Design Manual for Roads and Bridges

Control & Communications Technology
General Information

TG 411
Electricity supply connections

(formerly TG 511 which superseded IAN 132/11)

Version 0.1.0

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 National Highways team. The email address for all enquiries and feedback is: Standards_Enquiries@highwaysengland.co.uk

This is a controlled document.

Contents

Latest release notes

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
TG 411	0.**1**.0	January 2022	Core document, England NAA	Incremental change to requirements
No changes to core document compared to last publication apart from change of Highways England name to National Highways.				

Previous versions

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
TG 411	0	March 2020		
TG 511	0	June 2019		

Foreword

Publishing information

This document is published by National Highways.

This document supersedes IAN 132/11, which is withdrawn.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 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	National Highways. GG 101, 'Introduction to the Design Manual for Roads and Bridges'

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)

Version 0.1.0

Summary
This National Application Annex sets out the National Highways-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 National Highways team. The email address for all enquiries and feedback is: Standards_Enquiries@highwaysengland.co.uk

This is a controlled document.

Contents

Latest release notes

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
TG 411	0.**1**.0	January 2022	England NAA	Incremental change to requirements

This update of TG 411 constitutes the following: rewording of several requirements to reflect agreed terminology; updated references; and updated definitions; basic grammar corrections. Change of company name from Highways England to National Highways.

Previous versions

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
TG 411	0	March 2020		
TG 511	0	June 2019		

Foreword

Publishing information

This document is published by National Highways.

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 National Highways-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 National Highways. 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 National Highways has for those connections and the expectation National Highways has for its delivery partners to liaise with the DNOs to request the types of connections that National Highways prefers wherever possible.

National Highways' 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 motorway and trunk road network 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 National Highways correctly accounts for the consumption of all roadside electrical equipment connected to its network in order to produce accurate electricity billing information and complies with National Highways 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

Abbreviation	Definition
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
UMS	Unmetered supply
UMSO	Unmetered supply operator

Terms and definitions

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 National Highways' roadside scheme
Legacy equipment	existing exit points installed before the publication of the Electricity (Unmetered Supply) Regulations (2001) SI 2001 No. 3263 [Ref 4.N] .
Nominated electricity supplier	an electricity supplier that has tendered and been awarded the contract for the supply of electricity to National Highways 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 No. 3263 [Ref 4.N] .

NOTE *The criteria stated in the Electricity (Unmetered Supply) Regulations 2001 SI 2001 No. 3263 [Ref 4.N] for whether a supply can be UMS can be summarised as follows: the load is of a predictable nature and either less than 500 W 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 5.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 500 W. It is not uncommon for UMS supplies of between 2 kW and 5 kW or higher where equipment consumption is of a predictable nature. Ultimately the DNO decide what type of supply they offer, metered or UMS, in accordance with DNO policy.*

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 No. 3263 [Ref 4.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 National Highways scheme, the application form shall state that this is a National Highways project.

NOTE *For example; in the "name of appointed supplier" field in the application the format is: [nominated electricity supplier company name] EDF – National Highways 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 www.connectionterms.co.uk [Ref 3.N] shall be complied with.

E/1.6 Following installation, commissioning, replacement or removal of roadside lighting or technology assets, the relevant National Highways asset database shall be updated within 12 weeks of the commissioning of equipment on the motorway and trunk road network.

E/1.7 Electricity supplies for street 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 National Highways Electricity Connections 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. Advice should be obtained by contacting the National Highways Energy Procurement Team.

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 in stalled before the publication of the Electricity (Unmetered Supply) Regulations (2001) SI 2001 No. 3263 [Ref 4.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.

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

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

Nominated electricity suppliers

E/1.14 National Highways-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	EDF

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	National Highways. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 3.N	National Terms of Connection (Great Britain) and ENA. www.connectionterms.co.uk, 'National Terms of Connection'
Ref 4.N	The National Archives. legislation.gov.uk. SI 2001 No. 3263, 'The Electricity (Unmetered Supply) Regulations 2001'
Ref 5.N	Elexon. BSCP 520, 'Unmetered supplies registered in SMRS'

E/3. Informative references

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

Ref 1.I	Elexon, 'www.elexon.co.uk'

Appendix E/A. Contacts

E/A1 National Highways Electricity Connections Manager

National Highways

The Cube

199 Wharfside St

Birmingham

B1 1RN

Email: energyteam@highwaysengland.co.uk

E/A2 National Highways Energy Procurement Team

National Highways

Temple Quay House

2 The Square

Temple Quay

Bristol

BS1 6HA

Email: energyprocurementteam@highwaysengland.co.uk

Department for Infrastructure
An Roinn Bonneagair

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

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
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.

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: TSStandardsBranch@transport.gov.scot

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 Transport Scotland team. The email address for all enquiries and feedback is: TSStandardsBranch@transport.gov.scot

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Mar 2020	Transport Scotland 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.

Llywodraeth Cymru
Welsh Government

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.

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 Welsh Government team. The email address for all enquiries and feedback is: Standards_Feedback_and_Enquiries@gov.wales

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Mar 2020	Welsh Government National Application Annex to TG 511. 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.