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Engineering Recommendation G39

Issue 3 2020

Electrical safety in the planning, installation, commissioning and maintenance of public lighting and other street furniture

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PUBLISHING AND COPYRIGHT INFORMATION

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Issue	Date	Amendment
Issue 2	January, 2013	Major revision of Issue 1 to reflect significant changes to legislation and Standards since 1992. Converted into the new ENA Engineering Recommendation (EREC) template and updated in accordance with Engineering Recommendation G0 Issue 1 2012 *Rules for structure, drafting and presentation of ENA engineering documents*. Re-assigned retained text from Issue 1 into the revised structure of the template, along with considerable amendment and addition to the content. This issue includes the following principal editorial and technical changes. Foreword added and explanatory information included. Introduction amended (including applicable legislation) and list of organisations to be consulted updated. Clause 1 Scope: New clause added outlining revised scope of the document. Clause 2 Normative references: New and updated key documentation referenced. Clause 3 Terms and definitions: Existing terms and definitions updated and new terms and definitions added relating to agent, TN systems and TT systems.

		Clause 4 Statutory Requirements: The summary of applicable legislation updated and new referenced legislation added. Deleted reference to: • The Factories (Electrical Energy) Regulations 1908 • The Electricity (Factories Act) Special Regulations 1944 • The Electricity Supply Regulations 1988 Clause 5 Planning of Public Lighting Systems: Text amended and reference to Appendix C changed to Annex A. Added reference to ILP GP10 and requirement for consultation to include consultants or any other body planning public lighting installations. Clause 6 Means of providing electricity supplies to public lighting and other street furniture: Amended, updated and new sections added to reflect changes in legislation, recommendations and nomenclature whilst retaining general key points from Issue 1. Updated text relating to earthing and bonding of lighting column doors, 5^{th} cores, PME and TT systems. Deleted reference to The Electricity Supply Regulations Street Lighting Exemption 1991. Changed requirements for enclosure height from 3 m to 2.5 m in line with latest Standards. Added note regarding insertion/removal of the main fuse for metered supplies. Clause 7 Erection of columns, lanterns and other street furniture other than on DNO poles: Text updated and reference to Appendix C replaced by reference to Annex A. Clause 8 Erection of lanterns or illuminated signs attached to DNO-owned low voltage poles: Updated and new NOTE on public safety and positioning added. Clause 9 Commissioning, maintenance, repair and emergency attention: Text throughout extensively updated and new sub-clauses added. Clause 10 Avoidance of danger from accidental contact with live conductors during the erection, commissioning and maintenance of public lighting and other street furniture: Text throughout has been updated included “above LV” changed to “high voltage” and added recommendation for physical measures to prevent platforms infringing safety clearances. Clause 11 Competent Persons: Clause and associated Annexes B and C amended. Annex D added as general guidance notes for training providers. Deleted requirement to notify DNO of Category 2 and Category Authorisations at time of authorisation. Added reference to HERS competency scheme. Added note regarding insertion/removal of the main fuse for metered supplies. Clause 12 Developments in electrical equipment: Amended title and reformatted and updated. Annex A Clearances between columns and overhead lines: Originally Appendix A. Sub-clauses renamed and renumbered. Wording of Clause A.2 significantly rationalised and explanatory text deleted. Fig 1 (Clearances from Low Voltage Conductors) moved from the original Appendix C to Annex A as Figure A.1. Annex B Model form of Competent Persons Authorisation Certificate: Minor rewording and formatting of Model Form and cross reference to Annex C.

		Annex C Guidance notes for Competent Persons: Contents moved from Appendix B. Minor rewording and formatting of Guidance notes for Competent Persons. Added “These are considered the minimum requirements…” Changed “Company” to “DNO” throughout. Addition of a new Annex D General guidance notes on training requirements: New addition to EREC G39 to emphasise key points for consideration by organisations or individuals that provide Competent Persons training. Added requirements for trainer qualification and electrical background for persons, who are required to carry out electrical work. Bibliography added at end of document. 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).
Issue 3	January, 2020	Title - Change of title to remove reference to Model Code of Practice to avoid confusion with other Codes of Practice and to bring title into line with Introduction and Scope Clause 2 References General updating of references Clause 3 Definitions Added definition of Authorisation Expanded definition of street furniture to include Electric Vehicle Highway Charging Pillars Subclause 6.3.4 Added requirement from BS 7671 concerning TT supplies to street furniture in the vicinity of existing furniture Clause 11 – Competent Persons Major amendment to allow Competent Persons authorisation to be issued by agreed and acceptable schemes or the DNO/IDNO. Bibliography Recognition of the publication of *The Overhead Lines (Exemption) (Scotland) Regulations 2013*, IET Code of Practice for electric vehicle charging installations, Guide to Highway Electrical Street Furniture.

Contents

Figures

Foreword

This Engineering Recommendation (EREC) 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 “EREC G39”, which replaces the previously used abbreviation “ER G39”.

This EREC replaces and supersedes EREC G39 Issue 2, 2013.

This EREC is intended primarily for use by Distribution Network Operator and Street Lighting and Highway Authority personnel, who are involved in planning, installation, commissioning, and maintenance of public lighting and other street furniture. The requirements equally apply to contractors working on behalf of Street Lighting and Highway Authorities and may be applied to other bodies carrying out similar activities including new installations that will be adopted by Street Lighting and Highway Authorities. It is also a useful reference for providers of Competent Persons training.

The term “lantern”, as defined in Clause 3, is used throughout the document and is interchangeable with the term “luminaire”, which is commonly used.

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.

25

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Introduction

The EREC has been prepared with the intention of giving advice on how interface problems involving work on, or access to, public lighting and other street furniture may be dealt with in a reasonably practicable way, to provide a consistent approach when individual interests overlap. It is not intended to deal with fundamental approaches to safety or to re-state safety policies or the way in which these are implemented by the various parties concerned; neither does it deal with methods of work, tools and equipment developed to deal with a wide range of problems separately encountered by individual organisations.

This EREC has been prepared in consultation with the Health and Safety Executive (HSE), the Institution of Lighting Professionals (ILP), the Highway Electrical Association (HEA), the ENA Safety, Health and Environment (SHE) Managers Working Group and ENA Member Companies (ENA MCs).

Where a contractual agreement exists between parties concerned, this EREC is not intended to supersede such an existing agreement.

Following an agreement between DNOs and the Highway Authorities, particular requirements for training and authorisation of competent persons by the Authority or their agents are included in Section 11.

When public lighting is being installed, the Street Lighting Authority is responsible for safe conduct of the work and for ensuring that appropriate clearances from existing overhead lines are provided. The Distribution Network Operator (DNO) is responsible for ensuring that appropriate clearances are observed when they erect overhead lines adjacent to existing public lighting. For all work it should be remembered that the duties of the employer and employees must be governed by the *Health and Safety at Work etc Act*, *1974* [1], *The Electricity at Work Regulations*, *1989* [2], *The Electricity Safety, Quality and Continuity Regulations 2002* [3], as amended, and any other relevant statutory requirements (see Clause 4).

1 Scope

This EREC is primarily intended to address unmetered supplies and sets out recommended safety procedures and clearances for ensuring electrical safety in the planning, installation, commissioning and maintenance of public lighting and other street furniture. Where supplies are metered, different arrangements and authorisations may apply to the connection and isolation of these types of supplies.

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 7430:2011, *Code of practice for protective earthing of electrical installations*

BS 7671:2018, *Requirements for Electrical Installations. IET Wiring Regulations* (as amended)

Other publications

[N1] ILP GP10, *Safety during the Installation and Removal of Lighting Columns and similar Street Furniture in proximity to High Voltage Overhead Lines*

[N2] ILP GP03, *Code of Practice for Electrical Safety in Highway Electrical Operations*

[N3] HSE Guidance Note GS6, *Avoiding danger from overhead electric power lines*

[N4] ENA TS 43-8 Issue 5, 2019, *Overhead Line Clearances*

[N5] ENA EREC G12 Issue 4, Amendment 1, 2015, *Requirements for the Application of Protective Multiple Earthing to Low Voltage Networks*

3 Terms and definitions

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

3.1
agent
person or party who is authorised to carry out work on behalf of the DNO

3.2
Authority
authority responsible for public lighting or other street furniture installation

NOTE: This term includes contractors working on behalf of the Authority.

3.3
Authorisation
authorisation given to Competent Persons for the purposes of this document by means of a Certificate

NOTE: see Appendix C for a list of Authorisation categories

3.4
Distribution Network Operator (DNO)
organisation that owns and/or operates the electricity distribution network

NOTE: The requirements for DNOs may equally apply to Independent Distribution Network Operators (IDNOs).

3.5
Competent Person
person appointed in writing to carry out a defined range of tasks, who has the necessary skill, technical knowledge and/or experience, and other appropriate qualities, to identify and avoid danger to themselves and/or others when working on or near electrical installations

3.6
street furniture
plant or equipment on or adjacent to the public highway or other public place having a mains supply or indirectly connected to a mains supply.

NOTE: Street furniture includes highway charging pillars for electric vehicles and associated street distribution pillars.

3.7
switch wire
conductor supplying only public lighting or other street furniture but forming an integral part of the DNO's system, and normally controlled by the lighting authority

NOTE 1: Notwithstanding the use of the terms "road lighting" and "street lighting" in some other documents, the term "public lighting" is used in this document as being generally well understood and applicable to lighting in footpaths, etc as well as on roads.

NOTE 2: The term switch wire is also referred to as a "public lighting conductor" where the conductor carrying the public lighting supply is an integral part of the DNO's system, i.e. permanently energised 5th core conductor in a cable.

3.8
TN system
electrical system having one or more points of the source of energy directly earthed, the exposed conductive parts of the installation being connected to that point by protective conductors

3.8.1
TN-S system
TN system where neutral and protective conductors are separate throughout the system

3.8.2
TN-C-S system
TN system where neutral and protective functions are combined in a single conductor in part of the electricity distribution system (PME system)

NOTE: The neutral and protective functions are generally kept separate within public lighting installations.

3.9
TT system
system where the source of supply consists of a line and neutral conductor only

4 Statutory requirements

The following summary of legislation is intended to identify only the principal statutory requirements relating to this document. It is not intended to be a comprehensive statement of requirements. The latest (as amended) versions of the referenced legislation and associated Codes of Practice or Guidance documents apply.

Health and Safety at Work etc Act 1974

The *Health and Safety at Work etc Act 1974* [1] defines in general terms the responsibilities of all persons to ensure the safety and welfare of themselves and others.

The Management of Health and Safety at Work Regulations 1999 (as amended)

The *Management of Health and Safety at Work Regulations 1999* (as amended) [4] are addressed to employers in the majority of workplaces and broadly cover requirements regarding how to consult and involve employees in health and safety matters at work.

The Regulations require employers to carry out risk assessments, make arrangements to implement necessary measures, e.g. basic health and safety, health surveillance, apply principles of prevention and procedures for serious and imminent danger, appoint competent people and arrange for appropriate information and training.

The Electricity at Work Regulations 1989

The *Electricity at Work Regulations* 1989 [2] apply to all premises and workplaces subject to the Health and Safety at Work etc Act, including the electricity network, street lighting installations and associated equipment and to any electrical work to be carried out.

The Electricity Safety, Quality and Continuity Regulations 2002 (as amended) (ESQCR)

The ESQCR [3] specify safety standards which are aimed at protecting the general public and consumers from danger (associated with electricity supply). In addition, the Regulations

specify power quality and supply continuity requirements to ensure an efficient and economic electricity supply service for consumers.

Part II of the ESQCR [3], which covers protection and earthing, applies to electrical supplies to street lighting installations and other street electrical fixtures.

Part V (Overhead Lines), which includes requirements concerning the minimum height, position, insulation and protection of overhead lines should be noted.

Part VII is also of particular relevance and includes sections covering connections to installations or to other networks, provisions for disconnection or refusal to supply, and information to be provided on request.

Electricity Act 1989

Subject to limited exceptions, Section 37 of the *Electricity Act* [5] applies to overhead lines (see also *The Overhead Lines (Exemption) (England and Wales) Regulations 2009* [6A] and *The Overhead Lines (Exemption) (Scotland) Regulations 2013* [6B]). No such line may be installed above ground otherwise than in accordance with the approval of the Secretary of State or Scottish Ministers, as appropriate. Consent may include such conditions as appear appropriate to the Secretary of State or Scottish Ministers, including conditions as to ownership and operation of the line. Contravention of any of the provisions of Section 37 is a criminal offence.

The Construction (Design and Management) Regulations 2015

The *Construction (Design and Management) Regulations* 2015 [7] place obligations on clients, designers, those planning the work and contractors to prevent or reduce risks in those places where these Regulations apply. These obligations include risks from working near overhead lines.

5 Planning of public lighting systems

Apart from the procedures under the *New Roads and Street Works Act 1991* [8], there should be consultation between the Authority and the DNO when public lighting systems are planned[1]. Early consultation is essential when it is intended that a column be erected within the following horizontal distances from overhead line conductors.

a) 1.1 times the height of the column from conductors operating at less than 1 000 volts (LV); or

b) 2.5 times the height of the column in the case of steel tower lines with conductors operating above 1 000 volts (HV); or

c) 2.0 times the height of the column in the case of wood pole lines with conductors operating above 1 000 volts (HV).

In the case of clearances from LV overhead lines, the advice given by the DNO will normally be in accordance with Annex A of this document. In the case of clearances from HV lines, the DNO will give advice appropriate to individual situations (see A.2).

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[1] The requirement for consultation should include consultants or any other body, who are designing or planning public lighting installations.

ILP GP10 [N1] is an important supplement to ILP GP03 [N2] and should be followed in relation to any work to install or remove lighting columns and similar street furniture in the vicinity of high voltage overhead lines owned by the DNO.

Notwithstanding anything required by this document, it is important that the DNO should be approached for advice in any situation where danger exists or is likely to exist or where there is doubt as to the application of this document.

It is important that all parties should act expeditiously on advice given and that those asked for advice should be equally expeditious in providing it.

6 Means of providing electricity supplies to public lighting installations and other street furniture

NOTE: A Code of Practice for electric vehicle charging installations [11] is published by IET.

6.1 Enclosures

The Authority should provide a weatherproof enclosure such as a pillar, a column base or pole-mounted box suitable to the DNO for accommodating and fixing a cut-out and, where a metered supply is to be provided, a meter.

The enclosure shall give a degree of protection to the IP class specified in BS EN 60529 which is appropriate for the location of the enclosure and meets the minimum requirements in the relevant Standards for the type of installation (e.g. BS EN 40-2 for lighting columns).

When the enclosure is within 2.5 m of the ground, or any platform or structure to which the public has access, it is essential that access can only be gained by the use of a tool or key so as to prevent, as far as reasonably practicable, unauthorised access.

The enclosure should have within it a suitable consumer's earthing terminal, preferably independent of the DNO's earthing terminal, to which the Authority should have bonded all exposed metal parts of the street furniture except, under certain circumstances, metal doors (see 6.2).

6.2 Street furniture construction

With reference to the provisions of BS 7430:2011, street furniture may be of:

a) Class I construction, in which exposed-conductive-parts are connected to the earthing terminal within the equipment; or

b) Class II construction, in which no connection to earth is provided by the DNO and no provision is made for connection of exposed metallic parts of the street furniture to earth.

Access panels, covers or doors of street furniture may be of non-metallic or metallic construction and may be hinged or may have to be removed to gain access. Access panels, covers or doors of street furniture should not be relied upon as a means of basic protection for contact with live parts within street furniture.

For street furniture of Class II construction, no electrical connection should be made between metallic access panels, covers or doors and other metallic parts of the furniture.

For street furniture of Class I construction, the following factors should inform the designer’s risk assessment as to whether they do or do not require any electrical connection to earth.

a) Characteristics of the supply system.

b) Characteristics of the earthing system, including consumer earthing provisions.

c) The material of the street furniture, and any surface protection, and that of the access panels, covers or doors.

d) Whether access panels, covers or doors are hinged or have to be lifted off to gain access.

In coming to a reasoned engineering judgement, note should be taken of the recorded instances and future possibility of reversed polarity of the supply or the loss of the neutral connection on the supply side of a TN-C-S system. For example: it would be reasonable for small isolated metal doors of non-conductive columns such as concrete columns, supplied from a PME distribution system that conforms to the ESQCR [3], not to be earthed.

With reference to ILP GP03 [N2] Section 23 (*Appendix – Background to the bonding of lighting column doors*), which refers to Class I equipment: lighting column doors, which have no electrical equipment mounted on them and are not likely to come into contact with wiring do not need to be earthed. Where there is a reasonably foreseeable situation that the door could become “live”, or where the door not being bonded could lead to another danger, the door should be bonded.

In all cases, the DNO should be consulted before design work on new street furniture is commenced to ascertain the type of system that will supply the new installation (see 6.3.1) and reference should be made to BS 7671:2018 (as amended).

6.3 Supply systems for street furniture

6.3.1 General

The DNO may provide a single-phase or three-phase service for supplying individual units of public lighting and street furniture, or groups of such units, with conductors of not less than 4 mm^2 copper (or equivalent) terminated in a cut-out of a type having incoming phase and neutral terminals shrouded so as to prevent, so far as is reasonably practicable, accidental contact with live conductors and incorporating a high breaking capacity (HBC) cartridge fuse and carrier of correct rating.

NOTE: Service conductor size will be dependent on many factors including projected loading, distance from the mains cable, and DNO standards for new services, extensions or refurbishment.

Where cables are laid by the Authority, a similar requirement for all cables and cut-outs shall apply and the Authority should consult the DNO about their intentions. In special circumstances a 3-phase service may be provided, e.g. through a distribution pillar, and this will be treated as a normal service under the ESQCR [3].

NOTE: Where the Authority receives a single point of supply from the DNO and then distributes its own cable network, then the Authority is an (unlicensed) DNO for the purposes of ESQCR [3] compliance.

Each column, lantern or item of street furniture should have a suitable fuse of appropriate rating for the lamp(s) or other equipment which it contains. This should be in addition to, and in series with, any main service fuse. A separate safe and suitable means of isolation should be provided where the fuse link/fuse carrier of the DNO does not provide that facility. For lighting points supplied by a separate service, the additional fuse may not be necessary, provided the Authority is authorised to operate the DNO's cut-out fuse for isolation purposes. Cartridge fuse links (HBC) should be used in all new installations. Where installations are designed to receive HBC fuse links, only HBC fuse links of correct rating and of a type approved by the DNO should be used in the DNO's cut-out.

All internal wiring in the column, lantern or street sign must have separate neutral and earth wiring.

Street furniture supply systems may normally be either TN-S or TN-C-S but a TT system may be adopted, i.e. when the DNO does not provide an earth (see BS 7430 and ENA EREC G12 [N5]).

A DNO separate neutral and earth (SNE) cable/cut-out with a separate neutral and earth may be supplied from a PME network or a network that may be converted to PME in the future. The presence of a DNO SNE cable/cut-out must not be taken to mean that the network is not PME.

6.3.2 TN-S systems

Street furniture may be fed from and protected by a TN-S system and in such arrangements a supply cable with separate line, neutral and protective conductors should be used.

Exposed-conductive-parts of the item of street furniture being supplied should be earthed by connecting them to the earthing terminal within the equipment. The earthing terminal itself should be connected to the supply protective conductor.

If an installation is all Class II, no protective conductor is required. It is recommended that a circuit supplying one or more items of Class II equipment or a mixture of Class I and Class II should have a circuit protective conductor run to and appropriately terminated at each point in wiring and at each accessory.

6.3.3 TN-C-S systems (PME)

The usual method of supplying and protecting street furniture that may be used is by means of a TN-C-S system.

Requirements for the application of PME earthing to public lighting and street furniture shall comply with the general requirements of ENA EREC G12 [N5] and the specific requirements in Clause 6.2.14 and Clause 6.2.15 [of ENA EREC G12].

If the requirements of ENA EREC G12 [N5] necessary for providing a PME earth terminal to a Class I installation cannot be met, a PME supply should not be offered. In this case a TT system should be used.

6.3.4 TT systems

In the case of a TT system, the Authority should provide its own protective earthing electrode(s) and it is essential that both the initial and continuing impedance of the fault path is sufficiently low to ensure the operation of the protective device on the occurrence of a fault in the fixtures.

Where street furniture with a TT supply is to be installed within 2.5 m of existing street furniture, attention is drawn to the requirements of BS 7671. In this case, a suitable alternative location should be considered by all parties concerned or the existing street furniture supply should be converted to TT.

NOTE: See also IET Guide to Highway Electrical Street Furniture, 2018 [12]

6.4 Lighting points supplied from switch wires

Historically, supplies to some street lights have been provided from an additional 5th core within the LV mains cable or an additional small size additional overhead line conductor. This '5th wire' will normally be controlled by a time switch usually located in a feeder pillar or secondary substation.

For existing fifth core cable networks, where the 5th core conductor forms an integral component of the LV mains cable, the number of street lighting columns that can be connected to a single sub fused position will need to be limited such that the total power consumption does not exceed the threshold, which may be specified by the DNO for that fuse rating.

The DNO or Authority may wish to discontinue the provision of existing "switched" 5th core cable networks that are unreliable, uneconomic or no longer fit for purpose. In this case the DNO and Authority should seek to co-operate regarding a programme for transferring 5th core cable connections that accords with the relevant policy of the DNO.

NOTE: The DNO's policy may be to transfer 5th core connections to standard phase conductors of LV mains cables or to permanently energise 5th core cable networks.

When a street light is to be repositioned/replaced along with its immediate service connection to the 5th core cable main connection then the street light should be connected as defined in this document (see 6.3).

The DNO's policy may require this to be connected to a standard phase conductor of the LV mains cable. In normal circumstances, the DNO should liaise with the Authority to ensure this is economic and interruption to street light operation is minimised. Any relevant records should be updated accordingly.

Switch wires, both underground and overhead, including the services to individual lighting points, are the property of the DNO and the supply point is the DNO's cut-out at the termination of the individual service.

Switch wires should be sectionalised at the points where the mains are normally sectionalised, i.e. it should not be possible for a switch wire to remain connected when the mains have been made dead.

NOTE: The neutral conductors of a multiple-earthed system must not normally be sectionalised. If it is necessary to sectionalise the neutral conductor(s) of a multiple-earthed system for operational reasons, then this should be carried out in such a manner as to ensure that the resulting system(s) meet the appropriate Regulations.

Although the Authority may, in some cases, own and be responsible for the equipment controlling a switch wire, in no case should it be assumed by the Authority that an individual light has been made dead because the switch wire has been isolated at the control end.

7 Erection of columns, lanterns and other street furniture other than on DNO poles

The Authority is responsible for ensuring that:

a) the equipment is of such design and construction as to prevent, so far as reasonably practicable, access by unauthorised persons to live electrical equipment and/or danger to the public;

b) the procedures under the *New Roads and Street Works Act* (1991) [8], are observed where applicable; and

c) the agreement of the DNO is obtained for the positioning of equipment in proximity to overhead lines (see Annex A).

Consideration should be given by the Authority to fixing signs to lighting columns that are installed below or immediately adjacent to overhead lines, to alert personnel to the danger.

8 Erection of lanterns or illuminated signs attached to DNO-owned low voltage poles

Lanterns should be attached only to poles where the highest operating voltage on the overhead line does not exceed 1 000 volts.

The Authority must obtain prior written consent from the DNO for each lantern or illuminated sign, which is proposed to be attached to a DNO-owned pole, and it should be noted that the attachment of such lanterns and signs is at the sole discretion of that DNO. The erection or

removal of all lanterns, illuminated signs and other equipment on DNO poles should be carried out by the DNO personnel unless otherwise agreed between the parties involved.

The positioning of the equipment should be such that it does not unreasonably interfere with any subsequent work by the DNO at that location.

Lanterns, illuminated signs, supporting brackets and control equipment including accommodation for the DNO's cut-out should, as a unit, be to a standard appropriate to the circumstances of each case.

The lantern or illuminated sign and its supporting bracket should normally be at least 1 m from, and at least 1 m below any conductor and not less than 3 m from the ground. These minimum clearances are required in order that maintenance work can proceed in accordance with 10.2.

NOTE: Equipment should be positioned such that it does not provide ready access by the public to live conductors, i.e. as a climbing aid.

Live parts shall be either fully covered in insulating material or within an enclosure which provides a degree of protection to the IP class specified in BS EN 60529 appropriate to its location (see 6.1).

All extraneous-conductive-parts, including metallic poles themselves, should be effectively earthed.

Cables should be insulated and sheathed or otherwise adequately protected. All lighting equipment other than cables in earthed conduits or having an earthed metallic screen should be at least 0.3 m from any Telecommunications Provider’s equipment, which may be on the pole.

9 Commissioning, maintenance, repair and emergency attention

9.1 General

The Authority is responsible for ensuring that their installations and control gear, etc are properly installed and maintained in good condition and comply with statutory requirements and acceptable standards, e.g. BS 7671 and approved Codes of Practice.

9.2 Commissioning

At the discretion of the DNO, the Authority may test and wire their installations to the outgoing side of the DNO's cut-out and notify the DNO of the results of tests on the appropriate document as required by the DNO.

The initial insertion of the main fuse and any subsequent insertion, removal and/or replacement of main fuses at the supply point will be carried out by the DNO unless the DNO is satisfied that such insertion will only be carried out by Competent Persons (see Clause 11).

NOTE: Insertion/removal of the main fuse for a metered supply will only be carried out by the Meter Operator (or the DNO in the case of supply loss or an emergency).

9.3 Operation and maintenance

Although the development of cut-outs is a continuous process, many existing cut-outs are of a design and construction different from that of newer equipment in that they do not have shielded live terminals. The standard of competency of the person working on cut-outs must always be commensurate with the risks and requirements of the situation. It is therefore essential that steps should be taken to ensure that such persons understand clearly the method of work to be adopted in a particular case to prevent danger, e.g. the use of temporary

terminal shrouds. In case of doubt the DNO should be consulted. Site personnel carrying out such work should be Competent Persons (see Clause 11).

Work by the Authority in substations, network distribution pillars and other supply equipment owned by the DNO is not permitted unless specifically sanctioned by the DNO. Care should be taken to establish ownership and supply arrangements before proceeding with any work, e.g. on network distribution pillars that may not be DNO assets.

When work is being carried out in the vicinity of underground electric cables, care should be taken to avoid damaging existing cables and any other underground services, and work should proceed in accordance with HSE Guidance Note HSG47 [9].

9.4 Repair and emergency attention

The DNO should be notified without delay of any accidents, damage, repair requirements or suspected defects associated with their equipment. In an emergency, such as damage to a column or other equipment containing a DNO electricity supply, the Authority should take any necessary immediate action to safeguard the public. In such circumstances the DNO should be contacted to carry out any necessary disconnection and/or repair to their equipment.

The Authority is at all times responsible for ensuring that their enclosures are maintained so as to provide suitable security for the DNO's service equipment (see Clause 6).

9.5 Abnormal positioning of lighting brackets

All maintenance work of any nature on a lighting bracket on a DNO pole which has been placed level with or above the low voltage lines, rather than the normal position 1 m below, should be done by the DNO personnel or their agents, which may include Authority personnel who are Competent Persons.

10 Avoidance of danger from accidental contact with live conductors during the erection, commissioning and maintenance of public lighting and other street furniture

10.1 General

Prior to the erection of lighting equipment and other street furniture in proximity to live conductors the DNO may set down reasonable requirements such as those detailed below:

a) In the case of LV lines, the column or fixtures to be shrouded with suitable insulating material during erection.

b) In the case of LV lines, the conductors to be temporarily insulated while works are in progress.

c) Any special safeguards justified in particular circumstances which might include having the conductors made dead during erection work.

d) The use of hinged columns.

This in no way relieves the Authority of their responsibilities with regard to safety (see also Clause 4).

The work should be supervised on site by a Competent Person as detailed in Clause 11.

Where hinged columns are installed in the vicinity of overhead lines, operatives must not ascend to the top of any such column that is in the raised position unless, on account of special circumstances, specific permission is first obtained. All work must be carried out from ground level after such a column has been lowered with the appropriate raising/lowering device.

All working platforms must be constructed of suitable non-conducting material to ensure that the operator is working within an insulated zone. Advice must be obtained from the DNO before working near high voltage lines.

Relevant recommendations in HSE Guidance Note GS6:1997, *Avoidance of danger from overhead electric power lines* [N3] should be followed when planning and carrying out work near overhead lines.

10.2 Work in the vicinity of low voltage conductors

Any work on installations (including control units and fuse boxes and the painting of brackets and conduits) should be carried out by Competent Persons, who must at all times conduct the work in such a manner that they do not bring any part of their body, any working tool or any part of the working platform within a distance of 1 m of any uninsulated conductor operating at low voltage. The Authority must arrange for the DNO or their agents to undertake all work necessary on such installations where the 1 m clearance cannot be observed or where the bracket is level with, or above, the overhead line.

Before any wood pole is climbed it shall be tested by appropriately trained personnel. No pole badly impaired by decay or damage or to which a label has been affixed indicating impairment by decay or damage shall be climbed.

Metal ladders or ladders with exposed metal-reinforced stiles must not be used at or near poles which carry uninsulated conductors.

10.3 Work in the vicinity of high voltage conductors

It is essential that safe working clearances (normally not less than 3 m) from live conductors are observed at all times. No part of a working platform used in the vicinity of high voltage overhead lines operating must be raised to a height greater than 1 m below the top of the column and the platform must be kept as close to the column as practicable, depending on the position relative to the line. Where practicable, physical measures should be taken to prevent platforms from accidentally infringing safety clearances.

11 Competent Persons

11.1 General

Personnel carrying out work on Authority equipment that contains an electrical supply or is in proximity to overhead lines should be Competent Persons with written authority to carry out the specific work required.

A suitable form of written authority shall be issued to each Competent Person by the Authority or their agents (which may include the DNO), clearly stating the scope of the authorisation. This scope may include:

- Supervision of the erection of lighting columns and fittings in the vicinity of overhead electric power lines;
- all electrical duties including testing, wiring and maintaining the installation,
- work in the vicinity, i.e. at a distance of not less than 1 m for LV lines and 3 m for HV lines, of the DNO's overhead lines for lamp replacement, lantern cleaning and for the painting of structures.
- the initial insertion, removal and replacement of the DNO's cut-out fuse

NOTE: Insertion/removal of the main fuse for a metered supply will only be carried out by the Meter Operator (or the DNO in the case of supply loss or an emergency).

Training and/or authorisation of Competent Persons shall be either by the Authority or their agents, after ensuring that the relevant employee has been appropriately trained, assessed as competent and authorised in accordance with 11.2 below, or by the DNO or the IDNO, at the request of the employer (of the site personnel).

Attention should be drawn to the essential factors and to the electrical and mechanical dangers and other physical hazards which may be anticipated when carrying out the work. As an aid to interested parties, a “Model form of Competent Persons authorisation certificate” is included in Annex B, and Annex C provides accompanying guidance notes for Competent Persons.

Competent Person training, either internally or through a recognised external training provider, should be carefully tailored to ensure that the appropriate levels of skill, technical competence and safety awareness are achieved to prevent danger from electrical installations. It is very important that appropriate health and safety training is provided to all authorised staff who carry out assigned duties.

Where employers work across more than one DNO area, then training and/or authorisations given under this EREC which are accepted by one DNO shall be accepted by other DNOs.

11.2 Particular requirements for training and authorisation by the Authority or their agents

The training and authorisation process shall satisfy the following requirements for the administrative control of the training, refresher training, safety induction, competency assessment and authorisation responsibilities:

a) Authorities or their agents shall follow a nationally accredited scheme such as the HEA’s Electrical Registration Scheme (HERS)

NOTE: HERS is based on the requirements in NHSS8 [10]. See Annex D.

b) An Authority or its agent operating to a nationally accredited scheme shall conduct an information exchange with the DNO comprising:

- Presentation of compliance with the scheme;
- A DNO CDM safety induction;
- Confirmation of safety rules, PPE and electrical testing requirements for operation of cut-out fuses on unmetered connections.

c) Authorities or their agents shall authorise their competent operatives and maintain their authorised persons register. This register shall be shared with the DNO if and when requested.

d) Where a reportable incident occurs, the Authority shall cooperate with the DNO to investigate.

e) Authorities shall temporarily suspend authorisation of operatives involved in electrical incidents until investigation is complete and a plan agreed for the lifting of the temporary suspension.

f) Authorities shall assure an on-going competency refresher training scheme is in place and to maintain an accurate and current authorised person register.

12 Developments in electrical equipment

The development of electrical equipment is a continuous process and it is inevitable that certain items of electrical equipment and enclosures already in use on public lighting systems will be of a design and construction which may fall below that of current standards.

As new equipment and standards are introduced, e.g. new installations, maintenance practices or refurbishment projects, it is important that DNOs and Authorities continue to assess and develop appropriate safe work practices. A process for identifying and replacing equipment that falls below current standards should also be implemented.

Annex A
(normative)

Clearances between columns and overhead lines

A.1 Clearances from low voltage conductors

In the case of uninsulated conductors, the clearance between a conductor and a column or lantern mounted thereon shall be not less than 1.5 m, subject to the other requirements of this sub-clause.

In the case of conductors insulated for a distance of not less than 1.5 m on either side of the column, the clearance between a conductor and a column shall be not less than 0.3 m. Subject to the same provisos and the other requirements of this sub-clause, the clearance between a conductor and a lantern shall not be less than 1 m.

It shall not be permissible normally to install a column such that the overhanging arm of the column is located over the conductors unless:

a) the conductors are insulated throughout the length of the span; or

b) the conductors are insulated for a distance of not less than 1.5 m on either side of the column and spacers are provided to prevent conductor clashing; or

c) conductor clashing is prevented by some other means.

Where conductors are located beneath the overhanging arm of a column, the conductors shall not be located within a horizontal distance of 1 m from the lantern. The clearance between a column or lantern mounted thereon and a pole shall not be less than 1.5 m.

With reference to ENA TS 43-8 [N4], the clearances specified above are illustrated in Figure A.1.

The potential “falling arc” of a lighting column, whereby contact could be made with uninsulated live conductors beyond any insulated conductors, should also be considered, e.g. during the planning process. Clearances for high mast installations with integral maintenance facilities including permanent access platforms, which could reduce electrical clearances when in use, shall be agreed with the DNO.

A.2 Clearances from high voltage conductors

It is not possible to prescribe general safety clearances from high voltage overhead conductors because movement of the conductor depends upon site specific factors such as:

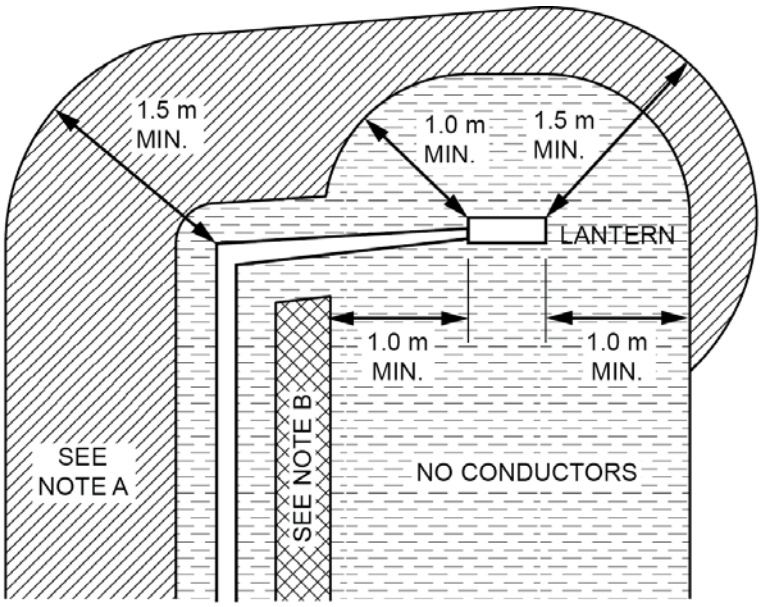
a) the span length of overhead lines;

b) ambient temperature;

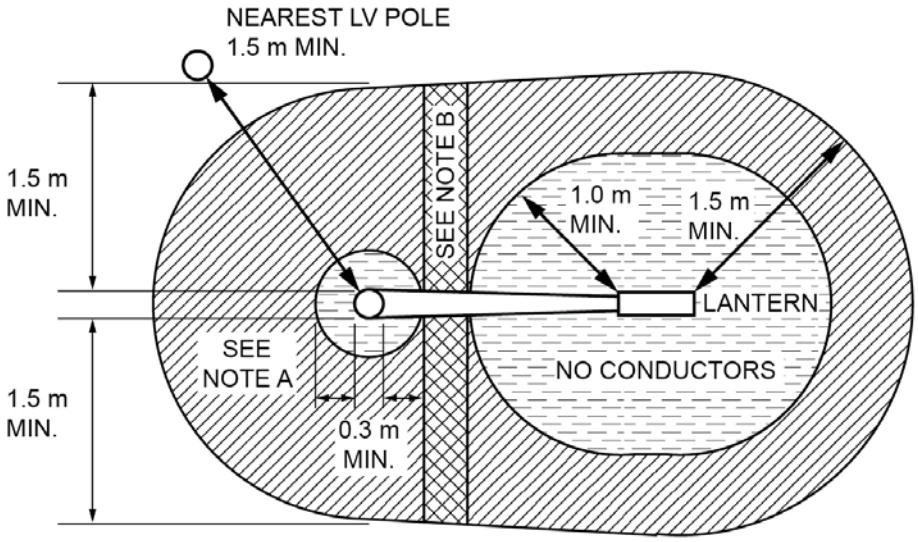
c) wind strength.

Additionally, clearance distances are dependent on the operating voltage of the particular line and it may not be possible for Authorities to identify this voltage. Another factor which affects any clearances specified is the use of hinged columns.

In light of these factors, it is not practicable to provide a schedule of clearance distances in this document and safe working clearances from HV lines shall be determined in consultation with the DNO. Any clearances specified by the DNO shall be maintained at all times.



ELEVATION



PLAN

A ALL PHASE AND NEUTRAL AND SWITCHWIRE CONDUCTORS IN THIS AREA SHALL BE EFFECTIVELY INSULATED FOR 1.5m FROM THE COLUMN OR LANTERN

B ALL PHASE AND NEUTRAL AND SWITCHWIRE CONDUCTORS BENEATH THE OVERHANGING ARM OF THE COLUMN SHALL BE INSULATED THROUGHOUT THE SPAN OR EFFECTIVELY INSULATED AS IN 'A' ABOVE BUT WITH SUITABLE CONDUCTOR SPACERS.

Figure A.1 — Clearances from low voltage conductors

Annex B
(informative)
Model form of Competent Persons Authorisation Certificate

Certificate Number …….....

Name and address of Authority in whose area work is being carried out

Category of Authorisation

*(Delete any Category, which is not applicable)

Category 1*

To supervise the erection of lighting columns and fittings in the vicinity of electricity overhead lines.

Category 2*

To carry out all electrical duties including the following:

a) the testing of installations;
b) the wiring of installations to the outgoing side of (but excluding the connection to, unless otherwise agreed) the DNO's cut-out;
c) the maintenance of installations;
d) the initial insertion, removal and replacement of the DNO's cut-out fuses (Public lighting fuses only).

Category 3*

To work in the vicinity of electricity overhead lines and to withdraw and replace the DNO's cut-out fuse carriers for:

a) lamp replacement and cleaning purposes;
b) painting of structures.

Name of Competent Person (BLOCK LETTERS) …….....

Name and address of employer .....

Authorised by ..... (signed) Position …..... Date .....

Received by ..... (signed) Date .....

This Certificate is valid until Date .....

A copy of this Certificate shall be held by the Competent Person named above. All Competent Persons must observe the appropriate guidance notes in Annex C.

Annex C
(informative)
Guidance notes for Competent Persons

NOTE: This Annex is presented for general information and does not over-ride the requirements in other parts of this document.

Competent Persons issued with an Authorisation Certificate must observe the requirements of this Engineering Recommendation (EREC), relevant parts of which are summarised below for general guidance. These are considered the minimum requirements for persons who work on electrical installations covered by the scope of this document.

Category 1 Authorisation

a) Work must be conducted in such a manner that no part of the body, working tool or any part of the working platform is within a distance of 1 m of any exposed overhead conductor operating at low voltage (LV). The DNO or their agent will undertake any work necessary on such installations where the 1 m clearance cannot be observed, or where the bracket is level with, or above, the overhead line.

b) When working in the vicinity of overhead lines operating above low voltage, a minimum safe working clearance of 3 m between any part of the body or any tool or equipment and the overhead line must be maintained at all times. No part of working platforms used in the vicinity of overhead lines operating above LV must be raised to a height greater than 1 m below the top of the column. The platform must be kept as close to the column as practicable. Where hinged columns are installed in the vicinity of overhead lines, operatives must not ascend to the top of any such column which is in the raised position unless, on account of special circumstances, authority in writing is first obtained.

c) Lifting and other equipment must be used in accordance with safety recommendations as issued by appropriate National Authorities.

d) The safety recommendations of the DNO must be ascertained and adhered to.

e) Clearances as may be agreed with the DNO must be adhered to.

f) The DNO must be notified without delay of any danger, repair requirements or suspected defect in their equipment.

Category 2 Authorisation

a) The work must be conducted in such a manner that no part of the body, working tool or any part of the working platform is within a distance of 1 m of any exposed overhead conductor operating at low voltage (LV). The DNO or their agent will undertake any work necessary on such installations where the 1 m clearance cannot be observed or where the bracket is level with, or above, the overhead line. When working in the vicinity of overhead lines operating above LV a minimum safe working clearance of 3 m between any part of the body or tool or equipment and the overhead line must be maintained at all times.

b) No part of working platforms used in the vicinity of overhead lines operating above LV must be raised to a height greater than 1 m below the top of the column. The platform must be kept as close to the column as practicable. Where hinged columns are installed in the vicinity of overhead lines, operatives must not ascend to the top of any such column which is in the raised position unless, on account of special circumstances, authority in writing is first obtained.

c) Before any wood pole is climbed it must be tested for the detection of decay. No pole impaired by decay or damage shall be climbed.

d) Metal ladders or ladders with metal-reinforced stiles must not be used.

e) Only HBC fuse links of the appropriate type and rating shall be used in the DNO's cut-out fuse carriers.

f) In no case shall it be assumed that a lamp or associated equipment has been made dead because a switch wire owned by the DNO has been isolated at the supply end.

g) The DNO must be notified without delay of any damage, repair requirement or suspected defect in their equipment.

h) Clearances as may be agreed nationally must be adhered to.

Category 3 Authorisation

a) The work must be conducted in such a manner that no part of the body, working tool of any part of the working platform is within a distance of 1 m of any exposed conductor operating at low voltage (LV). The DNO or their agent will undertake any work necessary on such installations where the 1 m clearance cannot be observed or where the bracket is level with, or above, the overhead line.

b) When working in the vicinity of overhead lines operating above LV, a minimum safe working clearance of 3 m between any part of the body or tool or equipment and the overhead line must be maintained at all times. No part of working platforms used in the vicinity of overhead lines operating above low voltage must be raised to a height greater than 1 m below the top of the column. The platform must be kept as close to the column as practicable. Where hinged columns are installed in the vicinity of overhead lines, operatives must not ascend to the top of any column which is in the raised position unless, on account of special circumstances, authority in writing is first obtained.

c) Before any wood pole is climbed it must be tested for the detection of decay. No pole badly impaired by decay or damage shall be climbed.

d) Metal ladders or ladders with metal-reinforced stiles must not be used.

e) The fuse line carriers in the DNO's cut-outs shall be removed and replaced for lamp renewal and cleaning purposes only.

f) The DNO must be notified without delay of damage, repair requirement or suspected defect in their equipment.

g) Clearances as may be agreed nationally must be adhered to.

Annex D
(informative)
General guidance notes on training requirements

These guidance notes are not prescriptive but serve to emphasise key points for consideration by organisations or individuals that provide Competent Persons training.

The appointed trainers (either internally or externally) should ideally hold nationally recognised trainer qualifications[2] and be fully conversant with relevant Health and Safety legislation, Standards and associated guidance referenced in this Engineering Recommendation. In particular, this should include familiarity with application of *The Electricity at Work Regulations 1989* (as amended) [2], *The Electricity Safety Quality and Continuity Regulations* 2002 (as amended) [3], BS 7671:2018 (as amended) and Annex C of this Engineering Recommendation.

Given the nature of the electrical risks involved, the trainer should have a recognised electrical qualification and/or appropriate electrical training. Ideally, the trainer should have practical experience of supervising work on street lighting systems and/or electricity distribution networks and be familiar with safety procedures. Similarly, those attending Competent Persons training, who are required to carry out electrical work or to isolate electrical supplies, should have a basic electrical background.

The training organisation or Authority should consult with the DNO in whose area the Authority operates and take in to account in the training course any particular requirements specified by the DNO.

It is important that the trainer possesses a thorough knowledge of the types of electrical equipment employed by both the DNO and the Authority and is fully conversant with respective Standards and electrical safety design, e.g. earthing requirements.

Training may need to include specific practical aspects, e.g. isolation procedures and emergency procedures. There may be a need for further Health and Safety training, e.g. about specific risks, required by other legislation.

Training is considered to be a pre-requisite to achieving the required level of authorisation and/or competency required by this Standard. Training and awareness by itself (i.e. without suitable experience and assessment of competence) does not constitute competence and relevant personnel should be competent or under appropriate supervision of a competent person to prevent risk of injury.

Competence will decline if skills are not used regularly, e.g. emergency procedures, operating particular equipment etc.). The process of training and authorisation should therefore be repeated periodically to ensure continued competence.

With reference to *The Management of Health and Safety at Work Regulations 1999* (as amended) [4], risk assessment is a vital component in ensuring a safe work environment. Therefore, Competent Persons training should:

a) ensure that significant electrical risks and hazards are addressed;

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2 One such nationally recognised qualification for trainers of adults is the Level 3 Award in Education and Training (AET)

b) ensure all aspects of the work activity are reviewed, including routine and non-routine activities;

c) take account of non-routine operations, e.g. maintenance, cleaning operations, emergency response arrangements;

d) take account of the management of incidents such as interruptions to the work activity and consider what procedures should be followed to mitigate the effects;

e) be systematic in identifying hazards and looking at risks;

f) take account of the way in which work is organised, and the effects this can have on health;

g) take account of risks to the public;

h) take account of the need to cover fire risks.

The Highway Electrical Registration Scheme (HERS) is a competency scheme called up by National Highways Sector Scheme 8 (NHSS8) [10]. The scheme was initiated by Highways England and is supported by Highways England, ADEPT, the Institution of Lighting Professionals (ILP), the Highway Electrical Association (HEA), the Association for Public Service Excellence (APSE) and others. HERS sets the training and competence assessments for organisations and individual employees in the highway electrical sector and is one such recognised standard for training and the assessment of competence. Certain HERS Approved Training Organisations provide specific training courses related to the competencies required in this Engineering Recommendation (EREC).

Bibliography

Standards publications

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS EN 60529, *Degrees of protection provided by enclosures (IP Code)*

BS EN 40-2:2004, *Lighting columns. General requirements and dimensions*

Other publications

[1] 1974 c. 37, *Health and Safety at Work etc Act 1974*

[2] Statutory Instrument 1989 no. 635, *The Electricity at Work Regulations 1989*

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

Note: In Northern Ireland, the ESQCR (NI) apply

[4] Statutory Instrument 1999 no. 3242, *The Management of Health and Safety at Work Regulations 1999.* (as amended)

[5] 1989 c. 29 , *Electricity Act 1989*

[6A] Statutory Instrument 2009 no. 640, *The Overhead Lines (Exemption) (England and Wales) Regulations 2009*

[6B] Statutory Instrument 2013 no. 264 *The Overhead Lines (Exemption) (Scotland) Regulations 2013*

[7] Statutory Instrument 2015 no. 51, *The Construction (Design and Management) Regulations. 2015*

[8] 1991 c. 22, *New Roads and Street Works Act 1991*

[9] Health and Safety Executive Guidance Note HSG47, *Avoiding Danger from Buried Underground Services*

[10] National Highway Sector Schemes for Management in Highway Works, Scheme 8 (NHSS8), *Particular Requirements for the Application of ISO 9001:2015 for The Overseeing and / or Installation and / or Maintenance of Highway Electrical equipment and supporting works,* UKAS

[11] The Institution of Engineering and Technology (IET), *Code of Practice for Electric Vehicle Charging Equipment Installation 2018*

[12] The Institution of Engineering and Technology (IET), *Guide to Highway Electrical Street Furniture 2018*