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Technical Specification 43-119

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Design and use of temporary scaffold guards and conductor support systems

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PUBLISHING AND COPYRIGHT INFORMATION

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Amendments since publication

Issue	Date	Amendment
Issue 2	February 2016	Major revision of Issue 1: (i) to reflect changes made to the Standards referenced (ii) to update scaffold design requirements in conjunction with the National Access and Scaffolding Confederation (NASC) (iii) to include option for an alternative to scaffold guards where on site clearance is inadequate. Clause numbering of this Technical Specification has changed significantly to conform to the latest ENA engineering document template. NOTE: To avoid confusion due to the re-numbering of existing clauses and addition of new clauses, the clause numbering (in the document) refers to this revised version, Issue 2. The clause numbers of Issue 1 are given in brackets, where relevant, for cross referencing. This issue includes the following principal technical changes. Foreword: Standard wording added in respect of ENA engineering document template and content largely replaced. Clause 1, Scope (Issue 1, Clause 1). New paragraph added to include ‘conductor support systems’ within the scope. Clause 2, Normative references (Issue 1, Clause 2). References updated, deleted or added as relevant. New Clause 3, Terms and definitions. Clause added to define terms used in the document and to clarify their intent. New Clause 4, Overhead line clearance considerations. Clause added to include requirements for the design of overhead lines at crossings and minimum clearances during erection works.

		New Clause 5, Approach to overhead line maintenance/refurbishment work. Clause added to include requirements for a feasibility study for the installation of a scaffold guard at a crossings and the option of using a scaffold guard or a conductor support system. Clause 6.1 (Issue 1, Clause 3.1), Railway infrastructure requirements. New paragraph 1 and 2 inserted to provide overview of Network Rail Standards and included reference to ENA EREC G56. Requirements for temporary conductor support system inserted. Clause 6.2 (Issue 1, Clause 3.2), Road infrastructure crossings — motorways and trunk roads. The term 'major road' has been changed to 'trunk road' throughout the document to align with the terminology used by the Department of Transport and the various highway authorities. Previous item i) relating to 'sockets in the central reservation' has been deleted as this is a legacy practice no longer used. Requirements for temporary conductor support system inserted. Clause 6.4 (Issue 1, Clause 3.4), Live overhead line crossings. Previous paragraph 1 deleted and new requirement to adhere to ENA TS 43-8 Clause 11 inserted. New Clause 7, Design and deployment of temporary conductor support system. Clause added to specify high level design and deployment requirements for conductor support systems. Clause 8.1 (Issue 1, Clause 4.1), Scaffold structures and foundations. Paragraph 2 has been amended to delete reference to BS 5973, BS 5950 and BS 1139 as these are superseded Standards. New references to BS EN 12811-1, TG20, BS EN 39, BS EN 10210-1, BS EN 12810-1 and BS 2482 inserted. Requirement details amended to reflect latest scaffolding practice. New Clause 8.2, Ground investigations. Clause added to stipulate requirements for ground investigations. These are necessary to ensure scaffold anchors are fit-for-purpose. Clause 8.3 (Issue 1, Clause 3.5). This Clause has been moved and re-titled to 'Earthing of temporary scaffold supports'. Reference to BS 7430 has been added and resistance to earth amended to 1000 ohm to align with an ENAMC specification. New paragraph 2 inserted to address issues with control of common earthing point between scaffolding contractor and ENAMC. Clause 8.4 (Issue 1, Clause 4.2), Nets and support wires. Sub-clauses 8.4.1 and 8.4.2 now clarify updated requirements for steel wire ropes and net respectively. New Clause 9, Clearances. All clearance requirements for scaffolds and conductor support systems are now included under a standalone clause. New Clause 9.1, General. Clause added to stipulate general requirements for clearances. Clause 9.3 (Issue 1, Clause 4.4.2), Road infrastructure crossings — motorways and trunk roads. This clause has been amended to include requirements for temporary conductor support systems. Table 1 has been amended by deleting the previous column for 'elevated and urban motorways and other major roads'. A new column for 'High load route' is inserted. Vertical clearances for Trunk and Non-trunk roads are now the same. Notes 1 and 2 inserted to add clarity for Table 1.

		Clause 9.5 (Issue 1, Clause 4.4.4), Live overhead lines. New sub-clauses 9.5.1 and 9.5.2 added to separate requirements for live lines which are above or below the crossing work. Table 2 column 2 clearance values have been changed to align with ENA TS 43-8 Table 2. New row inserted for '33 kV and below'. Note 2 associated with Table 2 has been amended. Clause 9.6 (Issue 1, Clause 4.5), Anti-climbing devices and warning notices and lamps. Previous paragraph 1 deleted and replaced with reference to a new Figure 3. New paragraph 3 inserted to describe option for fencing instead of anti-climbing devices. Reference to ESQCR inserted with regards to the danger notice added. Clause 10 (Issue 1, Clause 5). Clause retitled to 'Loads and factor of safety for temporary scaffold guards' to highlight that the requirements are not for conductor support systems. New Clause 10.1.1, Self weight. Requirement for scaffolds to withstand self-weight added. Clause 10.1.2 (Issue 1, Clause 5.1.1), Wind loads. All previous content deleted. New reference to BS EN 1991-1-4 inserted. Clause 10.1.3 (Issue 1, Clause 5.1.2), Snow and ice loads. All previous content deleted. New reference to BS EN 1991-1-3 and BS EN 1993-3-1 inserted. New paragraph inserted to clarify requirements for seasons when snow and ice are expected. Clause 10.2 (Issues 1, Clause 5.2), Factor of safety. New requirement inserted for factor of safety 'for stability against overturning'. Issue 1, Clause 5.3, Basis of calculation. The clause is outdated and unnecessary and has been deleted. Clause 11 (Issue 1, Clause 6), Inspection and maintenance. All previous content deleted and new requirements inserted. Previous Figures 1-4 deleted and replaced with new Figures 1 and 2 showing less detail to ensure depictions are 'typical' only. New Figure 3 inserted described anti-climbing arrangement for scaffolds. Annex A. Schedule of requirements. New section added. Annex B. New annex added detailing typical conductor support systems. Annex C. New annex added detailing additional guidance for snow and ice loading on temporary scaffold guards. Bibliography. New clause added to capture Standards not referenced in ENA TS 43-119 which could be relevant to the reader. Details of all other technical, general and editorial amendments are included in the associated Document Amendment Summary for this Issue (available on request from the Operations Directorate of ENA).

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Foreword

This Technical Specification (TS) is published by the Energy Networks Association (ENA) and comes into effect from the date of publication. It has been prepared under the authority of the ENA Engineering Policy and Standards Manager and has been approved for publication by the ENA Electricity Networks and Futures Group (ENFG). The approved abbreviated title of this engineering document is “ENA TS 43-119”.

This document replaces and supersedes ENA TS 43-119 Issue 1 1997.

Where it is necessary to maintain traffic flow below overhead line crossings of roads, railways and waterways during the installation, maintenance or removal of conductors, it is a requirement of the responsible authorities that their traffic is protected. Similarly, at crossings of other power lines, which need to remain energized and in situ during work on conductors of the upper line, it is essential to provide safe working conditions.

The purpose of this Technical Specification is to ensure temporary scaffold guards and similar protection systems are designed and installed in accordance with the relevant National Standards and the requirements of ENA Member Companies. The safe use of the temporary scaffolds and equipment is addressed in this document. The clearance requirements for the temporary scaffold guards are described and an overview of the requirements for each particular crossing.

The design of temporary scaffold guards is subject to BS EN 12811-1 as described in this Technical Specification. In addition, references to relevant parts of Eurocode 1 (BS EN 1991-1) have been included for the calculation of wind, snow and ice loading during scaffold design.

This Technical Speciation is intended for use predominately by organisations designing and installing temporary scaffold guards on behalf of ENA Member Companies.

In addition, this Technical Specification describes requirements for temporary conductor support systems, which may be used where temporary scaffold guards are unsuitable or there is insufficient clearance for a temporary scaffold guard at the crossing.

Those organisations designing and installing temporary scaffold guards should refer to the ‘Schedule of Requirements’ submitted by the ENA Member Company as outlined in Annex A of this document.

Where the term “shall” or “must” is used in this document it means the requirement is mandatory. The term “should” is used to express a recommendation. The term “may” is used to express permission.

NOTE: Commentary, explanation and general informative material is presented in smaller type, and does not constitute a normative element.

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1 Scope

This Technical Specification provides requirements for the design and construction of temporary scaffold guards and temporary conductor support systems to be used at line crossings of roads, railways, waterways and energized power lines, including minimum agreed clearances and advice on acceptable earthing and anti-climbing features.

Temporary conductor support systems are described for use where temporary scaffold guards are unsuitable or insufficient clearance is available at the crossing.

Other agreed methods of protection using scaffolds without netted guards on minor roads, Sky cradles over roads and railways, using interrupter cable on lower voltage power lines and temporary closure or traffic height restriction on waterways are not covered by this Technical Specification.

2 Normative references

The following referenced documents, in whole or part, are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Standards publications

BS 2482*, Specification for timber scaffold boards*

BS 5930, *Code of practice for ground investigations*

BS 7430, *Code of practice for protective earthing of electrical installations*

BS EN 39, *Loose steel tubes for tube and coupler scaffolds. Technical delivery conditions*

BS EN 1991-1-3, *Eurocode 1. Actions on structures. General actions. Snow loads*

BS EN 1991-1-4, *Eurocode 1. Actions on structures. General actions. Wind actions*

BS EN 1993-1-1, *Eurocode 3. Design of steel structures. General rules and rules for buildings*

BS EN 1993-3-1, *Eurocode 3. Design of steel structures. Towers, masts and chimneys. Towers and masts*

BS EN 1997-2, *Eurocode 7. Geotechnical design. Ground investigation and testing*

BS EN 10210-1, *Hot finished structural hollow sections of non-alloy and fine grain steels. Technical delivery requirements*

BS EN 12385-1, *Steel wire ropes. Safety. General requirements*

BS EN 12810-1, *Facade scaffolds made of prefabricated components. Product specifications*

BS EN 12811-1, *Temporary works equipment. Scaffolds. Performance requirements and general design*

BS EN 50341-1, *Overhead electrical lines exceeding AC 1 kV. General requirements. Common specifications*

BS EN 50341-2-9, *Overhead electrical lines exceeding AC 1 kV. National Normative Aspects (NNA) for Great Britain and Northern Ireland (based on EN 50341-1:2012)*

BS EN 62192, *Live working. Insulating ropes*

BS EN ISO 22476, *Geotechnical investigation and testing. Field testing*

Other publications

[N1] ENA EREC G56, *Arrangements for Access by ENA Member Company Staff to Network Rail Infrastructure*

[N2] ENA TS 43-8, *Overhead Line Clearances*

[N3] ENA TS 43-125, *Design guide and technical specification for overhead lines above 45 kV*

[N4] Statutory Instrument 2002 No. 2665, *The Electricity Safety, Quality and Continuity Regulations 2002 (as amended)*

[N5] Statutory Instrument 2015 No. 15, *The Construction (Design and Management) Regulations 2015*

[N6] National Access and Scaffolding Confederation, TG20:13 *Good Practice Guidance for Tube and Fitting Scaffolding*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
catenary wire
cable supported at its ends exhibiting a curved hanging shape

3.2
conductor support system
equipment installed and suspended independently of the conductor to support the conductor during maintenance/refurbishment

3.3
scaffolding contractor
competent scaffold design and installation organisation appointed by the ENA Member Company