

Street Lighting

Development Management Specification V4



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Contents

1.	General.....	4
2.	Requirements for Lighting.....	4
3.	Lighting Brief	4
4.	Design Approval.....	5
5.	Documentation Required for Approval.....	5
6.	Design	6
7.	Control.....	8
8.	Mounting	9
9.	Special / Cranked Roots	9
10.	Electrical Services.....	10
11.	IDNO	10
12.	Installation	10
13.	Pre Adoption (Maintenance) Period.....	11
14.	Adoption	11
15.	Commuted Sums	12
16.	Equipment Specification.....	12
	Series 000 Introduction.....	12
	Appendix 0/2: Contract Specific Minor Alterations to Existing Clauses and Tables	14
	Appendix 1/5: Testing to be Carried Out by Contractor	15
	Appendix 5/1: Drainage Requirements	15
	1. Chambers.....	15
	Appendix 5/2: Service Duct Requirements	16
	1. Ducts	16
	Appendix 12/1: Traffic signs: General	16
	1. Sign Plates	16
	2. Illuminated Traffic Signs.....	17
	3. Attachments on Columns.....	17
	4. Wide Based Sign Posts.....	17
	5. Additional Requirements for Passively Safe Sign Posts.....	17
	Appendix 13/1 Lighting columns and brackets.....	17
	1. General Column Requirements.....	17
	2. Column Door Requirements.....	19
	3. Hinged Columns.....	19
	4. Special Design Columns / Non Standard Columns	19
	5. Passively safe columns.....	20

6.	Retention Sockets / Flange Plates	20
7.	Maintenance Numbers	20
Appendix 14/1 Site records		20
1.	Site Records	20
Appendix 14/3 Temporary Lighting		21
Appendix 14/4 Electrical equipment for road lighting		21
1.	Luminaires	21
2.	Photo-electric Control Units (PECU) only where specified	22
3.	CMS (Central Management System)	23
4.	Drivers	23
5.	Cut-Outs & Isolators	23
6.	Miniature Circuit Breakers (MCB)	24
7.	RCBO	24
8.	Wiring	24
9.	Private Network Cabling	24
10.	Earthing	24
11.	Earth Rods and Earth Mats	24
12.	Feeder Pillars	25
13.	Internal Equipment	25
14.	Cable Identification	25
Appendix 14/5 Electrical equipment for traffic signs		26
1.	Illuminated Traffic Signs	26
2.	Traffic Bollards	26
3.	Belisha Beacons	26
4.	Centre Island Beacon	26
Appendix 19/1 Protection of steelwork against corrosion		27
1.	Sign, Column and Feeder Pillar Protection	27
2.	Root Protection	27
3.	Colour Finish	28
17.	List of standard details.	29
18.	Abbreviations.	30
ANNEX A - Design Considerations (Essex)		31
ANNEX B - Preferred Materials (Essex)		33
ANNEX C - Inventory Data (Essex)		35

1. GENERAL

- 1.1. This Document identifies the basic principles and standards for street lighting required by the Lighting Authority.
- 1.2. The Lighting Authority reserves the right to alter / amend the standards contained within this Document as deemed necessary.
- 1.3. This Document shall be read in conjunction with the following documents:
 - a) Manual of Contract Documents for Highway Works (MCHW) Volumes 1 and 2.
 - b) Lighting Authority site specific Lighting Brief.
 - c) Lighting Authority Standard Detail Drawings.

2. REQUIREMENTS FOR LIGHTING

- 2.1. This Document identifies the basic principles and standards for street lighting required by the Lighting Authority.
- 2.2. The Developer shall adhere to the requirements as outlined in this *Specification* and the site specific *Lighting Brief* (see section 3 below).
- 2.3. The Developer shall be responsible for undertaking any amendments to existing lighting equipment which is affected as a result of their proposals.
- 2.4. Where it is determined that lighting should be provided, extended or improved, the Developer shall be responsible for the supply and installation of that lighting equipment and all the associated electrical connections.

3. LIGHTING BRIEF

- 3.1. Before commencing a street lighting design the Developer shall request a Lighting Brief from the Lighting Authority. This shall be obtained via the Development Management (DM) Team.
- 3.2. When requesting the Lighting Brief the Developer shall provide the following:
 - a) Location Plan.
 - b) Adoption Plan.
 - c) Planning drawings (to include all phases of the development).
 - d) Confirmation of Stat diversions with details and plans provided.
 - e) Confirmation of Environmental issues that affect lighting and the provision of details such as Conservation Areas, Areas of Outstanding Natural Beauty and Bats etc.
 - f) Confirmation of lighting restrictions such as proximity to airports, aerodromes, navigable waterways etc.
- 3.3. The information provided for the purpose of obtaining a brief shall include the location of proposed bus routes, schools, shops, amenities, parking restrictions, disabled bays and the like. Changes in the provided information may result in a change to the Lighting Brief and subsequent change to any submitted street lighting proposals.
- 3.4. A Lighting Brief shall provide guidance to the Lighting Designer and shall include (but not limited to) the following:
 - a) Lighting Authority Project Contact.
 - b) The Lighting Class.
 - c) Extent of lighting area.
 - d) Variable lighting requirements (if applicable).
 - e) Mounting heights.
 - f) Control requirements.

- g) Special material requirements (if required).
- 3.5. If the Developer or Lighting Designer feel that an alternative lighting requirement is more appropriate than that indicated in the Lighting Brief, then this shall be communicated to the Lighting Authority with supporting information. The Lighting Authority shall review the supporting information and make a decision. The Lighting Authority's decision is final.

4. DESIGN APPROVAL

- 4.1. Lighting proposals shall be submitted to the Lighting Authority for approval via the DM team.
- 4.2. Designs shall be undertaken by a competent Lighting Designer.
- 4.3. In order for approval to be given, lighting designs must demonstrate compliance with the requirements of the *Lighting Brief* and this *Specification*.
- 4.4. Lighting scheme design approval shall be obtained in writing from the Lighting Authority (Via the DM Team) prior to commencement on site.
- 4.5. Once a street lighting design has been approved the Developer shall be required to review and re-submit the street lighting proposals if:
 - a) Design changes.
 - b) The housing, highway or landscaping layouts are changed.
 - c) The proposed luminaire (or optic) is no longer available.
 - d) There is a period of three years or more between approval of the street lighting proposals and implementations of the proposed works.

5. DOCUMENTATION REQUIRED FOR APPROVAL

- 5.1 All information specified in the *Lighting Brief* is to be sent electronically to the Lighting Authority via the DM team. The following information will be required for approval:
 - a) Location plan.
 - b) Adoption plan ("Pink Drawing").
 - c) Lighting Design Calculations including electronic calculation files, all input data and details of the software package that has been used (lighting plots alone are not acceptable), including min and max spacing's.
 - d) Details of Design Consideration(s) made, including assessment of existing site for S278 schemes.
 - e) Survey pictures for S278 schemes.
 - f) Details of all equipment proposed with supporting certification and documentation (if not detailed in this specification).
 - g) Details of power supplies, including Cable Calculations and Schematic drawings (where required).
 - h) If the scheme includes electrical design, please provide a copy of the Electrical Installation Certificate.
 - i) Column / Distribution Network Operator (DNO) connections schedule with Eastings and Northings, and electrical load of the proposed luminaires.
 - j) Scheme drawings – including minimum and average Lux ISO contour in DWG and PDF format.
 - k) Passive Safety Risk Assessment (as per ILP TR30 "Guidance on the Implementation of Passively Safe Lighting Columns and Signposts")
 - l) Details of signing layout including supply connections.
 - m) CDM details (Designer Risk Assessment, H&S File etc.).

- n) Environmental considerations.
 - o) Details of landscaping showing existing trees, proposed trees and tree clearance on the lighting layout drawing.
- 5.1. Lighting Design construction drawings shall;
- a) Be no larger than A1.
 - b) Ensure that DWG shall be aligned to OS base coordinates.
 - c) Schematic to be provided in DWG format
 - d) Be at a scale of 1:500.
 - e) Have a minimum text size of 2.5mm for A1 drawings and 1.8mm for A3 drawings.
 - f) Have cut lines where required.
 - g) Have a North point.
 - h) Have a key where symbols can be identified.
 - i) Show optic and lumen output in the drawing key.
 - j) Luminaire wattage shall be detailed as per Annex A.
 - k) Show overhead lines (LV, HV and BT), and major services (e.g. HV cable, High/medium pressure gas, fibre optic cable etc.).
 - l) Highlight significant hazards that the installer of the street lighting furniture and Lighting Authority shall have to allow for.
 - m) Grid coordinate to locate the development.

6. DESIGN

General

Note: This Section shall be read in conjunction with Annex A.

- 6.1. All Lighting Designs shall be in accordance with the latest edition of BS 5489 with reference to the latest edition of BSEN 13201 where required; or other lighting standards that are appropriate.
- 6.2. When approved by the Lighting Authority, a footpath or cycleway may be considered independent from the adjacent carriageway. Where this is the case the lighting for the footpath or cycleway shall have a separate calculation grid from the carriageway and may have a different lighting class.
- 6.3. For Luminaire Correlated Colour Temperature refer to Annex A.

Design Consideration

- 6.4. The proposed location of the lighting installation shall be inspected to determine the type, arrangement, source, supply details and any existing lighting within 100m of the scheme limits.
- 6.5. The street lighting system must be an integral part of the design of the estate and sufficient space for the installation of street lighting shall be provided.
- 6.6. Columns shall be located on highway land adopted by the Lighting Authority.
- 6.7. Columns shall not be placed in a shared surface.
- 6.8. On housing estates, columns shall not be located outside building frontages. Columns must be placed in front of driveways between properties in the first instance if this is not possible the Designer may locate a column on the party line of two adjacent properties, or in line with the side wall of a building.
- 6.9. Lighting columns shall be located at the back of the footway/path wherever possible. Where lighting columns are placed in the verge, they shall be placed in accordance with BS 5489. The lighting column set back shall be increased at the request of the Lighting Authority. With the

exception of a Zebra Beacon where the clearance to the beacon can be 450mm from kerb edge if required for visibility splays.

- 6.10. Designers shall specify tool free **mid-hinged** columns operated by one person where maintenance access cannot be achieved from a Mobile Elevated Work Platform (MEWP), such as:
- a) Remote footways.
 - b) Behind parking bays.
 - c) Near overhead electricity lines.
 - d) Any location where maintenance operation would require a road closure.
- 6.11. Where mid-hinged columns are specified, the Lighting Designer shall ensure that the column is located so that, when the column is being lowered or raised, the action of the column is not obstructed, and that no part of the column passes over un-adopted land when being lowered.
- 6.12. Where the new street lighting works are located within or adjacent to an existing lighting scheme, the proposed lighting design shall be integrated into the existing layout to provide a continuous lighting layout
- 6.13. Due consideration is to be given to trees and their growth, traffic calming, parking and pedestrians when deciding the locations of lighting columns. No column shall be located any closer than 5m to an existing or proposed tree, unless agreed with the Lighting Authority.
- 6.14. Within or adjacent to conservation areas, and in other environmentally sensitive areas, heritage style equipment may be required at the discretion of the Lighting Authority. This will be provided as part of the Lighting Brief and may attract an additional commuted sum.
- 6.15. The lighting shall provide visual guidance and assist in revealing the run of the road, particularly at junctions and bends, as described in the latest edition of *BS 5489*. The layout of columns at the junction with main roads and roundabouts shall be in line with the recommendation contained in ILP Professional Lighting Guide PLG02 "The Application of Conflict Areas on the Highway".
- 6.16. The lighting arrangements shall be co-ordinated with any traffic signing, signalling and surveillance installations.
- 6.17. The Lamp Lumen Maintenance factor shall be as per Manufacturer's guidelines. The Luminaire Maintenance Factor shall be based on a six year clean cycle.
- 6.18. Signs shall only be illuminated where it is a requirement of the latest edition of the Traffic Signs Regulations and General Directions (*TSRGD*).
- 6.19. Lighting Designers shall take into account guidance given in the ILP '*Guidance for the Reduction of Obtrusive Light*'.
- 6.20. Lighting Designers shall identify if Passively Safe equipment is required using the ILP *TR30 "Passive Safety Risk Assessment"*
- 6.21. The Lighting Designer shall provide a lighting design that reduces or eliminates the need for Passive Safe street lighting columns.
- 6.22. Where Passive Safe equipment is specified, they shall be fed via a RCBO in accordance with Appendix 14/1.
- 6.23. Lighting Designers shall identify the most appropriate and acceptable type of lighting for locations in rural, environmentally sensitive and conservation areas and discuss proposal with the Lighting Authority.
- 6.24. Where P classes are required the Lighting Designer shall carry out minimum and maximum design spacing's using a straight road calculation prior to carrying out an area calculation.
- 6.25. The Lighting Designer shall ensure that the design is the most economic by maximising column spacing's, to minimise the number of columns and energy used as well as to minimise the installation, operating and maintenance costs. However luminaires shall only have a maximum drive current of 700mA.

- 6.26. Where P class designs are required, calculation grids shall be per road except for roads that contain three or less lighting columns. These roads shall be included in the connecting road where they have the same lighting class.

Glare and Light Trespass

- 6.27. For illuminance designs (P and C classes) the Luminaries are to conform to the Glare Classification Class as described in *BS EN 13201-2, Table A.1* to provide adequate control of glare.
- 6.28. The following Lighting Control shall be applied for Environmental Zones:

Environmental Zone	G Class	Additional requirement
E1 & E2	G4	
E3 & E4	G2	Lighting intensity above 90° to be 0.0 cd

- 6.29. All Lighting Designs shall take account of the environment that they are located within and maintain light spill within ILP Guidance Note for the Reduction of Obtrusive Light.

Conflict Areas

- 6.30. Conflict area limits will be specified in the Lighting Brief and shall be designed as follows:
- a) Conflict areas shall be illuminated to the class as specified in the Lighting Brief and in compliance with BS 5489.
 - b) The application of the Conflict Area shall be as *ILP PLG02* "The Application of Conflict Areas on the Highway."
 - c) It shall be noted that the 5 second rule relates to the approach being lit to the correct lighting standard and does not require the approach to be included within the conflict area calculation.

Pedestrian Subways and Underpasses

- 6.31. Details for the lighting of Pedestrian Subways/Underpasses shall be included in the Lighting Brief from the Lighting Authority.
- 6.32. Motion sensors shall be incorporated where specified by the Lighting Authority.

Other Design Requirements

- 6.33. Cycleways shall be designed in accordance with the principles laid out in ILP *Technical Report TR23 "Lighting of Cycle Tracks"*, but with lighting classes to BS 5489 as defined in the Lighting Brief.
- 6.34. Cycleways next to the carriageway shall be lit by the carriageway lighting.
- 6.35. Zebra crossings shall be lit to ILP Technical Report *TR12 "Lighting of Pedestrian Crossings"*.
- 6.36. Refuge Beacons shall be in accordance with the requirements of the Traffic Signs Manual Chapter 4.
- 6.37. Belisha Beacons shall comply with the requirements of The Traffic Signs Regulations and General Directions and Lighting Authority Standard Detail Drawings.

7. CONTROL

Central Management System (CMS)

- 7.1. Where required by the Lighting Authority, the Developer shall ensure that there is existing cellular architecture coverage for the street lighting to work correctly. This may require an additional base station/s (or equivalent) to be installed as part of the proposed scheme. This shall be installed in an agreed position with the Lighting Authority in order to communicate with the system.

- 7.2. For larger developments, the Developer shall contact the Lighting Authority at the planning phase to determine the extent of existing CMS coverage and the potential need for additional CMS coverage.
- 7.3. For details of CMS requirements refer to Annex A

Photo Cell

- 7.4. Where required by the Lighting Authority, adoptable roads may require a photocell.
- 7.5. All non-adoptable areas lights will be controlled via Photocell not the Lighting authority CMS.
- 7.6. Photo-electric Control Unit switching levels shall be in accordance with the table below unless stated otherwise in the Lighting Brief:

Lighting Class	Switch on	Switch off
All except C0 and Zebra Crossing Luminaire	35 lux	35 lux
C0	55 lux	55 lux
TR12 Pedestrian Crossing Luminaire	100 lux	100 lux
Signs	100 lux	100 lux

8. MOUNTING

- 8.1. Unless otherwise agreed with the Lighting Authority, for columns, luminaires shall be mounted directly onto the lighting column by means of a post top mounted for columns up to 7m and for 8m and higher a bracket shall be used.
- 8.2. Steep hills where the gradient is 10% or more shall require side entry mounting and the luminaire shall be tilted sideways to be parallel to the road.
- 8.3. Brackets may be used or increased in projection where issues such as tree lined areas exist or where the use of brackets will significantly improve the design spacing. However, this shall be approved with the Lighting Authority prior to approval.
- 8.4. Pole mounting on poles not owned by the Lighting Authority such as DNO poles is not allowed.
- 8.5. No adoptable lighting shall be installed onto buildings unless:
 - a) No alternative is available.
 - b) It is agreed with the Lighting Authority.
 - c) The Developer obtains a wayleave or easement from the property owner.

9. SPECIAL / CRANKED ROOTS

- 9.1. All options for alternative column foundation must be explored before the approval of a Cranked Root Column is provided.
- 9.2. However, where Cranked Roots are approved they shall be labelled as follows:
 - a) Cranked Root marks shall be manufactured from one piece U.V. stabilized self-adhesive vinyl.
 - b) There are two labels required Type A as detailed on the Standard Detail Drawings and is to be positioned below the Maintenance Number as described above.
 - c) The second label denotes the direction and length of the cranked root and shall be placed facing the direction of the root as shown on the Standard Detail Drawings.
 - d) The labels shall consist of a neat rectangular reflective red background with no less than a 12mm border, with white gloss numbers sized as maintenance numbers above.
 - e) The number characters shall be in Arial font 75mm letter size.

10. ELECTRICAL SERVICES

- 10.1. For details of electrical service connections see Annex A.
- 10.2. DNO / IDNO cut outs shall be located at the bottom of the backboard and a secondary double pole isolator shall be installed above.
- 10.3. The primary cut-out (installed by the DNO / IDNO) shall be fitted with a fuse rated at not less than 10a.
- 10.4. Selectivity must be provided for all fuses and the secondary isolation fuse shall not be less than 4a.
- 10.5. The fuse ratings of the primary and secondary isolators shall be stated on the construction drawing.
- 10.6. All electrical supplies shall be unmetered.

11. IDNO

- 11.1. The Lighting Authority's preference is for the Developer to utilise DNO connections. If IDNO's are used, the Developer shall provide the Lighting Authority with contact details of the IDNO and shall include the information in the Health and Safety File.
- 11.2. If a Developer is to use an IDNO rather than DNO supplies they must ensure that an agreement is in place to ensure the IDNO will allow competent persons with G39 and / or ECS card to isolate the IDNO cut-out throughout the life of the service provided to the asset. This agreement must be provided to the Lighting Authority for approval prior to works being carried out.
- 11.3. Guidance on Independent DNO's can be found on the Highways Electrical Association website.

12. INSTALLATION

- 12.1. Installation shall be carried out in accordance with the approved layout. If the highway or property layout is changed then a revised lighting proposal will be required for technical approval via the Development Management team prior to installation.
- 12.2. For new works on existing adopted highways, e.g. Section 278 works, the Developer shall inform the Lighting Authority of the programmed works start date, not less than 28 days before commencement on site, (including the maintenance numbers of the items affected by the works).
- 12.3. Street lighting works shall be carried out by a competent contractor who shall be registered under HERS (Highway Electrical Registration Scheme) and that their operatives are suitably qualified under the National Highway Sector Scheme 8. The Lighting Authority shall request proof of accreditation and authorisation of any subcontractor to perform such duties. The Lighting Authority reserves the right to request a resubmission of any Test Certificates.
- 12.4. If the development works impedes access to a column (or other electrical highway asset) as a result of scaffolding, hoarding or the like, the Developer shall be responsible for the operation and safety of the electrical highway asset affected for the duration of the obstruction. The Lighting Authority shall be notified when this situation occurs.
- 12.5. Where lighting already exists, the Developer shall maintain an adequate standard of road lighting as detailed in Appendix 14/3.
- 12.6. The street lighting and electrical installation shall be inspected and tested in accordance with BS 7671 and the Specification for Highways Works. The Developer shall give the Lighting Authority 21 days' notice of electrical inspection and testing being carried out so that the Lighting Authority have the opportunity to witness the inspection and testing.
- 12.7. Where it has been agreed that existing columns may be retained as part of the permanent works, structural testing shall be undertaken in line with nationally recognised methods of non-destructive testing and copies of the certificates shall be supplied to the Lighting Authority.

13. PRE ADOPTION (MAINTENANCE) PERIOD

- 13.1. It shall be the Developer's responsibility to ensure that prospective purchasers of their properties shall be fully aware of the locations of all street lighting furniture.
- 13.2. Any relocation of equipment shall be at the Developer's expense, prior to adoption and shall be within design parameters. If a revised column location differs to that indicated in the approved lighting layout the Developer will be required to provide a revised lighting calculation and obtain technical approval prior to installation.
- 13.3. The Developer shall be responsible for the mitigation of light intrusion, such as putting up shields if required by the residents or the Lighting Authority.
- 13.4. For Section 38 Works: For Essex refer to Annex A.
 - a) Prior to the commencement of the Maintenance Period the Developer shall be responsible for the energy, routine maintenance and reactive maintenance of the street lighting installation. The Developer will require their own unmetered supply agreement and MPAN number to cover energy costs.
 - b) After the commencement of the Maintenance Period the Lighting Authority will take responsibility for the energy and routine maintenance. The Developer shall remain responsible for the reactive maintenance for the duration of the Maintenance Period.
- 13.5. For Section 278 Works: For Essex refer to Annex A.
 - a) Prior to the commencement of the Maintenance Period the Developer shall be responsible for the routine maintenance and reactive maintenance of the street lighting installation. The Lighting Authority shall be responsible for the energy and emergency response.
 - b) After the commencement of the Maintenance Period the Lighting Authority will take responsibility for the energy, routine maintenance and emergency response. The Developer shall remain responsible for the reactive maintenance for the duration of the Maintenance Period.
- 13.6. **Emergency Repair** - The Lighting Authority holds the right to make safe, or cause to be made safe, any equipment that is dangerous (i.e. though vehicular impact damage etc.) and all reasonable costs shall be chargeable to the Developer.
- 13.7. The Developer shall not offer the street lighting furniture for inspection by the Lighting Authority, until such time as they are confident that all works have been completed satisfactorily and copies of electrical test certificates supplied. See Appendix 14/1.
- 13.8. The Lighting Authority's inspection shall not to be utilised as a snagging inspection by the Developer. This will lead to the inspection being aborted where this appears to be the case.
- 13.9. Final numbering scheme shall be provided by the Lighting Authority. The Developer shall provide road names and postal addresses for each property so that the maintenance numbers can be specified. The Developer shall be responsible for fixing the numbers to all the street lighting furniture.
- 13.10. Prior to inspection the Developer shall provide a Health & Safety file which shall include the recorded information as detailed in Appendix 14/1 of this specification.

14. ADOPTION

- 14.1. Once the site is ready for adoption (after the maintenance period), a final inspection will be carried out by the Lighting Authority.
- 14.2. If the development is not adopted within 3 years of installation commencement, the Lighting Authority reserves the right to review the suitability of equipment installed and require it to be upgraded.
- 14.3. Only when the Lighting Authority is satisfied that all equipment has been installed and all issues resolved, will the street lighting system be accepted for adoption.

15. COMMUTED SUMS

- 15.1. Subject to the agreement of the Lighting Authority, where a change in material specification is requested a commuted sum shall be calculated and agreed prior to the granting of technical approval. The commuted sum shall be payable to the Lighting Authority prior to adoption of the completed scheme.
- 15.2. Where a commuted sum has not been paid, the adoption will not be granted.

16. EQUIPMENT SPECIFICATION

- 16.1 All new street lighting furniture shall be in accordance with this Specification.
- 16.2 Equipment shall be supplied in new and unused condition.
- 16.3 Electrical equipment shall be stored in suitable weatherproof accommodation.
- 16.4 The Developer shall ensure that the equipment supplied is compatible with all other equipment with which it is associated.
- 16.5 Manufacturers shall be certified for the manufacture, supply and verification of apparatus under BSEN ISO 9001.
- 16.6 Preferred materials are detailed in Annex B.
- 16.7 The following shall apply when the Manual of Contract Documents for Highway Works (MCHW) Volumes 1 and 2 is used where Local Authority documentation is not available:

Series 000

Introduction

Table 0/1: Schedule of Pages and Relevant Publication Dates (05/18)

Series/Appendix	Page Number	Publication Date
000	1 to 3	May 2014
000	6 to 7F	February 2016
000	4 to 5	May 2018
100	1 to 2, 4 to 9, 12 to 29F, WF1, N2 to N11F	May 2014
100	3, 10 to 11, N1	December 2014
200	1 to 3F	February 2016
300	1	May 2001
300	4	November 2002
300	2 to 3, 5 to 6F	May 2008
400	1 to 24F	May 2017
500	23 to 24, 26	November 2004
500	28F	May 2005
500	3, 22, N1F	May 2006
500	2, 5, 27	November 2006
500	6, 25	November 2007
500	1, 4, 7 to 21	November 2009
600	1 to 68, 70 to 77F, S1 to S4F, W1 to W4F, N1 to N5F	February 2016
600	69	February 2017
700	1 to 36F, N1 to N6F	February 2016
800	1 to 31F	February 2016
900	1 to 77F	May 2018
1000	1 to 45F	February 2016
1100	N1F	November 2006
1100	3	August 2008
1100	1 to 2, 4 to 6F	February 2017

Series/Appendix	Page Number	Publication Date
1200	5	May 2001
1200	2 to 3, W1F	August 2003
1200	1, 14 to 16F	May 2004
1200	4, 9 to 11, 13	May 2005
1200	12	November 2006
1200	6 to 7, N1 to N4F	November 2007
1200	8	May 2008
1300	N2F	November 2003
1300	3 to 4	November 2004
1300	1, 5 to 10, 12F	November 2005
1300	2, 11 and N1	May 2006
1400	2, N1F	May 2001
1400	1, 3 to 9F	May 2006
1500	1 to 31F	February 2017
1600	1, 4 to 5, 9, 15, 17 to 18, 24 to 26, 29 to 31, 35, 38, 49F	March 1998
1600	2, 6 to 8, 10 to 14, 16, 19, 27 to 28, 32 to 34, 36 to 37, 39 to 42, 44 to 48	November 2003
1600	3, 20 to 23, 43	November 2005
1700	1 to 27F	December 2014
1800	1 to 35F	August 2014
1900	1 to 35F, S1 to S2F	August 2014
2000	1, 3 to 4F	May 2001
2000	2	November 2004
2100	1 to 2F	February 2016
2300	1	March 1998
2300	2 to 3F	May 2001
2400	1, 4, 7F	May 2005
2400	2	May 2006
2400	3, 5 to 6	May 2008
2500	1	May 2001
2500	2, 8, 11F	November 2003
2500	10	November 2004
2500	6 to 7, 9	May 2005
2500	5	May 2006
2500	3 to 4	November 2006
2600	1	March 1998
2600	2 to 4	November 2003
2600	5	November 2004
2600	6	May 2005
2600	7F	November 2006
3000	4 to 7, 10, 12 to 17, 19, 22 to 27F	May 2001
3000	20	November 2004
3000	2 to 3	May 2006
3000	8 to 9, 11, 18, 21	May 2008
5000	1, 4 to 19F, S1F	May 2005
5000	2 to 3	November 2008
Appendix A	1 to 4F	May 2014
Appendix B	1 to 3F	May 2014

Series/Appendix	Page Number	Publication Date
Appendix C	1 to 2F	May 2014
#Appendix D	1F	May 2014
Appendix D (NI)	N1F	May 2014
Appendix E	1F	May 2014
Appendix F	1 to 54F	May 2018
Appendix G	Not used	
Appendix H	1	May 2004
Appendix H	2	November 2005
Appendix H	3	November 2006
Appendix H	4 to 9F	November 2008

Appendix 0/2: Contract Specific Minor Alterations to Existing Clauses and Tables

1409 Delete sub-clause 3:-

1419 Delete sub-clause 2 and insert:-

Wiring between the terminal block in the luminaire and the components in the base of the column or sign unit shall be PVC insulated and sheathed multi-core flexible cable to BS 6500 of 300/500V. Phase, neutral and CPC copper conductors shall be not less than 2.5 mm² in cross-sectional area.

1420 Delete sub-clause 4 and insert:-

All extraneous conductive parts, as described in BS 7671, and including hinged doors to feeder pillars, lighting columns and lit sign units, shall be bonded to the main earth terminal. Lift off doors to feeder pillars, lighting columns and lit sign units, shall be bonded to the feeder pillar, column or lit sign unit's earth bolt. The equipotential bonding conductor shall have a cross-sectional area of not less than 6mm². Earth electrodes shall be installed where required.

1421 Clause 1.

Delete and insert "Cables shall be 3 core - Copper Cable 90°C - XLPE/PVC/SWA/MDPE to BS5467:600/1000v

1424 Insert after sub-clause 2(j):-

Upon completion of testing a weather proof UV resistant label shall be fitted in the unit, which clearly indicates the month and year that the unit was tested.

The label shall:-

- Be 65mm in diameter.
- Have black text on white.
- Be made of a non-degradable material.
- Be either fixed to the backboard or tie-rapped to the internal cabling.

1424 Delete sub-clause 3 and insert:-

Power Cables in Jointed System.

No jointed system is allowed.

Power Cables in Looped System.

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 armour and the general mass of earth.

The measured insulation resistance shall not fall below 1.0 MΩ for the full duration of the test. The cable sheath test shall be carried out after the cable has been laid and the trench backfilled, and after the cable armour has been terminated.

Appendix 1/5: Testing to be Carried Out by Contractor

Clause	Work, Goods or Material	Test	Frequency of Test	Test Certificate	Comments
Series 1300					
1305	Anchorage for use in drilled holes	Tensile load (Manufacturer's tests)		Required	To provide well attested and documented evidence
1306	Anchorage in drilled holes to column flange plates	Load test on site			
Series 1400					
1421	Cable				Product certification scheme applies
1424	Lighting units	Tests specified in Clause 1424	Each unit	Required	Product certification scheme applies. Certification that the installation complies with BS7671 (the IEE Wiring Regulations) is required
	Networks	Tests specified in Clause 1424 (as amended in Appendix 0/2)	Each circuit and sub-circuit	Required	Certification that the installation complies with BS7671 (the IEE Wiring Regulations) is required

Appendix 5/1: Drainage Requirements

1. Chambers

1.1. Plastic duct chambers shall conform to the following and be installed as per the manufacturers guidelines:

- a) Either be 600mm x 600mm, 600mm x 900mm or 900mm x 900mm.
- b) Be installed with galvanised eye bolt(s) the number required is to be dependent on the required number of draw ropes (see ducting requirement above). An additional eye bolt(s) (as required) is to be installed in each draw pit which is to be used to support column cabling.
- c) Have a 100mm diameter drain hole cast into the concrete base of the draw pit and be filled level with suitable filter drain material. The foundation shall be cast on site.

- d) Standard colour black.
- e) Vertical loading capability of not less than 40 Tonnes.
- f) Comply with the following Standards:
 - (i) EN 124 B125 & D400 Vertical Loading Requirements.
 - (ii) BS 5834 Part 4. 1993 Side Wall loading for small chambers.
 - (iii) BS 1247 Part 2. Cold Impact Test.
 - (iv) EN 228 Resistance to Petrol & Chemicals.
 - (v) EN 295-3 Stress Relief.
 - (vi) BS 2782 Part 4. Methods 430A to 430D Water Absorption.
- 1.2. Covers and Frames shall conform to EN 124 and have load rating as appropriate for the location it is placed (B125, C250 & D400).
- 1.3. Shall state 'Street Lighting' on the Cover.
- 1.4. The Lighting Authority shall be provided with a set of access keys.

Appendix 5/2: Service Duct Requirements

1. Ducts

- 1.1. Ducts shall be smooth bore, manufactured from Medium or High Density Polyethylene, with a minimum wall thickness as follows:
 - a) For column entry from main duct, signs and supplies from mini pillars, duct shall be: Min Internal diameter 47mm, normally use 50mm diameter, 3.5mm thickness or twin wall.
 - b) For all other ducts they shall be: Min Internal Diameter 94mm, normally use 100 mm diameter, 5mm thickness or twin wall.
- 1.2. Ducting shall be in accordance with National Joint Utilities Group (NJUG) guidelines on positioning and colour coding of underground utilities.
- 1.3. Private street lighting duct is currently coloured orange and shall be laid at the following depth;
 - a) Minimum of 450mm depth in footway and verge.
 - b) Minimum of 750mm depth in the carriageway.
- 1.4. Equipment requiring a DNO electricity supply shall be fitted with a duct for the entry of the DNO supply cable, colour in accordance with NJUG guidance
- 1.5. Ducts shall be fitted with a pigmented, stranded, nylon draw rope of at least 5.0 kN breaking load, the ends of which shall be made fast.

Appendix 12/1: Traffic signs: General

1. Sign Plates

- 1.1. Signs shall comply with Class RA 2 of BSEN 12899.
- 1.2. Sign plates must have a guaranteed on-site life of not less than 25 years.
- 1.3. Sign plates shall be made from composite material.
- 1.4. All signs shall be manufactured and erected in accordance with BSEN 12899-1, Traffic Signs Regulations and General Directions, Traffic Signs Manual, Specification for Highway Works, location plan and associated Sign Schedules and the following specification.
- 1.5. The finish shall be Class RA 2 retro-reflective material with a warranted life of not less than ten years and shall fulfil the requirements of BSEN 12899-1.

- 1.6. Signs shall be stiffened such that post fixings can be positioned at any point across the width of the sign without the need for drilling of the stiffening to permit erection onto posts of unspecified spacing.
- 1.7. Protective overlay film shall be provided for signs.
- 2. Illuminated Traffic Signs**
 - 2.1. Illumination of sign plates shall be external and overhead mounted unless directed otherwise by the Lighting Authority. One piece light units with integral brackets shall be mounted directly on the sign post and/or on luminaire support posts or as directed by the Lighting Authority.
 - 2.2. All lit traffic signs shall comply with Class RA 2 of BSEN 12899 and sections 7.4.1.2 - Mean Illuminance and 7.4.1.3 – Uniformity of Illuminance.
 - 2.3. All sign and luminaire fixings shall have a guarantee of 25 years on site life.
 - 2.4. Signs which require illuminating shall be mounted on a wide based post or lighting column when within loading requirements.
 - 2.5. The orientation of sign post doors shall be in accordance with Lighting Authority standard details.
- 3. Attachments on Columns**
 - 3.1. Where signs are to be attached to lighting columns, the column shall be designed by the manufacturer to take the sign size, as per Appendix 13/1.
 - 3.2. Signs can be attached to existing columns subject to the approval of the Lighting Authority:
- 4. Wide Based Sign Posts**
 - 4.1. Sign posts shall conform to BSEN 40, BSEN 12899 and Appendix 13/1, in this document.
 - 4.2. Caps shall be applied to the top of the post to prevent ingress of water.
 - 4.3. Posts shall be galvanised steel with two pack glass flake epoxy to the external and internal root to 250mm above ground level, minimum dry film thickness 200µm colour black (shop applied).
 - 4.4. The housing shall have an aperture of not less than 400mm x 115mm and be fitted with a weatherproof metal door having a vandal-resistant lock with key. The door and housing shall have the same finish as the post, both inside and out.
 - 4.5. Wide based posts shall have an access door and cable entry slot. The cable entry slot shall be 75mm wide and 150mm high and shall be 500mm below ground level.
 - 4.6. The support posts and fittings shall comply with the requirements for sign posts and shall be fixed directly to the sign stiffening members.
 - 4.7. Caps shall be applied to the top of the post to prevent ingress of water.
 - 4.8. The supply should be as stated in Appendix 14/5.
- 5. Additional Requirements for Passively Safe Sign Posts**
 - 5.1. Shall comply with the same requirements for Passive Safe Columns. See Appendix 13/1 section 5.

Appendix 13/1 Lighting columns and brackets

1. General Column Requirements

- 1.1. Column shall be as shown in the Standard Details SD-1300-001.
- 1.2. Column label must be clear and state Authority spec compliance
- 1.3. Amendment to BSEN 40 column design life shall be 40 years.

- 1.4. All Columns and associated Brackets shall be CE marked in accordance with the European legislation.
- 1.5. Columns shall comply with BSEN 40 as above, using Annex A Table A.1 in PD6547 for the rationalized wind loading factor , and be designed for
 - a) For 5m-6m - Terrain Cat. 2.
 - b) For 8m-12m - Terrain Cat. 1.
- 1.6. Attachments to columns: Columns shall be designed to accept attachments in both configuration “A” and configuration “B” (as detailed below), but not at the same time. (i.e. a single design of column can be used for either configuration, “A” or “B”).

Height	Config	Attachment (area)	Eccentricity from the centre line of the column	Smart equipment assembly Area / Weight	Height	Rear shield (top of column, post top only)	Shape coefficient (BS EN 1991-1-4-2005)
5m & 6m	A	0.3m ² (e.g. signs)	300mm	Not permitted	2.5m	0.1m ²	1.8
	B	Not permitted	offset allowance of 150mm	0.13msq / 7.1 kg	at 0.75m from top of column	Not permitted	1
8m and above	A	0.6m ² (e.g. signs)	500mm	Not permitted	2.65m	0.1m ²	1.8
	B	Not permitted	offset allowance of 150mm	0.15msq / 8.5 kg	at 1.0m from top of column	Not permitted	1

- 1.7. See standard detail SD-1300-010 and SD-1300-011 for smart equipment general arrangement.
- 1.8. Column shall:
 - a) Where brackets are required they shall have maximum projections as detailed below:

Column Height	Bracket Projection (Maximum)
5m & 6m	1.0m
8m	1.5m
10m & 12m	2.0m

- b) Be designed for Luminaire Weight
 - (i) 5/6 metre 14kg.
 - (ii) 8/10 metre 18kg.
 - (iii) 12 metre 22kg.
 - c) Be suitable for a max luminaire windage area:
 - (i) 5/6 metre post top - 0.25m².
 - (ii) 5/6 metre side entry - 0.1m²
 - (iii) 8/10/12 metre - 0.12m²
- 1.9. Shall be protected as per Appendix 19/1 Section 1.
- 1.10. Brackets diameter shall be straight section tubular steel and not tapered.
- 1.11. Columns shall be coated in accordance with Section 19/1 Section 2 (where required by the Lighting Authority).

- 1.12. All columns shall come with a 76mm spigot when using post top mounted luminaires.
- 1.13. Shall have a 50mm duct cable entry hole to protect incoming cable.
- 1.14. Shall have a welded bead to identify ground level placed below the door with a minimum length of 40mm.
- 1.15. Have a backboard made from material which is substantially non hygroscopic and rot-resistant, of not less than 15mm thickness and suitable size. Fixed securely in the base compartment of each column to accommodate all equipment with adequate space left at the bottom for cable termination and service cut-outs.
- 1.16. Have a M8 tapped stud, set-screw and shake-proof washer to be used as an earth terminal and this is to be so positioned as to be easily accessible from the door opening. The screw, shake-proof washers and nuts are to be made of non-corrodible material.
- 1.17. The foundation design for the column shall allow for an installation tolerance of $\pm 50\text{mm}$. (i.e. the foundation shall be suitable for a column that has been installed 50mm too high or too low)
- 1.18. Where the column manufacturers identification label has been located on the back board (and therefore likely to be obscured by electrical equipment), a duplicate label shall be provided, laminated and fixed to the column earth terminal (or similar permanent part of the column).

2. Column Door Requirements

- 2.1. Generally have one access door (including double arm columns).
- 2.2. The door shall be wrap around with a single clamp fixing arrangement and M8 tri-head stainless steel bolts.
- 2.3. Door lock type shall be triangular type unless otherwise specified.
- 2.4. The column shall be designed so that the bottom of the column door shall be not be less than 400mm above ground level with a maximum of 1.0m.

3. Hinged Columns

- 3.1. Nothing shall be added to the column to hinder operation of the column, no attachments shall be added such as signs.
- 3.2. The design of the column only needs to take into account the luminaire and baffle windage in accordance with above spec.
- 3.3. All hinged columns shall be post top for 5/6m columns and be able to have a stub bracket (max 0.5m) for 8m or higher. ALC hinged columns shall be used for 8m – 9m columns. Lighting Authority must approve any mid-hinged column over 6m.
- 3.4. All hinged columns shall be tool-free mid-hinged and be operated by one person unless agreed otherwise by the Lighting Authority.
- 3.5. Hinged columns shall be fitted with a door and base compartment that is accessible without requiring the column to be folded down.
- 3.6. A captive length of flexible conduit should protect the internal wiring cables from accidental pinching between the column base and shaft sections.
- 3.7. When located on the central reservation, the luminaire(s) must fall within the central reservation or if required only in one lane of the carriageway.

4. Special Design Columns / Non Standard Columns

- 4.1. Any column that deviates from the above specification shall be agreed by the Lighting Authority.
- 4.2. Festive decorations and hanging baskets shall not be fitted to columns unless the column and foundation has been designed for the additional loading and approved by the Lighting Authority.
- 4.3. A consent from the Lighting Authority shall be required if festive lighting is to be used on any of the columns.

- 4.4. The installation of CCTV, ANPR & mobile phone masts requires consultation with, and approval from the Lighting Authority.
 - 4.5. Columns identified by the Lighting Authority as requiring additional security to the base compartment shall be specified by the Lighting Authority on a case by case basis.
 - 4.6. Additional attachments may be required by the Lighting Authority where the use of festive lighting, hanging baskets and other equipment are to be installed.
 - 4.7. Luminaire weights and windage area may be increased by the Lighting Authority where the use of decorative luminaire and brackets are specified.
- 5. Passively safe columns**
- 5.1. Passively safe lighting columns shall meet the requirements of BSEN 12767 Passive Safety of Support Structures for Road Equipment. Requirements, Classification and Test methods.
 - 5.2. Power supply cables must be supplied via a RCBO as described in Appendix 14/1.
- 6. Retention Sockets / Flange Plates**
- 6.1. Retention socket head shall be of cast steel construction, to BSEN 10340 Steel castings for Structural Uses, grade: GS240.
 - 6.2. Retention socket shall be capable of withstanding impact forces to steel posts with a wall thickness up to 6mm.
 - 6.3. Shall be galvanised on all internal and external surfaces as per Appendix 19/1.
 - 6.4. Shall be designed to take incoming and outgoing electrical cables.
 - 6.5. Shall be installed in accordance with the guidelines set out by the Manufacturer.
 - 6.6. Shall be provided with supporting calculations proving it fit for purpose.
- 7. Maintenance Numbers**
- 7.1. Electrical furniture shall be identified by a maintenance number in accordance with a schedule or drawing which will be provided by the Lighting Authority. The developer shall confirm the accuracy of the numbers with the Lighting Authority prior to purchase of the column labels.
 - 7.2. Maintenance numbers shall be as detailed in Annex A.
 - 7.3. Numbers shall be as detailed on the standard drawings.

Appendix 14/1 Site records

1. Site Records

- 1.1. As built drawings shall be produced by the developer and shall be in accordance with the requirements of Clause 1402 of the Specification for Highways Works
- 1.2. The record information and “As built” drawing must be submitted to the Lighting Authority prior to the works being adopted.
- 1.3. The recorded information shall include:
 - a) Electronic “As-built” drawings with grid references to be submitted after installation.
 - b) Schedule of lighting columns and other highway electrical equipment including maintenance numbers, connection type and electrical load (total circuit watts, as agreed by ELEXON), installation date.
 - c) A completed column data sheet to Appendix 13/2 where the installed column is not on the preferred list of columns in Annex B.
 - d) Electrical test certificates – for individual columns, illuminated signs etc.
 - e) Electrical installation certificates and electrical test certificates – for Feeder Pillars and Cable network.

- f) Column paint system data sheet.
 - g) Data for Lighting Authorities street lighting inventory. Details as required in Annex C.
 - h) List of remedial works completed.
 - i) Operation and maintenance manuals to support the site records together with all user information manuals to operate the plant.
 - j) Luminaire & column delivery notes.
- 1.4. The record information ("As built" drawings) to be provided by the developer shall clearly show the position of all street lighting equipment, cabinets, cables, draw pits, ducts, and the like, as actually installed, including cable sizes, and route, that cross or run within 5m of the line of a street lighting cable or duct.
- a) The location of cable ducts shall be shown by dimensions from fixed reference points on both sides of the carriageway, depth of cover on both sides of the carriageway and the length of any under kerbs.
 - b) The Developer shall make records of ducts installed during the contract and ducts that are re-used or exposed as part of the Works.

Appendix 14/3 Temporary Lighting

- 1.1. The levels of illumination of the existing trafficked carriageways shall be maintained at a level not lower than that existing until the date of the completion certificate for the whole of the works. New and temporary carriageway used for traffic during the course of the works shall be illuminated by temporary or permanent lighting to the standards detailed in paragraph 1.2 below.
- 1.2. The levels of illumination of temporary lighting shall not be lower than the standard provided by the permanent road lighting system, or BS 5489, whichever is the greater.
- 1.3. Where the Developer proposes to use either temporary lighting, or temporary supplies or cable networks, the Developer shall submit his proposals to the Lighting Authority for their approval. The developer shall not proceed until the temporary lighting proposals have been approved by the Lighting Authority.
- 1.4. Where necessary the developer shall provide protection to existing cables or install new diversion cables to maintain electrical supplies to luminaires.
- 1.5. The use of generators and portable lighting rigs shall only be considered by the Lighting Authority where there are no practicable alternative methods of temporary supply available
- 1.6. Where the use of generators or portable lighting rigs has been approved by the Lighting Authority, the Developer shall provide a maintenance schedule for checking the operation and refuelling of the generators or portable lighting rigs.

Appendix 14/4 Electrical equipment for road lighting

1. Luminaires

- 1.1. Luminaire correlated colour temperature shall be as specified in Annex A, unless specified otherwise in the Lighting Brief.
- 1.2. Luminaires shall be as stated below unless agreed otherwise.
- 1.3. CRI of no less than Ra. 70.
- 1.4. LED luminaires shall have a warranty of no less than 20 years on all parts including luminaire body, LED driver and any other internal parts. A collateral warranty must be in place to ensure that this warranty is transferred to the Lighting Authority.
- 1.5. Luminaires shall be Class I insulation and be of aluminium construction marine grade alloy.
- 1.6. Luminaires for road lighting shall have degree of protection rating of at least IP66 to BSEN 60529 for Luminaires, LED optics and LED Drivers.
- 1.7. LED luminaires shall conform to IEC 60598-1.

- 1.8. Luminaires shall be of a totally enclosed design, shall be of sound construction and be capable of being easily dismantled for maintenance.
- 1.9. LED luminaires shall be Constant Light Output (CLO), dimmable and be contained within a separate compartment to the LEDs.
- 1.10. Luminaires shall be supplied with a 7 pin NEMA socket suitable for the CMS system used on the network where the luminaires will be installed or to allow for future CMS installation.
- 1.11. The part of the luminaire providing access to the interior of the luminaire shall, when in the closed position, be firmly attached to the fixed part of the luminaire. In the open position it shall be attached so that it may not become accidentally detached.
- 1.12. The canopy, hinges, toggle catches, captive screws and nuts shall be of a non-corroding metal.
- 1.13. The Luminaire shall have a tilt adjustment of -15 to +5 degrees to enable luminaires to be mounted with 0 degrees uplift when fitting to existing bracket arms to ensure they are parallel to the road.
- 1.14. In relation to the maintenance factor, the luminaire shall be provided with the following:
 - a) Light Loss: L80 or better.
 - b) Cleaning Frequency: 72 Months.
 - c) LED Design Life: 100,000 Hours.
- 1.15. IK Rating (Impact Resistance) shall be IK08 or better.
- 1.16. Luminaires to be EMC Test Compliant / RoHS Compliant / CE compliant / WEEE compliant.
- 1.17. Luminaire LED modules must be capable of being simply removed and replaced at a later date to enable replacement for failure or to upgrade as improvements are made in LED technology.
- 1.18. LED shall be tested in accordance with IEC/PAS 62717(LED Modules) and 62722(LED Luminaires) performance requirements.

2. Photo-electric Control Units (PECU) only where specified

- 2.1. Photo-electric control units shall:
 - a) Have a UV Stabilised Polycarbonate
 - b) Be LED pulse-encoded to indicate current operating status.
 - c) Be one part for 7 pin NEMA socket type or (where agreed by the lighting authority) miniature type mounted on the luminaire canopy.
 - d) Be fully solid state with a self-test on initial power up with an output via a bi-stable relay and a filtered silicon photo diode sensor.
 - e) Be protected to at least IP65.
 - f) Have a power consumption of less than 0.25W.
 - g) Be capable of switching a 5A load.
 - h) Include a delay device so that the lamps are not switched on by transient changes in the illuminance, switching delay 10 - 20 seconds.
 - i) Sealing rings shall be provided to prevent dirt and moisture from entering into the photocell and luminaire.
 - j) Have sensor drift of zero over 10 years.
 - k) Have a guarantee of 10 years.
 - l) Comply with BSEN 60068 and EN 50081-1 Emissions and EN 61000 Immunity.
 - m) Have an operational temperature range of -20 °C to + 80 °C.

3. CMS (Central Management System)

- 3.1. Where the Lighting Authority uses a CMS as described in the Lighting Brief, the CMS specific equipment shall be specified in Annex A.

4. Drivers

- 4.1. LED shall not be driven at an amperage of more than 700mA.
- 4.2. Where used LED drivers shall be replaceable throughout the design life of the luminaire.
- 4.3. The driver shall be housed in a separate compartment to the LEDs but within the luminaire body.
- 4.4. Drivers to comply and be tested in accordance with EN 61347-1:2008, EN 61347-2-13:2014, EN 62384:2006.
- 4.5. The drivers shall include surge immunity in accordance with BS EN 61000 and can withstand multiple surges of a minimum 6kV.
- 4.6. The driver compartment shall have its own heat sink feature, independent of the LEDs.
- 4.7. The Power Factor must be above 0.85 @100% light output leading as required by UMSUG.
- 4.8. The installer must ensure that the equipment is not connected to electrical supplies unless they comply with the requirement of BSEN 50160.
- 4.9. The insulation test shall be carried out in accordance with the requirements of EN 60598-1.
- 4.10. Where required shall be pre-programmed as per Annex A.

5. Cut-Outs & Isolators

- 5.1. Cut-outs and isolators shall:
- a) Have a gland plate with grommets.
 - b) Be rated at 25A.
 - c) Provide double pole isolation.
 - d) Consist of a substantial moulded-plastic enclosure with separate terminals for live and neutral conductors, incorporating a BS 88 fuse.
 - e) Be designed primarily for use in road lighting columns and be suitable for terminations or looped services.
 - f) Have terminals large enough to accommodate the supply cables specified, in single cable or looped cable terminations.
 - g) Be securely fitted to the backboard by means of at least 3 No stainless steel screws.
- 5.2. Labelling and layouts shall be in accordance with the Standard Details.
- 5.3. Cut-outs shall be used when the cable termination is located below ground level (Bollards).
- 5.4. Isolators shall be used when the cable termination is located above ground level (Columns, Signs, etc.).
- 5.5. Cut-outs shall:
- a) Be designed and tested in accordance with BS 7654 and EN 60947-Part 1.
 - b) Be fitted with a BS 88 LST type fuse.
- 5.6. Isolator shall:
- a) Be designed and tested in accordance with IEC/EN 60269-1, IEC/EN 60947-3.
 - b) For 6m columns have a DIN Rail for taking 3 modules and for 8m columns and higher have a DIN rail capable of taking up to 4 modules. The Din Rail shall comprise of a 32A double pole isolator fitted in the centre with additional BSEN 60269 (BS 88) fuse carriers for outgoing circuits.

- c) Be fitted with a BS 88 MD type fuse.

6. Miniature Circuit Breakers (MCB)

- 6.1. MCB may be required to protect apparatus such as smart devices and CCTV equipment when required they shall conform to the below:
 - a) Miniature circuit breakers shall be for use on 230V single phase supply.
 - b) Have a "lock off" facility.
 - c) Be Type C or D (as appropriate).

7. RCBO

- 7.1. For circuits that include passive safe equipment these shall be via a type F RCBO

8. Wiring

- 8.1. All cable must be British Approvals Service for Cables (BASEC) approved.
- 8.2. Cable from cut out to luminaires shall be 3 core PVC, a minimum 2.5mm², insulated and sheathed flexible Copper Cable 70°C to BS 6004 table 44 rated 300/500V.
- 8.3. Connection between the cut-out and DNO apparatus shall be sheathed single core cable (double insulated).

9. Private Network Cabling

- 9.1. Cable joints are not allowed on the network.
- 9.2. All private cables shall be labelled (source and destination) as shown in the Standard Details.
- 9.3. All incoming and outgoing private supplies shall be connected securely using Central Earthing Terminals (C.E.T) glands.
- 9.4. Buried cable shall have a minimum length of 2m left as a loop at all feeder pillars which shall be coiled in a draw pit.
- 9.5. Electrical networks shall be designed using 16mm² for columns and 6mm² for signs using 3 core cross linked polyethylene steel wire armoured cable (XLPE SWA).
- 9.6. If utilising a private network supplies to lit traffic signs and bollards shall be sub-fused.

10. Earthing

- 10.1. In private cable arrangements with two or more columns; supply point and the last column shall be earthed with an earth rod and pit arrangement or earth mat.
- 10.2. Cable armouring shall be terminated in a CET. The CET shall be the bracketed, 'bend back' type (CET 003) and shall be securely fixed to the backboard, as detailed on the Lighting Authority Standard Detail Drawings.

11. Earth Rods and Earth Mats

- 11.1. Earth bonding conductor terminations shall be made using suitably sized crimp type lugs and brass bolts, nuts and washers of a minimum diameter of M8.
- 11.2. Attach the earth clamp and appropriate conductor to the column or pillar.
- 11.3. Where ground condition and/or existing services preclude the safe installation of earth rods, earth mats may be used subject to prior agreement with the Lighting Authority. The size, depth and number of mats or rods shall be selected to ensure an impedance of no greater than 20Ω.
- 11.4. Earthing to also comply with ENA G12 – requirements for the application of protective multiple earthing to low voltage networks and the DNO requirements.
- 11.5. Earth Rods

- 11.6. Earth rods shall be located in an earth rod core and surrounding housing, for details see Standard Detail Drawings.
- 11.7. The rod in the earth shall be backfilled with Marconite, FurseCem or other electrical conductive aggregate.
- 11.8. Earth rods shall be inserted in the ground to a depth to achieve the required impedance.
- 11.9. If unable get the required depth an additional rod can be installed adjacent to the rod at a distance not less than the length of rods already installed. This can be done multiple times until the correct impedance is achieved.
- 11.10. Earth mats shall comply with:
- 11.11. Earth mats must be solid and not lattice type with a minimum surface area of 1m².
- 11.12. Shall be encased in a minimum of 50mm surround layer of Marconite, FurseCem or other electrical conductive aggregate that includes an orange dye.
- 11.13. The required depth of cover above the earth mat shall not be less than 650mm, where possible use a minimum of 1m.

12. Feeder Pillars

- 12.1. Shall have two pack glass flake epoxy to the external and internal root to 200mm above ground level, minimum dry film thickness 200µm, colour black (shop applied) in accordance with appendix 19/1.
- 12.2. Steel feeder pillars shall be hot dip galvanised to BSEN ISO 1461 and if required painted in accordance with appendix 19/1.
- 12.3. Feeder pillars of up to 450mm wide shall be fabricated from a minimum of 3mm steel and larger pillars shall be fabricated from minimum of 5mm steel or constructed from cast iron and painted in accordance with appendix 19/1.
- 12.4. Feeder pillars must have a wiring schematic laminated in the feeder pillar. A pocket on the inside of the door shall be able to accommodate the schematic.
- 12.5. Outgoing supplies shall be labelled as shown on the Standard Details.
- 12.6. Shall have warning labels in accordance with BS 7671.
- 12.7. The door locks shall be as 1418.4 of "Specification of Highway Works" and shall be of a tamper proof design and be a greased non-corrodible lever design operated by 8mm triangular headed tamper proof lock.
- 12.8. Feeder pillar shall be sealed as per the Standard Details.
- 12.9. Feeder pillars shall be identified by maintenance numbers as detailed in Appendix 13.1.

13. Internal Equipment

- 13.1. The backboard shall be at least 18mm non-hygroscopic marine ply (with 5mm air-gap and pressure treated).
- 13.2. Internal equipment located in feeder pillars shall be housed in an arrangement of IP54 modular enclosures, occupying no more than 75% of the backboard, with at least 10% spare capacity in the enclosures and 20% additional electrical capacity.
- 13.3. Feeder pillars shall incorporate a residual current operated Circuit Breaker with Overcurrent protection (RCBO) 13A socket outlet and shall be connected to the DNO cut-out via an isolation switch.
- 13.4. There shall be a lockable isolator wired in between the DNO supply and the distribution panel and shall be rated for its intended use in accordance with BS 7671.

14. Cable Identification

- 14.1. The cables into (and out of) a unit shall be labelled to indicate where the cable comes from or what it supplies, respectively as shown in the Standard Details.

- 14.2. The supply source point of isolation shall also be indicated.
- 14.3. The labelling shall take the form of K-type markers on universal carrier strip fixed to the cable with using self-locking plastic cable ties or similar.

Appendix 14/5 Electrical equipment for traffic signs

1. Illuminated Traffic Signs

- 1.1. All sign and luminaire fixings shall have a guarantee of 25 years on site life.
- 1.2. Signs shall only be lit when the (TSRGD) states that a sign must be lit.
- 1.3. Lit traffic signs shall conform to BSEN 12899.

2. Traffic Bollards

- 2.1. Bollards shall conform to BS 8442 and BSEN 12899 where applicable.
- 2.2. Bollards shall be reflective R3B material.
- 2.3. The Annex B and/or the Lighting Brief will determine where and whether retro-reflective, Illuminated or solar powered bollards are to be used.
- 2.4. Reflective bollards shall have reflective material on the front, back and sides.

3. Belisha Beacons

- 3.1. Wide base post painted black to the same specification as the lighting column with the addition of micro prismatic reflective bands to BSEN 12899;
 - a) Refer to Standard Details
 - b) Light source shall be LED flashing at intervals in accordance with Traffic Signs and General Directions.
 - c) The globe shall be mounted on an anti-vandal gallery which is designed to be fitted quickly and securely onto a 76mm circular post.
 - d) Where required appropriate tunnel, half tunnel shields or halo boards shall be installed around the beacon.
 - e) Other enhancements or variations may be specified in Annex B or the Lighting Brief.

4. Centre Island Beacon

- a) Standard centre island post, shall be a 5m steel lighting column that may be mid hinged where specified in Annex B or the Lighting Brief, finished in accordance with the Lighting Column Specification. Complete with:
- b) Shall comply with the TSRGD.
- c) The globe shall be illuminated using an LED lamp, have easy access and minimum IP54 sealing. The globe shall be mounted on an anti-vandal gallery which is designed to be fitted quickly and securely onto a 76mm circular post.
- d) Illuminated 600mm diameter sign to diagram 610 back to back or a sign to diagram 611 on a one way street, mounted 3000mm above the surface of the carriageway.

1. Sign, Column and Feeder Pillar Protection

- 1.1. Columns shall be galvanised to the latest edition of BSEN ISO 1461 "Hot Dip Galvanised Coatings on Fabricated Iron and Steel Articles, Specifications and Test Methods" and shall be free from imperfections including porosity. Galvanising shall be fettled and rasped to remove all spikes and sharp edges and leave a smooth finish prior to finishing application.

2. Root Protection

- 2.1. Pre-treat galvanised external surface of the column and the internal root to 250mm above ground level shall be treated as the following Technical Data Sheet (shop applied). Rinse/wash after using fresh clean water and allow it to dry before proceeding.

3. Environment and accessibility		Factory applied	
4. Required durability of system		5. Colour of finish	
No maintenance	15 years	Black RAL 9005	
Minor maintenance	15 years		
Major maintenance	25 years		
6. Paint systems to be applied over:			
Clean, Lightly Abraded, De-Greased Hot Dipped Galvanised Steel			
7. Details			
Product Description:		High Solids Glass Reinforced Two Pack Epoxy	
Product Name:		Epidac 2 Glass Reinforced Epoxy	
Reference Number:		79-489	
Colour:		Black RAL 9005	
Application Shop/Site:		Shop	
Application Method:		Brush/Airless Spray	
Wet Film Thickness:		225 microns	
Dry Film Thickness:		200 microns	
8. Stripe coat description (including item No. and colour)		9. Paint manufacturer's official stamp	
Workshop:			

3. Colour Finish

- 3.1. Where required by the Lighting Authority that the column or sign post should be painted, the following will apply:

3. Environment and accessibility		Factory applied	
4. Required durability of system		5. Colour of finish	
No maintenance 15 years		As detailed in Annex A	
Minor maintenance 15 years			
Major maintenance 25 years			
6. Paint systems to be applied over:			
Clean, Lightly Abraded, De-Greased Hot Dipped Galvanised Steel			
7. Details		1 st Coat	2 nd Coat
Product Description:		2PK Epoxy Primer	Polysiloxane Finish
Product Name:		SigmaCover 280	PSX 700
Reference Number:		7417	7546
Colour:		Grey	As Annex A
Application Shop/Site:		Shop	Shop
Application Method:		Airless Spray	Airless Spray
Wet Film Thickness:		140 microns	100 microns
Dry Film Thickness:		75 microns	75 microns
10. Stripe coat description (including item No. and colour)		11. Paint manufacturer’s official stamp	
Workshop:			

17. LIST OF STANDARD DETAILS.

Drawing No	Description
SD-1300-001	Standard Column General Arrangement
SD-1300-002	Planted Column Foundation
SD-1300-003	Tree & Vegetation Trimming
SD-1300-004	Maintenance Number Location & Orientation
SD-1300-005	Column Door Orientation
SD-1300-006	Zebra Crossing Mid Post Beacon
SD-1300-007	Zebra Crossing Bracket Mounted Beacon
SD-1300-008	Zebra Crossing Beacon Only
SD-1300-009	Refuge Column & Beacon
SD-1300-010	Smart Equipment 5-6m Columns
SD-1300-011	Smart Equipment 8-12m Columns
SD-1300-012	Retaining Wall Pocket for Column
SD-1400-001	Cable Identification Labels for Private Cables
SD-1400-002	Typical Termination Detail DNO with optional looped sub circuit
SD-1400-003	Typical Termination Detail Private with optional looped sub circuit
SD-1400-004	Typical Mini Pillar
SD-1400-005	Pillar Switch Gear - Mini Pillar
SD-1400-006	Typical Standard Pillar
SD-1400-007	Pillar Switch Gear - Standard Pillar
SD-1400-008	Typical Large Pillar
SD-1400-009	Pillar Switch Gear - Large Pillar
SD-1400-010	Earth Rod

18.ABBREVIATIONS.

BASEC	British Approvals Service for Cables
C.E.T	Central Earth Terminal
CMS	Central Management System (computer)
DNO	Distributor Network Operator
IDNO	Independent Distributor Network Operator
IEC / PAS	International Electro-technical Commission Publically Available Specifications
PECU	Photo-Electric Control Unit
TSRGD	Traffic Signs Regulations and General Directions (Statutory Instrument)
UMS	Unmetered Supply

ANNEX A - Design Considerations (Essex)

A1.0 Documentation Required for Approval

- A1.1 Pre-construction drawing shall include luminaire wattage. Please provide actual wattage upon ordering of lanterns as this will reduce over time.

A2.0 Design

- A2.1 Luminaire correlated colour temperature is 4000k.

A3.0 Service Connections and Cable Network

- A3.1 Columns and illuminated signs shall have DNO / IDNO supplies unless they are located in areas that where DNO / IDNO supplies cannot be provided (e.g. traffic islands and roundabout central islands).
- A3.2 The use of private cable networks (in location other than traffic islands and roundabout central islands) shall only be permitted with the approval of the Lighting Authority.

A5.0 Column Hard Standing

- A5.1 Where column are located in a verge or service strip then the columns shall be provided with a hard standing and shall be as per standard detail SD-1300-002.

A6.0 CMS System

- A6.1 Road lighting luminaires shall be fitted with a 7 pin NEMA socket and 5 pin Telensa Telecell ref: T21EN-G-3.
- A6.2 The Telecell is supplied with 3 barcode labels with the unique identification number of each cell. The 3 bar code labels shall be used as follows:-
- a) Fixed to the Telecell.
 - b) Laminated and secured inside the base compartment of the lighting column.
 - c) Fixed to either a copy of the 'As-Built' street lighting layout drawing identifying the column with this Telecell number or a schedule of columns and Telecell numbers.
- A6.3 All sign lights shall have a factory fitted Telensa Telecell.

A7.0 Street Lighting Furniture Maintenance Numbers

A7.1 Maintenance numbers shall:

Be self-adhesive, reflectorised R3B or similar.

Have a text height of 75mm with a minimum 12mm border surrounding the character.

Be Arial Font.

Have black characters on a white background.

A8.0 Development Management Section 38 and Section 278 Agreements

A8.1 Section 38 agreements

Part 1

There is no Essex County Council responsibility with regards to energy or maintenance of the street lighting furniture.

Part 2

Essex County Council shall be responsible for the energy charges and the routine maintenance from the commencement of the maintenance period (i.e. the issue of the part 2 certificate). The Developer shall be responsible for all other maintenance until the issue of the final certificate and the road is adopted.

A8.2 Section 278 Agreements

Issue of Completion Certificate

Essex County Council shall be responsible for the energy charges. The Developer shall be responsible for all maintenance until the issue of the maintenance certificate and the road is adopted.

Issue of Maintenance Certificate

Essex County Council shall be responsible for the energy charges and the maintenance from the issue of this certificate which signifies full adoption.

ANNEX B - Preferred Materials (Essex)

B1. Luminaires

Luminaires shall be sourced from the following families of luminaires as per the table below unless otherwise agreed with the Lighting Authority.

Luminaire Type
CU Phosco P862
CU Phosco P863
DW Windsor Kirium Pro
Phillips Luma version 2
Urbis Ampera
Urbis Axia version 3
ASD Highways Diamond Elite Range
Simmons Signs Safeway Subway Light Unit

B2. Illuminated Traffic Signs

Manufacturer	Ref	Description
Signature	Delta 4	LED aluminium sign light for use with up to 1200mm traffic signs
Simmons Signs	LUA LED	LED aluminium sign light for use with up to 600mm traffic signs
Simmons Signs	LUB LED	LED Sign light for signs larger than 600mm
TMP	Apollo	LED aluminium sign light for use with up to 600mm traffic signs

B3. Traffic Bollards

Manufacturer	Ref	Description
Simmons Signs	WeeBoll	self-righting reflective highway traffic bollard
Glasdon	SignMaster	self-righting reflective highway traffic bollard
Signature	TrueFlex	self-righting reflective highway traffic bollard
Sign Post Solution	SPS 360	self-righting reflective highway traffic bollard
TMP	MegaFlecta	600mm sign face self-righting reflective bollard

Manufacturers 5 year Adhesion Warranty and a 12 year Delamination Warranty shall be provided.

If not provided, then please use one of the other suppliers on the list. This must be provided to Essex as part of the approvals process and Warranty must be transferred to Essex Highways.

B4. Beacons

Manufacturer	Ref	Description
Simmons Signs	Modubel / Midubel	LED Belisha Beacon
Simmons Signs	Centrenol	LED Illuminated Post and Refuge Beacon
Simmons Signs	Moducic	LED Refuge Beacon

B5. Embellishment Kits

Manufacturer	Ref	Description
TMP	Essex	5m, 6m and 8m columns
Others available on approval		

ANNEX C - Inventory Data (Essex)

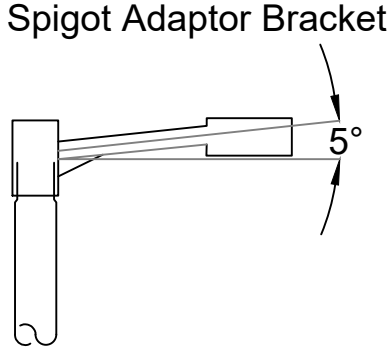
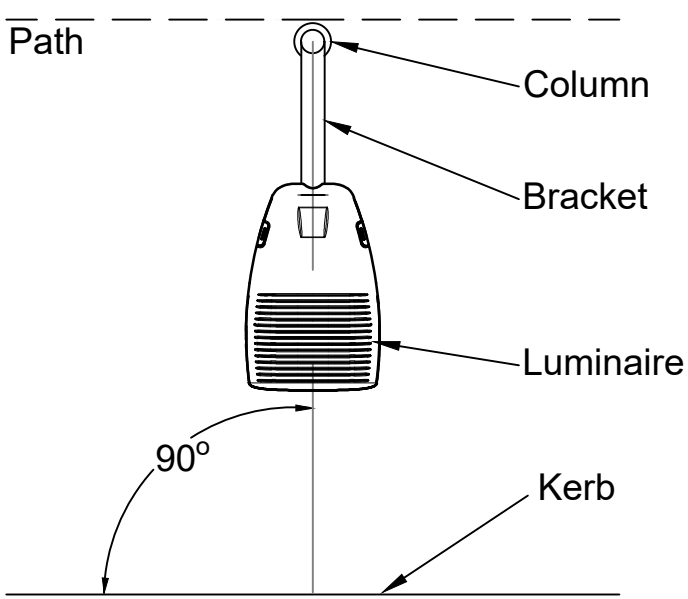
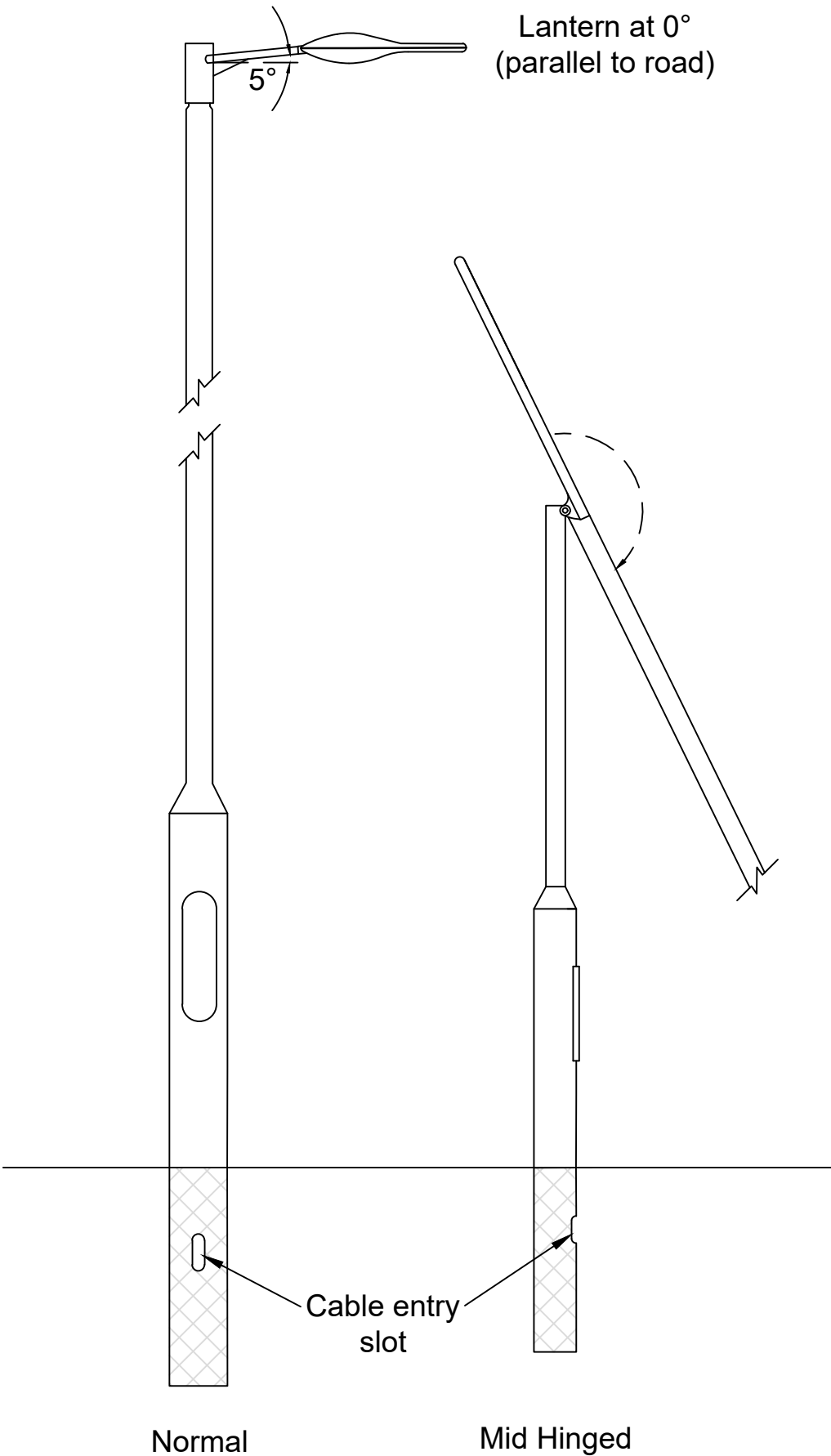
C1.0 Essex County Council uses Mayrise as its street lighting inventory. The Developer shall, upon completion of the installation compile the following information in the form of a spreadsheet and submit it to ECC prior to an inspection being carried out.


Ref	Field	Contents
1	Street Name	
2	Locality	
3	Town	
4	Unit Number	
5	Location (of unit)	
6	Outside House Number	
7	Opposite House Number	
8	Unit Type	<i>Column, Sign, Bollard, Pillar, Zebra Beacon, Refuge Beacon</i>
9	Position (of unit)	<i>Road Side, Attached to a column, Bridge Mounted, Car Park Area, Central Reservation, Cycle Track, Footpath, Subway, Roundabout, Traffic Island, Wall Mounted</i>
10	Ownership	<i>ECC, DEV1, DEV2 (to be completed by ECC)</i>
11	Service Owner	UKPN, ECC
12	Date installed	dd / mm / yyyy
13	Eastings	6 figure co-ordinates
14	Northings	6 figure co-ordinates
15	Column Cross section	<i>Tubular, Octagonal, Hexagonal, Other</i>
16	Column Material	<i>Steel, Aluminium, Stainless Steel, Other</i>
17	Column Finish	<i>Galvanised, Painted, Other</i>
18	Column Height	
19	Column Fixing	<i>Planted Root, Flange Mounted</i>
20	Column Manufacturer	
21	Column Root Protection	
22	Column Protective Coating	<i>Hot Dipped Galvanised, Hot Hipped Galvanised & Protective Coating</i>
23	Column Colour	
24	Column Bracket Type & Projection	
25	Column Cut-out Make & Model	
26	Control Switching Method	

Ref	Field	Contents
27	Control Control ID	Bar code number
28	Control Dimming Regime	
29	Luminaire Make & Model	
30	Luminaire Elevation	
31	Luminaire Mounting Height	
32	Luminaire – LED Array Ref	
33	ECC Adopted Square Mete	Y / N
34	DNO Cable in Unit	Y / N
35	Council Cable in Unit	Y / N
36	Surface type	
37	Cut Out Housing	
38	Supply Source	
39	Means of Access	<i>Tower, Ladder, Scaffold, Steps, Folding</i>
40	<i>Conservation Area</i>	Y / N
41	Quantity of MCBs	
42	Quantity of Fuses	
43	Cut Out Size	
44	No of Phase	
45	Main Isolation	
46	Earth Electrode	Y / N
47	Column Product No	
48	Sign Diagram No(s)	
49	Circuit Protection owner DNO	Fuse Type & Rating
50	Circuit Protection owner ECC	Fuse Type & Rating
51	Source of Supply	<i>Main Isolation point of units supply cable</i>
52	Sub Circuit	<i>Nearest isolation point of units supply cable</i>
53	Supply Type	Loop, Injection, Pilot
54	Cable Arrangement	<i>Underground, Overhead, Surface Mounted, Underground & Overhead</i>
55	No of outgoing circuits	
56	Earth Conductor CSA	
57	Circuit Conductor CSA	

Notes

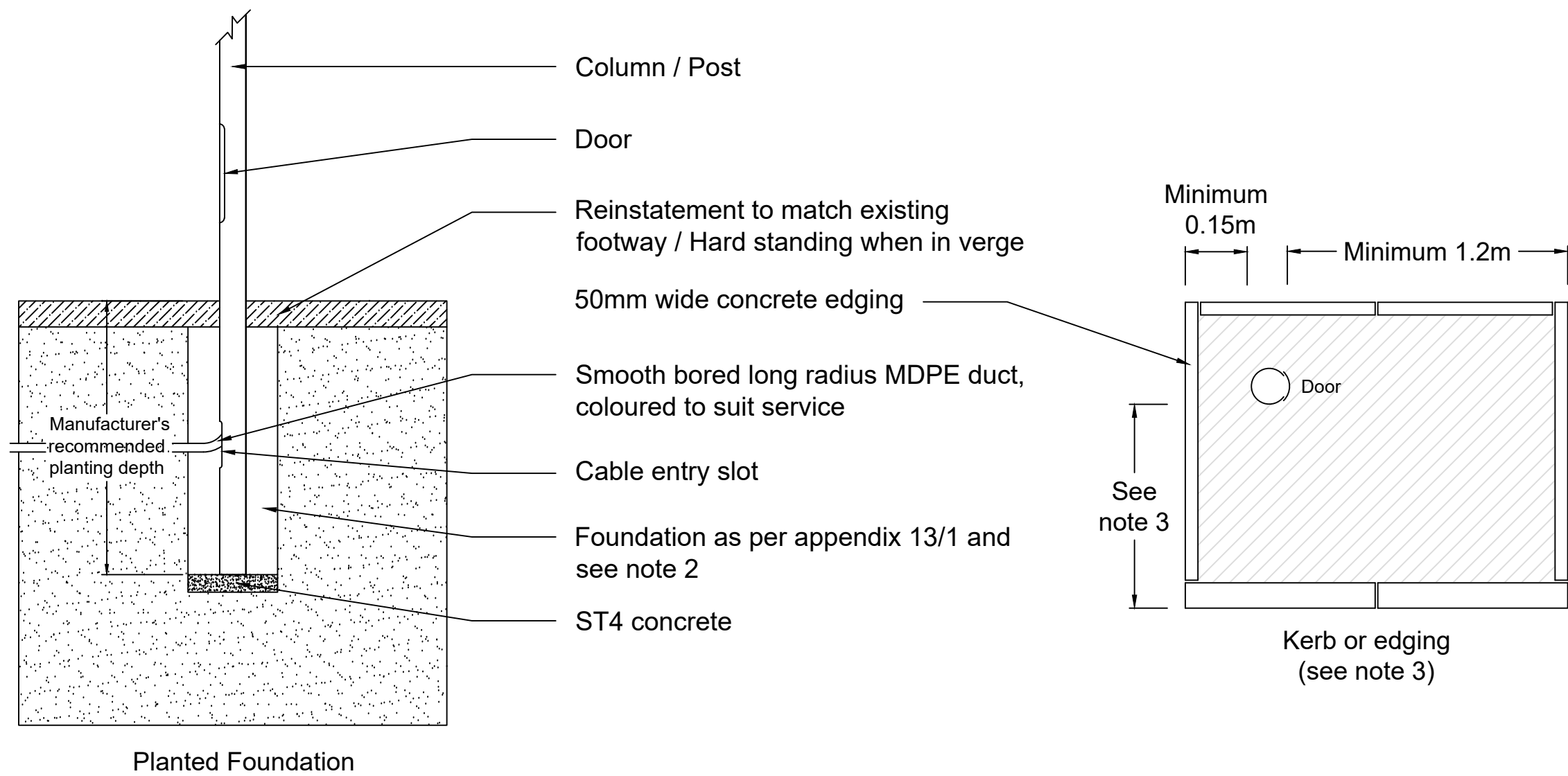
- 1. Columns can be either Post Top or with bracket arm. When used bracket arms shall be 5 degrees uplift.
- 2. Manufacturers label must be fitted indicating production date and batch number.
- 3. For more details on Planting Column Foundation refer to drawing SD-1300-002




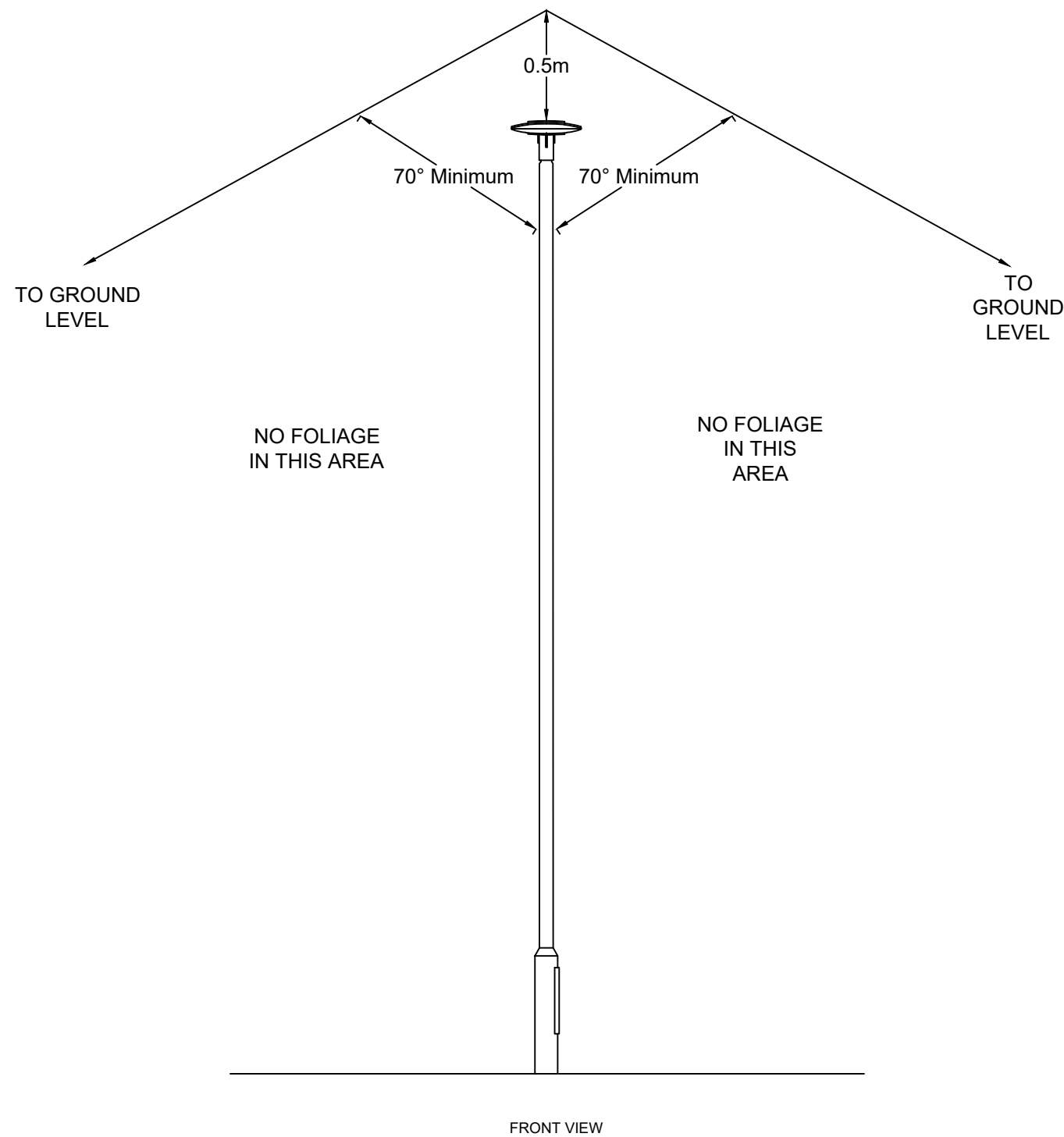
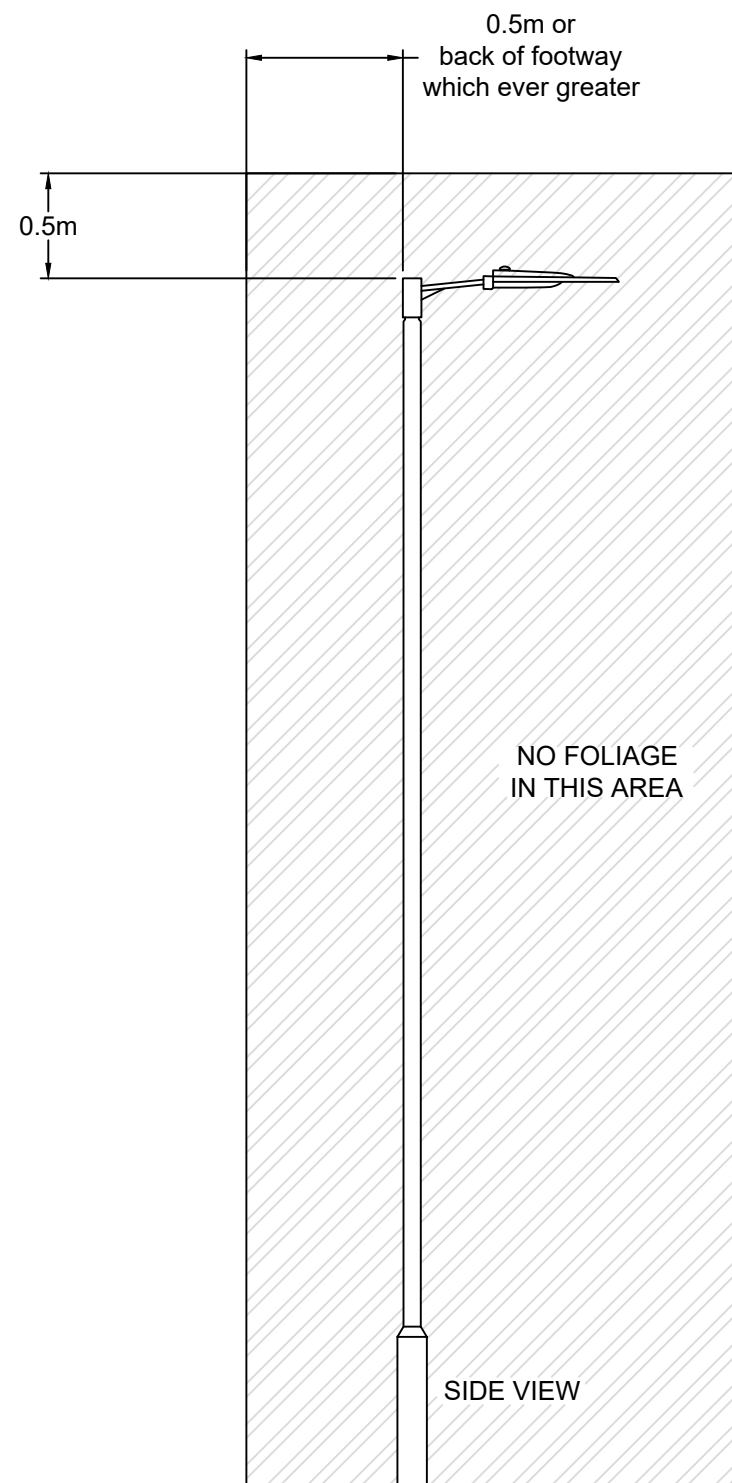
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Rev	Rev. Date	Purpose of revision		Drawn	Checked	Approved		
Principal Contractor:				<div> RINGWAY JACOBS <small>integrated expertise</small></div> <div>101-105 Victoria House, Victoria Road Chelmsford Essex CM1 1JR</div>				
Client:								
Project:								
Standard Detail Drawings								
Drawing Title:								
Standard Column General Arrangement								
Drawing status								
Scale	NTS		DO NOT SCALE					
Project No.	Standard Detail							
Sheet No.	Sheet 1 of 1							
Drawing number					Rev			
SD-1300-001					0			
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.								


NOTES

- 1. Manufacturers label must be fitted indicating production date and batch number.
- 2. Foundation width to be determined as per column manufacturers recommendations for ground soil factor in accordance with PD6547. If unknown this shall be treated as poor.
- 3. Hard standing to kerb edge unless column is placed at the back of verge and distance greater than 2m. If hard standing is not to kerb edge then edging shall surround the hard standing.

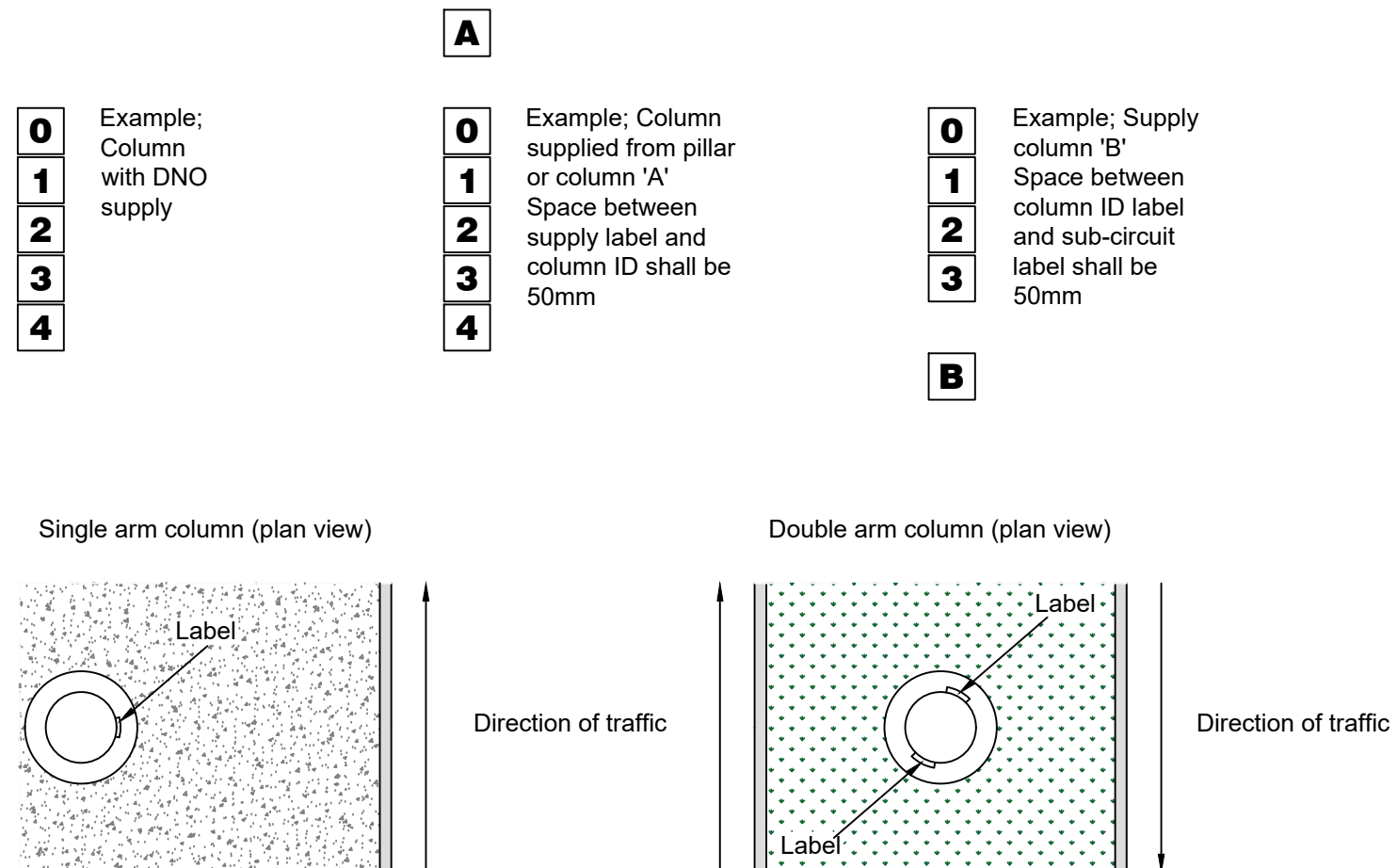



0	Nov 2019	ORIGINAL ISSUE	MD	TE	PB
Rev	Rev. Date	Purpose of revision	Drawn	Checked	Approved
Principal Contractor:			 101-105 Victoria House, Victoria Road Chelmsford Essex CM1 1JR		
Client:					
Project: Standard Detail Drawings					
Drawing Title: Planted Column Foundation					
Drawing status					
Scale	NTS		DO NOT SCALE		
Project No.	Standard Details				
Sheet No.	Sheet 1 of 1				
Drawing number SD-1300-002					Rev 0
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.					



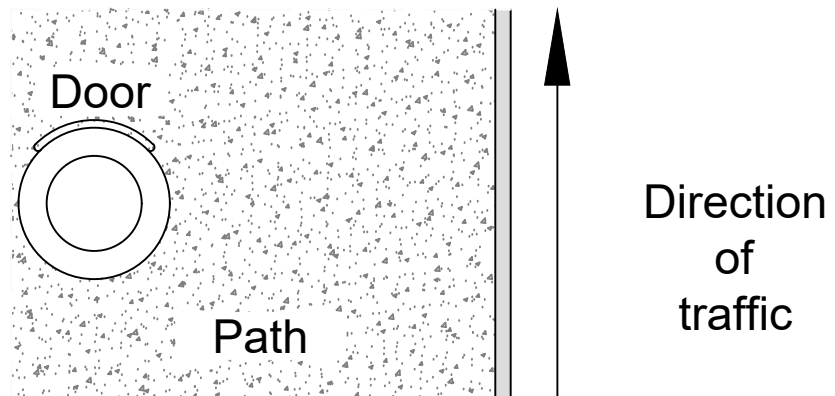
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Rev	Rev. Date	Purpose of revision	Drawn	Checked	Approved			
Principal Contractor:			101-105 Victoria House, Victoria Road Chelmsford Essex CM1 1JR					
 Integrated expertise								
Client:								
Project:								
Standard Detail Drawings								
Drawing Title:								
Tree & Vegetation trimming								
Drawing status								
Scale	NTS					DO NOT SCALE		
Project No.	Standard Details							
Sheet No.	Sheet 1 of 1							
Drawing number					Rev			
SD-1300-003					0			
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.								

1. Column ID shall read from top to bottom
2. Columns with private feed from pillar or column shall have label prefix indicating point of supply e.g. 'A 123'
3. Feeder columns shall have suffix letter e.g. '123 F'
4. Column numbering plan shall be provided by the local highway authority
5. Label colour, size and font, shall be in accordance with appendix 13/1

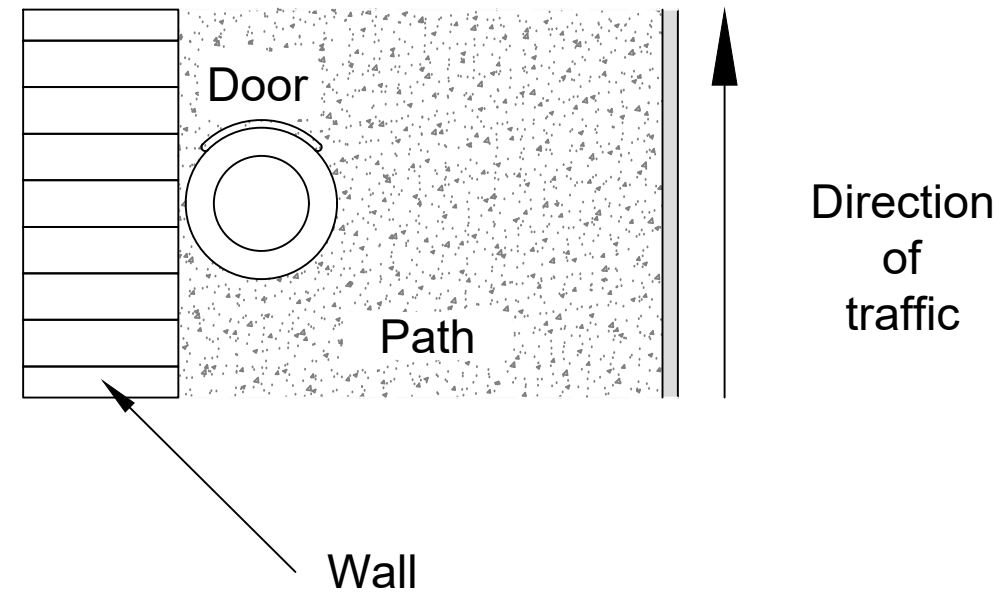


0	Nov 2018	ORIGINAL ISSUE	MD	TE	PD
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Principal Contractor:			 101-105 Victoria House, Victoria Road Chelmsford Essex CM1 1JR		
Client:					
Project:					
Standard Detail Drawings					
Drawing Title:					
Column Maintenance Number Location & Orientation					
Drawing status					
Scale		NTS	DO NOT SCALE		
Project No.		Standard Details			
Sheet No.		Sheet 1 of 1			
Drawing number					Rev
SD-1300-004					0
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.					

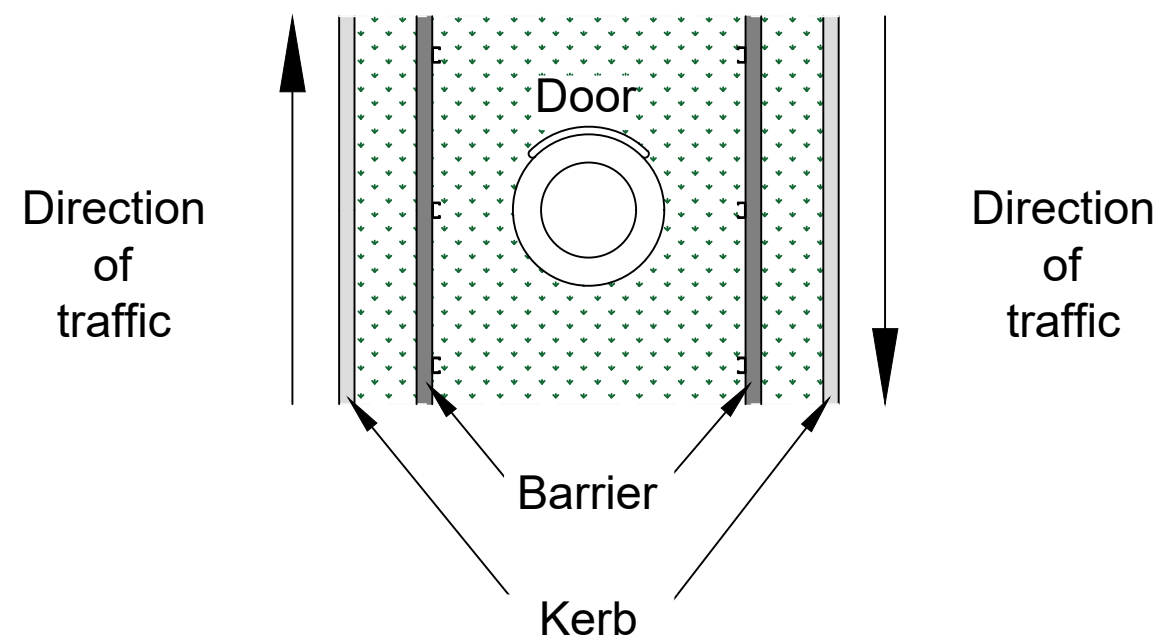
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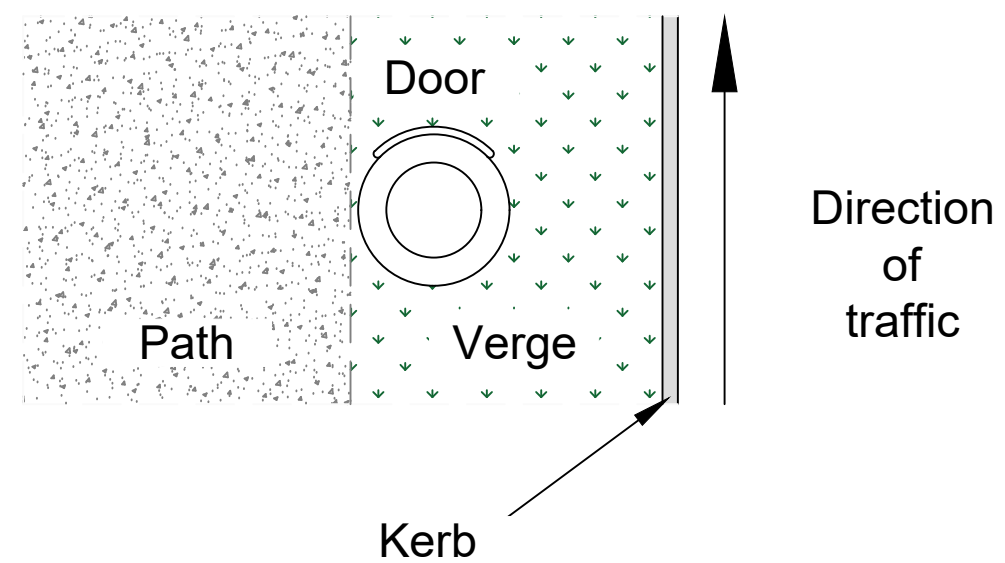
2. Adjacent to Obstruction




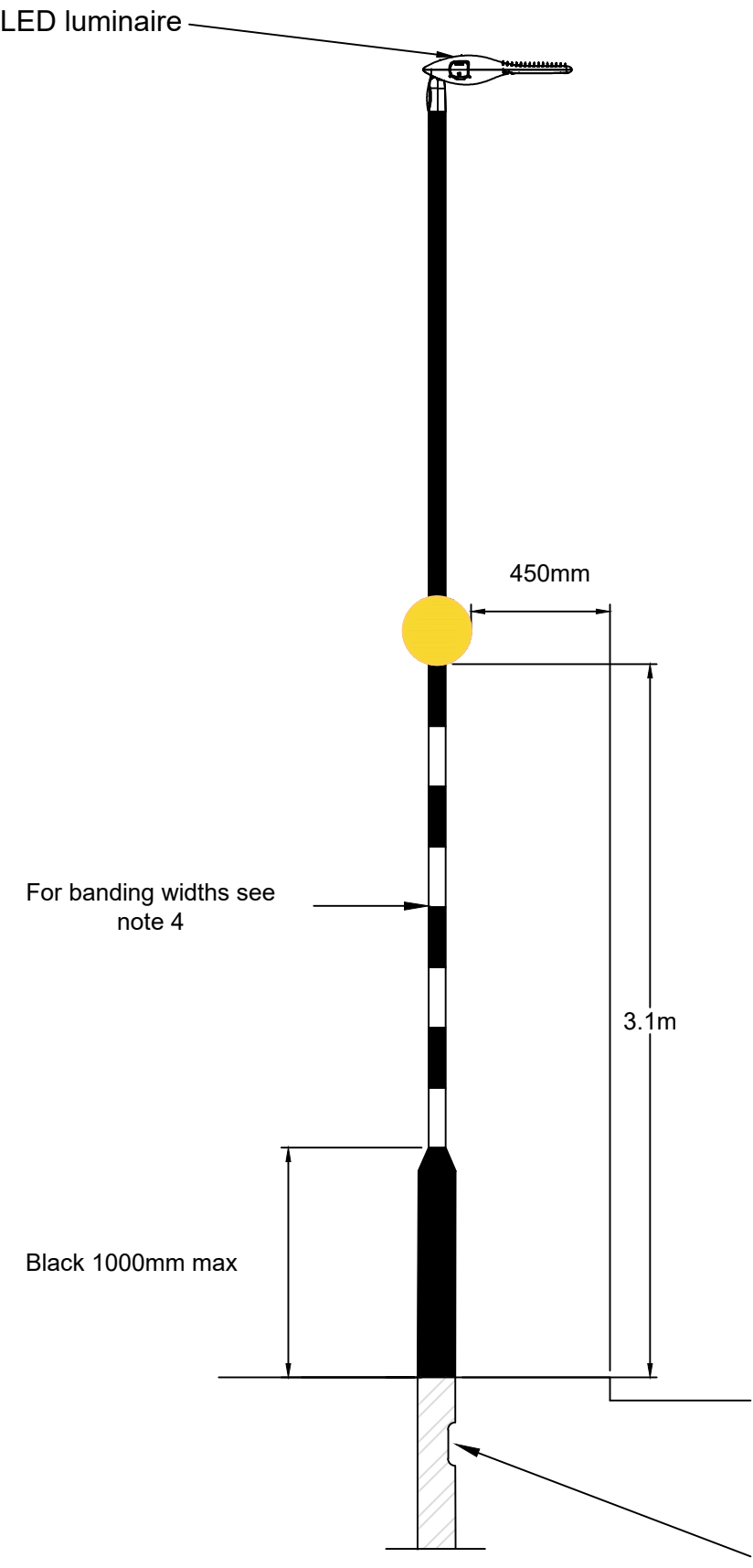
3. Dual Carriageway



4. Alternative location

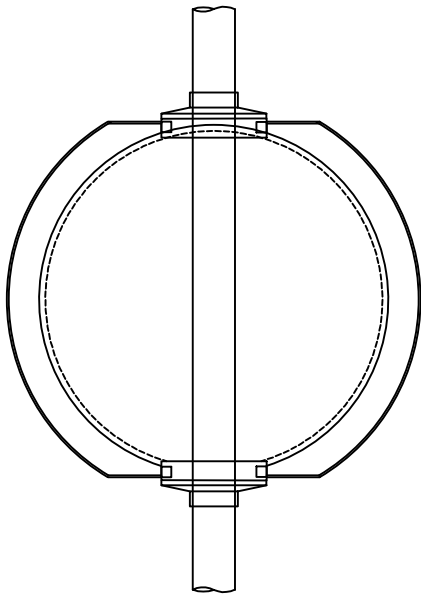


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Rev	Rev. Date	Purpose of revision		Drawn	Checked	Approved
Principal Contractor:		 Integrated expertise		101-105 Victoria House, Victoria Road Chelmsford Essex CM1 1JR		
Client:						
Project: Standard Detail Drawings						
Drawing Title: Column Door Orientation						
Drawing status						
Scale		NTS		DO NOT SCALE		
Project No.		Standard Details				
Sheet No.		Sheet 1 of 1				
Drawing number						Rev
SD-1300-005						0
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.						




ELEVATION

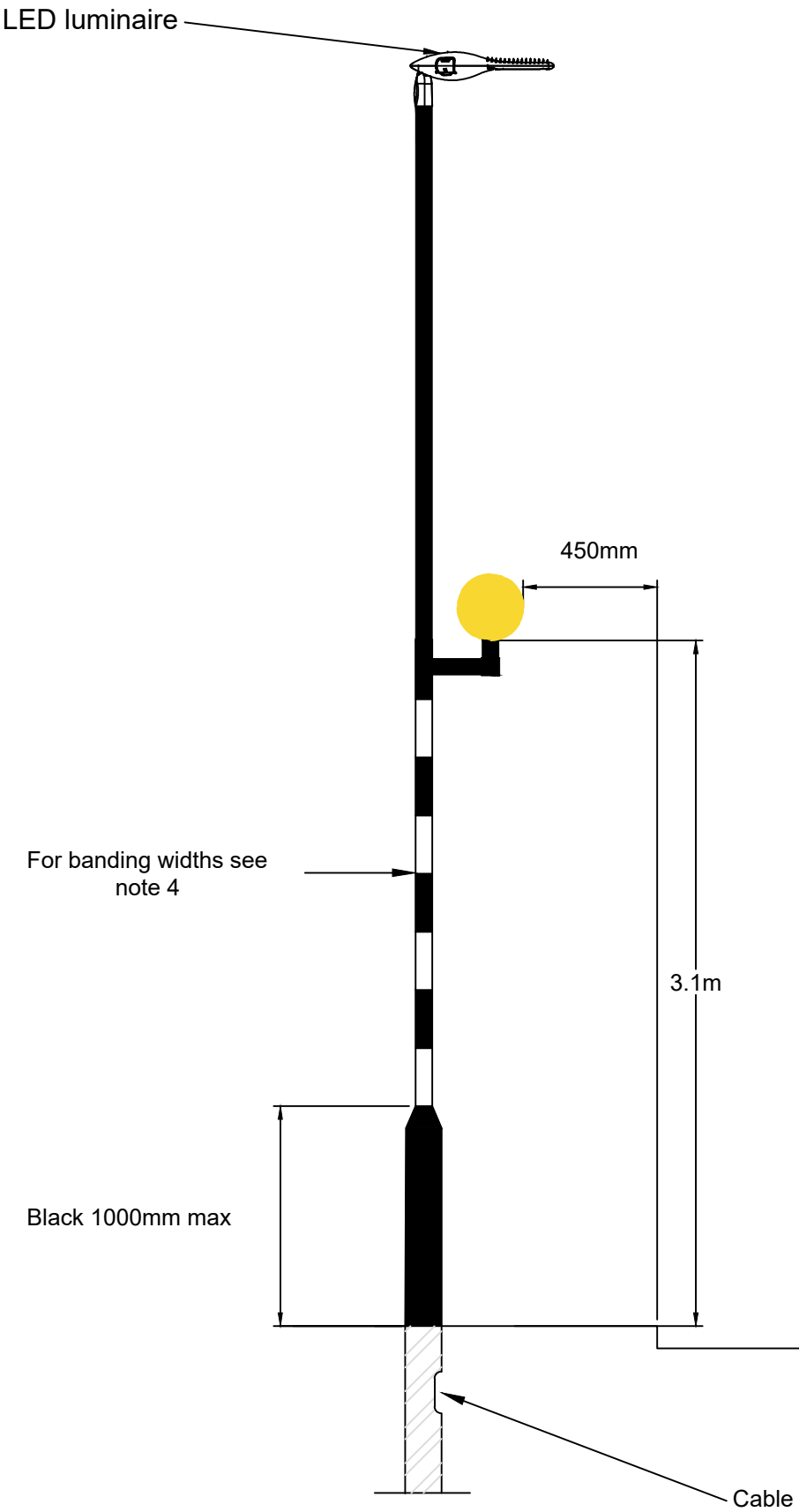
Single or Double Shield
(if required).



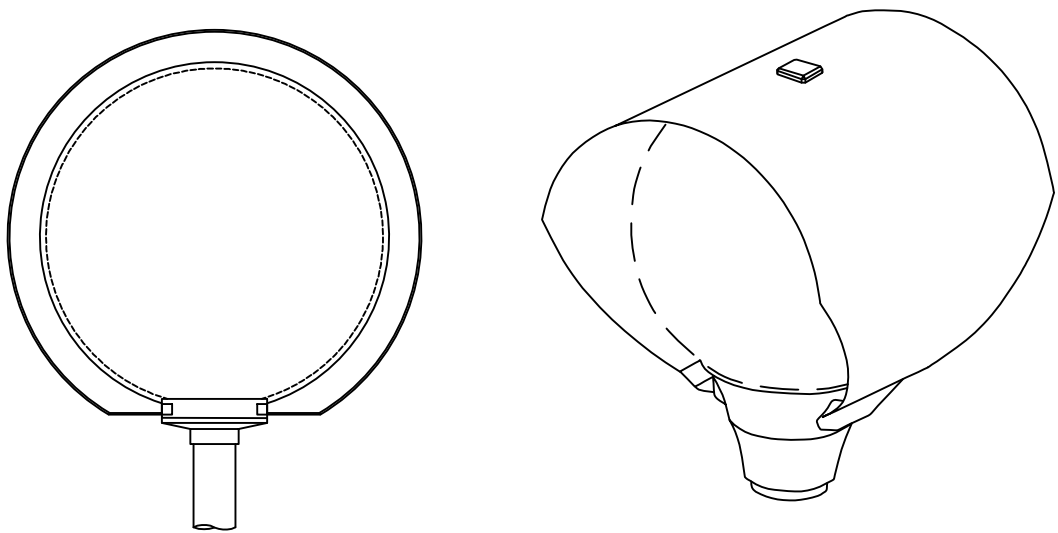
NOTES:

1. The column shall comply with the 1300 series.
2. The beacon, markings and globes shall comply with Traffic Signs Regulations and General Directions 2016 Statutory Instruments 2016 No 362
3. The yellow globe shall have a diameter not less than 275mm or more than 335mm.
4. Other than the bottom black band, the black and white bands shall be not less than 275mm or more than 300mm high and all of equal height.
5. The globe shall be fitted with a single or double shield, where required.
6. Lantern and control will be specified in the works package drawing.
7. The white bands shall be reflectorised R3B material or painted using reflective paint.

0	Nov 2019	ORIGINAL ISSUE		MD	TE	PB		
Rev	Rev. Date	Purpose of revision		Drawn	Checked	Approved		
Principal Contractor:				<div><p>101-105 Victoria House, Victoria Road Chelmsford Essex CM1 1JR</p></div>				
Client:								
Project:								
Standard Detail Drawings								
Drawing Title:								
Zebra Crossing Mid-Post Beacon								
Drawing status								
Scale		NTS					DO NOT SCALE	
Project No.		Standard Details						
Sheet No.		Sheet 1 of 1						
Drawing number					Rev			
SD-1300-006					0			
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.								




Shield (if required).



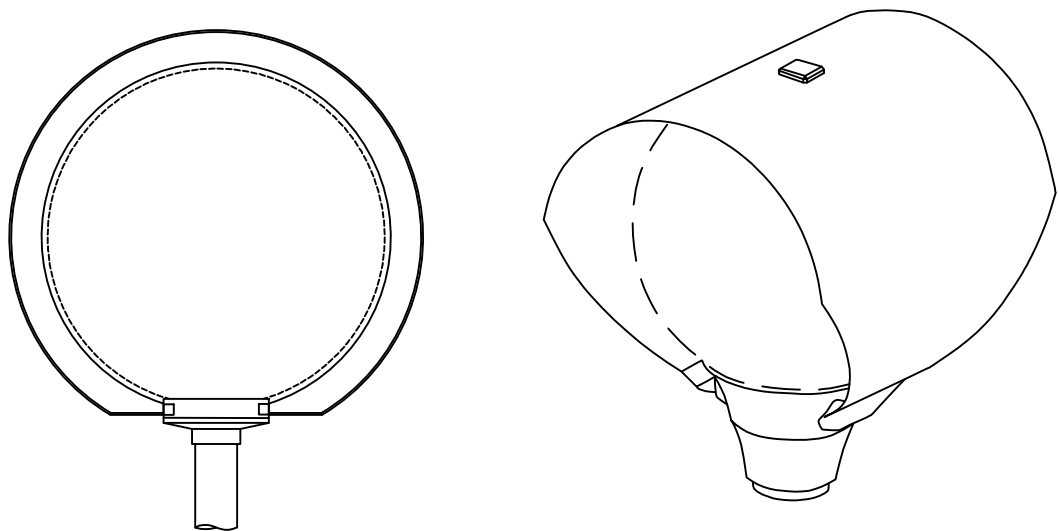
NOTES:

1. The column shall comply with the 1300 series.
2. The beacon, markings and globes shall comply with Traffic Signs Regulations and General Directions 2016 Statutory Instruments 2016 No 362
3. The yellow globe shall have a diameter not less than 275mm or more than 335mm.
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5. The globe shall be fitted with a single or double shield, where required.
6. Lantern and control will be specified in the works package drawing.
7. The white bands shall be reflectorised R3B material or painted using reflective paint.

ELEVATION

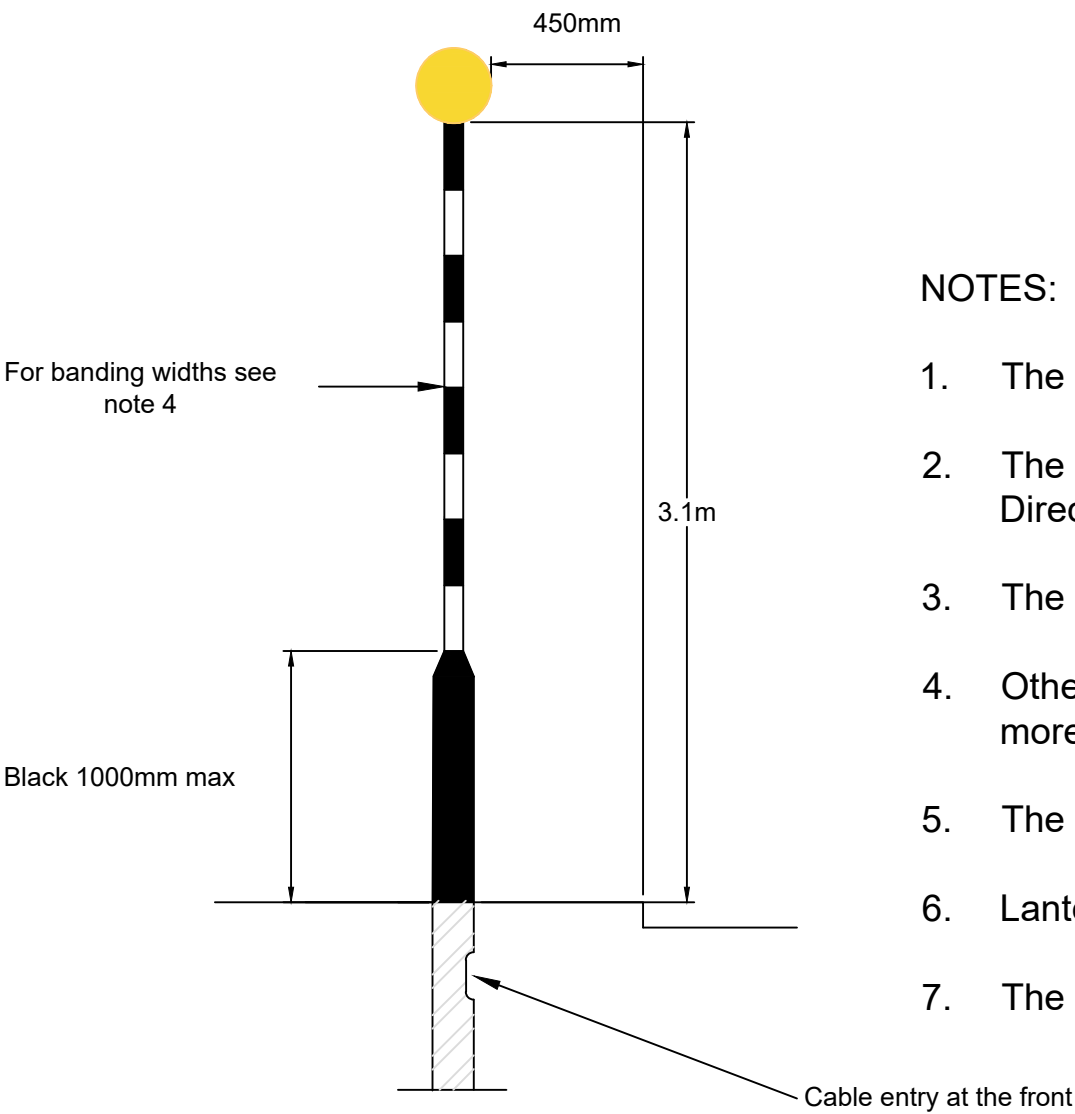
0	Nov 2019	ORIGINAL ISSUE		MD	TE	PB		
Rev	Rev. Date	Purpose of revision		Drawn	Checked	Approved		
Principal Contractor:				<div><p>101-105 Victoria House, Victoria Road Chelmsford Essex CM1 1JR</p></div>				
Client:								
Project:								
Standard Detail Drawings								
Drawing Title:								
Zebra Crossing Bracket Mounted Beacon								
Drawing status								
Scale	NTS		DO NOT SCALE					
Project No.	Standard Details							
Sheet No.	Sheet 1 of 1							
Drawing number					Rev			
SD-1300-007					0			
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.								

Single or Double Shield
(if required)




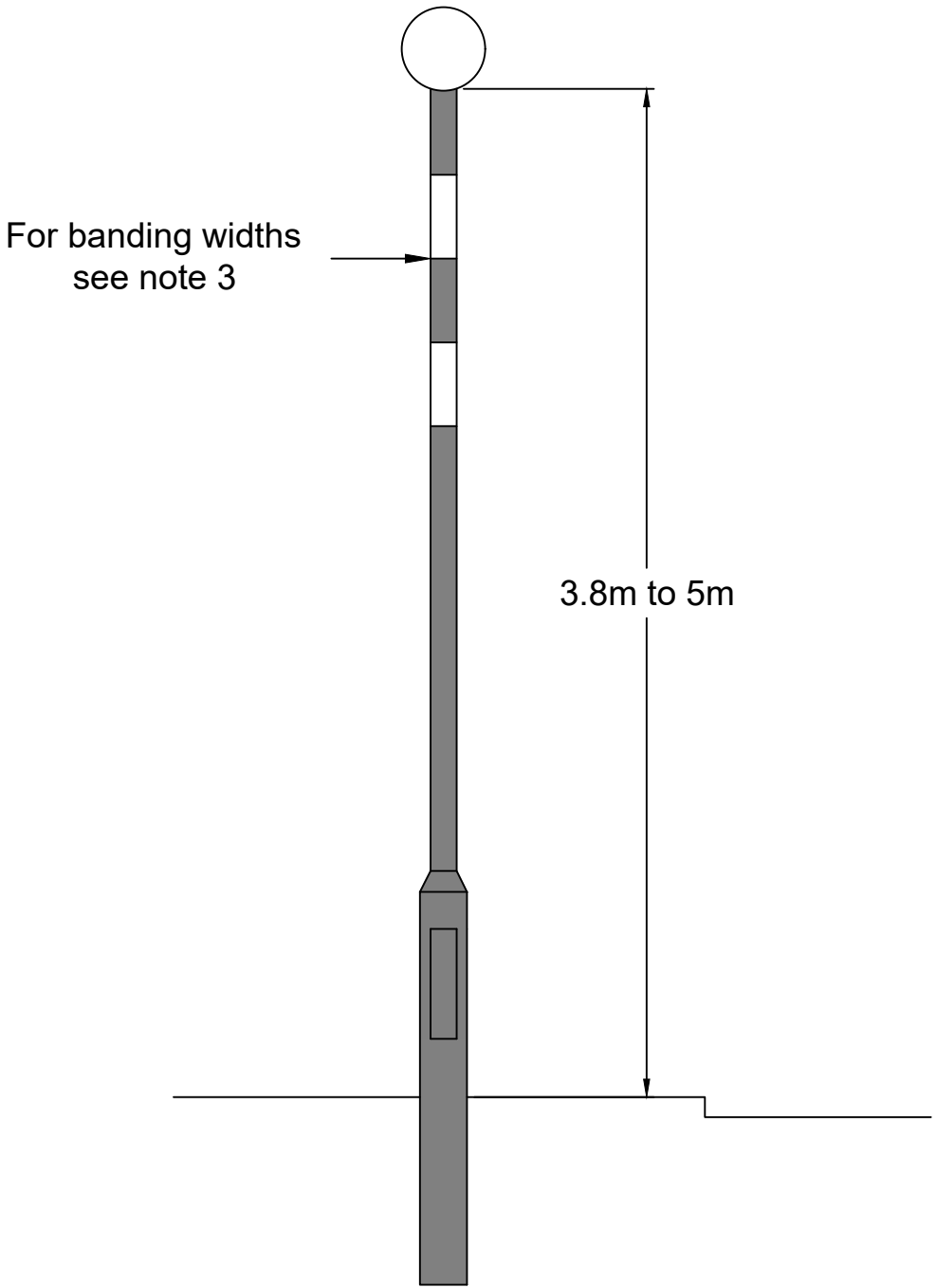
NOTES:

1. The column shall comply with the 1300 series.
2. The beacon, markings and globes shall comply with Traffic Signs Regulations and General Directions 2016 Statutory Instruments 2016 No 362
3. The yellow globe shall have a diameter not less than 275mm or more than 335mm.
4. Other than the bottom black band the black and white bands shall be not less than 275mm or more than 300mm high and all of equal height.
5. The globe shall be fitted with a single or double shield, where required.
6. Lantern and control will be specified in the works package drawing.
7. The white bands shall be reflectorised R3B material or painted using reflective paint.




ELEVATION

0	Nov 2019	ORIGINAL ISSUE		MD	TE	PB		
Rev	Rev. Date	Purpose of revision		Drawn	Checked	Approved		
Principal Contractor:				<div><p>101-105 Victoria House, Victoria Road Chelmsford Essex CM1 1JR</p></div>				
Client:								
Project:								
Standard Detail Drawings								
Drawing Title:								
Zebra Crossing Beacon Only								
Drawing status								
Scale	NTS		DO NOT SCALE					
Project No.	Standard Details							
Sheet No.	Sheet 1 of 1							
Drawing number					Rev			
SD-1300-008					0			
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.								

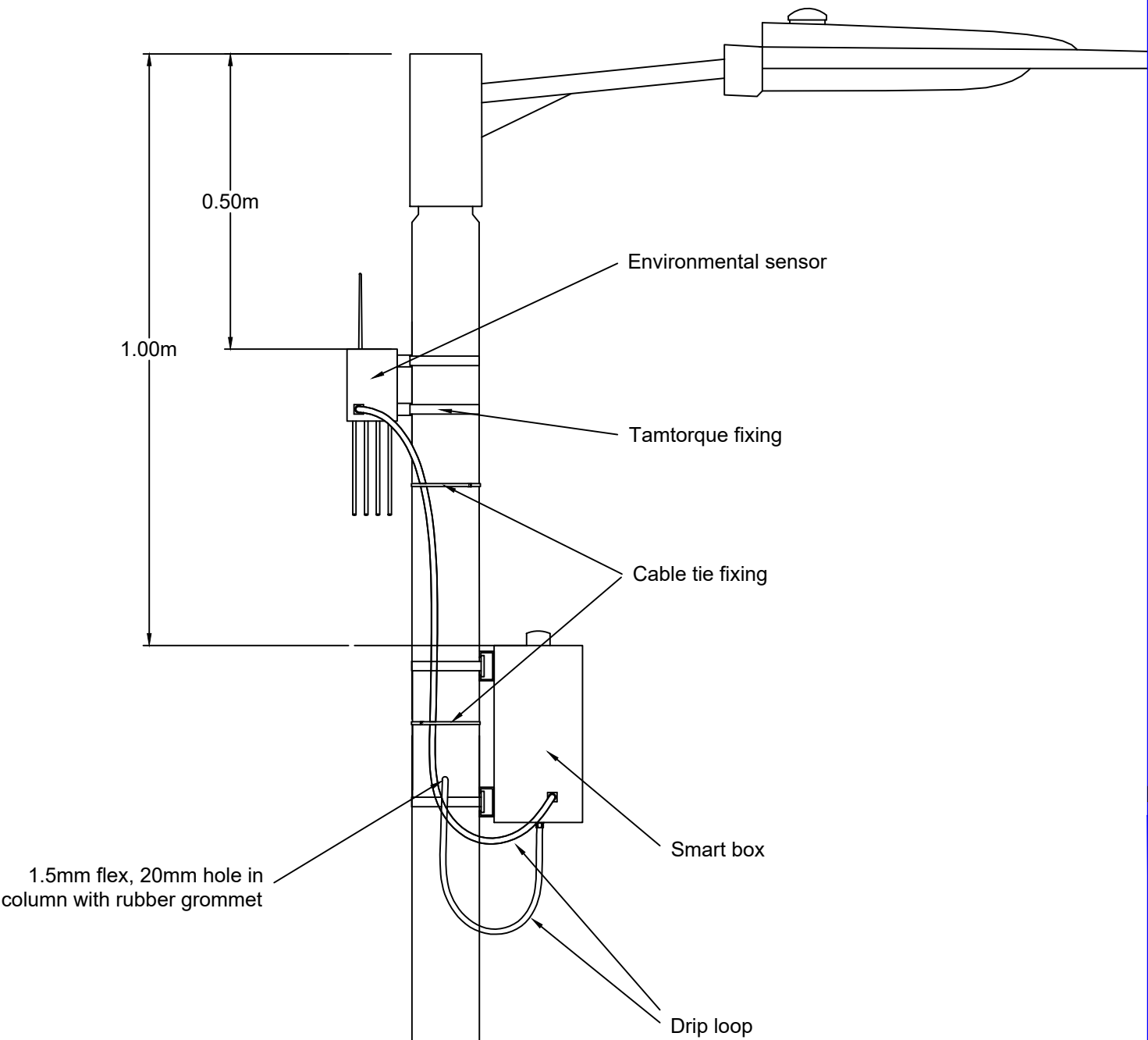
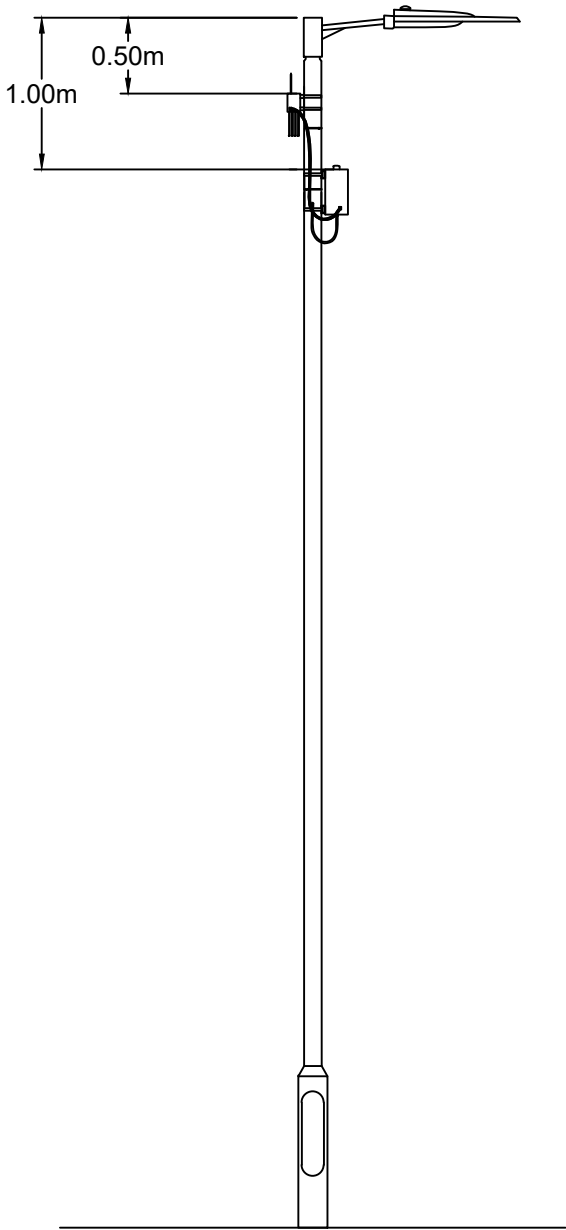



NOTES:

1. The globe shall be white.
2. The globe shall have a diameter not less than 290mm or more than 310mm.
3. The beacon post shall be factory painted - coloured grey (grey can be column material if galvanised only) with two white bands starting at 300mm below the globe, each band being 300mm in depth separated by a 300mm gap
4. The white band shall be R3B reflective material.
5. The globe shall be internally illuminated with a low wattage LED traffic signal lamp, compliant with BS 8442. The lamp and conversion unit shall be installed as detailed in the manufacturer's instructions.
6. The column shall comply with the 1300 series.

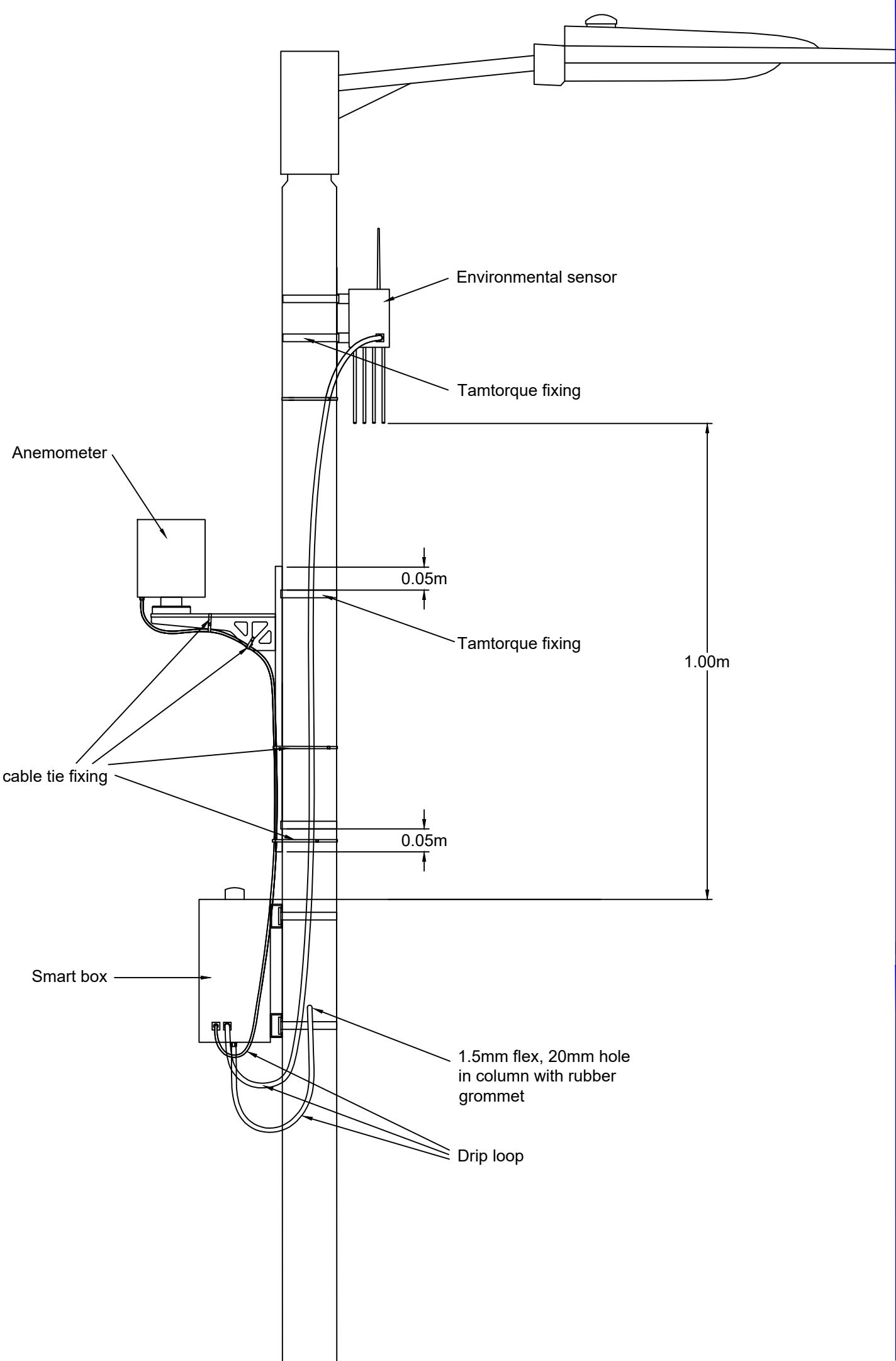
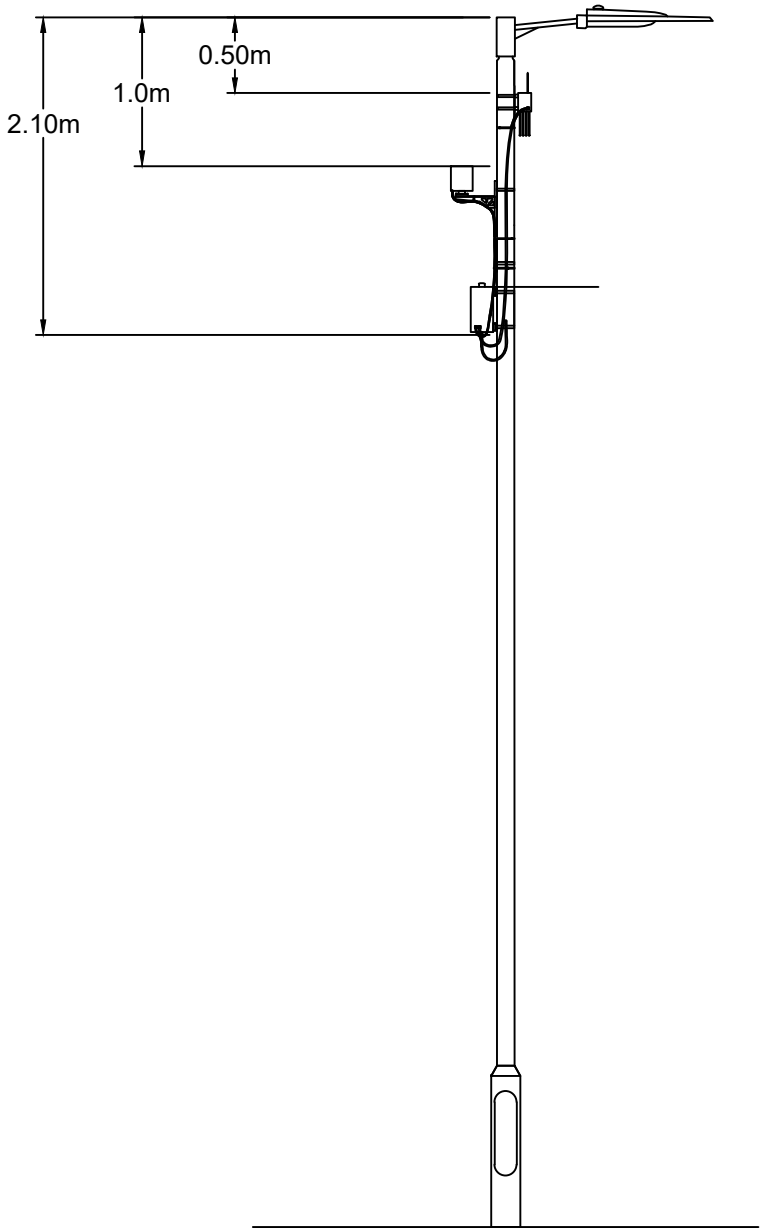
0	Nov 2019	ORIGINAL ISSUE		MD	TE	PB		
Rev	Rev. Date	Purpose of revision		Drawn	Checked	Approved		
Principal Contractor:				<div><p>101-105 Victoria House, Victoria Road Chelmsford Essex CM1 1JR</p></div>				
Client:								
Project:								
Standard Detail Drawings								
Drawing Title:								
Refuge Column and Beacon								
Drawing status								
Scale		NTS					DO NOT SCALE	
Project No.		Standard Details						
Sheet No.		Sheet 1 of 1						
Drawing number					Rev			
SD-1300-009					0			
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.								

	Smart Box	Environmental Sensor
Weight (Kg)	4.25	1.43
Mounting Height (m)	1m down from column top	0.5m down from column top
Offset	0	0
Equipment Dimensions (mm)		
Height	300	410
Length	200	164
Depth	150	85



0	Nov 2019	ORIGINAL ISSUE	MD	TE	PB
Rev	Rev. Date	Purpose of revision	Drawn	Checked	Approved
Principal Contractor:		 101-105 Victoria House, Victoria Road Chelmsford Essex CM1 1JR			
Client:					
Project: Standard Detail Drawings					
Drawing Title: Smart Equipment 5-6m Columns					
Drawing status					
Scale	NTS		DO NOT SCALE		
Project No.	Standard Details				
Sheet No.	Sheet 1 of 1				
Drawing number: SD-1300-010					Rev 0
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.					

	Smart Box	Anemometer	Environmental Sensor
Weight (Kg)	4.25	2.77	1.43
Mounting Height (m)	2.1m down from column top	1.5m down from column top	0.5m down from column top
Offset	0	420	0
Equipment Dimensions (mm)			
Height	300	163	410
Length	200	142	164
Depth	150	142	85



0	Nov 2019	ORIGINAL ISSUE	MD	TE	PB
Rev	Rev. Date	Purpose of revision	Drawn	Checked	Approved

Principal Contractor: **RINGWAY JACOBS** Integrated expertise
101-105 Victoria House, Victoria Road, Chelmsford Essex CM1 1JR

Client:

Project: **Standard Detail Drawings**

Drawing Title: **Smart Equipment 8-12m Columns**

Drawing status

Scale	NTS	DO NOT SCALE
Project No.	Standard Details	
Sheet No.	Sheet 1 of 1	

Drawing number: **SD-1300-011** Rev **0**

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.

INCOMING CABLES IN COLUMNS/SIGNS SHALL BE LABELLED AS FOLLOWS:

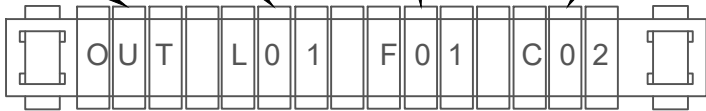
Incoming feed - from col / sign no. - from feeder pillar no. - circuit no.



* For DNO supply only no label is required

OUTGOING CABLES IN COLUMNS/SIGNS SHALL BE LABELLED AS FOLLOWS:

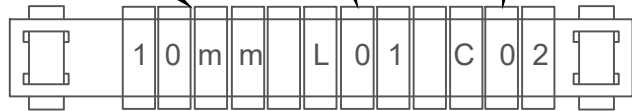
Outgoing feed - to col / sign no. - from feeder pillar no. - circuit no.*



* For DNO - to col / sign no. - only required

OUTGOING CABLES IN DISTRIBUTION PILLAR SHALL BE LABELLED AS FOLLOWS:


Outgoing cable size - to first col / sign no. - circuit no.



1. Drawing shall be printed out in colour

CABLE IDENTIFICATION LABLES:

- 1. Labels are to be k type critchley labels or similar approved
- 2. A blank must be in between each section as shown
- 3. Labels attached to cables using cable ties fitted below gland plates.

0	Nov 2019	ORIGINAL ISSUE	MD	TE	PB
Rev	Rev. Date	Purpose of revision	Drawn	Checked	Approved
Principal Contractor:		 101-105 Victoria House, Victoria Road Chelmsford Essex CM1 1JR			
Client:					
Project: Standard Detail Drawing					
Drawing Title: Cable Identification Labels For Private Cables					
Drawing status					
Scale:	NTS		DO NOT SCALE		
Project No.	Standard Details				
Sheet No.	Sheet 1 of 1				
Drawing number SD-1400-001					Rev 0
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.					

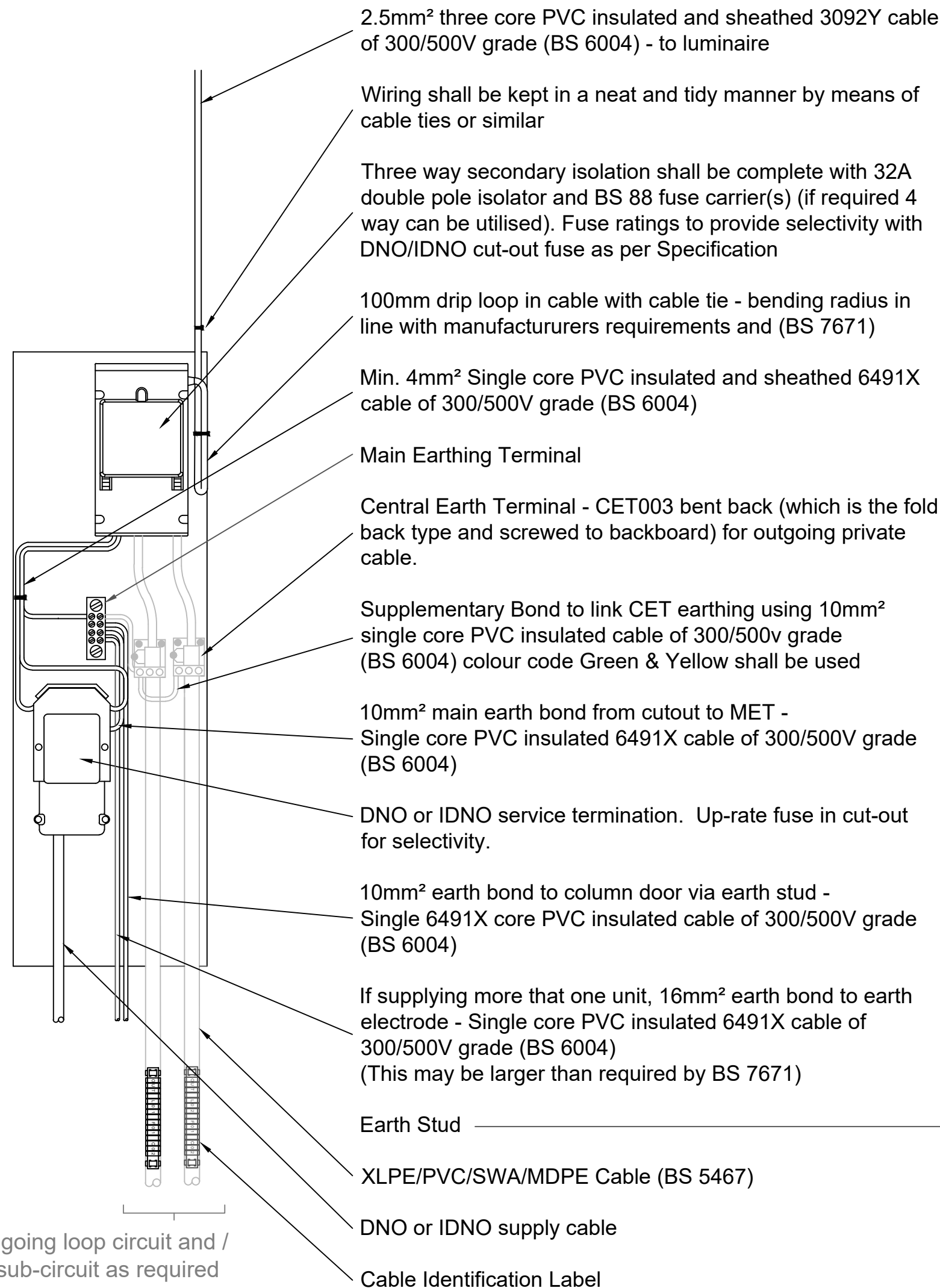
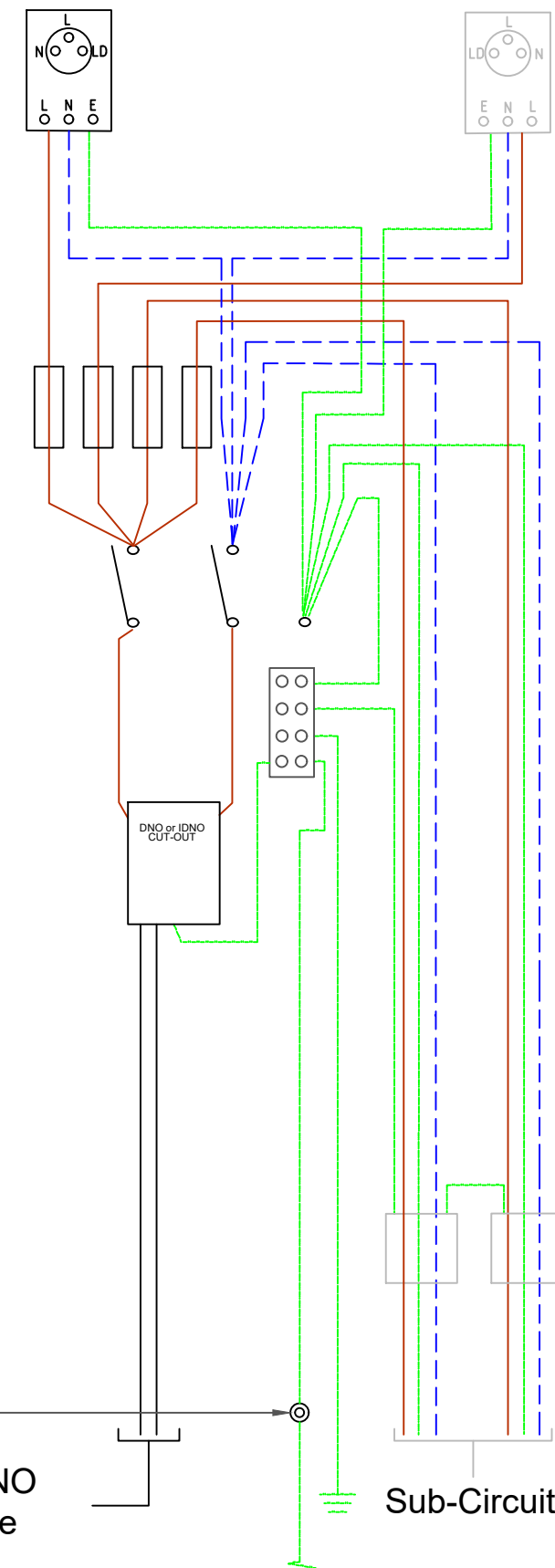
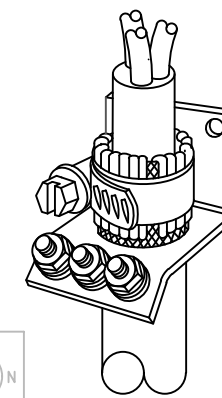



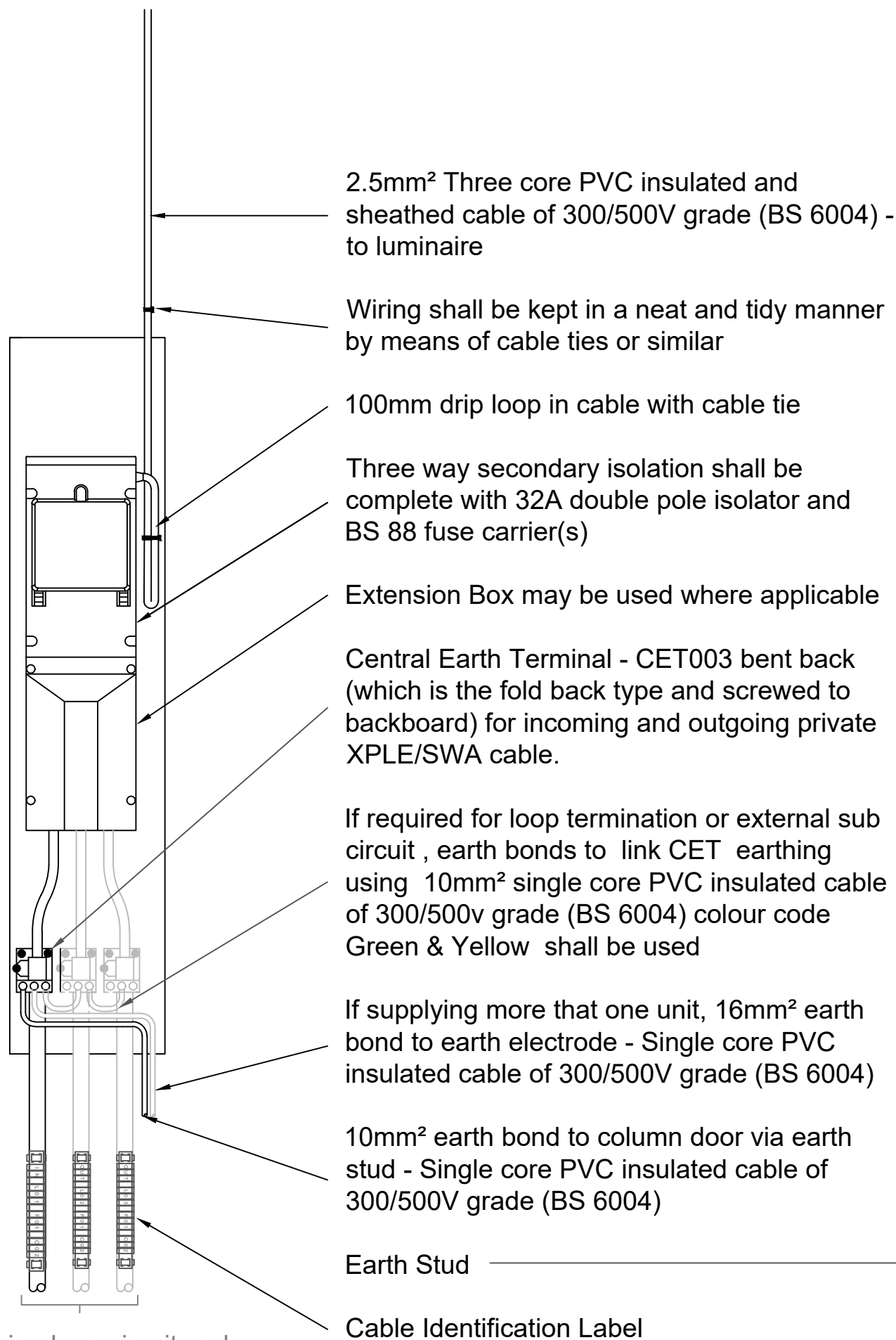
Diagram showing required CET003 arrangement



NOTES :

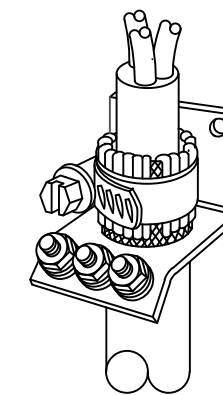
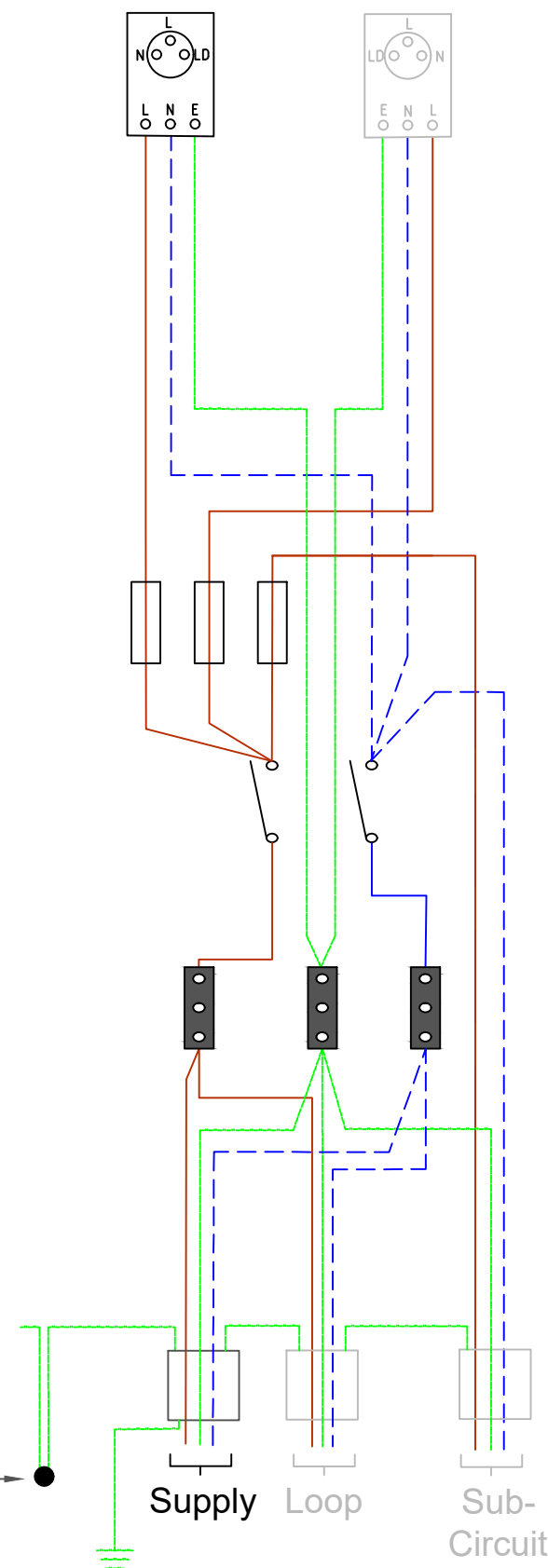
1. Drawing shall be printed in colour
2. All cables to be copper

0	Nov 2019	ORIGINAL ISSUE		MD	TE	PB
Rev	Rev. Date	Purpose of revision		Drawn	Checked	Approved
Principal Contractor:				 181-185 Victoria House, Victoria Road Chelmsford Essex CM1 1JR		
Client:						
Project:						
Standard Detail Drawing						
Drawing Title:						
Typical Termination Detail DNO Supply with Optional Fused Sub-Circuits						
Drawing status						
Scale		NTS		DO NOT SCALE		
Project No.		Standard Details				
Sheet No.		Sheet 1 of 1				
Drawing number						Rev
SD-1400-002						0
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.						




Out going loop circuit and / or sub-circuit as required

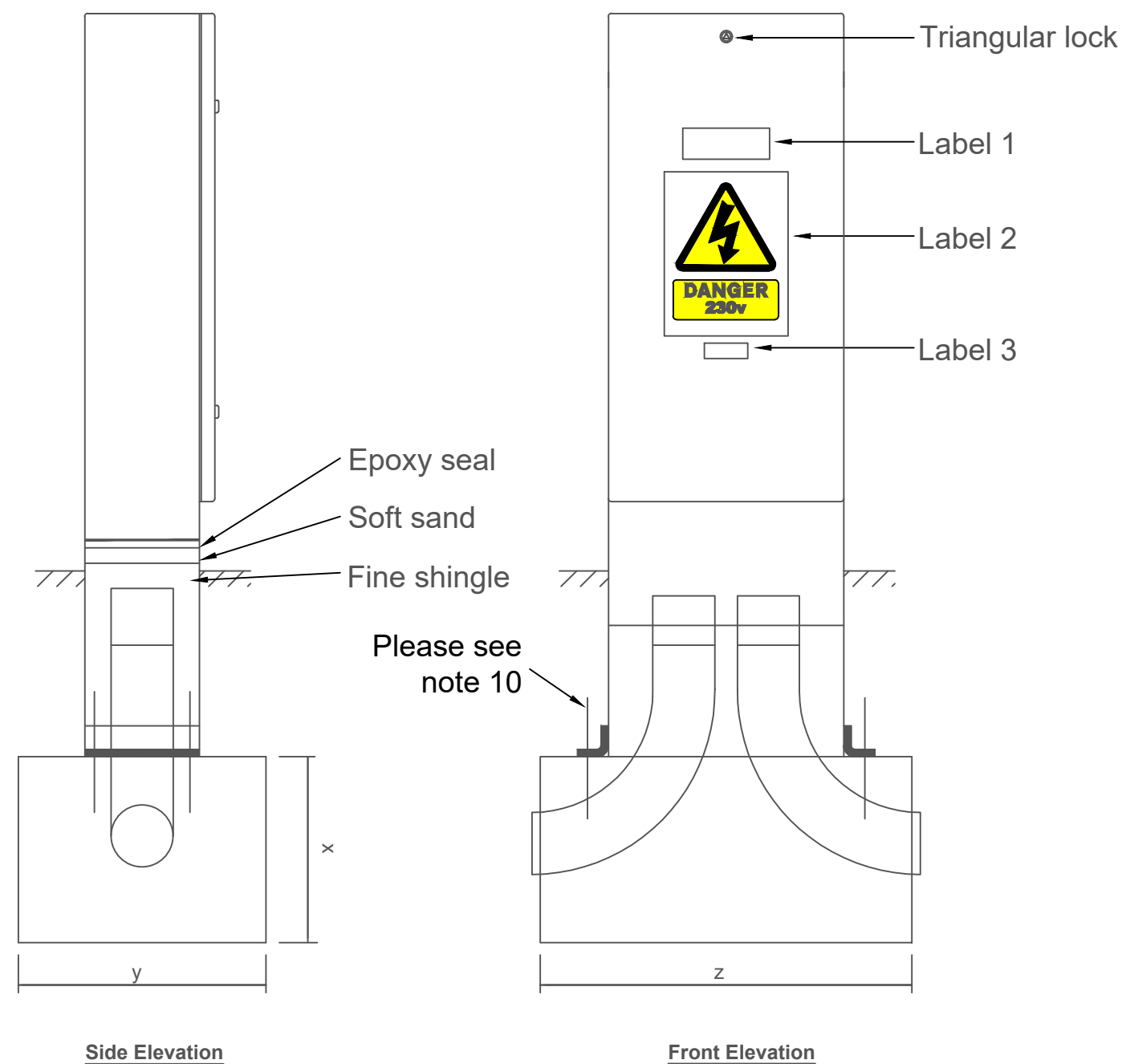
Diagram showing required CET003 arrangement



NOTES :

1. Drawing shall be printed in colour

0	Nov 2019	ORIGINAL ISSUE	MD	TE	PB
Rev	Rev. Date	Purpose of revision	Drawn	Checked	Approved
Principal Contractor:					
 Integrated expertise			101-105 Victoria House, Victoria Road Chelmsford Essex CM1 1JR		
Client:					
Project:					
Standard Detail Drawing					
Drawing Title:					
Typical Termination Detail for Private Cable with Optional Second Luminaire, Loop or Sub-Circuit					
Drawing status					
Scale	NTS		DO NOT SCALE		
Project No.	Standard Details				
Sheet No.	Sheet 1 of 1				
Drawing number					Rev
SD-1400-003					0
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.					



LABELS:

1. "Street Lighting" - 50mm high black text on white background
2. Electric hazard sign with 230v
3. Maintenance Numbers as described in appendix 13/1

Mini Feeder Pillars shall:

1. Shall have a minimum depth 150mm and a width between 150mm and 350mm
2. Lock to be triangle standard key as detailed in the DMRB
3. Unless in Footway be provided with 1no. 900mm x 600mm x 50mm concrete paving flags in front of the door.
4. Be provided with:
 - 4.1. 1no. 50mm black duct for DNO/IDNO Service.
 - 4.2. Minimum 1no. 50mmØ orange duct.
 - 4.3. Ducts shall be self-coloured, smooth bore MDPE and have "Easy Bends".
5. Be provided with concrete foundation according to the manufactures specification
6. Have an earth bond from the pillar door to the pillar earth stud this shall be 10mm². Single core PVC insulated cable of 300/500V grade (BS 6004) and shall terminate with an integral lug.
7. Have a thin coating of graphite grease applied to all moving parts (hinges and locks etc)
8. Labels shall be according to the Local Authority's Specification and BS 7671.
9. Installation and Feeder Pillar Foundations (x,y,z) are to be according to the manufacturer's Specification
10. Feeder Pillar shall be secured to the foundations as per manufactures guidelines
11. The pillar shall have by construction or by installation an IP rating of at least IP55

NOTES :


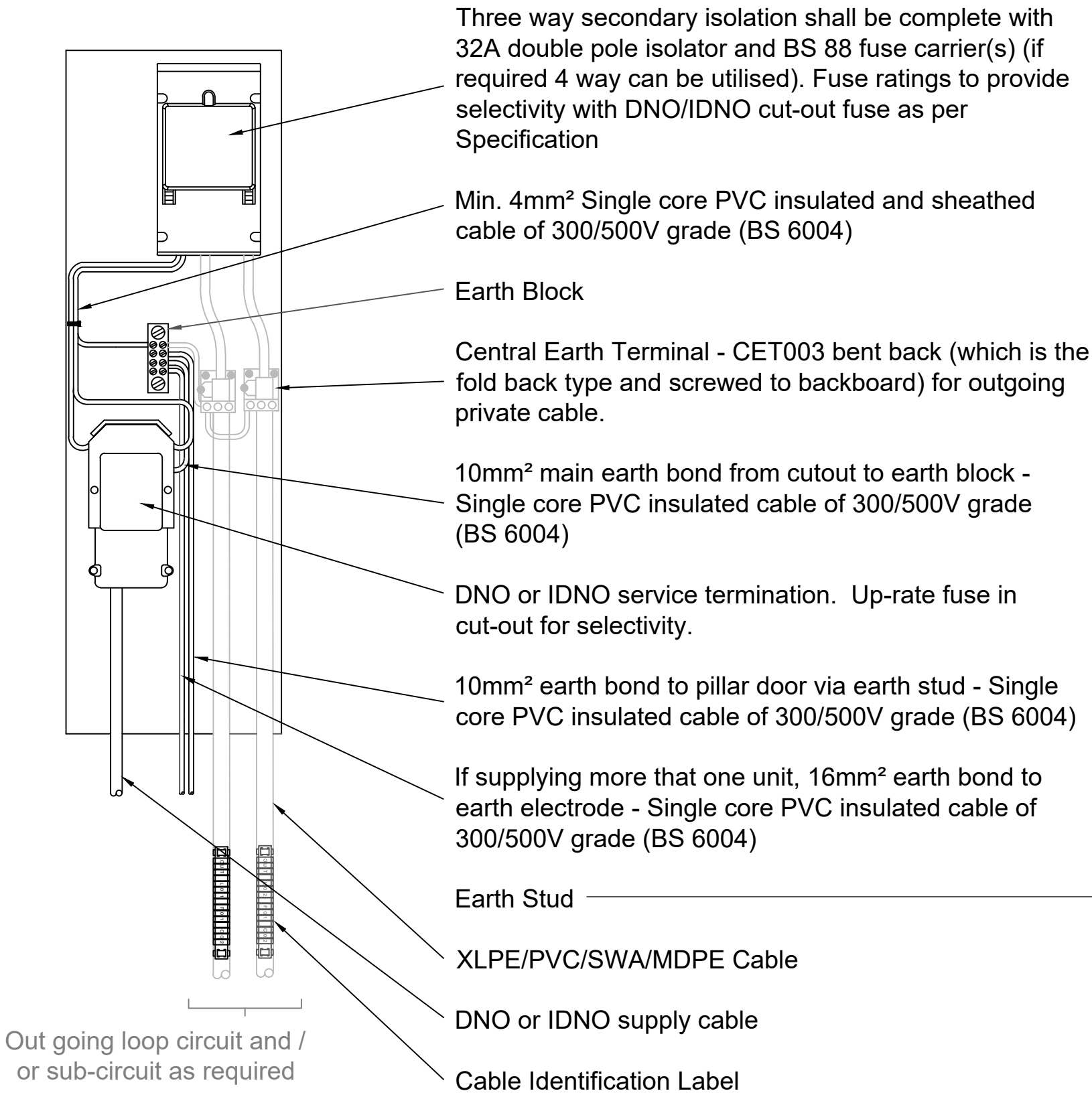
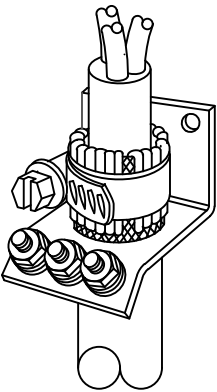
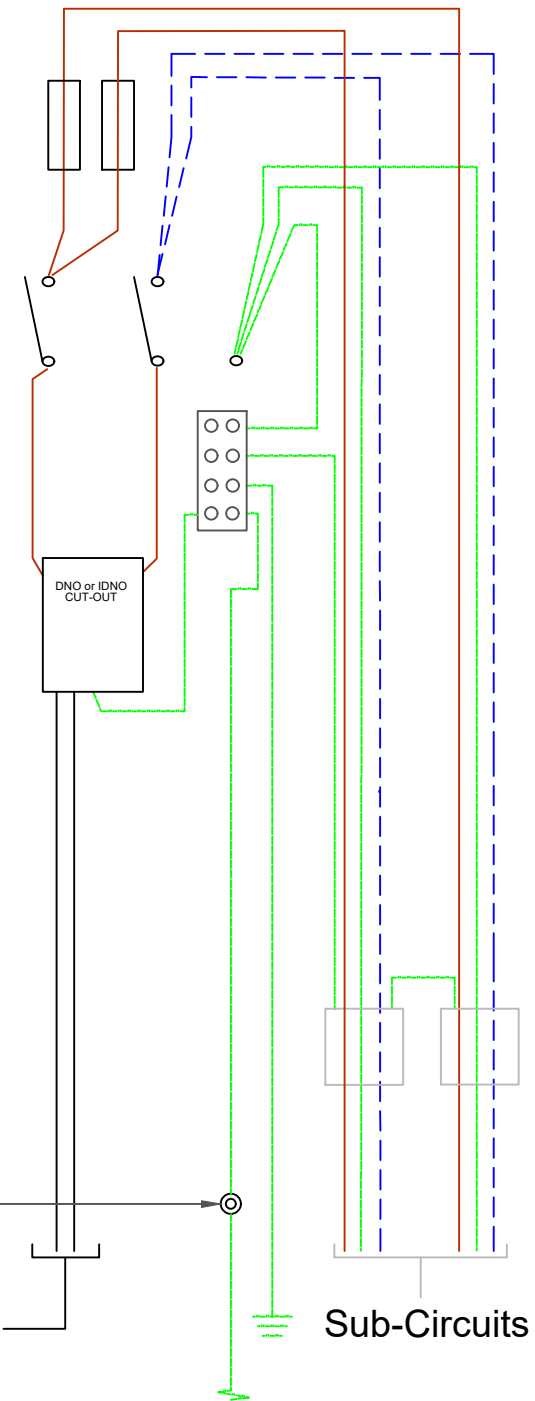
0	Nov 2019	ORIGINAL ISSUE		MD	TE	PB
Rev	Rev. Date	Purpose of revision		Drawn	Checked	Approved
Principal Contractor:				181-185 Victoria House, Victoria Road Chelmsford Essex CM1 1JR		
 Integrated expertise						
Client:						
Project:						
Standard Detail Drawing						
Drawing Title:						
Typical Mini Pillar						
Drawing status						
Scale		NTS		DO NOT SCALE		
Project No.		Standard Details				
Sheet No.		Sheet 1 of 1				
Drawing number						Rev
SD-1400-004						0
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.						

Diagram showing required CET003 arrangement

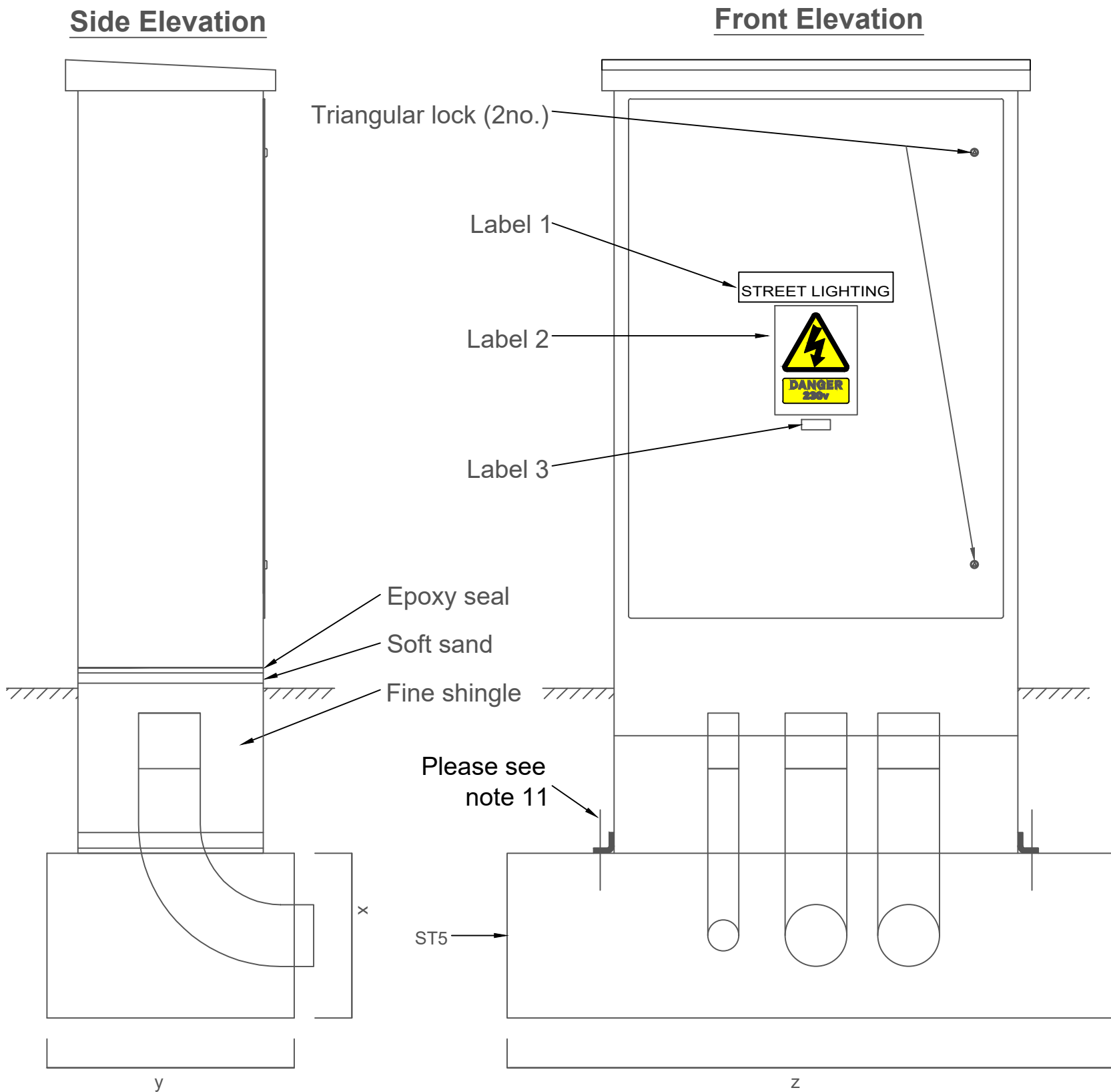


DNO or IDNO supply cable



Sub-Circuits

0	Nov 2019	ORIGINAL ISSUE		MD	TE	PB
Rev	Rev. Date	Purpose of revision		Drawn	Checked	Approved
Principal Contractor:				<div><div>101-105 Victoria House, Victoria Road Chesham Essex CM1 1JR</div></div>		
Client:						
Project: <div>Standard Detail Drawing</div>						
Drawing Title: <div>Mini Pillar Switch Gear Details</div>						
Drawing status						
Scale		NTS		DO NOT SCALE		
Project No.		Standard Details				
Sheet No.		Sheet 1 of 1				
Drawing number						Rev
SD-1400-005						0
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.						




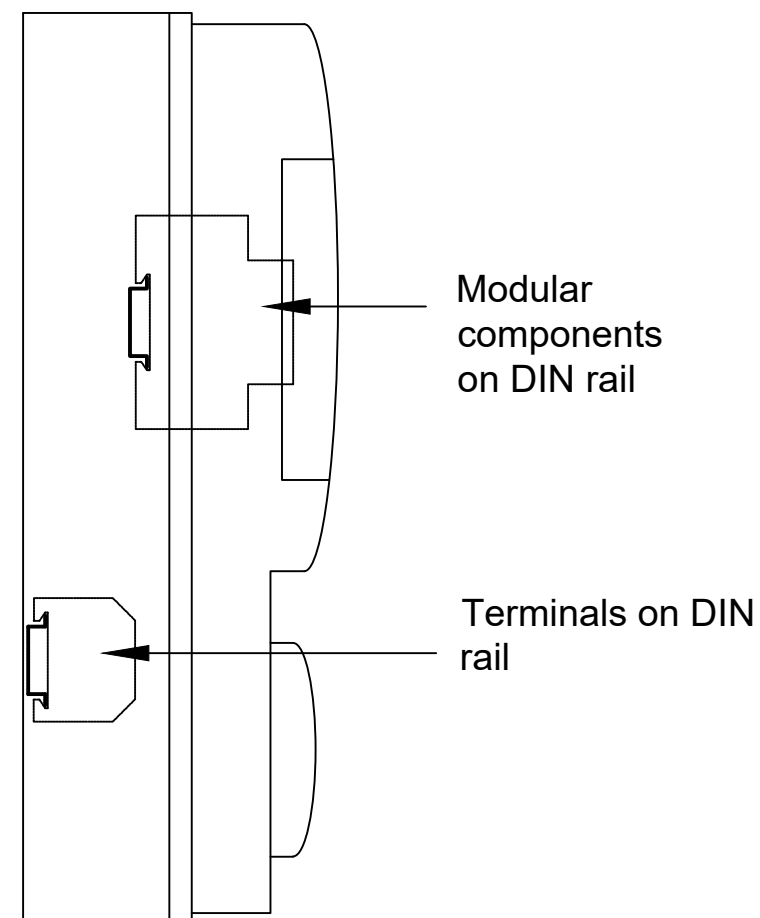
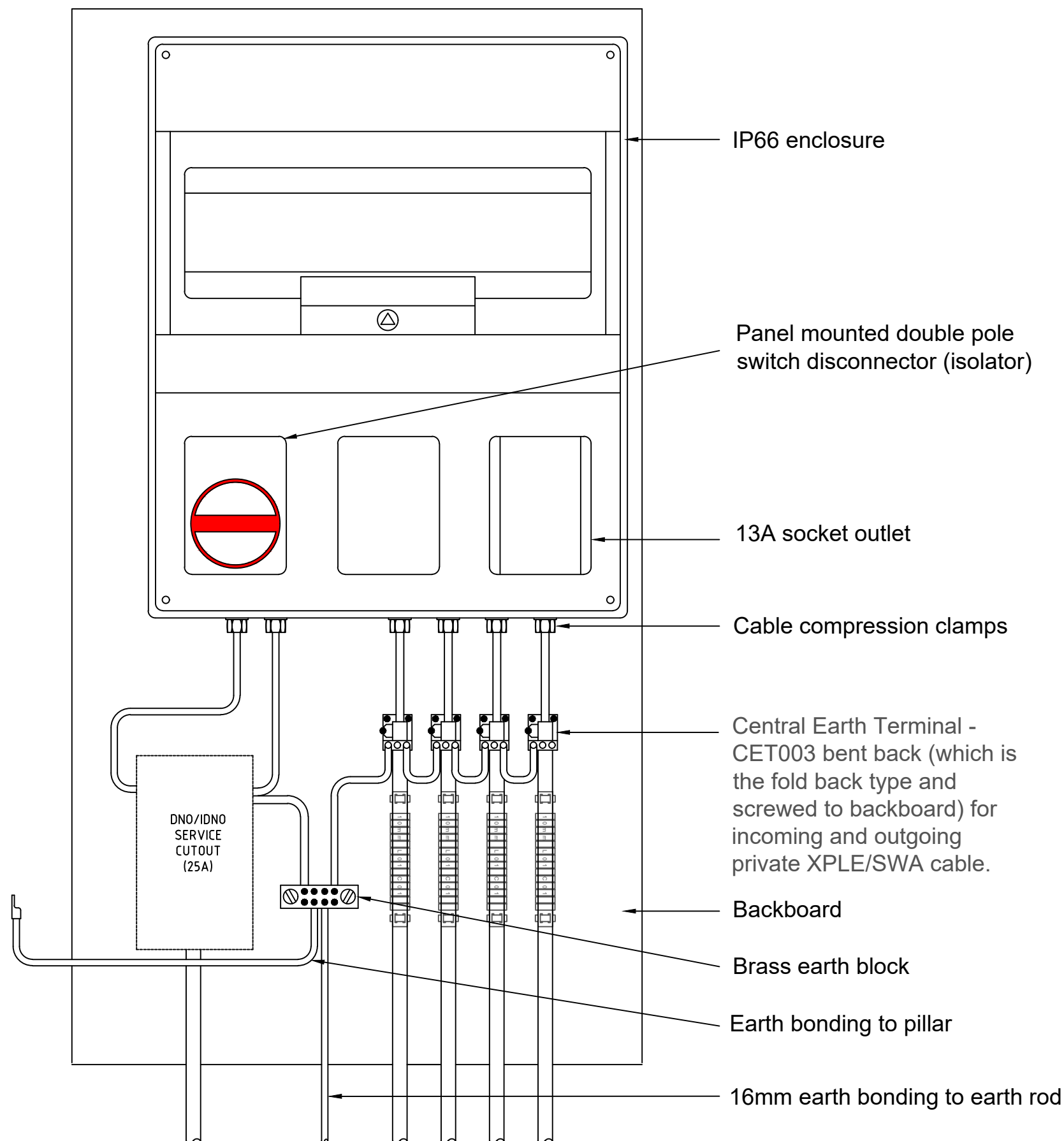
LABELS:

- "Street Lighting" - 50mm high black text on white background
- Electric hazard sign with 230v
- Maintenance Numbers as described in the appendix 13/1


Feeder Pillar Shall:

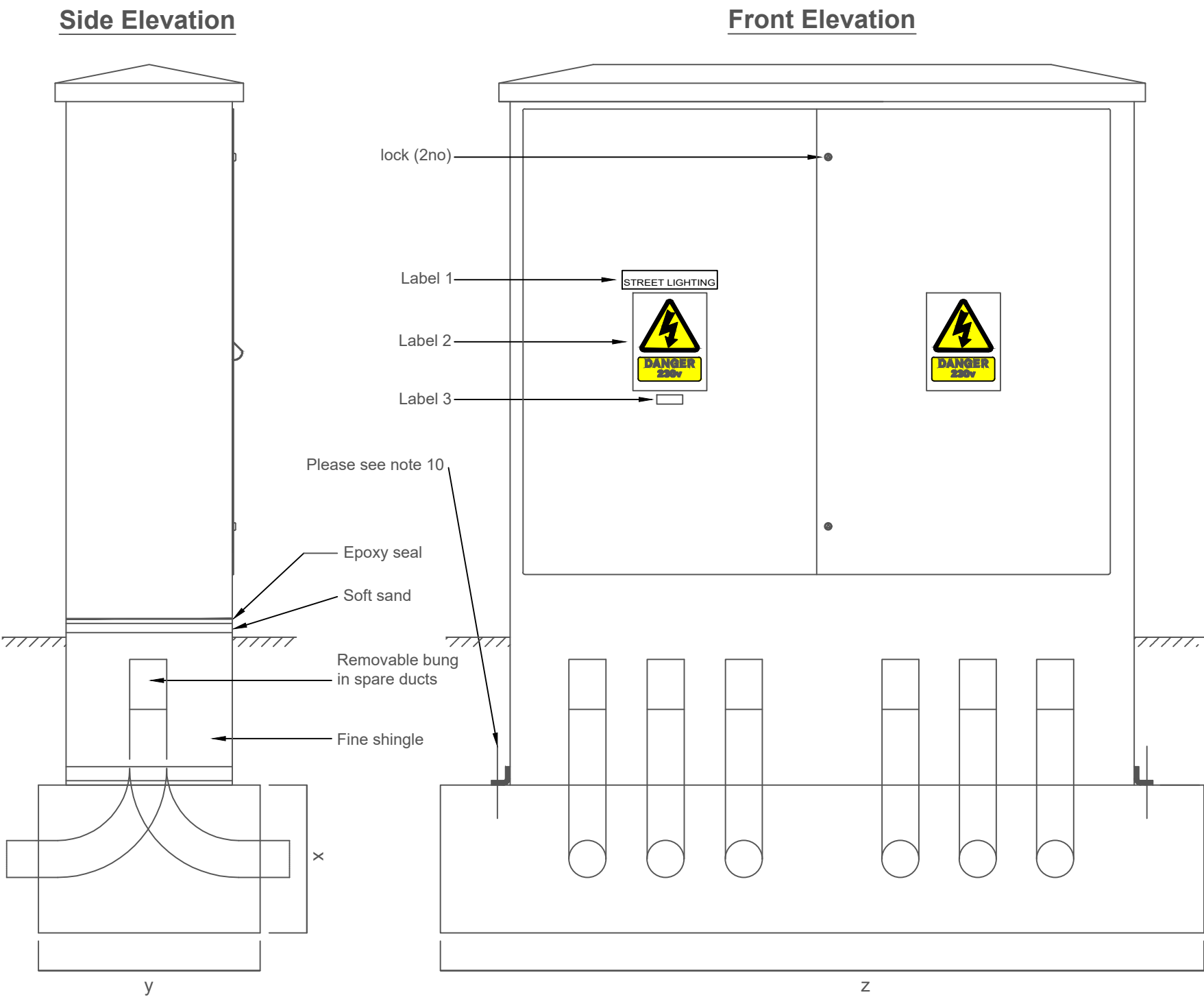
- Have room to fit the approximate backboard size to suit electrical equipment and spare space of 25%
- Shall have a Minimum Depth of 200mm and a width between 350mm and 1000mm
- Lock to be triangle standard key as detailed in the DMRB
- Unless in footway be provided with a minimum of 1no 900mm x 600mm x 50mm concrete paving flags in front of the door to cover full width of pillar.
- Be provided with:-
 - 1no. 50mmØ black duct for DNO/IDNO Service.
 - 100mmØ orange ducts to fill the remaining width of the pillar (minimum 2no.)
 - Ducts shall be self-coloured, smooth bore MDPE and have "Easy Bends".
- Be provided with concrete foundation according to the manufactures specification
- Have an earth bond from the pillar door to the pillar. This shall be flexible copper braid bond in accordance with BS 7671. The ends of the copper braid shall terminate with an integral lug.
- Have a thin coating of graphite grease applied to all moving parts (hinges and locks etc)
- Labels shall be according to the Local Authority's Specification and BS 7671.
- Installation and Feeder Pillar Foundations (x,y,z) are to be according to the manufacturer's Specification
- Feeder Pillar shall be secured to the foundations as per manufactures guidelines
- The pillar shall have by construction or by installation an IP rating of at least IP55

0	Nov 2019	ORIGINAL ISSUE		MD	TE	PB
Rev	Rev. Date	Purpose of revision		Drawn	Checked	Approved
Principal Contractor:				 101-105 Victoria House Victoria Road Chelmsford Essex CM1 1JR		
Client:						
Project:						
Standard Detail Drawing						
Drawing Title:						
Typical Medium Feeder Pillar						
Drawing status						
Scale		NTS				
Project No.		Standard Details				
Sheet No.		Sheet 1 of 1				
Drawing number					Rev	
SD-1400-006					0	
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.						



1. Earth Bonding shall comply with the current edition of BS 7671
2. All cables shall be neatly installed and be either tie wrapped or fixed to the back board
3. All conductors from SWA cables of 6mm CSA or larger shall be terminated in the terminal rail. Terminals shall be "KLIPPON" or equivalent

0	Nov 2019	ORIGINAL ISSUE	MD	TE	PB		
Rev	Rev. Date	Purpose of revision	Drawn	Checked	Approved		
Principal Contractor:			 <div>161-165 Victoria House, Victoria Road Chelmsford Essex CM1 1JR</div>				
Client:							
Project:							
Standard Detail Drawing							
Drawing Title:							
Feeder Pillar Switch Gear Details							
Drawing status							
Scale	NTS					DO NOT SCALE	
Project No.	Standard Details						
Sheet No.	Sheet 1 of 1						
Drawing number				Rev			
SD-1400-007				0			
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.							



LABELS:

- "Street Lighting" - 50mm high black text on white background
- Electric hazard sign with 230v (or 400v if applicable)
- Maintenance Numbers as described in the appendix 13/1

Feeder Pillar shall:

- Have room to fit the approximate backboard size to suit electrical equipment and spare space of 25%
- Shall have a Minimum Depth of 400mm and a width between 1200mm and 2000mm
- Lock to be triangle standard key as detailed in the DMRB
- Unless in footway be provided with 900mm x 600mm x 50mm concrete paving flags in front of the door to cover full width of pillar.
- Be provided with: -
 - 1no 100mmØ black duct for DNO/IDNO service
 - 100mmØ orange ducts to fill the remaining width of the pillar (minimum 4no.)
 - Ducts shall be self-coloured, smooth bore MDPE and have "Easy Bends".
- Be provided with concrete foundation according to the manufactures specification
- Have an earth bond from the pillar door to the pillar. This shall be flexible copper braid bond in accordance with BS 7671. The ends of the copper braid shall terminate with an integral lug.
- Have a thin coating of graphite grease applied to all moving parts (hinges and locks etc)
- Installation and Feeder Pillar Foundations (x,y,z) are to be according to the manufacturer's Specification
- Feeder Pillar shall be secured to the foundations as per manufactures guidelines

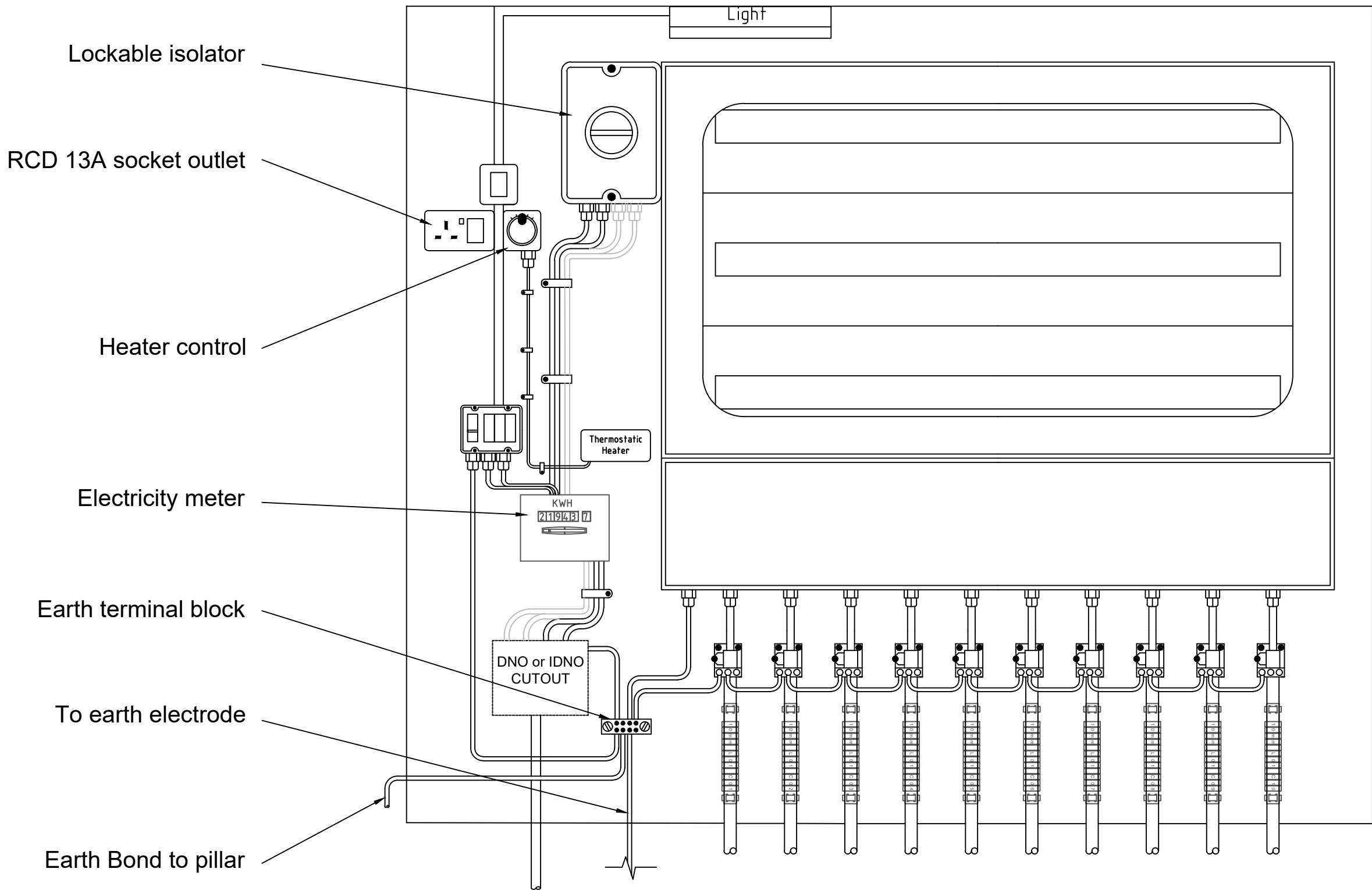
0	Nov 2019	ORIGINAL ISSUE	MD	TE	PB
Rev	Rev. Date	Purpose of revision	Drawn	Checked	Approved
Principal Contractor:			101-103 Victoria House, Victoria Road Chelmsford Essex CM1 1JR		
Client:					
Project:					
Standard Detail Drawing					
Drawing Title:					
Typical Large Feeder Pillar					
Drawing status					
Scale	NTS		DO NOT SCALE		
Project No.	Standard Details				
Sheet No.	Sheet 1 of 1				
Drawing number					Rev
SD-1400-008					0
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.					


Notes

- 1. Typical arrangement, designer to submit internal detailed arrangement and schematic prior to approval

NOTES :

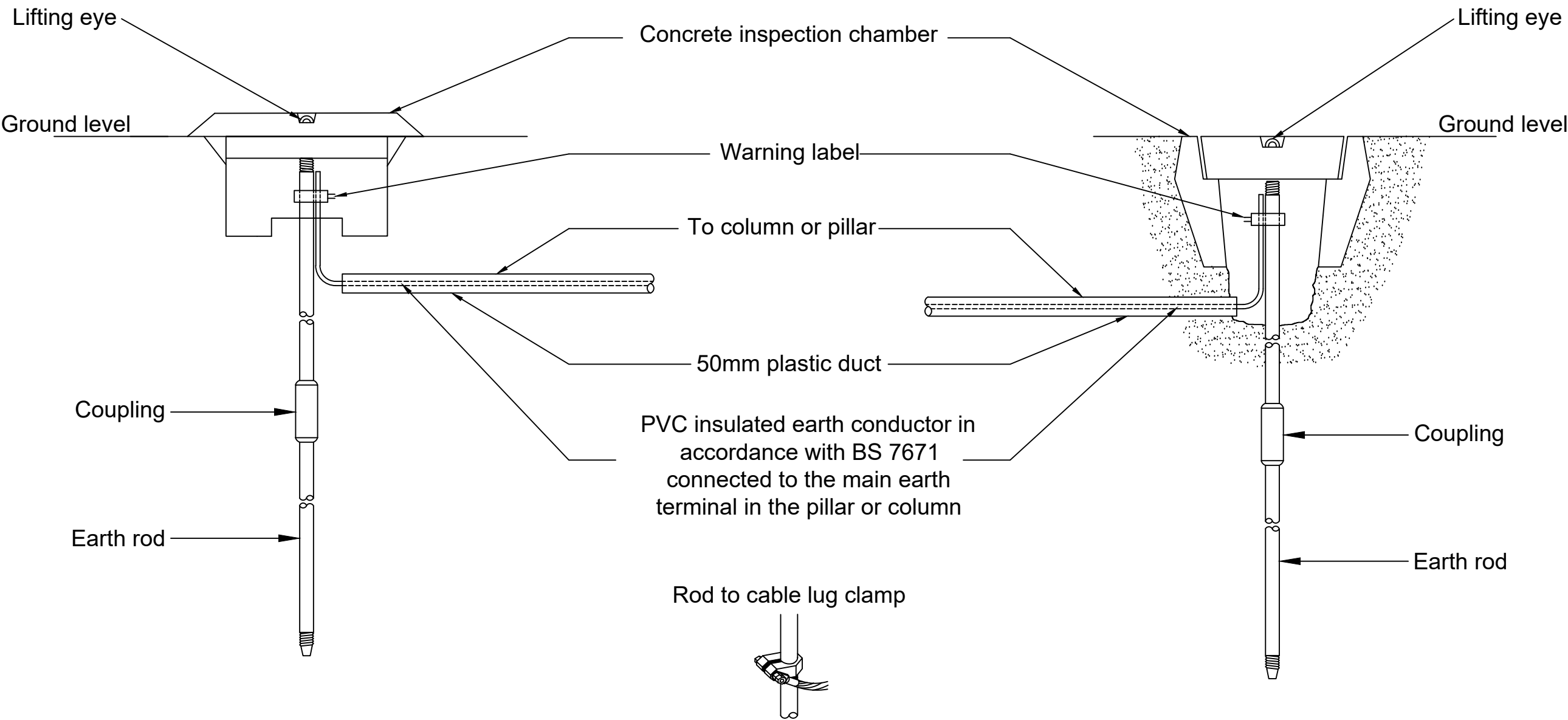
- 1. Drawing shall be printed in colour



	Nov 2019	ORIGINAL ISSUE	MD	TE	
Rev	Rev. Date	Purpose of revision	Drawn	Checked	Approved
Principal Contractor:			<div> 101-105 Victoria House Victoria Road Chelmsford Essex CM1 1JR</div>		
Client:					
Project:					
Standard Detail Drawing					
Drawing Title:					
Large Feeder Pillar Switch Gear Details					
Drawing status					
Scale	NTS		DO NOT SCALE		
Project No.	Standard Details				
Sheet No.	Sheet 1 of 1				
Drawing number					Rev
SD-1400-009					0
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.					

Surface mounted for verges etc.


Flush version for finished surfaces.



Connection shall be wrapped in Denso tape.
Clamp shall be made of copper alloy

Notes

1. The earth rods and Cabling arrangements shall conform to BS 5951, BS 7671 and BS 7430.
2. The warning label shall comply BS 5951 and BS 7671; regulation 514.13. Label to be fitted connection on earth connection in pillar/column.
3. The length and number of earth rods required shall be verified by testing in accordance with BS 7671.

0	11/05/2018	ORIGINAL ISSUE		MD	ST	PB
Rev	Rev. Date	Purpose of revision		Drawn	Checked	Approved
Principal Contractor:				<div> 181-185 Victoria House, Victoria Road Chelmsford Essex CM1 1JR</div>		
Client:						
Project:						
Standard Detail Drawing						
Drawing Title:						
Earth Rod						
Drawing status						
Scale	NTS		DO NOT SCALE			
Project No.	Standard Details					
Sheet No.	Sheet 1 of 1					
Drawing number					Rev	
SD-1400-010					0	
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing.						