

North Lincolnshire Council

B1450 Burringham Road Eastern Roundabout, Scunthorpe

Specification Appendices

Reference: SLDS-4664

P1 | 25 March 2026

Document Verification

Project title B1450 Burringham Road Eastern Roundabout, Scunthorpe
Document title Specification Appendices
Job number SLDS-4664
Document ref SER-SLDS-ZZ-SPEC-D-C-PH1

Revision	Date	Filename	SER-SLDS-ZZ-SPEC-D-C-PH1-P0		
P0	10 March 2026	Description	Preliminary Draft Issue		
			Prepared by	Checked by	Approved by
		Name	Paul Brownbridge		
		Signature			
P1	25 March 2026	Filename	SER-SLDS-ZZ-SPEC-D-C-PH1-P1		
		Description	Preliminary Issue Revision 1 (Client issued new layout & QA Review)		
			Prepared by	Checked by	Approved by
		Name	Paul Brownbridge	Ian Harker	Anthony Smith
		Signature			
		Filename			
		Description			
			Prepared by	Checked by	Approved by
		Name			
		Signature			

Issue Document Verification with Document

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APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT

The following is a complete list of the Numbered Appendices Referred to in the Specification for Highway Works with those not adopted marked with strikethrough text.

Those identified by the letters (T) or (C) shall be completed by the Tenderer or Contractor respectively.

Guide to types and Numbered Appendices - who compiles/completes

(Co) Compiler compiles

(Co/C) Compiler partially compiles, and the Contractor completes and returns to Employer.

(Co/T) Compiler partially compiles, and the Tenderer completes and returns with their tender.

(C) Contractor completes and returns to Employer.

(O) Employer to compile

(I) For Contractor's information only

(P) This indicates the Appendix is a National pro-forma and the format must not be altered

List A: Contract Specific Numbered Appendices Referred to in the Specification for Highway Works and Included in the Contract

Compiler	App. Ref	Appendix Title
SERIES 000 – INTRODUCTION		
(Co)	0/4	LIST OF DRAWINGS INCLUDED IN THE CONTRACT
SERIES 100 – PRELIMINARIES		
(Co)	1/16	PRIVATELY AND PUBLICLY OWNED SERVICES AND SUPPLIES
(Co)	1/17	TRAFFIC SAFETY AND MANAGEMENT
SERIES 200 – SITE CLEARANCE		
(Co)	2/4	LIST OF BUILDINGS, ETC, TO BE DEMOLISHED OR PARTIALLY DEMOLISHED
SERIES 500 – DRAINAGE AND SERVICE DUCTS		
(Co/C)	5/2	SERVICE DUCT REQUIREMENTS
SERIES 1300 – ROAD LIGHTING COLUMNS AND BRACKETS, CCTV MASTS AND CANTILEVER MASTS		

Compiler	App. Ref	Appendix Title
(Co)	13/1	INFORMATION TO BE PROVIDED WHEN SPECIFYING LIGHTING COLUMNS AND BRACKETS
(C)	13/2	(SPECIFICATION FOR HIGHWAY WORKS) TYPICAL LIGHTING COLUMN AND BRACKET DATA SHEETS 1 AND 2
(C)	13/3	INSTRUCTIONS FOR COMPLETING OF LIGHTING COLUMN AND BRACKET DATA SHEETS
SERIES 1400 – ELECTRICAL WORK FOR ROAD LIGHTING AND TRAFFIC SIGNS		
(C)	14/1	SITE RECORDS
(Co)	14/2	LOCATION OF LIGHTING UNITS AND FEEDER PILLARS
(C)	14/3	TEMPORARY LIGHTING
(C)	14/4	ELECTRICAL EQUIPMENT FOR ROAD LIGHTING
(Co/C)	14/6	DETAILED ELECTRICAL TESTING
(Co)	14/71	MAINTENANCE OF EXISTING LIGHTING
(Co)	14/72	EMERGENCY ELECTRICAL SITE ATTENDANCE

APPENDIX 0/4: LIST OF DRAWINGS INCLUDED IN THE CONTRACT

Contract Specific Drawings

Table 0/4/1: Contract Specific Drawings

Drawing Number	Title
SER-SLDS-ZZ-13-D-C-1301-PH1	Proposed Highway Lighting – Temporary Layout – Sheet 1 of 2
SER-SLDS-ZZ-13-D-C-1302-PH1	Proposed Highway Lighting – Temporary Layout – Sheet 2 of 2
SER-SLDS-ZZ-14-D-C-1401-PH1	Proposed Electrical Schematics & Standard Details – Sheet 1 of 6
SER-SLDS-ZZ-14-D-C-1402-PH1	Proposed Electrical Schematics & Standard Details – Sheet 2 of 6
SER-SLDS-ZZ-14-D-C-1403-PH1	Proposed Electrical Schematics & Standard Details – Sheet 3 of 6
SER-SLDS-ZZ-14-D-C-1404-PH1	Proposed Electrical Schematics & Standard Details – Sheet 4 of 6
SER-SLDS-ZZ-14-D-C-1405-PH1	Proposed Electrical Schematics & Standard Details – Sheet 5 of 6
SER-SLDS-ZZ-14-D-C-1406-PH1	Proposed Electrical Schematics & Standard Details – Sheet 6 of 6
MCX 0814	Installation Drawing NMCS (Ducted Cable) Duct Installation Longitudinal Ducts – Sheet 1 of 5
MCX 0814	Installation Drawing NMCS (Ducted Cable) Duct Installation Local Ducts – Sheet 2 of 5
MCX 0814	Installation Drawing NMCS (Ducted Cable) Duct Installation Transverse Ducts – Sheet 3 of 5
MCX 0815	Installation Drawing NMCS (Ducted Cable) Chambers Type A – Sheet 1 of 4
MCX 0815	Installation Drawing NMCS (Ducted Cable) Chambers Type B – Sheet 3 of 4

Standard Drawings Brought into the Contract by Reference:

- 0.4.1 HCD published by the Stationery Office (formerly HMSO) as Volume 3 of Manual of Contract Documents for Highway Works contains the following drawings brought into the Contract by reference. Unless otherwise stated below the whole drawing is brought in the Contract.

Table 0/4/2: North Lincolnshire Council Drawings Brought into the Contract by Reference

Drawing Number	Title	Date	Aspect / Alternative(s) required if not whole Drawing

APPENDIX 1/16: PRIVATELY AND PUBLICLY OWNED SERVICES AND SUPPLIES

- 1.16.1 Service information provided in the following appendix details the status of proposed diversionary works and service information as of March 2026. The Contractor shall satisfy themselves of the status of the information through direct liaison with the respective statutory undertakers.
- 1.16.2 Existing known services are shown on the drawings provided by the Statutory Undertakers; however, no guarantee is given as to the accuracy or completeness of the information given. For more information on the location of pipelines, mains and cables the Contractor shall refer to the relevant Statutory Undertakers drawings obtainable from the Authorities themselves (contact information below). Positive identification via site investigation should be undertaken as required.
- 1.16.3 Existing cabling and connections to street furniture are not detailed in this Appendix nor shown on the above drawings. The Contractor shall establish the locations of these cables before commencing work in a particular area.
- 1.16.4 Private services to individual properties and other services not listed in this Appendix have not been shown on the above drawings. The Contractor shall deal with these in accordance with the Manual of Contract Documents for Highway Works (MCHW).
- 1.16.5 The Contractor shall be responsible for the coordination and programming of their works and those of the Statutory Undertakers, and others concerned. No orders have been placed for electrical works associated with street lighting. These works are to be arranged by the Contractor.
- 1.16.5 The Contractor shall keep up to date records of the position, size and type of all service diversions and shall provide 1:250 scale record drawings to the Employer on completion of the Works for inclusion in the Health & Safety File.
- 1.16.7 The contractor shall refer to the responses received from individual statutory undertakers for particular requirements.

Table 1/16/1: Statutory Undertaker Contact Details

Statutory Undertaker	Address	Contact
BT Openreach	Openreach Telecom House Hanley Stoke-On-Trent ST1 5ND	cbyd@openreach.co.uk
Anglian Water	Anglian Water PO Box 4994 Lancing BN11 9AL	0345 60 66 087
Northern Powergrid	Records Information Centre New York road Shiremoor Newcastle upon Tyne NE27 0PL	safediggingplans@northernpowergrid.com 0191 229 4273 Emergency: 080 668 877
Cadent Gas Ltd	Cadent Gas Ltd Pilot Way Ansty Park, Coventry CV7 9JU	0800 389 8000
Virgin Media	Virgin Media	0870 888 3116 Opt 2

Statutory Undertaker	Address	Contact
	Field Services Units 1-12 Broad Lane Mayfair Business Park Bradford Yorkshire BD4 8PW	
Other Authorities	Address	Contact
Environment Agency	Environment Agency National Customer Contact Centre PO Box 544 Rotherham S60 1BY	03708 506 506
North Lincolnshire Council	North Lincolnshire Council Church Square House 30-40 High Street Scunthorpe North Lincolnshire DN15 6NL	01724 297000

Table 1/16/2 – Affected Services & Supplies

Location	Description	Group ¹	Drawing(s)	Notice Required to Commence	Time for Completion
Proposed Feeder Pillar FP01	Provision of new 80 Amp single phase 230V AC supply in proposed feeder pillar FP01	E	SER-SLDS-ZZ-13-D-C-1301-PH1	6	TBC

Notes:

1. Group as defined below:

- A – Work expected to be completed before the commencement of the Works.
- B – Work required after commencement of the Works, which does not require prior work by the Contractor.
- C – Work required after commencement of the works which does require prior work by the Contractor.
- D – Work expected to be in progress at the commencement of the Works
- E – Work to be wholly undertaken by the Contractor

APPENDIX 1/17: TRAFFIC SAFETY AND MANAGEMENT

Responsibility for Traffic Management

1.17.1 The Contractor shall be responsible for Traffic Safety and Management, and all associated work as described in Clause 117, and including the following:

Traffic Management Requirements

1.17.2 Phasing of the works.

1.17.3 Preparation of drawings showing traffic management layout including as appropriate:

- (i) Position of traffic signals.
- (ii) Width of lanes.
- (iii) Working area including temporary installations.
- (iv) Safety zone.
- (v) Cross-overs.
- (vi) Provisions for pedestrians and equestrian traffic.
- (vii) Use of original permanent signs prior to removal.

The Contractor's attention is drawn to the restrictions on the use of single way or shuttle working stated under "Other Requirements" in this Appendix.

1.17.4 The Contractor shall appoint a senior member of his site staff to act as Traffic Safety and Control Officer (TSCO) and shall notify the Engineer of his name within the timeframe agreed with the Employer prior to commencement of the Works. The TSCO shall be responsible for the following:

- (i) designing and implementing appropriate traffic management and control schemes.
- (ii) submitting all Traffic Management and Control Proposals to the Engineer for prior approval.
- (iii) enforcing the safety zone and designated site access points.
- (iv) ensuring that personnel are made fully aware of their responsibilities under the Health and Safety at Work Act 1974.
- (v) ensuring that all traffic management equipment is inspected at a frequency approved by the Engineer and is always maintained in a safe condition.
- (vi) liaising with the Engineer, the Highway Authority Agent, and the Police on all matters affecting traffic safety and control, including the holding of regular meetings.
- (vii) making proper provisions for handling traffic in emergencies.
- (viii) ensuring that suitable routes for abnormally indivisible loads are available when required.

The TSCO shall, when appropriate, take instructions direct from the Engineer and from the Police in emergencies when they have assumed control.

1.17.5 Liaison with the Highway Authority concerning arrangements for sweeping, salting and general maintenance of any temporary diversion, or any part of the Permanent Works used as a temporary diversion. The Contractor must clearly show in his proposals the arrangements made concerning these matters.

1.17.6 The Contractor shall establish which omnibus/coach operators are affected by the Works and shall allow for their requirements within his proposals.

- 1.17.7 Requirements of Department of Transport's Departmental Instructions (including those listed in this Appendix), and other general matters as listed in this Appendix.
- 1.17.8 Hazard warning lights are not considered an acceptable alternative to a roof mounted amber flashing lamp.
- 1.17.9 The Contractor shall keep all roads, accesses, rights of way, etc leading to, from or crossing the Site free from mud, slurry or other hazardous material that is deposited through his operations. Any such material deposited by the Contractor, or his sub-contractor, on any such road shall be promptly removed by the Contractor at his expense.
- 1.17.10 The Engineer shall have the authority to close such crossings and exits if the Contractor does not promptly remove such material deposited and any losses or expenses incurred as a result shall be borne by the Contractor.

Traffic Orders and Authorisation

- 1.17.11 Notice required by the Engineer, once in receipt of proposals finalised by discussion with the Engineer for the Contractor to arrange for:
- | | |
|--|---------|
| (i) amending or making Traffic Orders: | |
| Department of Transport | 8 weeks |
| Local Authority | 8 weeks |
| (ii) authorising of non-prescribed signs: | |
| Department of Transport | 8 weeks |
| (iii) authorising temporary traffic signals: | |
| Department of Transport (3 way) | 6 weeks |
| Local Authority | 6 weeks |
| (iv) moving signs to be compatible with the state of the works as described in Clause 117.7: | |
| Department of Transport | 6 weeks |
| Local Authority | 6 weeks |

Authorisation for Traffic Signals

- 1.17.12 It should be noted that authorisation from the Highway Authority is required when signals are to be used in the following situations:
- (i) where shuttle working is permitted,
 - (ii) when traffic signals are proposed at T-junctions, and
 - (iii) where it is proposed to use multiphase signalling.
- 1.17.13 The Contractor must note that portable traffic signals have no legal standing if used in situations other than those prescribed in the Traffic Signs Regulations and General Directions current at the date of the execution of the Works except where the legal requirements as to specification and placing applicable to permanent signals are met. Thus any exceptional use (e.g. to enable Contractor's traffic to cross a public road) will require site approval by the Highway Authority as appropriate, who will need to be satisfied that the number, siting, phasing, and control of the signals is adequate for the site in the same way as a permanent junction site. It should not be assumed that Contractor's traffic could have unimpeded priority over traffic on the public road.
- 1.17.14 All traffic signals including temporary signals used at roadworks must be type approved before they can legally be installed on public roads. Portable traffic signals

must also comply with the current requirements of the Traffic Signs Regulations and General Directions, which lays down the size, colour and type of prescribed traffic signals. Compliance with this Clause shall not relieve the Contractor of any of his other obligations and liabilities under the Contract and under the relevant provisions of the Highways Act.

High Visibility Garments

1.17.15 All persons directly or indirectly engaged on or near a highway must wear high visibility garments complying with BS EN ISO 20471:2013.

Relevant Department of Transport Standards and Advice Notes to be Complied With:

1.17.16 In designing appropriate traffic management and control schemes, the Contractor shall comply with the requirements of Chapter 8 of the Traffic Signs Manual and the Traffic Signs Regulations and General Directions (ST 1519) 1994 and any amendments thereto.

Public and Private Roads, and Other Ways affected by the Works

1.17.17 All public roads, footways and bridleways are under the authority of North Lincolnshire Council.

Other Requirements

1.17.18 In addition to complying with the relevant DTp Standards and Advice Notes referred to in this document the following provisions shall also be accommodated:

- (i) Singleway or shuttle working shall not be permitted.
- (ii) Contraflow lane widths to match existing lane markings.
- (iii) Where it is necessary to install temporary ramps in order to maintain the smooth vertical alignment of a carriageway the gradient of such ramps shall not exceed 6%.
- (iv) Where it is necessary to divert any existing pedestrian footpath or construct a temporary footpath, they should not be less than 1.5m wide, unless agreed otherwise by the Engineer.

Details of Events affecting Traffic Management

1.17.19 The following shall be taken into account by the Contractor when implementing the traffic management:

- (i) increased traffic flow caused by such items as events at local football stadiums; the Contractor must liaise with the police and organisers to evaluate the effect of this on traffic movements.
- (ii) adverse weather conditions preventing safe installation of the contraflow.
- (iii) removing or modifying the traffic management in the event of an emergency, if so instructed by the police and if approved by Traffic Safety & Control Officer.

APPENDIX 5/2: SERVICE DUCT REQUIREMENTS

General

- 5.2.1 Ducting is required for street lighting. Proposed ducting including duct access chamber requirements are detailed on individual series drawings. For standard details refer to SER-SLDS-ZZ-14-D-C-1400/Series.
- 5.2.2 The ends of all ducts shall be adequately sealed against the ingress of foreign matter as described in Clause 501, irrespective of whether the ducts terminate into chambers.
- 5.2.3 Road lighting service ducts shall be Type 1 ducts with a specification of flexible twin walled high-density polythene with smooth bore of 50mm or 100mm in diameter, as specified, orange in colour and printed with the words "STREET LIGHTING" at intervals of not more than one metre, in 6mm to 9mm high lettering throughout its length. When laid the wording shall be uppermost. Ducts shall comply with BS EN 61386-24:2010 Type 450N (normal duty impact resistance).
- 5.2.4 Ducts shall be impervious to water, capable of being laid in temperature down to -10°C and sufficiently flexible to follow undulations in a trench bottom.
- 5.2.5 Ducts shall be supplied in coiled lengths.
- 5.2.6 Duct laid under footway and verge shall have 100mm minimum clearance between the cable duct and the sides of the trench and between ducts sharing the same trench. Duct laid under carriageway shall have 75mm minimum clearance between the cable duct and the sides of the trench and between ducts sharing the same trench.
- 5.2.7 The minimum clearance between cable ducts and services pipes belonging to Statutory Undertakers shall be in accordance with Streetworks guidance.
- 5.2.8 The following colour coding shall apply for ducts:
- Street lighting – orange (flexible twin walled smooth bore)
 - DNO electrical supply – black (to DNO specification).

Street Lighting Ducting

- 5.2.9 The locations of the street lighting ducts and duct access chambers are shown on Drawing Numbers SER-SLDS-ZZ-13-D-C-1300/Series.
- 5.2.10 Street lighting ducts shall be installed in accordance with North Lincolnshire Council's specification.
- 5.2.11 Where ducts require joining, this shall be achieved by means of a compatible, push fit coupling maintaining a smooth bore.
- 5.2.12 A yellow, self-coloured PVC or polythene plastic tape for cable marking, not less than 0.1 mm thick and 150 mm wide with the wording "STREET LIGHTING CABLES BELOW" printed in black along the full length so as to occupy not less than 75% of its available length and occurring at least at 1m intervals, shall be laid approximately 250mm above any power supply cable. Where several cables are laid in one trench, only one line of marker tape need be installed.
- 5.2.13 The Employer shall be offered the opportunity to witness the duct being proved prior to the installation of cables. A register of mandrel test certificates shall be made available by the Contractor and handed over to the Employer on the successful completion of the ducting

work. This excludes the flexible duct into the street furniture. Records may be handed over in stages.

- 5.2.14 On completion of cabling, ducts shall be left with a draw rope in place and re-sealed with split plugs, or a suitable alternative material, to adequately seal the ducts against the ingress of foreign matter.

Street Lighting Duct Chambers

- 5.2.15 The contractor will be responsible for the supply and installation of all duct access chambers.
- 5.2.16 Duct chambers shall be installed in accordance with SER-SLDS-ZZ-14-D-C-1400/Series as specified with minimum size as specified on Drawing No's SER-SLDS-ZZ-13-D-C-1300/Series.
- 5.2.17 Oversized excavations shall be reinstated with compacted Type 1 sub-base. Covers, gratings and frames for drawpit and joint chambers shall comply with SER-SLDS-ZZ-14-D-C-1400/Series, North Lincolnshire Council's specification, and BS EN 124:2015. Chamber cover bolts shall comply with BS 4190:2014 and be grade A2 stainless steel. Frames and covers shall be C250 load class and shall be manufactured from composite materials in lieu of cast iron.
- 5.2.18 Frames for chamber cover gratings for draw pit chambers shall be set in cement mortar designation (i)* complying with Clause 2404 of MCHW (Manual of Contract Documents for Highway Works), or a suitable proprietary quick setting mortar of equivalent strength.
- 5.2.19 Four sets of lifting keys shall be delivered to the Employer for each type of draw pit and joint chamber supplied.
- 5.2.20 Draw pit chambers shall be clearly identified by the legend 'STREET LIGHTING' in accordance with the lettering requirements of sub-Clause 1532.14 of SHW (Specification for Highway Works).

APPENDIX 13/1: ROAD LIGHTING COLUMNS AND BRACKETS

General

- 13.1.1 All equipment shall be provided in accordance with North Lincolnshire Council's specification and the requirements of Drawing Numbers SER-SLDS-ZZ-13-D-C-1300/Series, SER-SLDS-ZZ-14-D-C-1400/Series and the main specification document.
- 13.1.2 The locations of road lighting columns, lanterns and electrical apparatus are shown on Drawing Numbers SER-SLDS-ZZ-13-D-C-1300/Series and Appendix 14/2.
- 13.1.3 For road lighting electrical design schematic details, refer to Drawing Numbers SER-SLDS-ZZ-14-D-C-1400/Series.
- 13.1.4 For road lighting standard details, refer to Drawing Numbers SER-SLDS-ZZ-14-D-C-1400/Series.
- 13.1.5 Road lighting columns and bracket arms shall be provided in accordance with the information contained in Table 13/1/1.

Column and Bracket Types

- 13.1.6 All road lighting columns shall comply with BS EN 12767, BS EN 40, BS 5469, galvanised to BS EN ISO 1461 where required, Highways Structures & Bridge Design – CD354 – Design of Minor Structures, and the requirements of Table 13/1/1, and be approved by North Lincolnshire Council.
- 13.1.7 The Contractor shall ensure that road lighting columns are suitable for the weight of the lanterns described in Appendix 14/4 and the windage of the lanterns as described in Table 13/1/1.
- 13.1.8 All columns shall be provided with a minimum cable entry slot 150mm long x 75mm wide.
- 13.1.9 Lighting columns shall be manufactured with 1 No. door opening with a baseboard suitable for equipment specified and in accordance with EN40/BS 5649.
- 13.1.10 The internal baseboard shall be rot proof and substantially non-hygroscopic. No fixing studs or bolts shall protrude beyond the front face of the baseboard to hinder the positioning of the equipment.
- 13.1.11 All lighting columns and doors shall be fitted with M8 brass earth studs 30 mm long, threaded the full length, fitted with two plain washers and two nuts. The doors shall not foul equipment in the base. The stud within the base compartment shall be easily accessible through the door opening.

Column Requirements

- 13.1.12 The positions of all new road lighting columns and apparatus shall be in accordance with the SER-SLDS-ZZ-13-D-C-1300/Series drawing and in accordance with the requirements of Appendix 14/2.
- 13.1.13 Road lighting column asset ID numbers shall be provided to each column.
- 13.1.14 The column manufacturer shall be registered and certified with a Certification body listed in Table A/2 of Appendix A Volume 1 of the SHW to Quality Management Scheme number 6 for the manufacture, supply and verification of lighting columns. The Contractor shall supply the Employer with a copy of the manufacturers UKAS certification. Lighting

columns shall be supplied to meet the requirements of North Lincolnshire Council's specification.

Contractor's Additional Responsibilities

- 13.1.15 The Contractor shall submit to the Employer for review the Column and Bracket Data Sheet (refer to Appendix 13/2) and the Design and Check Certificate (refer to Appendix 13/1), for each column and bracket arm combination in accordance with the timescales stated in Appendix 1/13 prior to incorporation in the works in accordance with sub-Clause 1302.1 of MCHW.
- 13.1.16 The Contractor shall design foundations for the planted lighting columns and cantilever masts in accordance with Highways Structures & Bridge Design – CD354 – Design of Minor Structures using the soil type information as described in Appendix 13/1.
- 13.1.17 The Contractor shall provide the Employer with 6 sets of any keys necessary for the maintenance of the road lighting columns.
- 13.1.18 The Contractor shall, prior to commencing any section of the Works, locate all buried and overhead services and electrical cables.
- 13.1.19 The Contractor shall ensure that the appropriate service suppliers have confirmed their approval to the methods of work and safety clearances to be provided to overhead and underground services and provide evidence to the Employer that agreement has been reached.
- 13.1.20 The Contractor shall ensure that no damage is caused to existing underground services, and before any site clearance or construction works are commenced reference shall be made to:
- The ILP Code of Practice for 'Electrical Safety in Highway Electrical Operations'.
 - The HSE publication HS(G)47 'Avoiding Danger from Underground Services' and GS6 'Avoidance of Danger from Overhead Electrical Lines'
 - The Electricity Association Engineering recommendation G39/3 Electricity Code of Practice E4, for the Electrical Safety and Planning, Installation, Commissioning and Maintenance of Public Lighting and other Street Furniture.
 - The Construction Design and Management (CDM) Regulations.

Certification

13.1.21 Sample Certification extract from the DMRB Volume 1 Section 1 Annex C2, CG300 – Technical Approval of Highway Structures, Manufacturers Design and Check Certificate.

Design and Check Certificate		
(Lighting Column Systems / CCTV Mast / Cantilever Masts / Telecom Masts on motorway trunk roads)	Name of Project	
	Name of Structure	
	Structure Ref	
	Date	
Appendix J Model form of certificate for minor structures and telecom masts on motorways and trunk roads	Name of Project	
	Column / Mast Ref	
1. We certify that the Lighting Column System/CCTV Masts / Cantilever Masts for Traffic Signs / Signals and / or Speed Cameras ¹ and Telecom Masts or Noise Barriers ¹ accurately shown on drawing(s) numbers (list drawing numbers) has / have ¹ been designed / checked ¹ for the following range of parameters ² and fully complies with:		
(i) The Specification for Highway Works (edition, date)		
(ii) CD354		
(iii) The following Standards (for the design of Telecom masts)		
Signed		
Name	Designer / Check Team Leaders ³	
Engineering Qualifications		
Signed		
Name		
Position Held		
Name of Organisation		
Date		
2. This certificate is accepted by the TAA ⁷		
Signed		
Name		
Position Held		
Engineering Qualifications		
TAA		

Date

Notes

1. Delete as required
2. For lighting column systems specify the range of combinations of column heights and lengths of bracket together with the weights and windage areas of the attachments such as lanterns, design wind speed and assumed ground conditions for which the column has been designed. For CCTV mast, cantilever mast and telecom mast, specify the design wind speed and assumed ground conditions for which the column has been designed. (Note: model data sheets are contained in Series NG1300 of MCHW)
3. Delete as appropriate or repeat if signed by both Designer and Checker
4. Engineer with appropriate position, qualifications and experience for Categories 0 and 1. And with CEng MICE, CEng MIStructE or equivalent for Categories 2 and 3
5. A principal of the organisation responsible for the design or check
6. Manufacturer or organisation responsible for the design or check
7. For category 0 minor structures, section 2 is not required.

Contractor's Specific Column Requirements

13.1.22 The following values shall be established by the Contractor to ensure that the road lighting column to be provided shall be suitable:

- The lantern weights and windage areas, and centres of application of the forces from the centroid of the column shaft.
- The size, length and angle of the lantern.

Identification and Location Markings

13.1.23 Each road lighting column shall be identified by a unique system of Asset ID reference letters and numbers for adoption by North Lincolnshire Council. Identification system to be agreed. The bottom digit is to be located 2.1 metre above ground level and positioned in line with the lantern, facing the carriageway/footway.

Column Foundations, Anchorages and Attachment Systems

13.1.24 Foundations for planted column shall be provided in accordance with the manufacturer's instructions and the column and soil types as described in Table 13/1/1.

13.1.25 Any overbreak for column foundations shall be backfilled with concrete in accordance with Clause 1305. Earth backfill will not be permitted.

13.1.26 Where different materials are in contact, consideration shall be given to the necessary measures to avoid galvanic corrosion.

13.1.27 Where practicable and subject to the proximity of adjacent underground services, a layer of well compacted, 20N concrete, 450mm x 450mm x 75mm thick shall be placed in the bottom of the excavation at the level necessary to obtain the required planting depth of the lighting column.

13.1.28 The Contractor shall refer to the manufacturers standard detail drawings with regard to the planting depths of each type of column.

13.1.29 The cable entry slot shall be temporarily plugged in order to prevent any ingress of concrete or filling material during the concreting and backfilling operations.

13.1.30 Above the concrete base, lighting columns shall be placed in the excavation and backfilled above the level of concrete.

13.1.31 The lighting column root is to be surrounded to the level of the cable entry slot with class 20N concrete, well compacted by vibration over the full planting depth of the lighting column.

13.1.32 The hole is to be backfilled with material placed in 150mm thick layers and shall be well rammed and compacted in order to provide full lateral support to the planting depth of the lighting column.

13.1.33 The backfill material shall be placed to a level whereby permanent reinstatement of the footway can be undertaken.

13.1.34 The column door opening and the cable entry slot shall be in line and be so arranged so that when the column is erected, an operator facing the door opening will be facing the oncoming vehicular traffic.

- 13.1.35 A duct equal in size to the width of the cable entry slot, shall be formed through the backfill material using a suitable preformed lining tube capable of retaining its cross-sectional shape during compaction.
- 13.1.36 Lighting columns shall be erected with their shafts truly vertical.
- 13.1.37 Where lighting columns are installed adjacent to walls or vertical obstructions that are adjacent to the highway they shall be erected with a gap of 50 mm - 100 mm between the back of the lighting column and the wall / obstruction.

Information required when specifying Lighting Columns and Brackets:

Table 13/1/1: Road Lighting Column Information

Column Reference	Type: 1
Number of Columns:	15
Nominal Mounting Height:	10.0 metres
Bracket Projection:	N/A – Post Top
Luminaire Weight:	18.2kg
Luminaire Windage:	0.18m ²
Luminaire Fixing:	Post Top
Luminaire Fixing Angle:	0°
Bracket Spigot Size:	In accordance with manufacturer's instructions
Acceptable Luminaires:	Refer to Appendix 14/4
Strength Required Before Loading:	In accordance with manufacturer's instructions
Administrative Area:	North Lincs
Rationalised Wind Loading Region:	Extra Light
Rationalised Wind Loading Factor Rwf (N/m ²):	350
Terrain Category:	II
Exposure Coefficient (Ce):	2.35
Topography Factor (f):	1
Reference Wind Velocity Speed (V _{ref o}):	22.5m/sec
Height of installation above ground level:	10.0 metres
Maximum Altitude:	107 metres
Type of Column Base:	Planted root in accordance with manufacturer's instructions
Planting Depth:	1500mm to be confirmed with column manufacturer
List of Columns with flange plates:	Not Required
Soil Type:	Poor
Requirements for backfilling:	Refer to SER-SLDS-ZZ-14-D-C-1400/Series
Passively Safe Requirements:	Yes
Speed Class	70 (kph)
Energy Absorption Category	NE – (70-NE-B-S-SE-MD-0)
Number of Door Openings:	1

Column Reference	Type: 1
Door Type and Size:	In accordance with BS EN 40 and CD354
Base Compartment (Width x Height x Depth):	Each base compartment shall have the capacity to accommodate equipment as detailed on drawing SER-SLDS-ZZ-14-D-C-1400/Series
Acceptable Column Material:	Aluminium Passively Safe in accordance with BS EN 12767
Corrosion Protection:	N/A
Root Protection:	In accordance with North Lincolnshire Council requirements, manufacturer's instructions and provided with additional ground level protector
Requirement for Aesthetic Approval:	Not Required
Number of Door Keys Required:	One for every Five (or part of) columns
Identification and Location Markings:	To be issued prior to commencement of works
Requirements for Wall Mounting:	Not Required
Requirements for Earthing:	In accordance with BS 7671. Columns shall be provided with either brass or stainless steel earth terminals on the column and column door and shall be fitted with a distinct and durable metal label marked: "SAFETY ELECTRICAL CONNECTION – DO NOT REMOVE"
Requirements for Columns Mounted on Structures:	Not Required
Requirements for Cable Entry Slot:	Minimum 150mm x 75mm
Requirements for Attachments:	PD 6547:2004 + A1:2009, Table 3, Class A, 1.0m ²

Column Reference	Type: 2
Number of Columns:	8
Nominal Mounting Height:	10.0 metres
Bracket Projection:	N/A – Post Top
Luminaire Weight:	18.2kg
Luminaire Windage:	0.18m ²
Luminaire Fixing:	Post Top
Luminaire Fixing Angle:	0°
Bracket Spigot Size:	In accordance with manufacturer's instructions
Acceptable Luminaires:	Refer to Appendix 14/4
Strength Required Before Loading:	In accordance with manufacturer's instructions
Administrative Area:	North Lincs
Rationalised Wind Loading Region:	Extra Light
Rationalised Wind Loading Factor Rwf (N/m ²):	350
Terrain Category:	II
Exposure Coefficient (Ce):	2.35
Topography Factor (f):	1
Reference Wind Velocity Speed (V _{ref 0}):	22.5m/sec
Height of installation above ground level:	10.0 metres
Maximum Altitude:	107 metres
Type of Column Base:	Planted root in accordance with manufacturer's instructions
Planting Depth:	2000mm to be confirmed with column manufacturer
List of Columns with flange plates:	Not Required
Soil Type:	Poor
Requirements for backfilling:	Refer to SER-SLDS-ZZ-14-D-C-1400/Series
Passively Safe Requirements:	Yes
Speed Class	70 (kph)
Energy Absorption Category	HE – (70-HE-D-S-NS-MD-0)
Number of Door Openings:	1

Column Reference	Type: 2
Door Type and Size:	In accordance with BS EN 40 and CD354
Base Compartment (Width x Height x Depth):	Each base compartment shall have the capacity to accommodate equipment as detailed on drawing SER-SLDS-ZZ-14-D-C-1400/Series
Acceptable Column Material:	Aluminium Passively Safe in accordance with BS EN 12767
Corrosion Protection:	N/A
Root Protection:	In accordance with North Lincolnshire Council requirements, manufacturer's instructions and provided with additional ground level protector
Requirement for Aesthetic Approval:	Not Required
Number of Door Keys Required:	One for every Five (or part of) columns
Identification and Location Markings:	To be issued prior to commencement of works
Requirements for Wall Mounting:	Not Required
Requirements for Earthing:	In accordance with BS 7671. Columns shall be provided with either brass or stainless steel earth terminals on the column and column door and shall be fitted with a distinct and durable metal label marked: "SAFETY ELECTRICAL CONNECTION – DO NOT REMOVE"
Requirements for Columns Mounted on Structures:	Not Required
Requirements for Cable Entry Slot:	Minimum 150mm x 75mm
Requirements for Attachments:	PD 6547:2004 + A1:2009, Table 3, Class A, 1.0m ²

Column Reference	Type: 3
Number of Columns:	6
Nominal Mounting Height:	10.0 metres
Bracket Projection:	N/A – Post Top
Luminaire Weight:	18.2kg
Luminaire Windage:	0.18m ²
Luminaire Fixing:	Post Top
Luminaire Fixing Angle:	0°
Bracket Spigot Size:	In accordance with manufacturer's instructions
Acceptable Luminaires:	Refer to Appendix 14/4
Strength Required Before Loading:	In accordance with manufacturer's instructions
Administrative Area:	North Lincs
Rationalised Wind Loading Region:	Extra Light
Rationalised Wind Loading Factor Rwf (N/m ²):	350
Terrain Category:	II
Exposure Coefficient (Ce):	2.35
Topography Factor (f):	1
Reference Wind Velocity Speed (V _{ref o}):	22.5m/sec
Height of installation above ground level:	10.0 metres
Maximum Altitude:	107 metres
Type of Column Base:	Planted root in accordance with manufacturer's instructions
Planting Depth:	1500mm
List of Columns with flange plates:	Not Required
Soil Type:	Poor
Requirements for backfilling:	Refer to SER-SLDS-ZZ-14-D-C-1400/Series
Passively Safe Requirements:	No
Speed Class	N/A
Energy Absorption Category	N/A
Number of Door Openings:	1

Column Reference	Type: 3
Door Type and Size:	In accordance with BS EN 40 and CD354
Base Compartment (Width x Height x Depth):	Each base compartment shall have the capacity to accommodate equipment as detailed on drawing SER-SLDS-ZZ-14-D-C-1400/Series
Acceptable Column Material:	Galvanised tubular steel in accordance with BS EN 40
Corrosion Protection:	N/A
Root Protection:	Thermoplastic coating in accordance with North Lincolnshire Council requirements and manufacturer's instructions.
Requirement for Aesthetic Approval:	Not Required
Number of Door Keys Required:	One for every Five (or part of) columns
Identification and Location Markings:	To be issued prior to commencement of works
Requirements for Wall Mounting:	Not Required
Requirements for Earthing:	In accordance with BS 7671. Columns shall be provided with either brass or stainless steel earth terminals on the column and column door and shall be fitted with a distinct and durable metal label marked: "SAFETY ELECTRICAL CONNECTION – DO NOT REMOVE"
Requirements for Columns Mounted on Structures:	Not Required
Requirements for Cable Entry Slot:	Minimum 150mm x 75mm
Requirements for Attachments:	PD 6547:2004 + A1:2009, Table 3, Class A, 1.0m ²

Column Reference	Type: 4
Number of Columns:	4
Nominal Mounting Height:	8.0 metres
Bracket Projection:	N/A – Post Top
Luminaire Weight:	4.8kg
Luminaire Windage:	0.03m ²
Luminaire Fixing:	Post Top
Luminaire Fixing Angle:	0°
Bracket Spigot Size:	In accordance with manufacturer's instructions
Acceptable Luminaires:	Refer to Appendix 14/4
Strength Required Before Loading:	In accordance with manufacturer's instructions
Administrative Area:	North Lincs
Rationalised Wind Loading Region:	Extra Light
Rationalised Wind Loading Factor Rwf (N/m ²):	350
Terrain Category:	II
Exposure Coefficient (Ce):	2.21
Topography Factor (f):	1
Reference Wind Velocity Speed (V _{ref 0}):	22.5m/sec
Height of installation above ground level:	8.0 metres
Maximum Altitude:	107 metres
Type of Column Base:	Planted root in accordance with manufacturer's instructions
Planting Depth:	1200mm
List of Columns with flange plates:	Not Required
Soil Type:	Poor
Requirements for backfilling:	Refer to SER-SLDS-ZZ-14-D-C-1400/Series
Passively Safe Requirements:	No
Speed Class	N/A
Energy Absorption Category	N/A
Number of Door Openings:	1

Column Reference	Type: 4
Door Type and Size:	In accordance with BS EN 40 and CD354
Base Compartment (Width x Height x Depth):	Each base compartment shall have the capacity to accommodate equipment as detailed on drawing SER-SLDS-ZZ-14-D-C-1400/Series
Acceptable Column Material:	Galvanised tubular steel in accordance with BS EN 40
Corrosion Protection:	N/A
Root Protection:	Thermoplastic coating in accordance with North Lincolnshire Council requirements and manufacturer's instructions.
Requirement for Aesthetic Approval:	Not Required
Number of Door Keys Required:	One for every Five (or part of) columns
Identification and Location Markings:	To be issued prior to commencement of works
Requirements for Wall Mounting:	Not Required
Requirements for Earthing:	In accordance with BS 7671. Columns shall be provided with either brass or stainless steel earth terminals on the column and column door and shall be fitted with a distinct and durable metal label marked: "SAFETY ELECTRICAL CONNECTION – DO NOT REMOVE"
Requirements for Columns Mounted on Structures:	Not Required
Requirements for Cable Entry Slot:	Minimum 150mm x 75mm
Requirements for Attachments:	PD 6547:2004 + A1:2009, Table 3, Class A, 1.0m ²

APPENDIX 13/2: ROAD LIGHTING COLUMNS AND BRACKETS DATASHEETS 1 & 2

General

- 13.2.1 The Contactor shall submit to the Employer for review the Column and Bracket Data Sheet and the Design and Check Certificate, for each column and bracket arm combination no later than four (4) weeks prior to incorporation within the Works, in accordance with sub-Clause 1302.1 of MCHW.
- 13.2.2 Instructions for completion of Bracket Data Sheets are contained in Appendix 13/3.

Typical Lighting Column and Bracket Data – Sheet 1

Name of Manufacturer:

Column Reference No.

Revision No.

Date

NAME OF CONTRACT

Part A General

Column nominal height

Column Material

Material Design Strength (N/mm²)

No. of door openings

Door opening size – Height (mm)

- Width (mm)

Cross section of base compartment	Height	Width	Depth
	(mm)	(mm)	(mm)

Acceptable positions of bracket arms relative to door position

Door Opening

Any

Manufacturer's drawing ref. no.

Corrosion protection (steel columns only) – basic system type (sub-Clauses 1911.9 and 1911.10)

Reference Wind Velocity $V_{ref,0}$ as defined in BS EN 40-3-1

 m/s

Details of signs and attachments allowed for in the design Area (mm²), Eccentricity (mm), Height

- additional sacrificial steel thickness, above that needed in the design, from the bottom of the column to at least 250mm above the anticipated ground level

 (mm)

Part B Foundation Design

Planted base

Planting depth

 (m)

Standard Soil Type Factor G		
630	390	230
<input type="text"/>	<input type="text"/>	<input type="text"/>

Diameter of concrete surround (if any)

Flange plate

Bolt hole centres	Hole diameter	Design load / bolt
400 mm	<input type="text"/> (mm)	<input type="text"/> (N)

Relevant forces and moments at ground level

Line of action of max. moment relating to door opening

Note: For flange plates with slotted holes a diagram shall be included with this Data Sheet

Typical Lighting Column and Bracket Data – Sheet 2

PART C ACCEPTABLE LUMINAIRES

Luminaire: Maximum Characteristics

Post Top Column	Luminaire Connection		Terrain Categories as defined in BS EN 40-3-1							
			I	II	III	IV				
	Diameter	Length	Luminaire Max Weight (kg)	Maximum Windage Area (m ²) for Terrain Categories as defined in BS EN 40-3-1						

Single Arm Bracket Column:	Luminaire Lever Arm (mm)	
	Due to weight of luminaire	Due to windage on luminaire

Bracket Projection (m)	Ref No.	Drawing No..	Material		Luminaire Fixing Angle	Luminaire Connection		Luminaire Maximum Weight (kg)	Maximum Windage Area (m ²) for Terrain Categories as defined in BS EN 40-3-1					
			Grade	Design Strength (N/mm ²)		Diameter (mm)	Length (mm)							

Double Arm Bracket Column:	Luminaire Lever Arm (mm)	
	Due to weight of luminaire	Due to windage on luminaire

Bracket Projection (m)	Ref No.	Drawing No..	Material		Luminaire Fixing Angle	Luminaire Connection		Luminaire Maximum Weight (kg)	Maximum Windage Area (m ²) for Terrain Categories as defined in BS EN 40-3-1					
			Grade	Design Strength (N/mm ²)		Diameter (mm)	Length (mm)							
0.250														

Part D Certification

It is certified that the information given in this Data Sheet has been obtained in accordance with Highways Structures & Bridge Design – CD354 – Design of Minor Structures and the Specifications.

Signed on behalf of the Contractor.....Date.....

APPENDIX 13/3: INSTRUCTIONS FOR COMPLETION OF LIGHTING COLUMN AND BRACKET DATA SHEETS

General

- 13.3.1 When information is not required a dash shall be inserted in the appropriate boxes.
- 13.3.2 Where a data sheet is amended it shall be given a new revision number with a date.
- 13.3.3 The revision number shall be consecutive letters of the alphabet, commencing with 'A'.
- 13.3.4 The date of the revision shall agree with the date of the Contractors signature.
- 13.3.5 The preferred column material shall be aluminium as specified in accordance with the requirements of Appendix 13/1.
- 13.3.6 The material design strength shall be the minimum specified in Appendix 13/1. Where more than one material is used values for all materials shall be given.
- 13.3.7 All relevant entries shall be made on the Data Sheet before the document is certified by the Contractor.

Column Data

- 13.3.8 The column nominal height shall be in accordance with the requirements of the Appendix 13/1.
- 13.3.9 The number of door openings shall agree with the manufacturer's drawing.
- 13.3.10 The cross section of the base compartment shall be indicated by a dimensional diagram / sketch.
- 13.3.11 Foundations shall be in accordance with the manufacturer's recommendations and designed by the Contractor in accordance with Highways Structures & Bridge Design – CD354 – Design of Minor Structures using the soil type information as described in Appendix 13/1.
- 13.3.12 The corrosion protection system used on the column when new shall be recorded. Where additional material is provided for sacrificial purposes, the amount shall be recorded.
- 13.3.13 The signs and attachments surface area, eccentricity from the centre line of the column to the centre of the area of the sign and height above ground level to the centre of the area of the sign shall be stated.

APPENDIX 14/1: SITE RECORDS

General

- 14.1.1 As built drawings shall be produced by the Contractor. Copies of the Contract drawings will be provided by the Project manager in AutoCAD (.dwg) format. The record drawings produced by the Contractor shall be produced in AutoCAD (.dwg) format and provided electronically to the Project Manager.
- 14.1.2 Information to be provided shall include, but not be limited to:
- Maintenance and operating manuals for installed equipment.
 - Charge Codes and/or Switch Regime Codes shall be provided for all items of electrical equipment.
 - Cable records shall be determined from kerb lines or fence lines.
 - A schematic distribution layout drawing indicating the distribution arrangement of each private cable network using issued asset identification numbers.
 - Test Certificates in accordance with BS7671.
 - A schedule of abandoned cables.
 - Cable offsets taken at 20 metre intervals where cables maintain a steady line, and at five metre intervals where the line of the cable varies.
- 14.1.3 If during construction the longitudinal location measurements have to be related initially to contract chainages the Contractor shall convert them to refer to permanent highway features such as bridge abutments or marker posts when these are defined.
- 14.1.4 The Contractor shall keep a daily record in duplicate in a clear and legible form, on the Contract drawings of all work carried out as it proceeds relating to the 1300 and 1400 series Appendices. One copy shall be kept available for inspection by the Overseeing Organisation during the Contract and shall at completion of the Works be issued to the Overseeing Organisation for record purposes.
- 14.1.5 The Contractor shall present “draft” copies of the 1300 series as-built drawings at the Date of Completion to the Overseeing Organisation. Final copies of the as-built drawings are to be provided within 4 weeks of the Date of Completion.
- 14.1.6 The AutoCAD as-built files shall be issued to the Overseeing Organisation with two copies of each drawing within 4 weeks of the Date of Completion. The Contractor shall also supply two full sets of as-built drawings in paper print format within 4 weeks of the Date of Completion.
- 14.1.7 A set of the as-built schematic diagrams are to be provided in a plastic wallet and fixed to the inside of the door of the feeder pillar, illustrating all the circuits and equipment supplied from that pillar.
- 14.1.8 The Contractor shall produce Schematic Cable layout drawings detailing the following:
- Jointed, looped and fused spur circuits.
 - Key identifying lighting columns and the like.
 - Protective device types and rating.
 - Circuit Phasing.
 - Both construction (if applicable) and Asset ID reference numbers.

- Each single schematic drawing shall detail all circuits emanating from one feeder pillar as minimum

14.1.9 The Contractor shall produce as-built site layout plans detailing:

- Depth of cables including number and size of cables and cable material.
- Duct locations including depth, number and size of ducts and duct material.
- Offset distances from the point of set-back (front face of kerb or back of hard shoulder) indicating the line of cables or ducts and any change in direction. Offsets of the existing cable shall be taken at 10m intervals where cables maintain a steady line, and at 5m intervals where the line of the cable varies.
- Locations of lighting columns, duct chambers, joints and the like.
- Locations of joint positions and sheath repairs shall be shown on all site layout plans.
- All Asset ID reference numbers.
- Redundant cables left in the ground.

14.1.10 The Contractor shall provide the Overseeing Organisation on the completion of all electrical works all original testing certification as required in Appendix 1/5 which shall be referenced to the apparatus identified on the as-built drawings. The Contractor shall supply Operations and Maintenance manuals to support the site records within 4 weeks of the Date of Completion.

APPENDIX 14/2: LOCATION OF LIGHTING UNITS

General

- 14.2.1 The locations of road lighting columns, luminaires, cabling and electrical apparatus are shown on Contract Drawings as listed in Table 0/4/1 and 0/4/2 of Appendix 0/4. The Contractor shall agree the exact location of all road lighting columns and associated apparatus with the Engineer prior to placement.
- 14.2.2 For road lighting electrical design schematic details, refer to Drawing No's. SER-SLDS-ZZ-14-D-C-1400/Series.
- 14.2.3 For road lighting standard details, refer to Drawing No's. SER-SLDS-ZZ-14-D-C-1400/Series.
- 14.2.4 Notwithstanding the Clause 1.1 above, the Contractor shall ensure that column locations do not vary by more than 1.0m in longitudinal spacing between 2 consecutive lighting columns. The Contractor shall ensure that column setbacks do not vary by more than 0.25m. The Contractor shall submit any proposals to vary the above tolerances to the Employer for review prior to installation of the mounting sleeve.
- 14.2.5 Any reasonable adjustment to route or alignment of the proposed road lighting ducting as shown on Drawing Numbers SER-SLDS-ZZ-13-D-C-1300/Series will be accepted.
- 14.2.6 The Contractor shall present his proposed route of the road lighting cabling to the Employer for review, 48hrs prior to commencement of the activity.
- 14.2.7 All information relating to the existing installations possessed by the Project Manager regarding the position of existing underground cabling, feeder pillars and lighting unit positions will be made available to the Contractor without any guarantee as to its accuracy.
- 14.2.8 It is recommended that the Contractor undertake a site survey prior to commencement of works to verify the accuracy and fullness of any information provided.
- 14.2.9 Statutory Undertaker's supplies to any new road lighting equipment shall not be connected prior to the Contractor confirming compliance with BS 7671 IET Wiring Regulations latest edition.

Electricity Supply Details

- 14.2.10 The proposed electricity network will comprise of a single phase 230V 50 Hz Statutory Undertaker supply.
- 14.2.11 During the Works, the following will apply:
 - Feeder Pillar FP01 (proposed) – Proposed new feeder pillar to be installed complete with single phase DNO supply with TT Earth.

Table 14/2/1A: Location of Road Lighting Units

Asset ID Reference	Termination Type and Max Cable Size	Minimum Termination IP Rating	Column Type	Lantern Type	Nominal Height (mounting height relative to carriageway) (m)	Column Setback (edge of carriageway to centre of column) (m)	Easting	Northing
LC01*	T3.NE 3c 2.5mm	IP33	1	D	10.0	3.0	485887.88	408495.26
LC02*	T3.NE 3c 2.5mm	IP33	1	D	10.0	3.0	485919.97	408503.55
LC03*	T1.NE 3c 2.5mm	IP33	1	B	10.0	3.0	485955.07	408489.90
LC04*	T1.NE 3c 2.5mm	IP33	1	D	10.0	3.0	485977.81	408479.59
LC05*	T1.NE 3c 2.5mm	IP33	1	B	10.0	3.0	486000.19	408468.46
LC06*	T3.NE 3c 2.5mm	IP33	1	B	10.0	3.0	486039.49	408448.61
LC07*	T1.NE 3c 2.5mm	IP33	1	B	10.0	3.0	486053.17	408421.33
LC08*	T3.NE 3c 2.5mm	IP33	1	B	10.0	3.0	486081.61	408420.44

Asset ID Reference	Termination Type and Max Cable Size	Minimum Termination IP Rating	Column Type	Lantern Type	Nominal Height (mounting height relative to carriageway) (m)	Column Setback (edge of carriageway to centre of column) (m)	Easting	Northing
LC09*	T1.NE 3c 2.5mm	IP33	1	A	10.0	3.0	486078.08	408391.55
LC10*	T1.NE 3c 2.5mm	IP33	1	A	10.0	3.0	486104.66	408431.63
LC11*	T4 3c10 SWA	IP33	2	A	10.0	5.5	486136.93	408422.00
LC12*	T2 3c10 SWA	IP33	2	A	10.0	5.5	486161.96	408399.32
LC13*	T5 3c10 SWA	IP33	2	B	10.0	5.5	486201.91	408383.01
LC14*	T5 3c10 SWA	IP33	2	B	10.0	5.5	486247.20	408372.41
LC15*	T1.NE 3c 2.5mm	IP33	1	B	10.0	3.0	486242.83	408352.04
LC16*	T1.NE 3c 2.5mm	IP33	1	B	10.0	3.0	486196.81	408359.44
LC17*	T2	IP33	2	A	10.0	5.5	486161.29	408365.65

Asset ID Reference	Termination Type and Max Cable Size	Minimum Termination IP Rating	Column Type	Lantern Type	Nominal Height (mounting height relative to carriageway) (m)	Column Setback (edge of carriageway to centre of column) (m)	Easting	Northing
	3c10 SWA							
LC18*	T2 3c10 SWA	IP33	2	A	10.0	5.5	486140.15	408359.03
LC19*	T2 3c10 SWA	IP33	2	A	10.0	5.5	486108.59	408343.62
LC20*	T1 3c10 SWA	IP33	2	A	10.0	5.0	486095.25	408355.27
LC21*	T5 3c10 SWA	IP33	4	F	8.0	5.5	486132.20	408333.02
LC22*	T1 3c10 SWA	IP33	4	F	8.0	5.5	486130.33	408288.25
LC23*	T1 3c10 SWA	IP33	4	F	8.0	5.5	486133.54	408445.29
LC24*	T1 3c10 SWA	IP33	4	F	8.0	5.5	486150.39	408482.26
LC25*	T1.NE	IP33	1	A	10.0	3.0	486071.24	408373.43

Asset ID Reference	Termination Type and Max Cable Size	Minimum Termination IP Rating	Column Type	Lantern Type	Nominal Height (mounting height relative to carriageway) (m)	Column Setback (edge of carriageway to centre of column) (m)	Easting	Northing
	3c 2.5mm							
LC26*	T1.NE 3c 2.5mm	IP33	1	B	10.0	3.0	486052.56	408350.25
LC27*	T3.NE 3c 2.5mm	IP33	1	B	10.0	3.0	486011.80	408346.19
LC28*	T2 3c10 SWA	IP33	3	B	10.0	5.5	486271.96	408368.87
LC29*	T2 3c10 SWA	IP33	3	B	10.0	5.5	486306.31	408365.71
LC30*	T2 3c10 SWA	IP33	3	B	10.0	5.5	486345.28	408364.58
LC31*	T2 3c10 SWA	IP33	3	B	10.0	4.5	486384.79	408363.81
LC32*	T1 3c10 SWA	IP33	3	E	10.0	4.5	486422.77	408364.56
LC33*	T1 3c10 SWA	IP33	3	E	10.0	4.5	486460.68	408364.51

Asset ID Reference	Termination Type and Max Cable Size	Minimum Termination IP Rating	Column Type	Lantern Type	Nominal Height (mounting height relative to carriageway) (m)	Column Setback (edge of carriageway to centre of column) (m)	Easting	Northing
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Notes

The Contractor shall provide Asset Maintenance identification references for proposed lighting columns in accordance with Appendix 13/1.

Lighting column locations are given for information purposed only. Final positions shall be agreed with the Employer.

* Identification numbers to be agreed with North Lincolnshire Council.

Table 14/2/1B: Location of Feeder Pillars

Asset ID Reference	Requirement	Type Reference	Drawing Numbers	Easting	Northing	Remarks
Proposed Feeder Pillar FP01*	Proposed new feeder pillar	Single Phase Metered (DNO)	SER-SLDS-ZZ-13-D-C-1301-PH1	486179.25	408358.21	Proposed feeder pillar to be provided with 80 Amp single phase DNO supply with TT earth. Refer to Drawing Number SER-SLDS-ZZ-14-D-C-1401-PH1.
Notes The Contractor shall provide Asset Maintenance identification references for all feeder pillars in accordance with Appendix 13/1. Feeder pillar locations are given for information purposed only. Final positions shall be agreed with the Employer. * Identification numbers to be agreed with North Lincolnshire Council.						

Table 14/2/1C: Location of Road Traffic Sign Lights

Asset ID Reference	Termination Type and Max Cable Size	Minimum Termination IP Rating	Sign Light Type	Sign Light Quantity
S01*	T1.NE 3c 2.5mm	IP33	Simmons signs 6 x 1W LUA LED	2
S02*	T1.NE 3c 2.5mm	IP33	Simmons signs 6 x 1W LUA LED	2
S03*	T1.NE 3c 2.5mm	IP33	Simmons signs 6 x 1W LUA LED	1
S04*	T1.NE 3c 2.5mm	IP33	Simmons signs 6 x 1W LUA LED	1
S05*	T1.NE 3c 2.5mm	IP33	Simmons signs 6 x 1W LUA LED	1
S06*	T1.NE 3c 2.5mm	IP33	Simmons signs 6 x 1W LUA LED	1
S07*	T1.NE 3c 2.5mm	IP33	Simmons signs 6 x 1W LUA LED	1
S08*	T1.NE 3c 2.5mm	IP33	Simmons signs 6 x 1W LUA LED	2
S09*	T1.NE 3c 2.5mm	IP33	Simmons signs 6 x 1W LUA LED	2

Asset ID Reference	Termination Type and Max Cable Size	Minimum Termination IP Rating	Sign Light Type	Sign Light Quantity
<p>Notes</p> <p>The Contractor shall provide Asset Maintenance identification references for all illuminated road traffic signs in accordance with Appendix 13/1.</p> <p>For further details of traffic signs, refer to the Traffic Signs Schedule, provided by others.</p> <p>* Identification numbers to be agreed with North Lincolnshire Council.</p>				

APPENDIX 14/4: ELECTRICAL EQUIPMENT FOR ROAD LIGHTING

Provider's Particular Requirements

- 14.4.1 The Contractor shall ensure the correctness and compatibility of all equipment to be installed as described in the Contract.
- 14.4.2 The Contractor shall insert in the following Tables of this Appendix, details of the equipment which he proposes to use in the Works and shall submit the information to the Employer in accordance with the timescales to be agreed.

Luminaire General Requirements

- 14.4.3 The luminaire shall meet the requirements of:
- BS EN IEC 60598-1:2021+A11:2022 Luminaires. General Requirements and Tests
 - BS EN 60598-2-3:2003+A1:2011 Luminaires. Particular Requirements. Luminaires for Road and Street Lighting
- 14.4.4 BS EN 60598 – Luminaires is a multi-part document, any luminaire specified shall be designed to meet the particular requirements of the standard for that type of luminaire.
- 14.4.5 The luminaire shall conform to all relevant UK Standards, including those for Electrical Safety, Electromagnetic Compatibility, Health and Safety and Photobiological Safety, under the UKCA Declaration of Conformity and be UKCA marked.
- 14.4.6 Photobiological safety shall be tested in accordance with the latest edition of BS EN 62471:2008 – Photobiological Safety of Lamps and Lamp Systems and conform to risk group RG1 for all drive current and optic combinations provided.
- 14.4.7 The complete luminaire shall be certified by a Third-Party Test House that is a member of the ENEC Certification Scheme and hold an ENEC Certificate.
- 14.4.8 The luminaire shall emit zero upward light above the 90-degree angle when installed.
- 14.4.9 When fitted to a column/column adaptor the lantern shall be at 0 degrees as detailed in Appendix 13/1.
- 14.4.10 Side entry luminaire spigots shall incorporate a plus and/or minus tilt radius to ensure luminaire is mounted in a horizontal position in relation to the sky.
- 14.4.11 The minimum Colour Rendering Index (CRI) shall be 70.
- 14.4.12 Luminaires shall, through a system of louvres and shields, be capable of light cut-off from the front, back and both sides in combination or all together.
- 14.4.13 Luminaire suppliers and manufacturers shall demonstrate a commitment to the Circular Economy (TM66) and have published sustainability goals which include, but are not restricted, to:
- Reducing total waste volumes
 - Reducing CO2 emissions
 - Ambition to be Climate Neutral

- 14.4.14 Luminaire manufacturers shall be registered with a WEEE collective compliance scheme.
- 14.4.15 Luminaires shall be compatible with the columns specified in Appendix 13/1 and 13/2.
- 14.4.16 Luminaires shall be supplied suitable for post top mounting direct to the spigot of the columns specified in Appendix 13/1 and 13/2.
- 14.4.17 The lamp enclosure shall have a minimum protection rating of IP66.
- 14.4.18 The gear enclosure shall have a minimum protection rating of IP66.
- 14.4.19 The means of supporting LED optical module shall be designed such that the position of the LED optical module in the luminaire remains substantially the same under all normal conditions throughout its life.
- 14.4.20 The luminaires shall have control gear modules, which are removable with plug-in connections to allow a complete unit to be changed for maintenance.
- 14.4.21 The body of the luminaire shall be manufactured from metal with the metal electronic control gear tray mounted directly to the lantern body to assist in heat dissipation.
- 14.4.22 Road lighting luminaires shall be individually fused in the column cut-out. Luminaire integral gear trays shall not be fused.

Luminaire Contract Specific Requirements

- 14.4.23 The road lighting luminaires shall be compatible with the columns specified in Appendix 13/1 and 13/2.
- 14.4.24 Luminaires shall be supplied with electronic control gear suitable for the proposed LED optical module, proposed LED drive current, and be provided with Constant Light Output enabled based on a maximum Lumen Depreciation Factor of 10% at a rated life of 100,000 hours.
- 14.4.25 All LED optical modules shall be provided with a colour temperature of 3000K and be classified as Warm White.
- 14.4.26 All road lighting luminaires shall be provided with an integral Type 3 surge protective device (SPD) in accordance with EN 61643-11 and BS7671 Table 443.2.
- 14.4.27 Road lighting luminaires shall be provided with a 7-pin NEMA socket.
- 14.4.28 Road lighting luminaires shall be provided with integral DALI dimmable control gear.
- 14.4.29 All luminaires shall be provided pre-wired with 12m long 3-core 1.5mm² H07RN-F power cable, all pre-wired by the manufacturer.
- 14.4.30 All luminaires shall be provided with optical specification, control method, and remarks as detailed in Table 14/4//1 below:

Table 14/4/1: Road Lighting Luminaires referred to in Appendix 13/1 and Appendix 14/2

Luminaire Reference	Type A
Manufacturer	Urbis Schreder
Model	Ampera Maxi
Protector Type	Flat Glass
Lamp Wattage	100 LED / 123W
Lantern Reference	AMPERA MAXI 5393 Flat glass 100 LEDs @ 400mA WW 730 230V 00-53-426 550702
Correlated Colour Temperature	3000K
Weight	18.2 kg (max)
Windage Area	0.18 sq.m
Luminous Intensity Class	G4 (Full Cut Off)
Inclination	0 degrees
Control Gear Type	Electronic
Control	Individual 7-pin NEMA socket and fitted with Lucy Zodion SS6 3-Pin NEMA Photocell, with a switching regime of 20 Lux On / 20 Lux Off

Luminaire Reference	Type B
Manufacturer	Urbis Schreder
Model	Ampera Maxi
Protector Type	Flat Glass
Lamp Wattage	80 LED / 178W
Lantern Reference	AMPERA MAXI 5304 Flat glass 80 LEDs @ 700mA WW 730 230V 00-53-426 550372
Correlated Colour Temperature	3000K
Weight	18.2 kg (max)
Windage Area	0.18 sq.m
Luminous Intensity Class	G6 (Full Cut Off)
Inclination	0 degrees
Control Gear Type	Electronic
Control	Individual 7-pin NEMA socket and fitted with Lucy Zodion SS6 3-Pin NEMA Photocell, with a switching regime of 20 Lux On / 20 Lux Off

Luminaire Reference	Type D
Manufacturer	Urbis Schreder
Model	Ampera Maxi
Protector Type	Flat Glass
Lamp Wattage	80 LED / 178W
Lantern Reference	AMPERA MAXI 5393 Flat glass 80 LEDs @ 700mA WW 730 230V 00-53-426 550702
Correlated Colour Temperature	3000K
Weight	18.2 kg (max)
Windage Area	0.18 sq.m
Luminous Intensity Class	G4 (Full Cut Off)
Inclination	0 degrees
Control Gear Type	Electronic
Control	Individual 7-pin NEMA socket and fitted with Lucy Zodion SS6 3-Pin NEMA Photocell, with a switching regime of 20 Lux On / 20 Lux Off

Luminaire Reference	Type E
Manufacturer	Urbis Schreder
Model	Axia 3.3
Protector Type	Flat Glass
Lamp Wattage	48 LED / 80W
Lantern Reference	AXIA 3.3 5279 Integrated lenses 48 OSOLON SQUARE GIANT@550mA WW 730 230V 00-70-393 429344
Correlated Colour Temperature	3000K
Weight	6.0 kg (max)
Windage Area	0.04 sq.m
Luminous Intensity Class	G2
Inclination	0 degrees
Control Gear Type	Electronic
Control	Individual 7-pin NEMA socket and fitted with Lucy Zodion SS6 3-Pin NEMA Photocell, with a switching regime of 20 Lux On / 20 Lux Off

Luminaire Reference	Type F
Manufacturer	Urbis Schreder
Model	Axia 3.2
Protector Type	Flat Glass
Lamp Wattage	32 LED / 59W
Lantern Reference	AXIA 3.2 5267 Integrated lenses 32 OSOLON SQUARE GIANT@600mA WW 730 230V 02-58-000 430092
Correlated Colour Temperature	3000K
Weight	4.8 kg (max)
Windage Area	0.03 sq.m
Luminous Intensity Class	G2
Inclination	0 degrees
Control Gear Type	Electronic
Control	Individual 7-pin NEMA socket and fitted with Lucy Zodion SS6 3-Pin NEMA Photocell, with a switching regime of 20 Lux On / 20 Lux Off

LED Driver General Requirements

14.4.31 The LED Driver shall be ENEC Certified in accordance with (as a minimum):

BS EN IEC 55015:2019+A11:2020	Limits and method of measurement of radio disturbance characteristics of electrical lighting and similar equipment
BS EN IEC 61000-3-2:2019+A2:2024	Electromagnetic Compatibility (EMC) – Limits. Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
BS EN IEC 61000-3-3:2013+A2:2021	Electromagnetic Compatibility (EMC) – Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection
BS EN 61000-4-4:2012	Electromagnetic Compatibility (EMC) Testing and measurement techniques. Electrical fast transient/burst immunity test
BS EN 61000-4-5:2014+A1:2017	Electromagnetic Compatibility (EMC) Testing and measurement techniques. Surge immunity test
BS EN 61347-1:2015+A1:2021	Lamp Control gear General and safety requirements
BS EN 61347-2-13:2014+A1:2017	Lamp Control gear Particular requirements for DC or AC supplied electronic control gear for LED modules
BS EN IEC 62384:2020	DC or AC supplied electronic control gear for LED modules. Performance requirements
BS EN IEC 61547:2023	Equipment for general lighting purposes. EMC immunity requirements
BS EN 62386-101:2014+A1:2018	Digital addressable lighting interface General requirements. System components
BS EN 62386-102:2014+A1:2018	Digital addressable lighting interface General requirements. Control gear
BS EN 62386-103:2014+A1:2018	Digital addressable lighting interface General requirements. Control devices
IEEE 1789-2015	IEEE recommended practices for modulating current in high-brightness LEDs for mitigating health risks to viewers

14.4.32 The driver shall have a minimum life expectancy of 100,000 hours at the maximum case temperature encountered in the luminaire at an external ambient temperature of 25° Celsius.

14.4.33 LED's shall not run at more than 70% of their maximum rated running current.

LED Driver Contract Specific Requirements

14.4.34 All luminaires shall be provided with electronic control gear.

14.4.35 Electronic Drivers shall comply with BS EN 60927/ BS EN 60929, BS EN 61547 and BS EN 55015/BS EN 55022 and have the CE marking and be suitable for the specified operating voltage of the network.

Cut-out Units General Requirements

14.4.36 Cut out units shall be modular in construction and purpose made for road lighting applications and shall have a moulded housing with minimum protection of IP2X.

14.4.37 The unit shall come pre-wired between the circuit protective devices, isolators and the incoming cable terminations with line, earth and neutral terminals fitted with suitable separators.

14.4.38 Cut out units shall connect together to give the appearance of being a single unit.

14.4.39 In addition, cut out units shall comply with the following:

- be fitted with a DIN rail mounted double pole isolator to BS EN 60947-3 having positive contact indication 32A rating.
- be fitted with a DIN rail mounted protective device as specified in drawing SER-SLDS-ZZ-14-D-C-1400/Series.
- have a lockable transparent cover which may only be removed by use of a tool.

14.4.40 Maximum incoming cable CSA for termination in double pole isolator shall be 6mm². Cables shall not be looped in and out of isolator terminals.

14.4.41 Where looped services from cut out units are required those units shall be fitted with extension boxes and terminal blocks of the same manufacture as the cut out unit.

14.4.42 All armoured cables shall be terminated by means of single brass gland plate using BW or CW compression glands (as applicable).

14.4.43 The plate shall come pre-drilled with minimum M6 earth studs complete with fitting and locking arrangement for crimp terminals to allow connection of protective conductors and extraneous bonding conductors, both internal and external.

14.4.44 The exposed SWA shall be insulated outside the cut-out using a shroud over the top of the cable outer insulation.

14.4.45 The gland plate shall be provided with the glands suitably stopped up with a PVC bung, which can be removed or left in place as required.

14.4.46 The conductor terminations shall be shrouded and only removed with the use of a tool with a separate terminal available for earthing which shall be wired with a 10mm² flexible green/yellow bonding conductor to the gland plate.

- 14.4.47 All incoming and outgoing non-SWA cables shall be terminated onto a removable single brass plate using plastic compression glands and be provided with blanking plugs where required.
- 14.4.48 The isolator shall be 32 Amp double pole.
- 14.4.49 The RCBO shall be type A and shall have a current rating as specified on Drawing No. SER-SLDS-ZZ-14-D-C-1400/Series and have a tripping current of 30mA and be single pole to BS 61009. Where additional circuits are to be connected from the fuse unit a separate single pole BS61009 RCBO shall be provided to allow for connection of the outgoing circuit. Both the isolator and RCBO(S) shall be mounted on the DIN rail.
- 14.4.50 The Contractor shall ascertain from the supplier the earthing arrangement of the installation.
- 14.4.51 For a TT-System an RCBO shall be installed in place of any fuses.
- 14.4.52 The unit shall come pre-wired between the RCBOs, isolators and the incoming cable terminations with line, earth and neutral terminals fitted with suitable separators.
- 14.4.53 Any separable parts that allow access to live terminations must be held together by slot headed bolts or screws, with a lock washer. A removable insulating shroud shall be installed with the unit, covering all line conductors. All fixing bolts or screws shall be non-corrodible.
- 14.4.54 The cut out shall be complete with a brass earth plate suitable for terminating XLPE/SWA/PVC cables.
- 14.4.55 Cut-outs shall have tinned brass terminals capable of taking cable conductors up to 25mm², as specified. Each cable terminated onto the gland plate shall be labelled in accordance with Drawing No's SER-SLDS-ZZ-14-D-C-1400/Series.
- 14.4.56 Cut outs units shall have a minimum rating of IP33.
- 14.4.57 The access cover to the isolator and RCBO(s) shall be translucent and be hinged and have the facility to be locked of using a miniature padlock.
- 14.4.58 Cut outs shall be suitably attached within the base compartment of lighting columns in accordance with the manufacturer's recommendations.

Cut-out Units Contract Specific Requirements

- 14.4.59 For further details of the typical layouts of cut-outs in the base compartment, and explanation of cut-out references, refer to Drawing No's SER-SLDS-ZZ-14-D-C-1400/Series.

Residual Current Operated Circuit-breakers (RCBO's)

- 14.4.60 The RCBO shall be certified and selected in accordance with (as a minimum):

BS EN 61009-1:2012+A13:2021	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) - General rules
BS 7671:2018/A3:2024	Requirements for Electrical Installations. IET Wiring Regulations

- 14.4.61 Shall be, single module, suitable for use with any brand of consumer unit or distribution board.
- 14.4.62 DIN rail mounted (35mm) to EN 60715.
- 14.4.63 Shall clearly indicate operating state and fault indication by means of green-red indicator flag in inspection window.
- 14.4.64 Minimum degree of protection IP20.
- 14.4.65 A separate single pole 30mA RCBO Type A to BS EN 61009 shall be provided in the road lighting column fuse unit for each lantern, sign light, and where indicated, any spur to a sub-circuit.

RCBO Contract Specific Requirements

14.4.66 All RCBOs shall comply with BS EN 61009 and have a minimum breaking capacity of 6kA, Type A, C Curve characteristics, single pole and with a current rating and rated tripping current as detailed on Drawing No's SER-SLDS-ZZ-14-D-C-1400/Series and 14.4.67 below.

14.4.67 RCBO's shall be provided in the road lighting cut-out unit where specified for each individual luminaire, and where indicated, any downward spur with the following current ratings:

Single LED luminaire = BS EN 61009 6 Amp 30mA RCBO

Downward fused spur circuit = BS EN 61009 10 Amp 30mA RCBO

Miniature Circuit Breakers (MCBs)

14.4.68 The MCB shall be certified and selected in accordance with (as a minimum):

BS EN 60898-1:2019 - TC	Electrical accessories. Circuit-breakers for overcurrent protection for household and similar installations - Circuit-breakers for a.c. operation
BS EN IEC 60947-2:2025	Low-voltage switchgear and control gear - Circuit-breakers
BS 7671:2018/A3:2024	Requirements for Electrical Installations. IET Wiring Regulations

- 14.4.69 Shall be, single module, suitable for use with any brand of consumer unit or distribution board.
- 14.4.70 DIN rail mounted (35mm) to EN 60715.
- 14.4.71 Have positive contact indication (on/off indication).
- 14.4.72 Have trip free mechanism operating even when toggle is locked.
- 14.4.73 Be lockable in the ON or OFF position.
- 14.4.74 Minimum degree of protection IP20.

Passively Safe Disconnection System

- 14.4.75 To provide electrical disconnection and ensure safety in the event of a vehicular collision leading to the occurrence of fault conditions within passively safe lighting equipment, all 230V passively safe equipment shall disconnect in 0.4 seconds by means of MCB/RCBO protection under earth fault conditions.
- 14.4.76 The disconnection of the circuit under fault conditions shall disconnect all electrical connection regardless of whether the column shears/detaches from its base.
- 14.4.77 For passively safe equipment rated NE classification, an in-line plug and socket system shall be used. The in-line plug and socket shall comprise of a 3-pin 16 Amp rubber sheathed male (2 metre length) and female (4 metre length) snatch plug assembly in standard format – other lengths can be used where required and approved by the Employer. It shall be designed to disconnect if the passively safe structure i.e. column or signpost, is knocked over. A drawstring shall be fitted to the female end of the snatch connector to allow for the cable to be pulled up to the column door for visual inspection. The drawstring shall be secured to a cleat on the backboard. Installation guidelines need to be followed regarding the clamping of the excess cable within the chamber and the fixing of the cable within the passive structure. Refer to Drawing No's SER-SLDS-ZZ-14-D-C-1400/Series for details.
- 14.4.78 For passively safe equipment rated HE classification, SWA cables can be looped in and out but shall still disconnect in 0.4 seconds by means of MCB/RCBO protection under earth fault conditions.

Surge Protective Devices (SPDs)

- 14.4.79 The surge protective device shall be certified and selected in accordance with Drawing No SER-SLDS-ZZ-14-D-C-1400/Series and (as a minimum):

BS EN 61643-11:2012+A11:2018	Low-voltage surge protective devices - Surge protective devices connected to low-voltage power systems. Requirements and test methods
IEC 62305-2:2024	Protection against lightning. – Part 2: Risk management
BS 7671:2018/A3:2024	Requirements for Electrical Installations. IET Wiring Regulations

- 14.4.80 The enclosure shall be manufactured from high temperature thermoplastic material (UL 94V-0).
- 14.4.81 Shall be suitable for use with any brand of consumer unit or distribution board.
- 14.4.82 DIN rail mounted (35mm) to EN 60715.
- 14.4.83 Shall clearly indicate operating state and fault indication by means of green-red indicator flag in inspection window.
- 14.4.84 Minimum degree of protection IP20.

Feeder Pillars General Requirements

- 14.4.85 The new feeder pillar, proposed for FP01, and components used shall be certified, as applicable, in accordance with (as a minimum):

BS 7671:2018+A3:2024 - SET	Requirements for Electrical Installations. IET Wiring Regulations
BS EN IEC 61439-1:2021	Low-voltage switchgear and control gear assemblies - General rules
BS EN ISO 1461:2022 - TC	Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods
BS EN 60529:1992+A2:2013	Degrees of protection provided by enclosures (IP Code)

- 14.4.86 Pillars shall be manufactured from 5mm thick mild steel sheet and hot dipped galvanised to BS EN 1461 following fabrication and incorporate the following features:
- 18mm thick exterior grade ply backboard treated with a clear water repellent paint.
 - Suitable heavy duty lifting lugs.
 - Fitted with industry standard stainless steel 'wedge' type lock c/w covers and security bungs.
 - The lock shall be operated by the use of a standard triangular key.
 - Designed for planted root installation.
 - A4 document holder fitted to the inside of the door.
 - Designed to offer a minimum ingress protection of IP34.
- 14.4.87 Proposed feeder pillars shall be provided with clear space for the DNO cut-out and metering equipment. The minimum space required will be 1000mm x 500mm (HxW). The incoming black DNO duct shall be positioned so that it is located below the centreline of the clear space.
- 14.4.88 Distribution boards shall be designed that a single circuit can be isolated/reset whilst not affecting the operation of other circuits fed from the same distribution board (i.e. protective devices inside interlocked, or non-interlocked, enclosures shall not be permitted). Distribution boards shall be manufactured using the Hensel Mi IP-rated enclosure system.
- 14.4.89 All circuit protective devices shall be manufactured by Schneider Electric and shall be in line with the requirements on Drawing No's SER-SLDS-ZZ-14-D-C-1400/Series.
- 14.4.90 All internal wiring to be tri-rated stranded PVC single sheath unless otherwise stated.
- 14.4.91 All internal current carrying wiring shall be colour coded appropriate for the phase conductor.
- 14.4.92 The distribution boards shall be marked with the current rating and type of protective device.
- 14.4.93 Feeder pillars shall be equipped with a waterproof information chart (ego screen printed laminated plastic or as otherwise approved by the Engineer) securely fixed to the inside of the door giving a permanent record of:
- The feeder cable distribution board, outlet or lighting circuit protected by each protection device.
 - The rating of each protection device.
 - The phase(s) to which outgoing cables are connected.
 - Schematic cable layout for all equipment and cables fed from pillar.

Feeder Pillars Contract Specific Requirements

- 14.4.94 All proposed feeder pillars shall be designed, built and tested in accordance with BS EN 61439-1 and shall meet all the requirements of North Lincolnshire Council, Drawing No's SER-SLDS-ZZ-14-D-C-1400/Series and this specification.
- 14.4.95 Proposed feeder pillar backboards shall be fitted with pre-wired switch gear incorporating main isolator switch, distribution boards, and ancillaries where required with wiring in accordance with Drawing Number SER-SLDS-ZZ-14-D-C-1400/Series and in accordance with the following requirements:
- Enclosures shall be connected using interconnecting seals. Trunking shall not be used.
 - All distribution boards shall be Class II and shall be manufactured using the Hensel Mi IP-rated enclosure system.
 - All internal wiring shall be enclosed within the distribution boards except for ancillary items which shall be contained within flexible PVC duct.
 - All earthing terminations shall be made inside the distribution board with the exception of the doors and the feeder pillar shell which shall be bonded to a gland plate.
 - All earth bonding shall be 16mm² unless otherwise stated.
 - All fused switches shall allow the neutral conductor to 'make' first and 'break' last.
 - All isolators shall have a lock off facility.
 - Protective devices shall be as required on the electrical design schematics.
- 14.4.96 Outgoing cables shall be terminated using BW glands mounted on a 3 mm brass gland plate and terminated inside a separate enclosure housing 'klippon' terminals and labelled in accordance with Drawing Number SER-SLDS-ZZ-14-D-C-1400/Series.
- 14.4.97 The distribution board, outgoing 'klippon' units, and spacing on the gland plate shall have spare ways as required by the Design Schematic Drawings.
- 14.4.98 Brass gland plates shall be bonded to earth inside the enclosures.
- 14.4.99 Anti-condensation heaters shall be controlled by an anti-tamper thermostat set to 5 degrees and with a minimum rated power output as specified on Drawing Number SER-SLDS-ZZ-14-D-C-1400/Series.
- 14.4.100 Feeder pillars shall be installed with duct details through the formation as detailed below:
- Feeder pillar FP01 shall be provided with 6 No. 100 mm internal diameter orange street lighting 90-degree slow duct bends. It shall also be provided with 1 no. 125 mm internal diameter black DNO 90-degree slow duct bend to Northern Powergrid specifications. Sufficient space shall be left clear on the feeder pillar backboard to accommodate the proposed DNO cut-out and meter. This space shall be a minimum 500 x 1000 mm (WxH) and shall be located on the left-hand side of the pillar (when viewed from the front of the pillar). The black DNO duct shall be located centrally below the space provided for the DNO cut-out and meter.

Base Compartment Fixing Arrangements

- 14.4.101 All electrical equipment installed within the base compartment of columns or posts shall be fixed in accordance with manufacturer's instructions with corrosion resistant fixing screws and laid out in accordance with SER-SLDS-ZZ-14-D-C-1400/Series.

Internal Wiring General Requirements

14.4.102 The cables used for wiring shall be certified, as applicable, in accordance with (as a minimum):

BASEC	The British Approvals Service for Cables (BASEC)
BS EN 50525-2-21:2011	Electric cables. Low voltage energy cables of rated voltages up to and including 450/750 V (U0/U) - Cables for general applications. Flexible cables with crosslinked elastomeric insulation
BS EN 60811-404:2012	Electric and optical fibre cables. Test methods for non-metallic materials - Miscellaneous tests. Mineral oil immersion tests for sheaths
BS EN 60811-507:2012	Electric and optical fibre cables. Test methods for non-metallic materials - Mechanical tests. Hot set test for cross-linked materials
BS EN 60332-1-2:2004+A12:2020	Tests on electric and optical fibre cables under fire conditions - Test for vertical flame propagation for a single insulated wire or cable. Procedure for 1 kW pre-mixed flame
BS 6231:2006	Electric cables. Single core PVC insulated flexible cables of rated voltage 600/1000 V for switchgear and control gear wiring
BS 7655-4.2:2000	Specification for insulating and sheathing materials for cables. PVC sheathing compounds – General application
BS EN 50363-3:2005+A1:2011	Insulating, sheathing and covering materials for low voltage energy cables – PVC insulating compounds
BS EN 60228:2005	Conductors for insulated cables

14.4.103 The wiring within road lighting columns shall be PVC insulated and PVC sheathed 3-core flexible cable for lamp circuits 300/500 volt rating in accordance with BS 6004.

14.4.104 All wiring colours shall comply with BS 7671.

14.4.105 All wiring shall have copper conductors. Phase and neutral copper conductors shall be 1.5mm² in cross-sectional area.

14.4.106 The final connection between the cut out unit and DNO/IDNO supply cut out shall be PVC insulated and sheathed single core cable of minimum cross-sectional area of 2.5mm².

14.4.107 All wiring shall be neatly bunched together with cable ties.

14.4.108 All terminations are to be accessible and no joints are allowed.

Specific Requirements

Cable Reference	H07RN-F	
Voltage Rating Uo/U	450/750V	
Temperature Rating	-25°C to +60°C	
Conductors	Class 5 Flexible Stranded Copper Conductor	
Insulation Material	EPR (Ethylene Propylene Rubber)	
Sheath Material	PCP (Polychloroprene)	
Core Identification	Three Core	Five Core
	Blue – Brown – Green/Yellow	Blue – Brown – Green/Yellow – Black - Grey
Minimum Bending Radius	6 x Overall Diameter	
Sheath Colour	Black	

Cable Reference	Tri-Rated	
Voltage Rating Uo/U	600/1000V	
Temperature Rating	-15°C to +90°C	
Conductors	Class 5 Plain Annealed Flexible Stranded Copper Conductor	
Insulation Material	N/A	
Sheath Material	PVC (Polyvinyl Chloride)	
Core Identification	N/A	
Minimum Bending Radius	6 x Overall Diameter	
Sheath Colour	Green/Yellow	

Internal Wiring Contract Specific Requirements

14.4.109 The wiring within lighting columns shall be as specified below:

- All luminaires shall be provided pre-wired with 12m long 3-core 1.5mm² H07RN-F power cable all pre-wired by the manufacturer.

Earthing General Requirements

14.4.110 The whole of the installation shall be earthed in accordance with the requirements of BS 7671 (the IET Wiring Regulations), BS 7430, and to the satisfaction of service supplier.

14.4.111 The earth continuity conductor connecting the door to the earthing terminal of the column base shall not be less than 10mm² in section and shall be tri-rated and insulated,

the colour being green yellow and shall be suitable length to ensure that the door can be laid flat on the ground without stressing the conductor.

- 14.4.112 A sound mechanical and electrical connection must be made between the earth continuity conductor and each item of exposed metal.
- 14.4.113 The earth continuity conductor shall be connected to all earthing terminals (provided for all metal parts of each lighting unit) using eye type terminal end. All such connections and joints shall be crimped, with the appropriate size terminal, and used with the correct size earth continuity conductor that is bent double inside the crimp with the bend extending through the crimp. They shall be mechanically sound electrically continuous and protected where necessary against corrosion. Additional external earth continuity conductors shall not be jointed but bonded to the column earth stud.
- 14.4.114 Where substantial brass or other non-ferrous clamping terminals are not provided in the equipment, it is the responsibility of the Contractor to supply and fit them.
- 14.4.115 The earth continuity conductor point of origin inside the road lighting column shall be the incoming supply fused cut out.
- 14.4.116 Refer to Drawing No's. SER-SLDS-ZZ-14-D-C-1400/Series for typical earthing requirements.
- 14.4.117 An earth electrode shall be installed adjacent to all feeder pillars as specified and indicated on the electrical design schematic diagrams shown on Drawing No's. SER-SLDS-ZZ-14-D-C-1400/Series. Additional earth electrodes shall be installed as required to achieve a maximum impedance as specified for each specific feeder pillar. This electrode is to ensure correct function of the specified RCBO's.

Earth Electrodes and Inspection Chambers General Requirements

- 14.4.118 Earth electrodes and inspection chambers shall be certified, as applicable, in accordance with (as a minimum):

BS 7430:2011+A1:2015	Code of practice for protective earthing of electrical installations
BS EN IEC 62561-2:2018	Shall be supplied in 1200mm lengths Lightning protection system components (LPSC) - Requirements for conductors and earth electrodes
BS EN IEC 62561-5:2024	TC Lightning protection system components (LPSC) - Requirements for earth electrode inspection housings and earth electrode seals
BS 7430:2011+A1:2015	Code of practice for protective earthing of electrical installations
PD 970:2005	Wrought steels for mechanical and allied engineering purposes. Requirements for carbon, carbon manganese and alloy hot worked or cold finished steels

- 14.4.119 Inspection Pit shall:

- be lightweight, less than 2.5kg, manufactured from high performance polymer.
- be UV stable and chemical resistant.
- have a lockable, black, polymer lid with a load bearing capacity of not less than 5000kg.

14.4.120 Earth Rod shall:

- be copper bonded, manufactured by molecularly bonding pure (99.9%) electrolytic copper onto a high tensile strength, low carbon, steel core.
- minimum copper bonded thickness shall be 250 micron.
- minimum diameter of rod shall be 16mm. Where ground conditions are adverse additional or large diameter rods are to be used.
- be supplied in 1200mm rolled threaded lengths which can be joined by means of a threaded copper coupler.
- be installed by means of a driving head or stud. Direct hammering of rod shall not be permitted.

14.4.121 Earth Rod Coupler shall:

- have the same mechanical strength as the earth rod and shall resist mechanical stress during driving.
- have sufficient mechanical capacity to ensure electrical conductance equivalent to the earth rod.
- be compatible with the earth rod material and shall not cause damage or harm, such as electrolytic corrosion, to the earth rod.

14.4.122 Earth Rod Clamp shall:

- be Type G manufactured from high strength copper alloy.
- be suitable for joining earth rod supplied to specified stranded copper conductor.
- be secure by means of M10 (25mm) phosphor bronze set having a tightening torque of 12Nm.
- have sufficient mechanical capacity to ensure electrical conductance equivalent to the earth rod.
- be compatible with the earth rod material and shall not cause damage or harm, such as electrolytic corrosion, to the earth rod.

14.4.123 Driving Head shall:

- be manufactured from hardened steel and be suitable for driving threaded copper bonded earth rods by hand or with a power hammer.
- be designed to make direct contact with the end of the rod.
- where applied by means of a coupler, not transfer the driving force through the coupler threads.
- have sufficient mechanical strength for multiple use without deformation.

14.4.124 Where soil resistivity is high soil enhancer shall be applied.

- For dry locations low-resistance earthing compound shall be used.
- For damp locations moisture retaining clay shall be used.

14.4.125 For TT feeder pillar installations, the earth electrode resistance shall be below 100 ohms. Earth electrodes will be required to be installed at each feeder pillar.

14.4.126 The earth connection cable between the earth electrode and the equipment earth terminal shall be carried out with a 16mm² insulated copper conductor. The cable shall be protected with a suitable length of orange street lighting duct.

Underground and Ducted Cable General Requirements

14.4.127 The cables used for underground and ducted services shall be certified, as applicable, in accordance with (as a minimum):

BASEC	The British Approvals Service for Cables (BASEC)
BS 5467:2016	Electric cables. Thermosetting insulated, armoured cables of rated voltages of 600/1000 V and 1900/3300 V for fixed installations. Specification
BS 7655-4.2:2000	Specification for insulating and sheathing materials for cables. PVC sheathing compounds – General application
BS EN 50363-3:2005+A1:2011	Insulating, sheathing and covering materials for low voltage energy cables – PVC insulating compounds
BS EN 60228:2005	Conductors for insulated cables

14.4.128 Cable shall be selected in accordance with the requirements of BS 7671:2018+A3:2024-SET – Requirements for Electrical Installations. IET Wiring Regulations.

14.4.129 Minimum permissible nominal cross-sectional area shall be 6.0mm².

14.4.130 Cables shall only be laid when the ambient temperature is above 0 degrees Celsius.

14.4.131 Cables shall not be bent to an internal radius of less than 12 times the external diameter of the cable or less than the radius recommended by the manufacturer.

14.4.132 Lighting cables shall be supplied in ducts in accordance with Highways Construction Detail Drawings MCX No. MCX 0814.

14.4.133 Cables crossing draw pits shall be adequately supported, with a maximum of 450 mm between supports.

14.4.134 All conductors shall be of high conductivity copper of equal cross-sectional area, the conductors shall be identified by colour throughout its length in accordance with BS 7671. The Contractor shall provide the Employer evidence that the cable length delivered to site has been tested at the place of manufacture and complies with the testing requirements of BS 5467.

14.4.135 All cable sheaths must also comply with Clause 1421 of Specification for Highway Works, Volume 1. i.e. the sheathing material shall be appropriate to the ground conditions in which it will be laid. In ground that is liable at any time to become waterlogged, then the sheathing material shall have an ASTM F1249 – 1 tested maximum permeability of 2.0 g.d -1-2, 90% R.H, 1mm.

14.4.136 All cable sizes shall be in accordance with the electrical design schematic diagrams.

Cable Reference	Steel Wire Armoured	
Voltage Rating Uo/U	600/1000V	
Temperature Rating	-15°C to +90°C	
Conductors	Class 2 Stranded Copper Conductor	
Insulation Material	XLPE (Cross-Linked Polyethylene)	
Bedding	PVC (Polyvinyl Chloride)	
Armour	Galvanized Steel Wire Armour	
Outer Sheath Material	PVC (Polyvinyl Chloride)	
Core Identification	3 Core	5 Core
	Brown – Black - Grey	Brown – Black – Grey – Blue – Green/Yellow
Minimum Bending Radius	2.5mm ² – 16mm ²	25mm ² and above
	6 x Overall Diameter	8 x Overall Diameter
Outer Sheath Colour	Black	

Underground and Ducted cable Contract Specific Requirements

14.4.137 The indicative locations of cables that are to be laid in ducts are shown on Drawing No's SER-SLDS-ZZ-13-D-C-1300/Series. Refer to Appendix 14/2.

14.4.138 The ends of all new and existing cables at termination points shall be clearly identified and labelled at the time of laying by means of an approved cable identification label with indelible marking of black lettering on a white or yellow background, or alternatively embossed onto an aluminium label, in accordance with this specification, and Drawing No's SER-SLDS-ZZ-14-D-C-1400/Series, showing the following information:

- Feeder Pillar reference number e.g. "FP01."
- Circuit reference number e.g. "Circuit 3."
- Origin or destination e.g. "From Column LC01" or "To Column LC02"

14.4.139 All lighting cables shall be 600/1000 Volt with XLPE insulation and black PVC sheathing with steel wire strip armouring to BS 5467 unless otherwise stated.

14.4.140 All lighting cables shall be of the types and sizes described on Drawing No's. SER-SLDS-ZZ-14-D-C-1400/Series.

14.4.141 Permitted cables associated with the installation of road lighting, shall comply with the requirements of Table 14/4/4.

Table 14/4/4: Permitted Cables

Permitted Cable Types
2.5mm ² 3-core PVC - PVC 300/500V cable with copper conductors
6mm ² 3-core XLPE – SWA – PVC - cable with copper conductors
10mm ² 3-core XLPE – SWA – PVC - cable with copper conductors
16mm ² 3-core XLPE – SWA – PVC - cable with copper conductors

Cable Joints

- 14.4.142 Underground cable joints shall not be permitted unless specifically shown on the electrical design schematic drawing. In the event of damage to new cables jointing will not be permitted and the cable shall be replaced for the complete length between terminations.
- 14.4.143 Jointing will not be permitted on external additional CPC; these shall be terminated using compression terminations and bonded to the column earth stud.
- 14.4.144 Cable joint markers are required over every joint marked on the drawings and shall be laid on 150m of well compacted type 1 GSB. Where they are laid within paved areas they are to be installed after the binder course and prior to the surface course at the finished level and reference measurements taken from nearby permanent features.
- 14.4.145 Joints shall be made using materials complying with BS6910 Part 1 and shall be installed in compliance with BS6910 Part 2 and the manufacturer’s recommendations.
- 14.4.146 Resin joints shall be to BS EN 50393. Joints, where required, shall be provided in a ‘single kit’ form from a single manufacturer.
- 14.4.147 Jointing shall only be carried out when all materials to be used in the jointing are free from visible signs of moisture and joints shall be left protected from the weather during the curing period.
- 14.4.148 The joint shall be insulated by a rigid, cold curing epoxy compound capable of being used under all reasonable temperatures anticipated on site.
- 14.4.149 All cables shall be encapsulated by the potting compound. Any traces of cable insulation or conductors exposed by the potting compound or visible against the mould will require the joint being encapsulated by an oversize joint.
- 14.4.150 Each joint unit shall be complete with a transparent mould, epoxy resin, plastic funnels, sealing tape, copper earth strip and instructions for use.
- 14.4.151 Before the mould is fixed all the cable outer insulation shall be severally roughed up around the whole diameter to improve the bonding of the potting compound and reduce the risk of water penetration.
- 14.4.152 The mould must be transparent to enable final inspection by the Overseeing Organisation of the joint easy immediately before pouring the resin. It must be constructed of material that is insulating and compatible with the epoxy resin. For easy assembly onto the joint the mould must be in two pieces which can be united by a positive fastening, leak-free tongue and groove arrangement requiring no gasket. One half of the mould shall be provided with ports onto which pouring funnels are a firm press-fit. Each

funnel shall have an integral locking device to prevent it from being inadvertently removed from the mould.

- 14.4.153 The entry ports shall be adaptable to allow the mould to be cut at six clearly defined steps not less than 10mm (top) and not greater than 30mm (main).
- 14.4.154 The epoxy resin used to fill the mould shall be a two-part cold curing type and shall be compatible with the insulation as used in power cables. It shall be compounded in such a manner that the colour change in the mixture will indicate when the two parts are adequately mixed.
- 14.4.155 The containers for the epoxy resin shall be of a type which will permit mixing of two parts without exposing them to touch or to contamination.
- 14.4.156 The conductors shall be jointed using shear type clamping bolts.
- 14.4.157 The armour continuity shall be of copper strip of not less than half the cross-sectional area of the largest conductor. The armour wires of each cable are terminated within the joint and clamped to a metal ferrule of cadmium plated steel or brass. Connections between terminated armoured cables are to be by means of a copper strip secured by worm drive clips.
- 14.4.158 Jointing shall be made under the protection of a specialist jointing tent.
- 14.4.159 Joints should be adequately supported at all times Backfilling shall not take place until the joint is fully completed in accordance with manufacturer's instructions including curing times, and is in a fit condition to withstand any stresses which may be imposed upon it.
- 14.4.160 Jointing should be carried out under adequate supervision and comply with BS6910: Part 2.

Armoured Cable Terminations

- 14.4.161 Cables shall be individually terminated and secured at cut-outs and other electrical apparatus by means of a brass gland and locknut to BS 6121 or armouring securing clamp with suitable brass gland plate and thereafter suitably shrouded.
- 14.4.162 The CW brass gland and plate assembly shall incorporate a non-ferrous earthing terminal.
- 14.4.163 All metal gland parts shall be brass, and the gland shall consist of gland body with an armour-clamping cone and locking ring, armour nut, brass skid washer.
- 14.4.164 The gland shall be of such a design that during assembly no torque will be induced in the cable sheath or armour. In addition, over tightening of the seals when clamping armour wires shall be prevented.
- 14.4.165 Each gland shall be locked onto equipment gland plates with suitable brass locknuts. In addition, at every gland a polychloroprene shroud shall be fitted over the gland for additional protection.
- 14.4.166 Each cable terminated onto the gland plate shall be labelled using the maintenance numbers to identify where the cable runs to / from as per section 14.4.138.

Cable Ducts General requirements

14.4.167 The ducts used for underground and ducted services shall be certified, as applicable, in accordance with (as a minimum):

BS EN 50626-1:2023	Conduit systems buried underground for the protection and management of insulated electrical cables or communication cables – General requirements
BS EN 61386-24:2010	Specification for 600/1000 V single-phase split concentric electric cables – Cables having PVC insulation

14.4.168 Ducts shall have minimum normal duty impact resistance of:

- 50mm internal diameter - Type 450N - (minimum wall thickness 5.0mm)
- 94mm internal diameter - Type 450N - (minimum wall thickness 5.0mm)

14.4.169 Ducts shall be twin wall construction with outer wall manufactured from High Density Polyethylene (HDPE) having a corrugated profile. Inner wall shall be manufactured from Low Density Polyethylene (LDPE) having a smooth bore to prevent cables snagging.

14.4.170 Ducts shall have a minimum internal diameter of 50mm or 94mm as required for number of cables installed.

14.4.171 Where ducts require joining this shall be achieved by means of a compatible push fit coupling and shall maintain a smooth bore.

14.4.172 Ducts shall be colour coded orange with the words "Street Lighting" printed along the length at intervals of not more than one metre. When laid the words shall be uppermost.

14.4.173 All ducts shall be compatible with the Access Chambers specified in this series.

14.4.174 On completion of installation all ducts shall have a draw cord, manufactured from polypropylene with a nominal strength of 5kN.

14.4.175 At each end of duct draw cord shall have a minimum length of 1.5 metres which shall be neatly coiled in access chamber.

Access Chambers General Requirements

14.4.176 The access chambers, covers and frames used with underground and ducted services shall be certified, as applicable, in accordance with (as a minimum):

BS EN 13598-2:2020	Plastic piping system for non-pressure underground drainage and sewage. Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) – Specifications for ancillary fittings and shallow chambers
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BS EN 13598-2:2020	Plastic piping system for non-pressure underground drainage and sewage. Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) – Specifications for manholes and inspection chambers
BS EN 124-1:2015	Gully tops and manhole tops for vehicular and pedestrian areas – Definitions, classification, general principles of design, performance requirements and test methods
BS EN 124-2:2015	Gully tops and manhole tops for vehicular and pedestrian areas – Gully tops and manhole tops made of cast iron
BS EN 124-3:2015	Gully tops and manhole tops for vehicular and pedestrian areas – Gully tops and manhole tops made of steel or aluminium alloys
BS EN 124-4::2015	Gully tops and manhole tops for vehicular and pedestrian areas – Gully tops and manhole tops made of steel reinforced concrete
BS EN 124-5:2015	Gully tops and manhole tops for vehicular and pedestrian areas – Gully tops and manhole tops made of composite materials
BS EN 124-6:2015	Gully tops and manhole tops for vehicular and pedestrian areas – Gully tops and manhole tops made of polypropylene (PP), polyethylene (PE) or unplasticized poly(vinyl chloride) (PVC-U)
BS 7903:2020	Selection and installation of manhole tops and gully tops within the highway. Guide

- 14.4.177 Shall be a twin-wall design and assembled from stackable 150mm deep sections.
- 14.4.178 Shall be tested to withstand a minimum vertical load of 40 tonnes without the use of concrete surround for support.
- 14.4.179 Shall be manufactured from thermoplastic material which is both recycled and recyclable at the end of product life.
- 14.4.180 External walls shall have an external rib of width no greater than 15mm, positioned at the bottom of each section, to allow full section depth compaction.
- 14.4.181 External walls shall be free from moulding voids in accordance with the New Roads and Street Works Act (1991).
- 14.4.182 Riser sections shall have the ability to be adjusted in height during installation and shall be capable of being cut laterally to allow for transitional gradient installations.
- 14.4.183 Access sections shall have pre-drilled duct entries and be supplied with removable caps.
- 14.4.184 Composite Covers shall:

- be manufactured from, high strength fibre reinforced, Sheet Moulding Compound (SMC) or Ductile Iron.
- be load tested to C250 (25.0 tonnes) loading in verges and D400 (40.0 tonnes) in carriageways.
- have a minimum Skid resistance value (SRV) 80
- be supplied with four centrally positioned keyholes to accept standard lifting keys.

14.4.185 Steel Frame shall:

- be manufactured from 5.0mm steel and be hot dipped galvanised to BS EN ISO 1461:2022.
- have a fixing mechanism which enables them to be mechanically secured to the access chamber by means of coach bolts or screws.
- have a locking mechanism which shall be compatible with the cover provided.
- have the ability to be adjusted in height and angle within the chamber.
- have a minimum up stand of 80mm to enable pavement materials to be installed directly against the frame. There should be no external flange.

14.4.186 Where chambers are installed in areas of enhanced surface finish, and with approval, standard steel frame may be substituted for a dropped or block frame to allow standard cover to be replaced with surface finish.

List of Contractor's Proposals

14.4.187 The Contractor is to complete the following table for their proposals. Completed Data Sheets shall be provided for all items offered.

Table 14/4-5 List of Contractor's Proposals

Item	Manufacturer	Type / Catalogue Number
Electronic Driver		
CLO enabled		
Cut-out Unit		
Type T1		
Type T2		
Type T1.NE		
Type T3.NE		
Type T4		
Type T5		
Surge Protection Device		
Type 2 – 1 module		
Type 2 – 4 module		
Feeder Pillar		
FP01		
Internal Wiring		
H07RN-F		
Tri-Rated		
Underground Cable		
Armoured (XLPE-PVC-SWA-PVC)		
Earth Electrode System		
Inspection Pit		
Earth Rod		
Earth Rod Coupler		
Earth Rod Clamp		
Driving Head		
Cable Ducts		

Item	Manufacturer	Type / Catalogue Number
50mm Diameter		
100mm Diameter		
Access Chambers		
600x600mm		

APPENDIX 14/6: ELECTRICAL INSPECTION AND TESTING

- 14.6.1 The detailed electrical inspections shall generally be carried out during daylight hours, unless otherwise instructed by the Employer.
- 14.6.2 Testing shall form an integral part of the Contractor's program of works
- 14.6.3 The Contractor shall test the whole of the new or modified installation in accordance with the recommendations of BS7671: Requirements for Electrical Installations. Existing installations not directly forming part of the works may also be tested at the discretion of the Employer.
- 14.6.4 The Employer shall be given the opportunity to be in attendance during testing. The accuracy of all tests shall be to the satisfaction of the Employer whose decisions shall be final. The Contractor shall supply all necessary attendance, assistance, materials, and instruments, and shall demonstrate, if required, the accuracy of any instrument used.
- 14.6.5 Whenever work requiring inspection or testing is subsequently to be concealed, due notice shall be given to the Employer so that inspection may be made or tests witnessed before concealment. Failure to give due notice may necessitate the Contractor uncovering the work and reinstating.
- 14.6.6 All tests shall be carried out at such reasonable times as required by the Overseeing Organisation and all labour and instruments for carrying out the test shall be provided by the Contractor
- 14.6.7 The Contractor shall follow the procedures for isolation, energising and making safe of existing power supplies and cables as described in the Institution of Lighting Professionals – Code of Practice for Electrical Safety in Highway Electrical Operations & BS 7671.
- 14.6.8 The testing and inspection of lighting unit internal wiring shall be carried out by an electrician who has completed the City and Guilds 2391 Inspection, Testing and Certification of Electrical Installations.
- 14.6.9 Where existing underground cable is replaced together with the associated fused cut out all the lighting columns and illuminated signs on the circuit shall be fully tested.
- 14.6.10 The lighting units and network underground cable as detailed above, on completion and before being energised shall be inspected and tested to verify that the requirements of BS7671 have been met. The method of testing shall be such that no danger to persons or property or damage to equipment can occur even if the circuit tested is defective.
- 14.6.11 For each installation, the following items shall be inspected and tested, in the sequence indicated, as per standard method of testing detailed in BS 7671:
- (i) Cable sheath insulation (new cables only).
 - (ii) Continuity of protective conductors, including main and supplementary equipment bonding.
 - (iii) Earth Electrode Resistance.
 - (iv) Insulation Resistance at a test voltage of 500V to be not less than 6 MΩ.
 - (v) Insulation test of site-built assemblies.
 - (vi) Polarity, including the continuity of circuit conductors.
 - (vii) Earth fault loop impedance.
 - (viii) Operation of residual current devices.

- 14.6.12 The cable sheath insulation test shall be carried out using an insulation tester. The insulation resistance test of 1000V, direct current, shall be applied and maintained for not less than one minute between the continuous cable armouring or earthing conductor and the general mass of earth. The measured value of insulation resistance shall not fall below 1.0 MΩ for the full duration of the test. The cable sheath insulation test shall be carried out after the cable has been laid and the trench backfilled, but before jointing has taken place.
- 14.6.13 Voltage readings shall be taken at each feeder pillar and at the terminals of the last current using equipment on each circuit, with all equipment energised.
- 14.6.14 The Contractor shall note all visual defects on an inspection sheet and submit a hand written copy to the Employer immediately after the test. The Contractor shall retain a copy of the sheet and have it typed before formal submission to the Employer. The test sheet shall also be submitted on electronic format compatible with the Maintenance Management System.
- 14.6.15 A statement of all items of test equipment used shall be recorded at the front of the results. This will negate the need to record the details on the top of each result sheet. However, if different equipment is used then the statement shall be attached at the front of each circuit results tested with the equipment. A copy of the calibration certificates shall also be enclosed at the front of the test results.
- 14.6.16 The Contractor shall ensure all test instruments have been calibrated and adjusted in accordance with BS EN ISO 9001 and come complete with calibration certificates to verify that BS EN ISO 9001 has been complied with.
- 14.6.17 If tests prove unsatisfactory on any portion of the installation provided by the Contractor, they shall rectify all faults to provide full compliance with the requirements of BS7671: Requirements for Electrical Installations and shall repeat all tests on that part of the installation.
- 14.6.18 All documentation associated with testing shall be submitted to Employer in advance of contract practical completion to enable the contract supervising engineer to ascertain the accuracy of submitted results. The contractor shall retain full responsibility for all results recorded by him on the test sheets.
- 14.6.19 Documentation shall include signed test and completion certificate complying with the requirements of the Appendix 6 of BS7671: Requirements for Electrical Installations as NICEIC pattern certificate or similar. Certificate shall be marked with the NICEIC (or other approved) registration number of the organisation carrying out the tests. Also, a schedule of each circuit giving details of cable type and CSA, protective device type and rating, and all test results as detailed in Appendix 6 of BS7671: Requirements for Electrical Installations as NICEIC pattern certificate or other approved.

Cable Testing

- 14.6.20 The Contractor shall provide the Overseeing Organisation evidence in the form of test certificates that any cable length delivered to site has been tested at the place of manufacture and complies in all respects with the testing requirements of BS 5467.
- 14.6.21 Two copies of all cable test results shall be supplied to the Overseeing Organisation on the completion of each test
- 14.6.22 The Contractor shall provide and display warning notices, barriers, etc. when testing cables.

- 14.6.23 All test instruments requiring calibration shall have a current calibration certificate, copies of which shall be available at the time of testing.
- 14.6.24 The Contractor shall give at least 1 weeks' notice to the Employer of his intention to test any cable.
- 14.6.25 In the event of the Contractor opening up a trench or drawing further cables through a duct after cables have been Stage 1 tested, then all cables in the trench or duct shall be retested. Any damage identified by this test shall be rectified by the Contractor and the cables then re-tested.

Lighting Unit Tests

- 14.6.26 For each lighting unit the following items shall be inspected and tested, in the sequence indicated, as per standard method of testing detailed in BS 7671:
- (i) Continuity of protective conductors, including main and supplementary equipment bonding.
 - (ii) Insulation Resistance at a test voltage of 500V to be not less than 1 M Ω .
 - (iii) Insulation test of site-built assemblies.
 - (iv) Polarity, including the continuity of circuit conductors.
 - (v) Earth fault loop impedance.
- 14.6.27 The Contractor shall provide the Overseeing Organisation evidence in the form of test certificates that any cable length delivered to site has been tested at the place of manufacture and complies in all respects with the testing requirements of BS 5467.

APPENDIX 14/71: MAINTENANCE OF EXISTING LIGHTING

General

- 14.71.1 The Contractor shall be responsible for all lighting and electrical apparatus within the Site limits (including the Works area) for the duration of the contract.
- 14.71.2 Before the commencement and after the completion of the contract, joint surveys shall be carried out between the Employer, the Contractor and the routine maintenance Contractor to agree the status of the lighting to be taken over / handed back on each occasion.
- 14.71.3 The Contractor shall remain responsible for the road lighting installation until the following criteria have been achieved:
- i. The new electrical works are complete.
 - ii. No further lane closures for the newly installed lighting and electrical installation are required.
 - iii. Satisfactory completion of all electrical testing and submission to the Employer of the completed 'Electrical Operation and Maintenance Manual' in accordance with Clause 1424 of MCHW.
- 14.71.4 Emergency electrical site attendance to damage and/or faults resulting in complete circuits being out of action.
- 14.71.5 The above requirements will apply until the Employer has granted completion of the Works. At this point, responsibility for maintenance of the road lighting (excluding the Works area) will pass back to the routine maintenance Contractor. A date for this transition shall be agreed with the Employer after the second joint survey has been carried out to establish the status of the lighting upon handover.
- 14.71.6 In the event of an emergency arising, e.g. vehicular accident damage, column doors missing, etc., and the Contractor cannot be contacted within 15 minutes, The Employer reserves the right at his sole discretion to arrange for the term maintenance Contractor to be dispatched to make the situation safe and to recharge the Contractor with the costs incurred. This in no way absolves the Contractor from his responsibility for the installation.

APPENDIX 14/72: EMERGENCY ELECTRICAL SITE ATTENDANCE

General

- 14.72.1 The Contractor shall provide an emergency electrical site attendance service consisting of plant, materials and operatives for making safe electrical equipment in the event of emergencies occurring within the Site limits and/or Works area.
- 14.72.2 Attendance by a qualified electrician is required within one hour of telephone notification. The service shall be provided both during normal working hours and outside working hours for the duration of the contract, regardless of whether the Contractor has personnel on or off site.
- 14.72.3 The Contractor shall provide a dedicated telephone number for this purpose, which shall be continuously available.
- 14.72.4 This emergency service is deemed to include make the site safe and general clearance of lighting and electrical related debris. The vehicle and staff attending site shall have adequate equipment, plant and expertise to isolate and make electrical supplies safe, effect repairs and restore service, until permanent repairs may be completed.
- 14.72.5 The Contractor shall ensure that personnel have access to a location map of the existing feeder pillars, to enable prompt isolation of electrical supplies to be made.
- 14.72.6 Should it be necessary to remove or dismantle lighting column(s), the Contractor shall ensure that a suitable crane vehicle is available within a further two hours (three hours in all from the initial notification).
- 14.72.7 Details of this emergency service shall be submitted and reviewed by the employer prior to the commencement of the contract.
- 14.72.8 This service is not measured separately, and the Contractor shall make all necessary allowances for this under the relevant sections of the contract as required.

APPENDIX 26/1: ANCILLARY CONCRETE

General

26.1.1 Ancillary concrete shall comply with the requirements of MCHW Clause 2602.