedure.

# 6 Personal Protective Equipment

6.1 Persons who are required to work or carry out work on or near the **System Shall** wear suitably **Approved** Personal Protective Equipment (PPE). Furthermore, where warning labels or signs identify the existence of a particular hazard, additional and appropriate PPE Shall be worn.

6.2 As a minimum, PPE **Shall** meet the requirements of WI-NET-OSM-002

# 7 Training and Authorisation

7.1 Where work under this **Approved** procedure is required to be completed on or near the **System**, the Persons engaged to complete the work **Shall** be suitably competent and authorised in writing in-line with the requirements of the **OSR** and associated **Approved** procedures.

7.2 Persons with responsibilities for the management of works under this **Approved** procedure, **Shall** ensure that all persons engaged to complete the works have been trained, assessed and demonstrate sufficient competence to complete works safely and effectively in-line with the respective requirements.

7.3 A copy of the training records of all persons engaged to complete works under this **Approved** procedure, **Shall** be kept within the pre-construction and construction files related to the works and as such made readily available throughout the works.

# 8 Hierarchy of Control Measures

When considering available options to protect an **Under-Running Line** the hierarchy of control measures listed below **Shall** be used. When using the hierarchy, each option **Shall** be considered, in order and so far as reasonably practicable, the lowest risk option **Shall** be chosen. Justification supporting the option chosen **Shall** be documented in the pre-construction and construction files associated with the works:

1. Remove the **Under-Running Line** and supply customers from an alternative part of the **System**.
2. Permanently underground or divert the **Under-Running Line**.
3. Temporarily remove, underground or divert the **Under-Running Line**.
4. Render the **Under-Running Line** safe for the duration of the works in accordance with the requirements of **OSR** section 4 and any associated **Approved** procedures.
5. Install **Scaffold** in conjunction with the use of a **Conductor Support System**, to protect the **Under-Running Line** in accordance with this **Approved** procedure.
6. Install **Scaffold** to protect the **Under-Running Line** in accordance with this **Approved** procedure, or
7. Use a **Conductor Support System** to protect the **Under-Running Line** in accordance with this **Approved** procedure.

# 9 Design of Scaffold

9.1 **Scaffold Shall** be designed in accordance with industry good practice; and:

- BS 1991: Eurocode 1; and

- BS EN 12811-1: Temporary Works Equipment. Part 1: Scaffolds. Performance requirements and general design

9.2 Where reasonably practicable, **Scaffold Shall** be a rigid protective structure constructed using **Scaffold** poles and/or staging and boards to form a solid protective guard around the **Under-Running Line**. Where, following assessment, it is deemed not reasonably practicable to do this, consideration may be given to the use of a protective guard formed using catenary wires and netting.

9.3 Whatever **Scaffold** construction method is chosen, the **Scaffold**, boards, netting and catenary wires **Shall** be designed to withstand the impact resulting from **Conductors** and/or equipment on the **Over-Running Line** falling onto the **Scaffold**.

9.4 Catenary and stay wires **Shall** be installed at a spacing no greater than 3 metres along the **Scaffold**.

9.5 Simultaneous contact of a 3 metre run of **Conductor(s)** with the guard **Shall** be assumed, and the weight per metre of **Conductor Shall** be taken as the weight of all **Conductors** and equipment that may fall simultaneously; alternatively, the gross weight of replacement **Conductor(s)** and working equipment **Shall** be assumed.

9.6 Where applicable, **Conductor** icing **Shall** be included with an assumed value of 8N/m per **Conductor**.

9.7 **Scaffold** either side of the crossing **Shall** be parallel to each other.

9.8 Each **Scaffold** design **Shall** consider the respective site environmental conditions to ensure ground/ foundation conditions for the **Scaffold** remain suitable for the duration the **Scaffold** is in place. These considerations **Shall** include contingencies for delays and bad weather and ensure that suitable and safe access and egress routes for each **Scaffold** are maintained.

9.9 The documents listed below **Shall** be included in the pre-construction and construction files and made readily available for inspection by persons at all times. These documents **Shall** be specific to each crossing. The list below is not exhaustive:

- A plan showing the extent of the **Scaffold** including outriggers, position of the **Earth** electrodes and associated **Earth** connections to the **Scaffold**, the position of the **Over-Running Line** and **Under-Running Line** and the number and position of catenary wires
- An elevation map/ diagram showing:
  - the position of the **Under-Running Line** and **Over-Running Line**
  - the **Scaffold**
  - the sag of the netting and catenary wires and the clearances which will be maintained
  - the position and type of stay foundations and anchor points
  - the extent/ height of the **Scaffold** that can be erected with **Conductor(s) Live**, i.e. with Persons complying with **Working and Access Clearances**, and other such requirements of the **OSR**
- A programme of work detailing the stages and estimated timescales for construction of the **Scaffold**. Including, where appropriate, details of works which can be carried out with the **Under-Running Line**, and/or **Over-Running Line Live**
- Site specific environmental requirements, including safe access/ egress arrangements, details of any buried services in the vicinity of a **Scaffold**, etc
- A specific risk assessment and work method statement for each **Scaffold**/crossing
- A detailed emergency plan to be enacted in the event of **Danger** arising, specifically detailing actions to be taken in the event of a broken **Conductor** and including a

procedure for recovery of **Conductor**s. The emergency plan **Shall** be agreed during the pre-construction stage of the works and kept in the pre-construction and construction files and made readily available to persons at all times

9.10 In regard to loading of **Scaffold**, the information listed below **Shall** be used:

- Wind load of 570N/m2 applied to **Scaffold** and netting covered with 12.5mm of ice of weight 5000N/m3
- The **Scaffold Shall** be designed to withstand the impact resulting from **Conductors** or pulling bonds on the **Over-Running Line** falling from a minimum height of 15 metres above the guard, onto the guard. Simultaneous contact of 3 metres run of **Conductor(s)** with the guard **Shall** be assumed, and the weight per metre of **Conductor Shall** be taken as the weight of all **Conductors** to be pulled/displaced simultaneously or as the weight of the replacement **Conductor(s)** to be replaced, whichever is greater. Where applicable **Conductor** icing **Shall** be included with an assumed value of 8N/m per **Conductor**

Note: Where the risk of ice is extremely low such as in mid-summer, then the calculations may exclude icing providing agreement has been obtained with **SSEN-D**.

9.11 **Scaffold Shall** extend at least 5 metres beyond the outermost **Conductor** of the **Over-Running Line**. Not more than 2 metres of this projection may take the form of outriggers. This arrangement is shown in Appendix B.

9.12 The permitted clearances between a **Scaffold** and an **Under-Running Line** are provided in Table 9.1 below.

**Table 9.1 - Permitted Clearances**

| Under-Running Line System Operating Voltage | Minimum Horizontal Clearance (Note 1) | Minimum Vertical Clearance to Underside of Scaffold Roof (Note 2) |
|---|---|---|
| <1000V (exposed) | 3.0m + length of longest scaffold pole | 2.9m |
| 11kV | 3.0m + length of longest scaffold pole | 2.9m |
| 33kV | 3.0m + length of longest scaffold pole | 2.9m |
| 66kV | 3.2m + length of longest scaffold pole | 3.1m |
| 132kV | 3.6m + length of longest scaffold pole | 3.5m |

**Note 1:**

Minimum Horizontal Clearance is to be used if **Scaffold** is to be erected with lower line **Live**. If however the **Under-Running Line** is made safe in accordance with the **OSR** for the erection of the **Scaffold**, it is permissible to use of the Minimum Horizontal Clearance minus the length of the longest scaffold pole. Figures stated in Table 9.1 are in still air and consideration **Shall** be given to any additional clearances required taking wind loading and possible **Conductor** movement into account.

**Note 2:**

Minimum Vertical Clearance between lower **Conductor** and the underside of the **Scaffold** roof subject to the imposed loads and with the lower line **Conductor** at -5.6°C and significant wind loading, e.g., that which might result in **Conductor** swing of 45˚.

9.13 The **Scaffold** on both sides of the crossing **Shall** be **Earthed** to an **Earth** electrode system with a combined **Earth** impedance of ≤50Ω.

9.14 1.2-metre-long **Earth** electrodes **Shall** be installed at each of the extremities of the **Scaffold** and supplemented as required to achieve the required **Earth** impedance value. The complete electrode assembly should be tested once all the electrodes are in place and connected together.

9.15 The **Earth** electrode system **Shall** be designed to carry 8kA for 1 sec.

9.16 **Earth** electrodes **Shall** be connected to the **Scaffold** by an **Approved** method.

9.17 Supplementary **Earth** bonding **Shall** be used to ensure the resistance to **Earth** throughout the **Scaffold** installation is as low as reasonably practicable.

9.18 All parts of the **Scaffold Shall** be adequately interconnected to provide low impedance electrical continuity and mitigate, so far as reasonably practicable, the reliance on steel **Scaffold** tubes and fittings conducting electrical fault current in the event of an incident.

9.19 If any part of a **Scaffold** is within 6 metres of any tower steelwork, the **Scaffold Shall** be effectively bonded to the tower using two separate **Earth** bonds. Each **Earth** bond **Shall** be designed to carry 8kA for 1 second. The first **Earth** bond **Shall** be connected between the base of the **Scaffold** and the lowest accessible point on the tower leg; the second **Earth** bond **Shall** be connected between the top of the **Scaffold** and the same lowest available position on the tower leg.

9.20 Where reasonably practicable, the **Scaffold Shall** be enclosed with a temporary security fence designed and installed to prevent unauthorised access. The fence **Shall** be installed greater than 2 metres from any part of the **Scaffold** installation and where deemed necessary (by a **Senior Authorised Person** associated with the works) the fence **Shall** be **Earthed**. In such circumstances the **Senior Authorised Person Shall** determine the **Earthing** requirements for the fence in-line with **SSEN-D** asset standards, and if necessary, seek guidance from the **Designated Engineer**. If a fence is used, it **Shall** be fitted with substation fencing Danger of Death Notices (compliant with Electricity Safety Quality and Continuity Regulations requirements); these notices **Shall** be positioned conspicuously (e.g., at eye level) at regular intervals around the fence circumference, e.g., every other fence panel.

9.21 In situations where the **Scaffold** is not enclosed using a temporary security fence, anti-climbing devices and steel tower type Danger of Death Notices (compliant with Electricity Safety Quality and Continuity Regulations requirements) **Shall** be fitted to the **Scaffold**. In these circumstances ENA TS 43-90 **Shall** be used as guidance in terms of the requirements for the anti-climbing measures needed, so far as reasonably practicable, to prevent third party interference with the **Scaffold** and **Under-Running Line**. Anti-climbing devices **Shall** be fitted to **Scaffolds** at a height between 2.75 metres and 3 metres from ground level; Danger of Death Notices **Shall** be fitted to **Scaffolds** above the anti-climbing device but not higher than 3.5 metres from ground level. Danger of Death Notices **Shall** be positioned conspicuously on the **Scaffold** (e.g. on each face at every corner and at intermediate positions between corners) and separated horizontally at a distance no more than 3 metres apart.

# 10 Scaffold Safety Measures

10.1 All work and operations associated with this **Approved** procedure **Shall** be completed in accordance with the **OSR** and associated **Approved** procedures.

10.2 Safe working methods for the erection of **Scaffold Shall** ensure that **Scaffold** equipment (e.g., catenary wires, netting, etc) does not come into contact with the **Under-Running Line** or **Over-Running Line**, and cause unnecessary damage to the **Under-Running Line**.

10.3 Site measurements relating to **Conductors**, structures, etc, **Shall** be undertaken using optical instruments unless otherwise agreed by an **SSEN-D Senior Authorised Person** associated with the works.

10.4 Immediately prior to construction, the precise location and position of the **Scaffold Shall** be confirmed, and measurements taken at that location. The location and measurements **Shall** be checked for correlation with the pre-construction and construction file information and approved by an **SSEN-D Senior Authorised Person** associated with the works.

10.5 Arrangements **Shall** be put in place to identify and keep safe any buried services in the vicinity of a **Scaffold** before work to erect **Scaffold** commences. Plans of buried services **Shall** be kept within the pre-construction and construction files and made readily available to all parties involved in the work.

10.6 The movement and/or handling of materials and equipment in the vicinity of **Live Conductors Shall** be completed in accordance with the requirements of the **OSR** and associated **Approved** procedures.

10.7 During construction the **Scaffold** structure **Shall** be connected to **Earth** as soon as reasonably practicable. Under no circumstances **Shall Scaffold** be erected above 3 metres in height without the required **Approved Earthing** arrangements in place.

10.8 Anti-climbing devices or security fencing associated with **Scaffold Shall** be installed without delay as soon as the **Scaffold** is erected to a height of 4 metres above ground level. No **Scaffold Shall** be left unattended for any period of time without either its complete anti-climbing device or security fence in place.

10.9 Auto-reclosing facilities **Shall** be disabled on any **SSEN-D Under-Running Line** and **Over-Running Line** during erection of **Scaffold** and the same requested of any other Distribution or Transmission Company as required; this precaution **Shall** also be deployed during **Conductor Displacement Works**.

10.10 In the event of a **System** fault, **Under-Running Line** or **Over-Running Line**, all **Scaffold Shall** be inspected without delay to ensure integrity and suitability for use.

10.11 Circuit protection settings for the **Under-Running Line Shall** be set as sensitive and as fast operating as practicable for the duration of the works. Care must be taken to avoid nuisance tripping on the respective circuit when doing this.

10.12 Each **Scaffold Shall** be inspected and tagged as being fit for purpose before use by a **Competent Person**. Details of each inspection **Shall** be recorded and kept within the construction file. Inspections **Shall** be completed:

- immediately following installation
- every 7 days (maximum)
- following every fault on the **Under-Running Line**, or **Over-Running Line**; and
- following severe weather events, e.g., high winds, ice storms, etc

10.13 When **Scaffold** defects are identified, a **Senior Authorised Person** associated with the works must be informed without delay and the **Scaffold Shall** not be used until inspected and tagged as being fit for purpose.

10.14 During **Conductor Displacement Works**, a **Competent Person Shall** be positioned at a safe distance from each **Scaffold** with full visibility of the **Scaffold** and work site. The **Competent Person Shall** have in place, continuous open communication with the workforce (e.g., winch and drum operators) and be able to communicate an immediate stop to works if **Danger** arises.

10.15 Actions to be taken in the event of **Danger** arising **Shall** be detailed in an emergency plan which has been agreed and shared with all persons engaged in the works prior to works commencing. This emergency plan **Shall** be kept in the construction file and made readily available to persons at all times.

10.16 In situations where there is an operational boundary between the **Under-Running Line** and the **Over-Running Line**, the requirements for co-ordination across the boundary **Shall** be agreed with the respective **System Control Engineers**, in-line with standard procedures and protocols.

# 11 Design of Conductor Support Systems

11.1 Only **Conductor Support Systems** that have been previously **Approved** by the **Designated Engineer** can be considered for use with this **Approved** procedure.

11.2 The documents listed below **Shall** be included in the pre-construction and construction files and made readily available for inspection by persons at all times. These documents **Shall** be specific to each crossing. The list below is not exhaustive:

- An elevation document showing the position of the **Under-Running Line**, the **Over-Running Line**, the sag of the catenary support system during travel, the electrical clearances required, and the direction of travel.
- A detailed emergency plan which can be enacted in the event of **Danger** arising. This plan **Shall** detail the actions to be taken in the event of a broken **Conductor** and/or equipment failure; details regarding how **Conductors** and/or equipment (including the **Conductor Support System**) will be effectively recovered **Shall** also be included. The emergency plan **Shall** be agreed during the pre-construction stage of the works and kept in the pre-construction and construction files and made readily available to persons at all times
- A specific risk assessment and work method statement for each deployment of the **Conductor Support System.**

11.3 The feasibility of using a **Conductor Support System Shall** be determined by design during the design/planning stage of the respective project. Supporting technical information to justify using a **Conductor Support System Shall** be made available and kept within the pre-construction file. Such justification **Shall** include information relating to clearances, weights, tensions, factors of safety, assumed condition of existing **Conductors** and available working strength, emergency recovery requirements, other assumptions used, references to industry standards and guidance, etc.

11.4 Clearances between the **Under-Running Line** and the **Conductor Support System**, **Shall** be recorded with the wind loading on the **Under-Running Line** at 45˚ **Conductor** movement, and the operating temperature of the **Under-Running Line** and **Over-Running Line** between -5.6°C and maximum operating temperature (MOT). Consideration for these clearances **Shall** also be given to the weight of the deployed system and its net effect on the sag of the **Over-Running Line**.

11.5 The condition and integrity of the **Over-Running Line Conductors Shall** be established and deemed sufficient to withstand any additional forces they may become subject to during the work. **Conductor** integrity may be established by sampling the **Conductor(s)** at an appropriate location or by Cormon testing. If the **Conductor Support System** is to be used in conjunction with a **Scaffold**, the suitability of existing **Over-Running Line Conductors** for use in conjunction with a **Conductor Support System** can be determined by visual engineering assessment.

11.6 The permitted clearances between the **Conductor Support System** and the **Under-Running Line**, are provided in Table 11.1 below:

**Table 11.1 - Permitted Clearances**

| Lower Line System Operating Voltage | Minimum Vertical Clearance Between Upper and Lower Lines |
|---|---|
| <1000V | 2.9m + Maximum Distance (spacing) Between Cradle Blocks |
| 11kV | 2.9m + Maximum Distance (spacing) Between Cradle Blocks |
| 33kV | 2.9m + Maximum Distance (spacing) Between Cradle Blocks |
| 66kV | 3.1m + Maximum Distance (spacing) Between Cradle Blocks |
| 132kV | 3.5m + Maximum Distance (spacing) Between Cradle Blocks |

11.7 All containment/ cradle blocks **Shall** have the properties listed below:

- the ability to effectively contain **Conductor(s)** over the crossing in the event of a breakage during **Conductor Displacement Works**; and
- allow the unhindered passage of a mid-span **Conductor** joint, or a **Conductor** stocking connection

11.8 Ropes associated with **Conductor Support Systems Shall** have the properties listed below:

- high strength to low weight ratio
- low stretch under loading; and
- non-conductive

11.9 Additional loads and forces introduced by a **Conductor Support System** will impact existing tower designs and therefore the design justification for use of a **Conductor Support System Shall** consider all reasonable eventualities, including:

- deployment of the **Conductor Support System** on existing **Conductors** and structures
- tensioning of the existing **Conductors**
- tensioning the temporary **Conductor Support System**
- tensioning during pulling of the **Conductors**; and
- tensioning of the new **Conductor** up to sag and working tension/ position

## 12 Conductor Support System Safety Measures

12.1 All work and operations associated with this **Approved** procedure **Shall** be completed in accordance with the **OSR** and associated **Approved** procedures.

12.2 Site measurements relating to **Conductors**, structures, etc, **Shall** be undertaken using optical instruments unless otherwise agreed by an **SSEN-D Senior Authorised Person** associated with the works.

12.3 The movement and/or handling of materials and equipment in the vicinity of **Live Conductors Shall** be completed in accordance with the requirements of the **OSR** and associated **Approved** procedures.

12.4 Actions to be taken in the event of **Danger** arising **Shall** be detailed in an emergency plan which has been agreed and shared with all persons engaged in the works prior to works commencing. This emergency plan **Shall** be kept in the construction file and made readily available to persons at all times.

12.5 During **Conductor Displacement Works** using **Conductor Support Systems**, **Competent Persons Shall** be positioned at sufficient safe locations from **Over-Running Line**, but with full visibility of the works. **These Competent Persons Shall** have in place, continuous open communication with the workforce (e.g. winch and drum operators) and be able to communicate an immediate stop to works if **Danger** arises.

12.6 Auto-reclosing facilities **Shall** be disabled on both the **Under-Running Line** and **Over-Running Line** during the installation of **Conductor Support Systems** and for the duration of **Conductor Displacement Works**.

12.7 Circuit protection settings for the **Under-Running Line Shall** be set as sensitive and fast operating as practicable for the duration of the works. Care must be taken to avoid nuisance tripping on the respective circuit when doing this.

12.8 In situations where there is an operational boundary between the **Under-Running Line** and the **Over-Running Line**, the requirements for co-ordination across the boundary **Shall** be

agreed with the respective **System Control Engineers**, in line with standard procedures and protocols.

# 13 Conductor Support System Deployment

13.1 The **Conductor Support System** in its entirety **Shall** be inspected by a **Competent Person** before every use. Inspection tags and/or colours **Shall** be confirmed as being in place and records **Shall** be kept in the construction file. Equipment deemed to be not suitable for use **Shall** be quarantined in a specific controlled area and prevented from being used.

13.2 A crossing specific cradle block spacing schedule **Shall** be available on each respective work site and within the construction file. The schedule **Shall** be used by **Competent Persons** during the installation of the cradle blocks on the support rope. On completion of the cradle block installation, cradle block spacing **Shall** be checked against the cradle block spacing schedule by two **Competent Persons**, and the associated records in the construction file should be updated with the related details, including the names of the **Competent Persons** involved.

# 14 Revision History

| No | Overview of Amendments | Previous Document | Revision | Authorisation |
|---|---|---|---|---|
| 01 | New document created | n/a | 1.00 | Richard Gough |
| 02 | Update to new template and to bring into the Operational safety Manual | PR-NET-OSM-012 (Rev1.00) | 2.00 | Richard Gough |
| 03 | | | | |

# Appendix A Elevation of Scaffold and Netting over 11kV Crossing

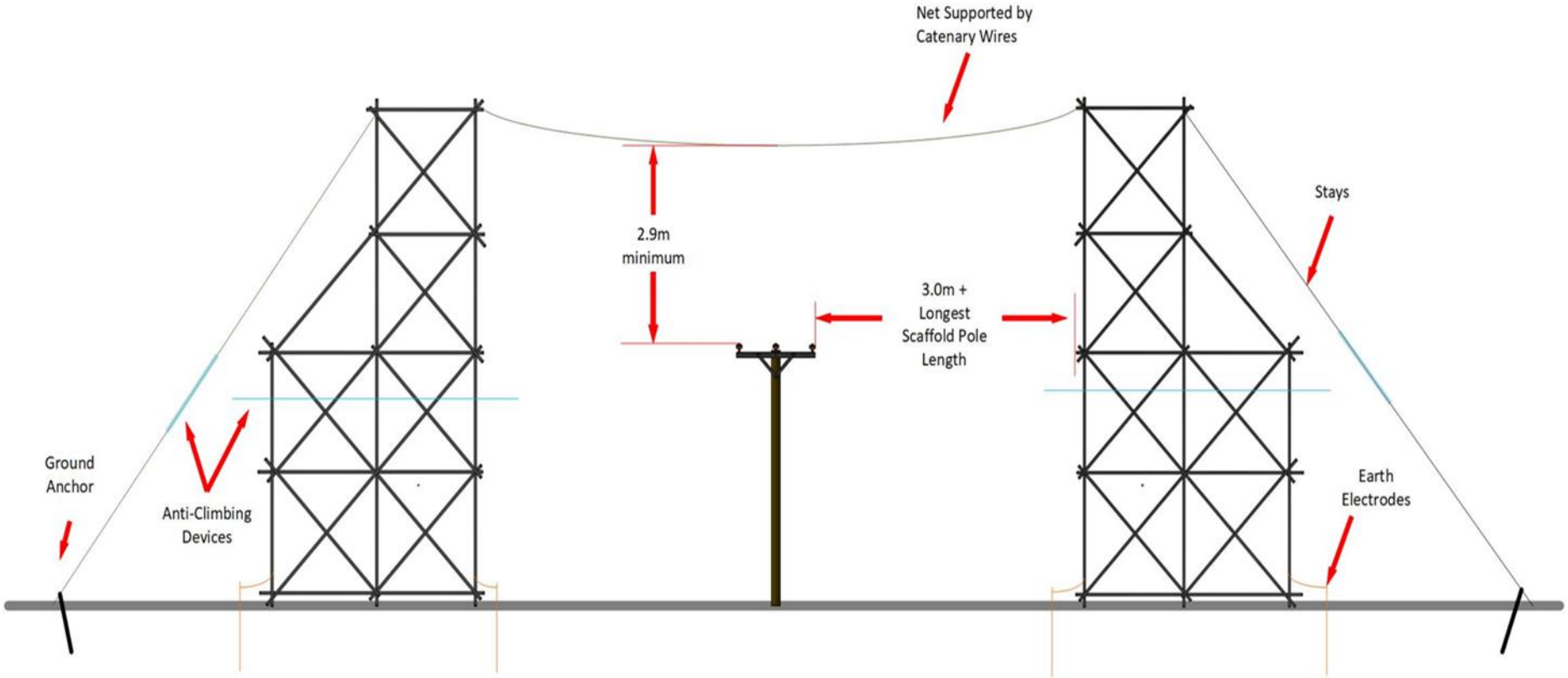


**Figure A.1 - Elevation of Scaffold and Netting over 11kV Crossing**

# Appendix B Plan of Scaffold and Netting over 11kV Crossing

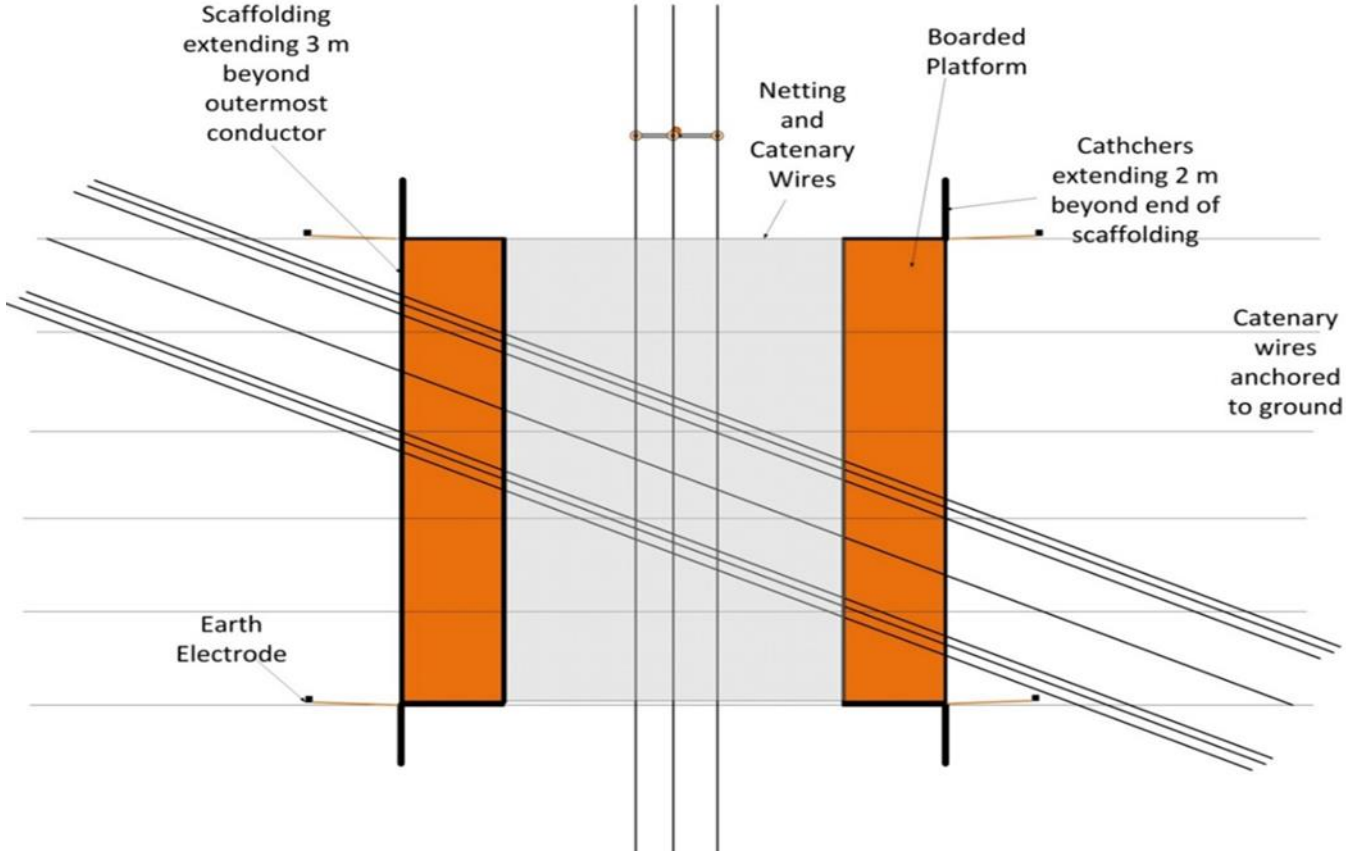


**Figure B.1 - Plan of Scaffold and Netting over 11kV Crossing**