



# Standards and Guidance Documents

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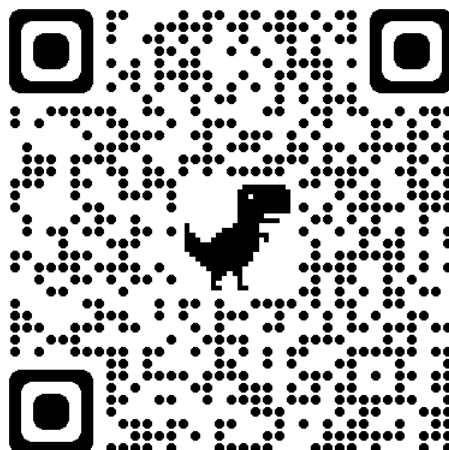
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## Design Manual for Roads and Bridges



Control & Communications Technology  
General information

# TG 411

## Electricity supply connections

(formerly TG 511 which superseded IAN 132/11)

Revision 0

### Summary

This document provides the requirements and advice for electricity supply connections.

### Application by Overseeing Organisations

Any specific requirements for Overseeing Organisations alternative or supplementary to those given in this document are given in National Application Annexes to this document.

### Feedback and Enquiries

Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Highways England team. The email address for all enquiries and feedback is: [Standards\\_Enquiries@highwaysengland.co.uk](mailto:Standards_Enquiries@highwaysengland.co.uk)

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## Release notes

Version	Date	Details of amendments
0	Mar 2020	TG 411 replaces TG 511 which superseded IAN 132/11. The full document has been re-written to make it compliant with the new Highways England drafting rules. TG 411 was previously published as TG 511 and the number has been changed due to an error in the previous number set that was assigned to documents in the control and communications technology discipline.

## **Foreword**

### **Publishing information**

This document is published by Highways England.

This document supersedes IAN132/11, which is withdrawn.

### **Contractual and legal considerations**

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

## **Introduction**

### **Background**

This document has been created to provide the requirements for electricity connections for roadside equipment.

### **Assumptions made in the preparation of this document**

The assumptions made in GG 101 [Ref 1.N] apply to this document.

## **1. Scope**

### **Aspects covered**

- 1.1 The national requirements for electricity supply connections for roadside equipment set out in the National Application Annexes shall be followed.

### **Implementation**

- 1.2 This document shall be implemented forthwith on all schemes involving electricity supply connections for roadside technology and lighting assets on the Overseeing Organisations' motorway and all-purpose trunk roads according to the implementation requirements of GG 101 [Ref 1.N].

### **Use of GG 101**

- 1.3 The requirements contained in GG 101 [Ref 1.N] shall be followed in respect of activities covered by this document.



## 2. Normative references

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

Ref 1.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
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Control & Communications Technology  
General information

## TG 411

# England National Application Annex to TG 411 Electricity supply connections

(formerly TG 511 which superseded IAN 132/11)

Revision 0

### **Summary**

This National Application Annex sets out the Highways England specific requirements for electricity supply connections.

### **Feedback and Enquiries**

Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Highways England team. The email address for all enquiries and feedback is: [Standards\\_Enquiries@highwaysengland.co.uk](mailto:Standards_Enquiries@highwaysengland.co.uk)

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## Release notes

Version	Date	Details of amendments
0	Mar 2020	Highways England National Application Annex to TG 411. TG 411 was previously published as TG 511 and the number has been changed due to an error in the previous number set that was assigned to documents in the control and communications technology discipline.

## **Foreword**

### **Publishing information**

This document is published by Highways England.

This document supersedes IAN 132/11, which is withdrawn.

### **Contractual and legal considerations**

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

## Introduction

### Background

This National Application Annex gives the Highways England-specific requirements for electricity supply connections (exit points) for roadside equipment. The Road Investment Strategy programmes (RIS1 & 2) have resulted in an increase in the number of major schemes being designed and delivered on behalf of Highways England. It is necessary to clarify the regulations and guidance that direct what types of electricity supply connections are offered by the Distribution Network Operators (DNOs), what preferences Highways England have for those connections and the expectation Highways England have for its delivery partners to liaise with the DNOs to request the types of connections that Highways England prefers wherever possible.

Highways England's preference is for unmetered supply (UMS) for technology and lighting assets wherever possible. This is for two reasons, firstly for safety reasons as meters, even smart meters, have to be maintained, repaired and manually read periodically and their location on or near to the SRN could present significant risk to staff who carry out these tasks and are likely to require traffic management in order to allow access to the meters. Secondly metered supplies tend to be more expensive over the life of the supply when compared to UMS, particularly where the consumption is modest, as is the case for most technology and lighting installations.

The requirements have been created to ensure Highways England correctly account for the consumption of all roadside electrical equipment connected to its network in order to produce accurate electricity billing information and complies with Highways England electricity connections and supplies contracts.

### Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 2.N] apply to this document.

## Abbreviations

### Abbreviations

<b>Abbreviation</b>	<b>Definition</b>
BEIS	Department for Business, Energy and Industrial Strategy
DNO	Distribution Network Operator
kVA	kilo Volt Ampere
MPAN	Meter Point Administration Number
SMRS	Supplier Meter Registration Service
SRN	Strategic Road Network
UMS	Unmetered Supply
UMSO	Unmetered Supply Operator



## Terms and definitions

### Terms

Term	Definition
Distribution network operator	The company responsible for the management and operation of the electricity distribution network in a specific area.
Electricity supplier	The company from whom electricity is purchased. NOTE: The electricity supplier is independent of the DNO.
Elexon charge codes	A charge code is a 13 digit number assigned to electrical apparatus connected to UMS and is used to calculate consumption.
Elexon switch regimes	A three digit numeric/alpha-numeric code for any unmetered supply equipment identifying the number of hours that the equipment will be operational.
Exit point	The electricity supply connection point between the DNO owned distribution network and Highways England's roadside scheme.
Legacy equipment	Existing exit points installed before the publication of the Electricity (Unmetered Supply) Regulations (2001) SI 2001/3263 [Ref 3.N].
Nominated electricity supplier	An electricity supplier that has tendered for the supply of electricity to Highways England as part of a central purchasing contract.
Meter point administration number	The individual electricity supply number given to a metered exit point or an unmetered inventory.

## E/1. General requirements

E/1.1 All unmetered electricity supply connections must comply with the Electricity (Unmetered Supply) Regulations 2001 SI 2001/3263 [Ref 3.N].

*NOTE The criteria stated in the Electricity (Unmetered Supply) Regulations 2001 SI 2001/3263 [Ref 3.N] for whether a supply can be UMS can be summarised as follows: the load is of a predictable nature and either less than 500W or it is impractical for the supply to be metered either technically, financially or for legal reasons.*

E/1.2 Where UMS equipment is installed on motorways and all-purpose trunk roads, the Unmetered Supplies (UMS) Procedures BSCP 520 [Ref 4.N] shall be complied with.

E/1.2.1 Electricity supply connections to technology and lighting assets should be UMS.

*NOTE Many DNOs offer UMS for supplies exceeding 500W. It is not uncommon for UMS supplies of 5kW or higher where equipment consumption is of a predictable nature. Ultimately the DNO decide what type of supply they offer, metered or UMS.*

E/1.2.2 The electricity connection application should not pre-empt the decision made by the DNO.

*NOTE The primary driver for UMS is the predictability of load, so whilst the UMS regulation SI 2001/3263 [Ref 3.N] quantifies an upper limit of 500 Watts the Department for Business, Energy & Industrial Strategy (BEIS) Guidance SI 2001/3263 (Guidance) [Ref 1.N] recognises that it is not always practical or financially viable to meter supplies and the cost of metering could considerably outweigh the value of the electricity consumed. BEIS encourage all DNOs to consider the cost and practicality of metering. BEIS state that they "believe there is sufficient scope for them [the Regulations] to be interpreted in a pragmatic way" when deciding whether a supply might be metered or UMS.*

E/1.3 Where an application is made for a connection for a Highways England scheme, the application form shall state that this is a Highways England project.

*NOTE For example; in the "name of appointed supplier" field in the application the format is: [nominated electricity supplier company name] EDF – Highways England national contract – unmetered lighting – MPAN 1234567891011.*

E/1.4 The distribution network operator (DNO) UMS connection agreement shall be complied within each DNO area.

E/1.5 Where there is no DNO agreement, the National Terms of Connection National Terms of Connection [Ref 5.N] shall be complied with.

E/1.6 Following installation, commissioning, replacement or removal of roadside lighting or technology assets, the relevant Highways England asset database shall be updated in line with delivery contracts.

E/1.7 Electricity supplies for lighting and technology equipment shall be kept separate at all times.

### **Elexon charge codes for UMS**

E/1.8 All lighting assets shall be assigned the correct Elexon switch regimes / control codes in order to qualify for UMS.

E/1.8.1 Where charge codes are provided and the DNO insists on a metered supply being installed, advice should be obtained by contacting the Highways England Energy Manager or Energy Procurement Team (see Appendix E/A).

*NOTE Details of how to apply for Elexon charge codes can be found on the Elexon website Elexon [Ref 1.I].*

E/1.9 Charge codes that are not available for technology equipment at the point of scheme design shall be sought from the manufacturers prior to commissioning.

E/1.9.1 Before the charge codes are available it can be possible to add the equipment to the technology equipment UMS inventories using the load Watts (dim, bright & quiescent) together with the operating hours and advice should be obtained by contacting the Highways England Manager.

*NOTE Not having charge codes at the design stage of a scheme is not a reason to apply for a metered supply.*

### Existing electricity supplies

E/1.10 Existing exit points installed before the publication of the Electricity (Unmetered Supply) Regulations (2001) SI 2001/3263 [Ref 3.N] shall be classed as legacy equipment and retain UMS status.

*NOTE Where additional load is requested at an existing UMS exit point, the DNO can require a meter to be fitted retrospectively due to a change of use.*

E/1.11 Where the addition of extra UMS equipment to an unmetered exit point is permitted by the DNO, the existing MPAN shall be supplied in the DNO connections section of the application form.

E/1.12 The electricity consumption (load) of equipment connected to existing metered exit points shall be measured by the existing meter or by the new meter if an upgrade is required to support the additional load.

*NOTE Where the existing load is varied above or below the energy supplier threshold then a new energy supplier will be selected which can include the installation of a new meter (electricity suppliers often install their own meters when a supply changes).*

E/1.12.1 Where a new energy supplier is selected and a new meter installed, the Highways England Energy Manager or Energy Procurement Team should be contacted for advice.

E/1.12.2 There are two occasions when additional load to an existing exit point requires a change in electricity supplier and in both occasions the Highways England Energy Procurement Team should be contacted for advice:

- 1) scenario 1 - additional load to a metered site increases the supply capacity to above 80kVA;
- 2) scenario 2 - modifying or adding additional load to an unmetered exit point makes the site no longer eligible for UMS, requiring a meter to be installed.

E/1.13 Where the attributes of the supply (e.g. UMS / metered / capacity) changes before or during the process of applying to the DNO for a new exit point, the Highways England nominated electricity supplier shall be reviewed and updated to reflect this change.

### Nominated electricity suppliers

E/1.14 Highways England approved electricity suppliers shall be nominated for the supply of electricity to roadside equipment in accordance with Table E/1.14.

**Table E/1.14 Highways England nominated electricity suppliers**

Connection type	Nominated supplier
Unmetered Lighting equipment	EDF
Unmetered Technology equipment	EDF
Metered exit point over 80kVA	EDF
Metered exit point under 80kVA	British Gas

### DBFO contracts

E/1.15 For implementation on DBFO contracts, changes to the procedural and process requirements and guidance in this document shall be made to ensure the requirement is implemented under the contract in a manner compatible with the risk transfer principles in the specific contract.

E/1.16 Any changes to the procedural and process requirements and guidance made to implement DBFO contracts shall be subject to the agreement of the Department's Nominee / Department's Representative through the appropriate change or review procedure in the contract.

## E/2. Normative references

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

Ref 1.N	BEIS. SI 2001/3263 (Guidance), 'BEIS, 2018. Guidance on Unmetered Supply Regulations '
Ref 2.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 3.N	legislation.gov.uk. SI 2001/3263, 'The Electricity (Unmetered Supply) Regulations 2001'
Ref 4.N	Elexon. BSCP 520, 'Unmetered supplies registered in SMRS'
Ref 5.N	National Terms of Connection, ' <a href="http://www.connectionterms.org.uk">www.connectionterms.org.uk</a> '

**E/3. Informative references**

The following documents are informative references for this document and provide supporting information.

Ref 1.1	Elexon, 'www.elexon.co.uk'
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## **Appendix E/A. Contacts**

### **E/A1 Highways England Energy Manager**

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# Design Manual for Roads and Bridges



Control & Communications Technology  
General information

## TG 411

# Northern Ireland National Application Annex to TG 411 Electricity supply connections

(formerly TG 511)

Revision 0

### **Summary**

The requirements of TG 411 are not applicable in Northern Ireland.

### **Feedback and Enquiries**

Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated team in the Department for Infrastructure, Northern Ireland. The email address for all enquiries and feedback is: [dcu@infrastructure-ni.gov.uk](mailto:dcu@infrastructure-ni.gov.uk)

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**2**

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0	Mar 2020	Department for Infrastructure Northern Ireland National Application Annex to TG 411. TG 411 was previously published as TG 511 and the number has been changed due to an error in the previous number set that was assigned to documents in the control and communications technology discipline.

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Control & Communications Technology  
General information

## TG 411

# Scotland National Application Annex to TG 411 Electricity supply connections

(formerly TG 511)

Revision 0

### **Summary**

Please contact Transport Scotland for the application of TG 411. The email address is:  
[TSSStandardsBranch@transport.gov.scot](mailto:TSSStandardsBranch@transport.gov.scot)

### **Feedback and Enquiries**

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[TSSStandardsBranch@transport.gov.scot](mailto:TSSStandardsBranch@transport.gov.scot)

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## **Contents**

**Release notes**

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## Release notes

Version	Date	Details of amendments
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Control & Communications Technology  
General information

## TG 411

# Wales National Application Annex to TG 411 Electricity supply connections

(formerly TG 511)

Revision 0

### **Summary**

Please contact Welsh Government for the application of TG 411. The email address is:  
[Standards\\_Feedback\\_and\\_Enquiries@gov.wales](mailto:Standards_Feedback_and_Enquiries@gov.wales).

### **Feedback and Enquiries**

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## **Contents**

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Version	Date	Details of amendments
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