PUBLIC

STREET LIGHTING SPECIFICATION

JANUARY 2021

AN ELEMENT OF THE HIGHWAY INFRASTRUCTURE ASSET MANAGEMENT SYSTEM

Document Information
Title Street Lighting Specification
Author: Chris Green/Rob Baines
Reviewed: Julian Gould

Document Issue Status

Table of Amendments

NO	APPROVAL DATE	SECTION	DETAILS	AUTHOR
1	01/2021	All	First Issue	CG/RB
2	01/2025	All	See Review Schedule 1	CG/RB

Contents

INTRODUCTION

This document provides the technical details that supports the Highways Infrastructure Asset Management Plan for Street Lighting and forms part of the Highways Infrastructure Asset Management suite of documents.

It is a working document that provides the processes and information on the standard requirement for Design, Construction and Equipment of street lighting, other powered assets and associated electrical infrastructure.

The document is not considered a complete archive and referencing of other material sources or seeking further guidance and/or approval from the Street Lighting Engineer or their representative, may be a requirement.

SCOPE

This document covers the street lighting assets on the Derbyshire highway network that Derbyshire have a responsibility to maintain. Street lighting assets include street lighting columns, which can be constructed of either aluminium or steel, lighting units (including those mounted onto walls or poles), associated cables/ducting, subway lighting units, parking meters, illuminated signs, bollards, beacons and bus shelters.

ADOPTION CONDITIONS

Development Control shall be the first point of contact regarding any future development site, who will be able to provide guidance on the Highways Development Control process. Further guidance on the 'Highways Development Control' process is available on the Authority's website.

The developer will be responsible, unconditionally, for the condition, operation and any risk or liability of all the highway electrical equipment, on all approved Section Agreement works until the date of formal adoption of the development.

Adoption of the lighting and electrical equipment may be delayed or withheld if the following conditions are not met:

Energy Payments

The developer will be required to setup an arrangement for energy payments with their electricity supplier through the Distribution Network Operator (DNO) or Independent Distribution Network Operator (IDNO), until the date of formal adoption of the development. The developer must contact the DNO/IDNO directly or via an Independent Connection Provider (ICP) providing the approved street lighting & electrical design pack / drawings to arrange and schedule the electrical connection works. Notification of the DNO/IDNO whose network has been used must be provided to enable the Authority to update its asset inventory and make future energy payments from the date of formal adoption.

Developers implementing works as part of an approved Section 278 Agreement may receive an exemption from energy payments with prior approval from the Street Lighting Engineer or their representative.

Derbyshire County Council (Authority) does not provide it's 'MPAN' number(s) to developers, so where an exemption may be granted, the Developer or their representative shall provide the DNO enquiry reference to the Authority. The Street Lighting Engineer or their representative will then confirm the exemption, notifying the DNO accordingly. Where an ICP is being utilised an 'MPAN' may be provided on confirmation of the permitted organisation and development site, as this only applies within a certain area of the County.

Design

A lighting design provided by the Authority, or a consultant lighting design approved by the Authority must be obtained prior to any street lighting work commencing on site. The lighting design brief is to produce a Street Lighting and Electrical design for the Section Agreement e.g. S38/S278, in accordance with this specification. This shall generally cover the Section Agreement limits but may also require assessment or works beyond this e.g. assessment of a new development access. If any alteration to any part of the lighting design is required, for whatever reason approval must be obtained for the amendment.

It is anticipated that Section 278 Agreements shall have a lighting assessment undertaken in accordance with this specification, to ensure the proposals do not have a detrimental impact on the existing Highway or street lighting & electrical infrastructure.

Due to rapid increases in LED lantern technology if the street lighting installation for this site is not presented for adoption within two years of the design approval, a review of the equipment and the design will be required.

'TA01' provides further design guidance.

Construction

All installation work / equipment shall comply with Sector 8 of the National Highways Sector Schemes (NHSS) and with the current edition of the Authority's standard technical Specifications and Highway Electrical Standard Details (HESD) provided in 'TA08'.

The Street Lighting and Electrical Sub Contractor for the installation of all highway electrical equipment shall be registered and full members of both Sector 8 (NHSS) through Highway Electrical Association (HEA) registration scheme Highway Electrical Registration Scheme (HERS) and The Department for Communities and Local Government (DCLG) competent person's scheme for highway electrical installations, such as NICEIC. All personnel shall carry a relevant competency card for inspection on request by the Street Lighting Engineer or their representative. Compliant contractors can be found at 'HERS Registered Organisations' through the HEA website.

Organisations who design, manufacture, assemble, supply and distribute equipment into the highway electrical sector may be registered through the HEA website at 'HEA-HEMSA Registered Organisations'.

The Independent Connection Provider (ICP) for the installation of DNO/IDNO service connections shall be accredited through LRQA registration scheme National Electricity Registration Scheme (NERS). Compliant ICP's can be found at 'NERS Accredited Independent Connection Provider' through the LR website.

The electrical element of the installation shall comply with the IET Regulations BS7671 and every other element of the installation shall comply with the relevant Regulations and British Standards.

Electrical inspection and testing certificates in compliance with BS7671 shall be supplied for all the approved electrical works to the Authority before adoption. Contact details are provided in 'TA05'.

The developer shall notify the Authority before alterations to existing equipment are scheduled to allow timely update of the asset inventory. Contact details are provided in 'TA05'.

'TA02' provides further construction guidance.

Adoption Procedure

Development Control shall be the first point of contact regarding the adoption procedure, who will be able to provide guidance and instruction accordingly.

The preadoption inspection is normally requested by Development Control on receipt of the Part A certification, issued by the Highway Clerk of Works, for potential progression of the maintenance period.

The maintenance period shall not commence if significant works are still to be undertaken, including remedial works, such as lighting columns to be installed, replaced, out of position, damage to their structure, protection system or associated electrical components, with prior approval of Development Control and the Street Lighting Engineer or their representative.

The following information and documentation will be required as part of the preadoption inspection, as applicable:

- As-built drawings, schematic diagrams, asset data reports, photographs etc.
- As-built OSGB coordinates of all electrical assets in a spreadsheet format.
- Electrical inspection and testing certificates in compliance with BS7671

- Confirmation of all lantern specifications installed, either from the manufacturer, through purchase orders etc.
- Confirmation of the DNO/IDNO low voltage electrical infrastructure adopting organisation regulated by OFGEM
- Confirmation of the registered Street Lighting and Electrical Sub-Contractor

In addition to the above the following may also be required:

- Full details of passive safety products & systems to be utilised shall be submitted including technical drawings, certificate of conformity etc.
- Manufacturers product specifications and technical drawings etc.
- Condition reports generated in line with the Institution of Lighting Professionals (ILP) Guidance Note GN22/19 Asset-Management Toolkit: Minor Structures
- Actual electronic lighting design software and AutoCAD files shall be provided for record purpose

TECHNICAL APPENDICES

TA01 - Lighting Design

General

The lighting design shall be carried out in accordance with British Standards BS5489-1, BS EN 13201, Institution of Lighting Professionals (ILP) guidance documents and other relevant national standards. Lighting class shall be determined in conjunction with these and the Authority's 'Network Hierarchy' flowchart 'TA06'.

Any Highway will need to be categorised into a network hierarchy group as part of designer's assessment in accordance with the Authority's network hierarchy plan. Existing Highway network hierarchy can be obtained through the 'Mapping Portal' available on the Authority's website.

Further guidance can be obtained from the 'Network Hierarchy Plan' available on the Authority's website.

The design may require integration into the existing street lighting infrastructure, either lighting or electrically. This information may be made available upon request, but accuracy of any information provided cannot be guaranteed, therefore should be verified on site. Any data provided by the Authority will be produced in good faith and cannot accept any liability for any inaccuracies. Requests should be made to the Street Lighting Engineer or their representative. Contact details are provided in 'TA05'.

The design assessment may require local crime data, traffic flow (AADT) and collision data for the scheme location to complete the design. Traffic flow data and collision data should be provided by the Developer/Client/Principal Designer.

If the Authority elects to produce the street lighting & electrical design for inclusion within the Section Agreement process, for instance. Then the following will be required to progress the works, as applicable:

- Confirmation of the Client, Principal Designer & Principal Contractor
- Development layout in electronic AutoCAD format, *indicating the latest approved adoptable area including carriageway, footway, maintenance margin, plot & driveway layouts and any topographical or ordnance survey information; in addition, electronic drawings shall be provided in real-time coordinates*
- Structure(s) detailed drawings, *including retaining walls, bridge decks, parapets, culverts, and safety fences*
- Environmental or planning requirements or considerations*, e.g. Ecological Mitigation Report, Planning Conditions*
- Residual hazards including existing, diversions or proposed apparatus services plans
- Locations of electrical substations, gas governors, pumping stations or other infrastructure easements / access proximity requirements
- DNO/IDNO electrical infrastructure layout and the adopting organisation regulated by OFGEM
- Electrical supplies, *including illuminated signage (signs/bollards) and bus shelter requirements*
- Landscaping plan, *indicating soft landscaping areas, trees, and any proposed Highway tree pits, including tree pit technical detail*
- Overall development layout plan, *including all phases indicating intended use of future S38 or private areas*
- Annual Average Daily Traffic (AADT) flows existing and projected reports
- Plot elevations, *indicating windows, doors, service points, other special features e.g. bat boxes etc.*
- DNO/National Grid overhead line profiles, proximity clearances etc.
- Designer Hazard Identification and Risk Reduction Schedule
- Existing and proposed Highway Adoption Limits *i.e. Highway records and section agreement layouts*
- Engineers Reports *e.g. Road Safety Audits (RSA's), Traffic & Safety Engineer requirements and/or approvals etc.*

Designs undertaken by third-party consultants; the following additional documentation will be required:

- Designers' assessment
- Passive safety assessment
- Lighting design calculations*, actual electronic files shall be provided for record purposes upon completion*

- Electrical design calculations, *where appropriate*
- Manufacturers specifications, *where appropriate*

Document file names must be responsibly practicable, not exceed 65 characters (including spaces) in length.

Approval Process
All required documentation shall be submitted through Development Control as part of the section agreement approval process. Upon reaching a satisfactory stage within the process, Development Control will instruct the Street Lighting Engineer or their representative to either carryout the design on behalf of the Developer or provide comment on a third-party design, which the Developer has already submitted as part of the approval process.

Only 'Detailed' Street Lighting & Electrical designs or design submissions completed to this Specification within a reasonable timeframe, shall be considered for approval in accordance with CDM2015. 'Outline Designs' will not be considered e.g. Procedure 2 under the HEA-HEMSA Guidance Note, 'CDM 2015 Regulations: Applicability to Highway Lighting Design'.

Once designs or design submissions have received approval from the Street Lighting Engineer or their representative, they shall be incorporated into a PDF format design pack, containing all relevant information e.g. specifications, highway electrical standard details, drawings etc. The design pack will be issued to Development Control for approval within the section agreement; Development Control will then release it on satisfactory completion of this stage.

All design drawings will require unique numbers allocating to drawings and unique asset numbers allocating to electrical street furniture, which will be provided by the Street Lighting Engineer or their representative. All unique numbers will require including on drawings and resubmitting to allow incorporation with the approved design pack.

Designer Competency
Competency for those undertaking the design of lighting installations shall be as defined in BS5489-1 and electrical installations defined as a Skilled Person and Instructed Person in BS7671.

The lead in the lighting design process shall be at least AMILP EngTech / MILP IEng (or equivalent) and experienced in the design and implementation of street lighting systems and associated infrastructure with an evidence record of competency measured against the Institution of Lighting Professionals (ILP) 'Competency for Lighting Professionals' framework document, to be made available to the Authority, on request.

The designer shall complete and submit with every street lighting & electrical design submission and iteration the 'Skill & Care Certificate', refer to 'TA07'.

The Authority reserves the right to refuse any submission which does not comply with the Designer competency requirements.

Sustainability
Designs should be carried out to reduce or eliminate negative environmental impacts by utilising the latest materials and technologies, to minimise, the number of assets, energy consumption and waste throughout the lifetime of the installation.

Energy performance indicators shall be calculated in accordance with BS EN 13201-5 and included within lighting calculations and on drawings.

Road profile tables in BS EN 13201-5: Annex A.3 Typical values of energy performance indicators, shall be utilised to set the maximum Power Density (PD) and Annual Energy Consumption Indicator (AECI) values, which shall not be exceeded.

Care should be taken to ensure correct wattages for the type of lantern i.e. full power (Non-CLO) or CLO and burning hours i.e. dimming or non-dimming regimes are utilised within calculations. Further guidance on burning hours can be found in the equipment section under 'Switching'.

To ease future maintenance operations, roads shall be designed utilising the minimum number of lantern optics, wattages and, tilt angles i.e. installed at 0°. The use of a flood type road lantern optic shall be permitted to light turning heads, to eliminate the need for additional columns, but must be installed with the tilt angle (0°).

A departure from standard may be considered on a reasonable practical approach if it reduces the need for additional lighting columns or overall lantern wattage, further guidance and approval should be sought from the Street Lighting Engineer or their representative.

Environmental Impact

To minimise the impact of artificial lighting on the wider environment including the potential adverse effect on local wildlife and/or within areas designated as 'dark sky' environments, which have been specifically highlighted under the local planning conditions, we would expect street lighting to be designed with the minimum tilt angle (0°) and using luminaires with a colour temperature of 3000K featuring peak wavelengths greater than 550nm, which meet luminous intensity class 'G4' or greater as referenced in BS EN 13201-2.

In addition, the lantern optic shall have zero output at, and above Imax90 (including Imax95), to achieve full cut-off to reduce sky glow. A flood type road lantern optic which does not meet this criterion may be permitted to light turning heads for instance, if this eliminates the need for additional columns, further guidance and approval should be sought from the Street Lighting Engineer or their representative.

Columns should generally be positioned on the side of Highway adjacent hedge rows or foraging routes for instance, so that light is directed into the development and so that any backwards spill light could be controlled using louvres or shields.

The use of lantern louvres or shields to additionally control spill light into habitats such as roosts, foraging & commuting routes, water courses etc. may be permitted with prior approval from the Street Lighting Engineer or their representative. Further guidance on louvres and shields can be found in the equipment section under 'Louvres & Shields'.

Areas within or adjacent protected areas, such as, National Parks or World Heritage Sites may need further consideration under the design assessment.

Situations may arise where an appropriate lighting class needs to be determined. A more balanced approach may be required for lighting class selection for a town within such an area. Categorising such a town as being within an environmental zone of 'E1', may lead to a lower level of lighting not appropriate for a town setting and, vice versa, selecting a normal environmental zone may lead to a higher level of lighting not appropriate for a protected area. This situation is more prevalent for areas surrounding the town, rather than the town centre itself, where primary and secondary shopping areas may be prioritised.

Relevant criterion shall be incorporated within the lighting design and evidenced through calculation i.e. road and area calculations.

The Peak District National Park have identified the following areas as 'dark sky sites' from which unpolluted views of the night sky are available.

- Surprise View off the A6187 near Hathersage
- Parsley Hay off the A515 near Hartington
- Minninglow off the A515 at Pikehall

Although it is unlikely that development could take place at these specific sites, the requirements for lighting should be carefully assessed and designed in accordance with good practice to prevent light spill and sky glow on all new sites.

Further guidance on lighting within the national park can be obtained from the Peak District National Park, 'Transport Design Guide'.

Further guidance can be sought from ILP 'Guidance Notes for the Reduction of Obtrusive Light (GN01)' and ILP 'Bats and Artificial Lighting in the UK (GN08)'.

The 'Corporate Environment Policy' is available on the Authority's website.

Heritage
Section under development. If required, seek further guidance from the Street Lighting Engineer or their representative.

Lighting columns constructed from 'Cast Iron' would be an indication of heritage characteristics. A list of heritage and listed assets is available on request.

Contact details are provided in 'TA05'.

Uniformity
In accordance with BS5489, it is recommended that the actual overall uniformity of illuminance (Uo) be as high as reasonably practicable.

Roads and conflict areas lit to M and C lighting classes shall comply with BS5489 and BS EN 13201 minimum requirements, i.e. 0.40. Roads lit to P lighting classes shall not full below 0.13. However, in accordance with the above note, it should always be the Designer's objective to exceed minimum uniformity requirements i.e. 0.2 or greater.

Where the road geometry conforms to a long straight section and the road hierarchy has determined the use of a P class for busy and above usage, a luminance calculation shall be carried out to the comparable lighting class, to ensure longitudinal uniformity (U_l) is not compromised.

Variable Lighting
Lanterns shall be pre-programmed to ELEXON/UMSO step-less incremental Switch Regime 'F02' unless stated otherwise on approved drawings. Further guidance can be found in the equipment section under 'Control Gear'.

This dimming regime is to be used in most locations unless a reduced level of lighting wouldn't be appropriate, for example in areas with an above average record of crime or safety concerns.

Whilst it may be possible to use dimming in most locations, it would not be used in the following areas unless well evidenced risk management identified that a level of lighting appropriate to a reduced highway usage could be introduced:

- in town centres
- locations with a significant night-time traffic accident record
- areas with an above average record of crime
- areas provided with CCTV, local authority or police surveillance equipment
- areas with sheltered housing and other residences accommodating vulnerable people
- areas with a 24hr operational emergency services site, including hospitals and nursing homes
- formal pedestrian crossings, subways, enclosed footpaths and alleyways and where there are potential hazards on the highway (roundabouts, central carriageway islands, chicanes, speed-humps etc.)

When varying the lighting, each lighting level should ideally meet the requirements of a distinct lighting class from BS EN 13201-2, uniformity should be not significantly affected, and adjacent areas should not be more than two equivalent lighting classes apart with the higher road hierarchy being in the higher class so that conflict areas are not compromised; and evidenced through calculation i.e. road and area calculations. Further guidance and approval should be sought from the Street Lighting Engineer or their representative.

Maintenance Factor
Luminaire maintenance factors shall be derived in conjunction with BS5489-1 and assume the following:

The luminous flux factor (f_{LF}) value of '0.9' shall be utilised for a full power driver and Constant Light Output (CLO) driver, where the luminous flux depreciation has not been accounted for in luminaire photometric data.

Or, the luminous flux factor (f_{LF}) value of '1' shall be utilised for a Constant Light Output (CLO) driver, where the luminous flux depreciation has already been accounted for in luminaire photometric data.

The survival factor (f_S) value of ‘1’ shall be utilised, which assumes a spot replacement strategy.

The luminaire maintenance factor (f_{LM}) value of ‘0.92’ shall be utilised, which assumes a 6-year cleaning frequency within all environmental zones, as Derbyshire is predominantly rural.

Table 1 Maintenance factors for LED type luminaires

Driver Type	Maintenance Factor (fm)
Full Power	0.83
Constant Light Output (CLO), without depreciation	0.83
Constant Light Output (CLO), with depreciation	0.92

The indicated maintenance factors in ‘Table 1’ are to be utilised in all scenarios for LED type luminaires. Other maintenance factors may be utilised with prior approval by the Street Lighting Engineer or their representative. Other types of light source technology shall utilise a representative maintenance factor.

Lighting Principles

This section provides additional guidance on principles of lighting and/or electrification of Highway features. It is not to be considered a complete archive and referencing of other material sources or seeking further guidance and/or approval from the Street Lighting Engineer or their representative may be necessary.

Conflict Areas

Conflict areas such as junctions, roundabouts including traffic signals and right-turn harbourages shall be defined and lit in accordance with the ILP ‘The Application of Conflict Areas on the Highway (PLG02)’.

Conflict areas such as junctions etc. not conforming to a true conflict area in accordance with the ILP ‘The Application of Conflict Areas on the Highway (PLG02)’ but have been identified under the designer’ assessment requiring further consideration, shall be lit to the equivalent conflict area lighting class, of the highest associated road hierarchy lighting class, e.g. M4 = C4 in accordance with the ILP ‘The Application of Conflict Areas on the Highway (PLG02)’, unless supporting evidence warrants classification as a true conflict area in accordance with the ILP ‘The Application of Conflict Areas on the Highway (PLG02)’.

When undertaking any conflict area assessment the designer must consider and manage any scenario which could cause rise to ‘Conflict Creep’ i.e. where conflict areas merge into each other, effectively just raising the overall road lighting class.

Pedestrian Crossings

Formal controlled or uncontrolled pedestrian crossings such as Puffin, Toucan, Pegasus, Zebra shall be defined and lit in accordance with the ILP ‘Lighting of Pedestrian Crossings (TR12)’. As these are defined as conflict areas then the ILP ‘The Application of Conflict Areas on the Highway (PLG02)’ shall also be adhered too, as controlled crossings may also form part of a wider conflict area such as a junction, roundabout etc.

In accordance with the ILP ‘Lighting of Pedestrian Crossings (TR12)’, pedestrian crossings shall be assessed as follows:

The immediate crossing point area shall be assessed, including footway tactile waiting areas up to at least 1.8m from the kerb edge.

The adjacent controlled areas either side the crossing point area shall also be assessed, including adjacent footways, to the edge of the controlled area, in relation to local characteristics.

If deemed necessary, due to high traffic speed for instance, then approaches either side the crossing point area from the stop lines shall be assessed to the ‘5 second rule’ in accordance with the ILP ‘The Application of Conflict Areas on the Highway (PLG02)’

If footways are considered remote from the carriageway, e.g. with a verge in between, then just the carriageway may be considered in these scenarios for the controlled areas and approaches.

Zebra crossings must also be assessed vertically in accordance with the ILP ‘Lighting of Pedestrian Crossings (TR12)’.

Typical example:

Crossing point = ≥0.6 Uo

Controlled areas = ≥0.4 Uo

Approaches = ≥0.2 Uo

Pedestrian Refuge Islands
Pedestrian refuge islands are to be lit to the equivalent conflict area lighting class e.g. M4 = C4, unless part of a wider conflict area lighting class assessment. The immediate crossing point area shall be assessed, including footway tactile waiting areas up to at least 1.8m from the kerb edge. Approaches to the crossing point area shall also be assessed, including adjacent footways for a practical distance e.g. 20m either side the crossing point, in relation to local characteristics. Essentially replicating the controlled areas of a formal crossing point as required in the ILP ‘Lighting of Pedestrian Crossings (TR12)’.

If footways are considered remote from the carriageway, e.g. with a verge in between, then just the carriageway may be considered in these scenarios for the approaches.

Housing Estate Access
Avenue style housing estate access roads may need further consideration under the design assessment. This type of road may have additional usage and features, such as cycleway facilities, bus route and be tree lined.

Lighting class assessment shall be adjusted accordingly:

- Lighting road class selected based on ‘TA06 - Network Hierarchy Flowchart’.
- If separate or combined cycleway facilities or bus route are proposed, the lighting road class to be increased to next class.
- In addition to the above, if the access road has additional access characteristics, such as a school/sport site etc. the lighting road class to be increased by a further class.

Example: ‘TA06 - Network Hierarchy Flowchart’ commands road lighting class ‘P5’.

The access road is a minor loop or link road, has separate or combined cycleway facilities or bus route are proposed, then ‘P5’ would increase to ‘P4’.

The access road is a major loop or link road, has additional access characteristics, such as a school/sport site, then ‘P4’ would increase to ‘P3’.

Commercial and Industrial Access
Roads having commercial applications such as industrial parks shall have a minimum column height of 8m and, the luminaire colour temperature shall be 4000K.

Smaller commercial parks within areas having additional environmental factors, shall have a minimum column height of 6m and, the luminaire colour temperature shall be 3000K.

Turning Heads
Turning heads shall be lit in their entirety to the appropriate lighting class, which is more prudent if they service additional access, such as private roads to properties or other infrastructure.

If the turning heads only function is for vehicle manoeuvres and light levels just fall short of the required standard and, the introduction of additional lighting would be unsustainable, then a departure from standard may be considered with prior approval from the Street Lighting Engineer or their representative.

However, with the use of modern lantern technology it should be achievable to produce a sustainable design to standards. For further guidance see ‘Sustainability’ in this section.

Cycleways
Cycleways associated with traffic routes whether remote or adjacent to the carriageway, which are either separate or have combined footway facilities shall be lit to minimum road lighting class ‘P3’. Cycle lanes associated with the carriageway shall be incorporated within the road lighting class selected for the traffic route.

Separate lighting calculations shall be undertaken for cycleways to evidence compliance to the ‘P’ Lighting class, or equivalent ‘P’ Lighting class for cycle lanes.

Cycleways associated with subsidiary roads shall be lit to the same road lighting class selected for the type of road.

Further guidance can be sought from the ILP ‘Lighting for Cycling Infrastructure (PLG23)’.

Town Centres
In accordance with the Authority’s ‘Network Hierarchy’ flowchart Town centres can be categorised into two areas. The main shopping area normally either a shared pace for pedestrians, where vehicles are controlled or main road with separate footways. This area or road is sometimes identified using textured surfaces or paving and would be categorised as Primary Shopping, commanding the highest footfall.

All shopping areas connected to the primary shopping normally roads with separate footways with or without textured surfaces or paving, commanding lower footfall, would be categorised as Secondary Shopping.

Primary and secondary shopping areas would command the highest environmental zone category for the town centre, in accordance with the environmental zone table, detailed on the ‘Network Hierarchy’ flowchart. For example, Chesterfield town centre would be categorised as ‘E4’, with the remaining suburban areas categorised as ‘E3’ or Matlock town centre would be categorised as ‘E3’, with the remaining suburban areas categorised as ‘E2’.

For further guidance on town centres within or adjacent protected areas see ‘Environmental Impact’ in this section.

Calculation Grids
Lighting calculations shall be carried out on the appropriate calculation grid in accordance with BS5489-1; i.e. Luminance calculations to be undertaken on ‘EN13201:2015 Luminance’ grid and Illuminance calculations to be undertaken on ‘BS5489-1:2020’ or ‘EN13201:2015 Illuminance’ grid.

Horizontal grids for area calculations shall be sized* and masked appropriately to the area** with grid points spaced ≤1.5x1.5m apart. Where smaller areas are being considered e.g. narrow footways, grid point spacing shall be appropriately reduced to suit the application.

Area calculations shall be to the same coordinate format as drawings in alignment with Ordinance Survey (OS) coordinate system. For further guidance on coordinate systems see ‘Drawings’ in this section.

Where specific characteristics are defined e.g. conflict areas, cycleways, zebra crossings, calculation grids shall be in accordance with the appropriate Institution of Lighting Professionals (ILP) guidance & technical documents recommendations, i.e.

- PLG02 - The Application of Conflict Areas on the Highway
- PLG23 - Lighting for Cycling Infrastructure
- TR12 - Lighting of Pedestrian Crossings

* grids that cover large areas and subsequently ones that are too small, average figures can become distorted not representing realistic light levels and therefore are not acceptable.

** area can mean the specific area that is being considered or a whole road, cul-de-sac, turning head etc.

Drawings
Design drawings shall be setup in accordance with the Ordinance Survey (OS) coordinate system. Topographical surveys shall also be practically aligned with the Ordinance Survey (OS) coordinate system.

Drawing layouts shall generally be set to A1 @ 1:500, or A4 to A0 @ 1:500. Other scales are permissable such as 1:200, 1:1000, 1:1250 with practical application.

Drawing keys should indicate minimum data as indicated in 'Table 2' accordingly.

Table 2: Minimum data for drawing keys

Structure	Luminaire	Control
Nominal Height	Manufacturer / Model	Photocell Type
Material	LED's / Drive Current	Switching
Passively Safe Performance Class	Lumen Package / Optic	UMSO Code
Base or Mid-Hinged	Wattage / Colour Temperature	
Mounting	Tilt	
Protection Finish	Full Power / CLO Driver	
UMSO Code	Driver Profile (Dimming Regime / Non-Dimming)	
	Internal louvres or shields	

To assist the preconstruction and construction phases, including purchasing, installation, energy payments etc. drawings may indicate specific manufacturers. However, it shall be also indicated on drawings that equivalent equipment or materials compliant with this Specification and Highway Electrical Standard Details can also be considered accordingly with prior approval from the Street Lighting Engineer or their representative.

All OSGB coordinates of electrical assets shall be electronically recorded and provided in a spreadsheet format.

Residual Hazards

Designers have a duty to reduce or 'design out' risks. Having reduced the risks to a level as low as reasonably practicable by design, information should be provided to those doing the work about the risks that remain. In most cases, the best way of informing contractors and individuals doing the work is by providing this on working drawings.

Design measures taken to eliminate or reduce risk shall be provided under the designer assessment.

Glare

To reduce the effects of disability and discomfort glare, the lantern optic shall comply with luminous intensity class 'G3' as a minimum and threshold increment (TI) lighting class requirements, in accordance with BS EN 13201-2.

This criterion shall be incorporated within the lighting design and evidenced through calculation i.e. road calculations.

Spill Light

Significant spill light would not normally be expected with the use of modern lantern technology, employing principles set out within this specification.

Further guidance on environmental considerations can be found in the design section under 'Environmental Impact'.

Further guidance on louvres and shields can be found in the equipment section under 'Louvres & Shields'.

Third party lighting installations, on or adjacent the highway, shall be designed and maintained in accordance with ILP 'The Reduction of Obtrusive Light (GN01)', in addition illuminated advertisements shall be in accordance with ILP 'The Brightness of Illuminated Advertisements (PLG05)'.

To fully assess lighting installations impact on the surrounding environment it would be recommended a night-time safety audit is undertaken during the commissioning process, by a competent independent lighting engineer at the developer's expense. This could form part of the Stage 3 safety audit where the development has an associated Section 278 agreement.

Passive Safety

The Authority is committed to safe and well-maintained roads and recognises the potential hazard that street furniture may pose to both motorised and non-motorised road users and will consider the installation of passively safe lighting columns and illuminated signposts in accordance with BS EN 12767.

The requirement for passive safety equipment is different for each individual site and type of road. Each new and replacement lighting installation will be subject to a risk-based assessment to determine the need for passively safe equipment.

- Passively safe equipment shall be considered on all roads with an AADT of greater than 5,000 and a speed limit of 50mph or more.
- Passively safe equipment will not be considered on roads with a speed limit of 30mph or less.
- All other roads, actual road speed data will be considered and applied in accordance with the ILP 'Passive Safety (TR 30)'.

The designer is, however, recommended to consider any site they feel may be vulnerable and to seek guidance in accordance with BS EN 12767.

If a system of passive safety equipment exists or is intended, then all other street furniture shall be passively safe e.g. if a system of passive safety street lighting equipment exists or is intended, then all other street furniture such as signage shall be passively safe, and vice versa if signage is, or is intended to be passively safe then street lighting shall be passively safe.

Further guidance can be obtained from the 'Highway Network Management Plan' available on the Authority's website.

Accessibility

Where street furniture is not accessible within normal operations the use of hinged or demountable equipment shall be employed. Further guidance on hinged lighting columns can be found in the equipment section under 'Lighting Column'.

Note: 'not accessible', could be for equipment located on remote footpaths or for health & safety e.g. under overhead power lines etc. The relevant organisation must be contacted to ensure proximity to special features is adhered too.

Streetlights or illuminated signposts shall be positioned in conjunction with the proposed landscaping plans so that the operational capability or maintenance access, will not be adversely affected by any trees or shrubs, throughout the lifetime of the installation in accordance with HESD 'Foliage Clearances'.

Clearances

Lighting columns shall be positioned in accordance with HESD 'Positions of Columns, Brackets and Doors' generally at the back of footways or verges. Lighting columns with setbacks shall be in accordance with BS5489-1, recommended minimum horizontal clearances from edge of carriageway to face of lighting column and shall be detailed on drawings.

Signs shall be positioned in accordance with the 'Traffic Signs Manual' and shall not exceed minimum clearance of 450mm from edge of carriageway to edge of sign face. Sign plates shall be mounted to provide minimum headroom of 2.1M above footways and 2.3M above cycle tracks or shared cycleways/footways, in accordance with approved drawings and the Traffic & Safety Engineer requirements.

No part of street furniture should protrude over the carriageway of a public highway open to vehicular traffic, vertically within 5.7m of the carriageway surface, unless a height restriction applies.

Where street furniture is required to be positioned in areas where a raised kerb footway has not been provided, additional protection shall be provided e.g. buildout, bollards etc. which shall be included on drawings submitted as part of the Section Agreement approval process, to be agreed with Development Control and the Street Lighting Engineer or their representative.

Clearances or setbacks for street furniture e.g. lighting columns shall not exceed safe operational capabilities for work equipment i.e. Mobile Elevated Work Platforms (MEWPS) and Lorry Loader Cranes in conjunction with 'Table 3' and manufacturers guidance.

Table 3 Clearances or setbacks for street furniture

Structure Height (m)	Maximum Setback (m)
≤12	5

Street furniture required to exceed safe operational procedures shall comply with accessibility requirements, refer to 'Accessibility' in this section.

Positioning

All street furniture must be sited within existing highway or future adoptable highway under the appropriate section agreement in accordance with HESD 'Positions of Columns, Brackets and Doors'.

Lighting columns and other electrical assets should be positioned in the most suitable location, considering for potential constructional restraints.

New development roads may not have 2m footways either side and instead designed with a narrower highway maintenance margin. A road with a footway and margin with houses both sides of the road, lighting columns should favour the footway, ensuring adequate room for installation and service connection, as the margin may contain multiple apparatus services rendering it unsuitable.

Margins should only be considered if they are free from other apparatus services, this is normally when no houses are present behind the margin, and it has been suitably assessed; verification may be required for service connection.

Lighting columns should be positioned in conjunction with landscaping plans, with special or architectural landscaping features taking priority. All other circumstances lighting columns shall take priority being a highway safety feature, any conflicts arising with highway trees/pits or private trees should be requested for relocation or removal.

To assist the construction phase specific lighting column setbacks should be indicated on drawings, including other design requirements accordingly.

Lighting columns should not be positioned on bridge decks, instead located either side even if the lighting column or lantern specification requires further consideration, further guidance and approval should be sought from the Street Lighting Engineer or their representative.

Further guidance can be found in the construction section under 'Siting'.

Wayleaves

Wayleaves or easements may be acceptable with prior approval from the Street Lighting Engineer or their representative. All wall or pole lantern brackets must have prior approval and legal wayleave agreements in place organised under the preconstruction phase.

Although wayleaves may be organised by others, the final legal agreement must be between the property freeholder and the Authority.

Earth Electrodes

Earth electrodes shall be provided as required in accordance with BS7430, DNO/IDNO standard technique guidance requirements and HESD 'Earth Electrodes'.

Due to the nature of earth electrodes the Designer may be required to provide assistance during the construction phase.

Further guidance on earth electrodes can be found in the equipment section under 'Earth Electrodes'.

Signage

Signage details including signposts, bollards and sign plates shall be found in scheme approved schedules or drawings, in accordance with the Traffic & Safety Engineer requirements.

For electrical supply service requirements refer to 'Supplies' in this section.

Attachments

Attachments to lighting columns shall be permitted to reduce street furniture/clutter. The column must be specifically designed to carry the additional weight and windage of the attachment, which shall be provided to manufacturers for them to provide detailed design drawings for the specialist column structure. This may also include for drilling a hole within the column, with a minimum diameter as practicable, at a specific height to allow cable access for electrification of equipment.

Large attachments to and drilling of passively safe type columns shall not be permitted.

Sign plates with a small surface area may be permitted on columns but, where proposed on passively safe equipment this must be specifically designed to take the additional weight and windage of the sign plate. Written assurance that the passive safety performance will not be affected shall be provided by the manufacturer.

Lighting columns proposed with larger sign attachments must be specifically designed to take the additional weight and windage.

Attachments such as hanging baskets, festive decorations, CCTV equipment to existing lighting columns shall be in accordance with 'Guidance Notes for the Erection of Permanent or Temporary Attachments onto Highway Lighting Columns' policy.

The policy, application process and further guidance on the 'Attachments to street lights' is available on the Authority's website.

Bird deterrents may be installed on lanterns within town centres etc. to deter roosting with prior approval by the Street Lighting Engineer or their representative.

Asset Numbers

Asset numbers which are unique to each piece of electrical street furniture will need to be included on drawings.

Where existing street furniture is to remain or replaced in-situ the existing asset number shall be utilised, unless instructed otherwise by the Street Lighting Engineer or their representative.

New assets shall have a new unique number provided upon request by the Street Lighting Engineer or their representative.

New roads on development sites for instance shall be numbered in a logical practical manner to aid future maintenance operations, by either:

1. Where the full length of a road can be identified it shall be numbered from beginning to end in one sequence.
2. Where the full length of a road cannot be identified then it will be allowable to start at the beginning of an access road picking up other roads, cul-de-sacs in sequence, within the numbering sequence.

Equipment

It may be necessary to provide details of materials under the preconstruction phase, which may need to be specifically detailed on drawings e.g. passive safety equipment, lighting column, or lantern specification etc.

Confirmation from the luminaire manufacturer will be required for the latest lantern specification including lumen output, wattage etc. either for Constant Light Output (CLO) or Full Power (Non-CLO) utilised in the design.

To assist purchase and energy payment requirements this shall be detailed on drawings, including the corresponding ELEXON/UMSO code.

'TA03' provides guidance on the selection and installation of equipment and materials.

Supplies

Any supply service must connect back to a DNO/IDNO owned and maintained system, regulated by 'OFGEM'. Supply services can form part of an Authority owned and maintained system i.e. from a feeder pillar or sub-circuit, shall only connect to Highway lighting assets, which will ultimately connect back to a DNO/IDNO system.

Authority systems must be installed within the Public Highway or adoptable Highway under an approved Section Agreement for instance. Wayleave agreements must be obtained for any system on private property and, only wayleaves on buildings will be considered for Authority systems, unless approved otherwise by the Street Lighting Engineer or their representative.

Services to lighting columns & other powered assets shall be provided by a DNO/IDNO owned and maintained system, regulated by 'OFGEM', unless for safety reasons or viability. Further guidance on DNO/IDNO services can be found in the construction section under 'Servicing'.

Authority owned and maintained systems will only be considered for safety reasons or if a DNO/IDNO low voltage network is not viable. Written confirmation from the DNO/IDNO may be required if requested by the Street Lighting Engineer or their representative.

Passively safe equipment operating at 230V shall be supplied via a passively safe disconnection system, owned, and maintained by the Authority. Further guidance on passive safety can be found in the equipment section under 'Passive Safety'.

DNO/IDNO supply services are prohibited within passively safe equipment, which are specifically designed to collapse under impact.

Signage on islands e.g. splitter or pedestrian refuge islands, shall be supplied via a separated extra-low voltage (SELV) system, owned, and maintained by the Authority. Use of supplies via a LV passively safe system for signage on islands, shall have prior approval by the Street Lighting Engineer or their representative.

Signage adjacent the carriageway may be fed via a DNO/IDNO low voltage network, unless supplied by an Authority owned and maintained system, these therefore shall be supplied via a SELV system, unless supplied via a LV passively safe system, the operating voltage prohibits this or otherwise approved by the Street Lighting Engineer or their representative.

Circuits

Circuits shall be generally wired on a single loop in/loop out system. Where significant road lengths are to be lit, they should be risk assessed to ensure in the event of a fault not all lighting is lost, which is more prudent on traffic or high-speed roads. One solution to this would be to adopt an alternate dual loop in/loop out system. Conflict areas such as roundabouts, junctions etc. should also be risk assessed accordingly utilising the same principles.

Sub-circuits to lighting columns or other electrical apparatus as part of a new installation should not be necessary.

Three-way terminations are not acceptable i.e. a circuit should loop continuously without deviation and only have one end of circuit termination.

Cable Calculation

Authority owned and maintained systems proposed as part of the design must be compliant with BS7671 which shall be evidenced through calculation as part of the design submission.

Desktop designs in accordance with BS7671 shall assume a nominal operating voltage of 230V, Ze impedance of 0.35Ω and Prospective Short Circuit Current (PSCC) rated at a maximum breaking capacity of 6kA.

However, if actual readings within acceptable range as part of the inspection and testing process render accessories non-compliant e.g. PSCC >6kA, then this must be referred to the Designer, Street Lighting Engineer or their representative, to ensure correct selection of accessories.

Calculation of inductive loads will assume a multiplier of 1.8 and 1.25 for non-inductive loads, to account for initial in-rush current.

Initial circuit information and calculation results shall be contained within a schematic diagram and included on drawings, in such a manner that it can be laminated for retention in feeder pillars.

Private Lighting

We would only be involved in Highway or future adoptable Highway lighting; therefore, any private lighting requirements or considerations will solely be the landowner or others responsibility

TA02 - Construction

Temporary Street Lighting

The Contractor shall either provide Temporary Street Lighting or maintain the existing lighting whether in the old or new position throughout all the works including diversions of traffic and to a standard not less than existing unless otherwise approved by the Street Lighting Engineer or their representative.

Any temporary works should be provided and maintained in accordance with the characteristics of the highway to national standards throughout the duration of the works, solely at the contractors or their client's liability.

Any alteration to the temporary works, including re-opening the highway should be undertaken in accordance with the Traffic and Safety Officer or their representative requirements and should be safe to do so.

If temporary lighting cannot be provided, then the highway may need to be closed until such time as temporary or permanent lighting is operational, further guidance should be sought from the Traffic and Safety Officer or their representative.

Equipment

All equipment and materials with metal securing screws or similar devices e.g. bolts, locks, hinges etc. shall be adequately greased.

'TA03' provides guidance on the selection and installation of equipment and materials.

Tilt Angles

Lanterns and brackets shall be supplied and installed as indicated on design drawings. Lanterns shall be capable of positive and negative tilt adjustments, to achieve a maximum of '0° - 5°' tilt to the horizontal, whether the mounting arrangement is side entry or post top.

In the absence of design drawings or instruction from the Street Lighting Engineer or their representative, lanterns shall be installed at '0°' tilt.

Siting

Lighting columns shall be erected generally at the rear of footways, grass verges, or maintenance margins (sometimes referred to as service strips), within existing highway or the proposed adoptable public highway, in accordance with BS5489-1, recommended minimum clearances from edge of carriageway to face of lighting column, HESD 'Positions of Columns, Brackets and Doors' and approved drawings, as appropriate i.e. where setbacks have been specifically designed.

Lighting columns installed on highspeed roads (≥40mph) in narrow verge areas or in vulnerable locations from an operations point of view, the door aperture shall be orientated away from the nearside oncoming traffic. This enables the operative working in the base of a lighting column to be facing the oncoming traffic on the nearside, to reduce the risk of potential collisions stepping away from the lighting column. If adjacent structures prevent orientation by obstructing the door aperture, further guidance should be sought from the Street Lighting Engineer or their representative.

Columns positioned on house frontages adjacent driveways shall be located around the midpoint from the driveway edge (up to 0.5m clearance) to the edge of windows, doors, pathways etc. practically for each individual situation, to ensure columns do not obstruct driveways or other property features / access points. Columns adjacent driveways or pathways shall be located practically for each individual situation, up to 0.5m clearance, again to ensure through adequate clearance they do not cause an obstruction or leave the column in a vulnerable position.

Due to the characteristics of lighting columns and general availability of practical locations for siting lighting columns, columns adjacent driveways would be considered acceptable, however, any significant reduction of visibility due to lighting columns or other street furniture should be referred to the Designer, Street Lighting Engineer or their representative for clarification on positions.

Symbols on drawings are generally not to scale, therefore if required, further clarification should be sought from the Designer, Street Lighting Engineer or their representative, on column positions.

Feeder pillars shall be positioned in practical locations, practically orientated and with maximum achievable setback clearances for future maintenance operations or, confirmed by the street lighting engineer or their representative.

Columns and other lighting assets constitute a highway safety feature and being a physical feature above ground reduces the availability of good design locations, which can be further exacerbated by the development layout, these therefore should be given priority over other apparatus.

It is the Developer's responsibility to ensure adequate space has been allowed for the installation of lighting columns especially in narrow footways or maintenance margins. Where other apparatus services are contained within these and adequate space is not available, services should be designed around these accordingly or the footways, or maintenance margins made wider to accommodate all infrastructure.

Further guidance on the positioning of underground utilities apparatus can be sought from 'Volume 1' and 'Volume 2' of the National Joint Utilities Group (NJUG) documentation available through the 'Streetworks' website.

Column relocation requests due to poor planning/implementation onsite may be refused. For relocation request requirements refer to 'Resite' in this section.

Lighting assets shall not be positioned and no trees or shrubs shall be planted in a position which will adversely affect either the operational capability or maintenance access of any streetlight or illuminated signpost, throughout the lifetime of the installation in accordance with HESD 'Foliage Clearances'.

Sleeves or pots are not acceptable for any item of highway electrical street furniture unless part of the structure, provided by the manufacturer as one piece of equipment or material.

Resite

Resite of an existing lighting asset may be required to allow access e.g. for a new driveway or development.

Simple requests including guidance is available on the Authority's website. Contact details are provided in 'TA05'.

More complex requests associated with development works, will either be implemented as a simple request where the Authority undertakes the works on a recharge basis, on behalf of the Developer. Or, where the works are to be undertaken by the Developer or are considered complex beyond a recharge basis, then they shall be included within lighting design drawings, submitted through Development Control as part of the section agreement approval process. Further guidance on the Development Control process can be found under 'Adoption Conditions'.

Resite requests which already form part of an approved design under a Section Agreement, should be carefully considered. Such requests could cause rise to a complete or significant redesign of the lighting layout and justification for the resite would need to be carefully considered.

For instance, if columns have not been accounted for, so adequate space is not made available or road crossing ducts have been missed, if any objection(s) were raised regarding the relocation, the Authority would find it difficult to support the proposal, as this type of issue should have been addressed earlier within the design or construction phase.

It is therefore the Developers responsibility to ensure all consultations have been carried out before raising such requests.

Numbering

All highway electrical assets shall have a unique identification number which shall be indicated in a prominent position on a smooth section of the structure. The numbering system shall be as indicated on approved street

lighting & electrical design drawings or obtained from the Street Lighting Engineer or their representative. Further guidance on numbering can be found in the design section under 'Asset Numbers'.

Identification numbers shall have numerals 50mm (H) x 40mm (W) either painted in fine white gloss applied directly to the surface or, other method such as a one-piece self-adhesive vinyl label, UV stabilised with a non-degradable life span of 7 years; with a white background and black numerals, as approved by the Street Lighting Engineer or their representative.

All lighting columns and illuminated signposts are to be numbered as indicated, 1800mm above ground level. Other electrical assets such as bus shelters are to be numbered as indicated, on the roof section, or bollards not obstructing sign faces.

Servicing

Unless shown otherwise on the approved scheme drawing(s) or agreed by the Street Lighting Engineer or their representative prior to commencement of the scheme, services to lighting columns & other powered assets must be provided by the DNO or IDNO / ICP which are regulated by 'OFGEM', as listed below; further information on 'Distribution Networks' and 'Connections and Competition' can be found on the 'OFGEM' website.

DNO/IDNO services shall be un-metered TN-C-S (PME) type and suitable for Class 1 equipment, with appropriate earthing arrangements. Alternate service connections shall have prior approval by the Street Lighting Engineer or their representative.

Service cut-out fuse for 25-amp supplies shall be BS88 rated at 10 amps unless otherwise stated. Separately fused double pole isolation shall be provided in accordance with HESD 'DNO/IDNO Isolation Arrangements.

The colour and specification of electricity supply service ducts must be clarified with the operator/provider prior to the commencement of excavation works, unless otherwise stated on approved drawings.

Distribution Network Operators (DNO)
• **National Grid Electricity Distribution** Tel: 01332 623114 Email: nged.umso@nationalgrid.co.uk • **Electricity North West** Tel: 0800 988 1730 Email: connectionapplications@enwl.co.uk • **Northern Powergrid** Tel: 0800 011 3433 Email: getconnected@northernpowergrid.com
Independent Distribution Network Operators (IDNO)
A full list of 'Independent Distribution Network Operators' licensed by OFGEM can be found can be found on their website.

Earth Electrodes

Earth electrodes shall be provided as required in accordance with BS7430, DNO/IDNO standard technique guidance requirements and HESD 'Earth Electrodes'.

Due to the nature of earth electrodes more emphasis shall be required during the construction phase, however designer assistance shall be enlisted as required.

Electrical inspection and testing certificates in compliance with BS7671 shall be supplied for all earth electrodes to the Street Lighting Engineer or their representative for approval, before completion of the construction phase. Contact details are provided in 'TA05'.

Further guidance on earth electrodes can be found in the equipment section under 'Earth Electrodes'.

Permit to Work

'Permit to Work' process shall follow the relevant organisations procedure, operated in accordance with BS7671.

Where a ‘Permit to Work’ process is utilised for decommissioning works, these shall follow the relevant organisations procedure, operated in accordance with BS7671. Along with formal forms, photographs shall be obtained of the asset, location, works etc. and once disconnected the asset shall be labelled, to indicate disconnection.

Roadworks

Further guidance on ‘Roadworks’ can be found on the Authority’s website:

Including;

- Map of current and planned roadworks
- Roadworks responsibility
- Apply for a road closure or temporary traffic management
- Apply for temporary traffic signals
- Highway permit scheme

Reinstatement

The Contractor shall be responsible for the backfilling and permanent reinstatement of all excavations in accordance with the New Roads and Street Works Act 1991, and the Specification for Highway Works.

Permanent reinstatements in carriageway and footway shall be in accordance with the ‘Materials Policy’ and/or approved drawings. Any excavations in flagged, paved, or blocked areas particular care must be taken to avoid damage, with any replacement matching the existing surface, and shall have prior approval by the Street Lighting Engineer or their representative.

All verge ‘grassed’ areas are to be treated as though it were turf.

Further guidance can be obtained from the ‘Materials Policy’ available on the Authority’s website.

As-Built Drawings

As-built street lighting & electrical drawings shall mirror requirements as indicated in the lighting design section under ‘Drawings’ and supplied electronically in AutoCAD format.

The detailed location of earth electrodes and cable joints shall be recorded and included on drawings accordingly.

Schematic diagrams shall be updated in accordance with ‘as-builts’ and supplied electronically in AutoCAD format. A legible physical laminated copy shall be obtained in feeder pillars.

Photographs shall be taken and supplied of every highway electrical asset, including feeder pillar internals and protective devices.

In addition to ‘as-built’ drawings, all other supporting documentation as indicated in the adoption conditions section under ‘Adoption Procedure’ shall be supplied accordingly.

All OSGB coordinates of electrical assets shall be electronically recorded and provided in a spreadsheet format.

TA03 - Equipment

General

This section provides guidance on the selection and installation of equipment and materials. It must be read in conjunction with the full suite of Highway Electrical Standard Details (HESD) refer to 'TA08'.

The appendix is not considered a complete archive and seeking further guidance from Manufacturers and the Street Lighting Engineer or their representative, and prior approvals may be a requirement.

Unless excluded from the Construction Products Regulations and Declarations of Conformity, all products shall be CE/UKCA marked.

It will be necessary to provided details of materials throughout the different stages of a scheme e.g. passively safe equipment before purchase, lanterns on adoption inspection etc. Contact details are provided in 'TA05'.

Reuse of equipment shall only be considered if it complies with specification requirements and is structurally sound e.g. lighting columns installed within the last 10 years which have undergone a structural inspection evidenced through certification.

Lighting Column

The lighting column manufacturer shall be quality assured registered against ISO 9000 series and with 'Scheme 6' of the 'National Highways Sector Schemes (NHSS)'.

The lighting column shall be of nominal height 5, 6, 8, 10 or 12 metre with post top spigot (76mm) in accordance with BS EN 40, as per approved drawings.

Typical scenarios in relation to lighting column heights can be found on the Authority's 'Network Hierarchy' flowchart 'TA06', a departure from these may be considered, with the approval of the Street Lighting Engineer or their representative.

Outreach brackets shall be acceptable for double arm lighting columns or, for specialist reasons such as architectural or site characteristics with the approval of the Street Lighting Engineer or their representative.

Outreach brackets for passively safe lighting columns shall only be acceptable for double arm lighting columns, which have been risk assessed accordingly with the approval of the Street Lighting Engineer or their representative.

Column shafts shall not be stepped unless with the approval of the Street Lighting Engineer or their representative.

Hinged lighting columns (base or mid) may require mechanical lifting devices or tools compliant with the Lifting Operations and Lifting Equipment Regulations (LOLER) and as such shall be approved by the Street Lighting Engineer or their representative prior to purchase. The lifting devices or tools shall be supplied free of charge with certification documentation, if different from that of the Authority's.

For guidance on protection systems and final finishes requirements refer to 'Protection System' in this section.

Further guidance can be sought from HESD 'Tubular Columns'.

Signposts

Signposts & brackets shall be manufactured in accordance with BS EN 12899-1 and with 'Scheme 9A' of the 'National Highways Sector Schemes (NHSS)' as per approved drawings.

For further guidance on passively safe signposts refer to 'Passive Safety' in this section.

For guidance on protection systems and final finishes requirements refer to 'Protection System' in this section.

Further guidance can be sought from HESD 'Tubular Signpost'.

Passive Safety

Where passively safe is specified on approved drawings lighting columns and signposts shall be in accordance with BS EN 12767.

Typically, these shall comply to either;

High energy absorbing: 100:HE:NR:NR:NS:MD:0

Non-energy absorbing: 100:NE:NR:NR:SE:MD:0

Signposts located on islands e.g. splitter or pedestrian refuge islands, shall be passively safe in accordance with 'non-energy' (NE) absorption category. Typically, these shall comply to '100:NE:NR:NR:SE:MD:0' class of conformity as above.

Situations may occur which indicates a specific energy absorption class, but due to manufacturing restrictions may not be viable. This should be dealt with under the designers' passive safety assessment of the site, if in doubt, further guidance and prior approval should be obtained from the Street Lighting Engineer or their representative.

Passively safe disconnection systems shall comply with the Electricity at Works Regulations and IET Wiring Regulations: BS7671 Requirements for Electrical Installations.

All lighting columns and illuminated signs operating from a 230V supply protected by the system shall have an impact sensor in the base compartment. In the event of an impact, the circuit shall disconnect within 0.4 seconds. Impact sensors shall not be sensitive to the point where passing vehicles cause false activations.

Systems protecting multiple assets, the monitor board for the system shall be capable of being mounted to a DIN rail system in a feeder pillar.

Systems protecting individual assets shall be installed within an IP67 enclosure suitable for installation in a non-passively safe column, mini-pillar or chamber. Chamber systems are generally not acceptable unless specified on approved drawings, which have prior approval by the Street Lighting Engineer or their representative.

Disconnection systems which rely on plug and socket style mechanisms are not acceptable as electrical disconnection cannot be guaranteed.

Any disconnection system shall be capable of communication with CMS systems.

Full details of passively safe products & systems to be utilised shall be submitted including technical drawings, certificate of conformity etc. to the Street Lighting Engineer or their representative. Contact details are provided in 'TA05'.

Every passively safe highway electrical feature shall have an associated 450x450mm service duct chamber in accordance with 'Service Ducts & Chambers' in this section and HESD 'Chambers and Underground Service Ducts', practically positioned within a few metres of the asset. Service duct chambers associated with feeder pillars, road crossings etc. shall be utilised if compliant with this criterion, reducing the need for additional service duct chambers.

For guidance on protection systems and final finishes requirements refer to 'Protection System' in this section.

Feeder Pillars

Feeder pillars shall be Class 1 either stainless steel or galvanised mild steel construction, in accordance with HESD 'Feeder Pillar base and Chamber Connection', HESD 'Feeder Pillars', HESD 'Pillar Internals' and HESD 'Passive Safety Mini System'. Alternate feeder pillars shall have prior approval by the Street Lighting Engineer or their representative.

A Surge Protection Device (SPD) shall be included as part of the feeder pillar installation. For SPD requirements refer to 'Surge Protection Devices' in this section.

For Passively Safe Disconnection System's requirements refer to 'Passive Safety' in this section.

For guidance on protection systems and final finishes requirements refer to 'Protection System' in this section.

Backboards

Back boards in electrical assets i.e. lighting columns, signposts, belisha beacons, refuge beacons, bus shelters, feeder pillars, mini- feeder pillars, including passively safe structures etc. shall be:

- Non-hygroscopic marine ply treated with clear water repellent.
- Backboard size to maximise available space and be at least the size of the door aperture.
- Minimum thickness of 12-18mm.
  With at least a 5mm air gap.

Protection System

Minor structures shall have a complete protection and finish system either by application of Performance Polymer Alloy Coating or Performance Paint System.

Glass reinforced fibre composite structures shall be coated with an outer layer of UV-resistant coloured polyethylene, which is an integrate part of the structure.

Any one coating/system shall be obtained from the same manufacturer and shop applied to the manufacturer's guidance and recommendations.

'TA04 - Protection Systems' provides further guidance on minor structure protection systems.

Final colour finishes (Minor structures):

Columns / Feeder Pillars / Reducers	-	Derbyshire Green (RAL6006)
Signposts / Wall or Pole Brackets	-	Aircraft Grey (BS381C 693)
Refuge Beacons	-	Aircraft Grey (BS381C 693) with White (RAL9016) bands*
Belisha Beacons	-	Black (RAL9005) with White (RAL9016) bands*

*White bands may be reflectorised, with prior approval in accordance with the Traffic & Safety Engineer requirements.

Final colour finishes (Luminaires):

Lighting Column Lanterns**	-	Manufacturers standard finish e.g. Grey
Sign Lanterns	-	Manufacturers standard finish e.g. Grey
Refuge Beacon Gallery	-	Manufacturers standard finish i.e. Grey
Belisha Beacon Gallery	-	Manufacturers standard finish i.e. Black
Flashing Amber Warning Lights (FAWLs)	-	Manufacturers standard finish i.e. Black

** preferred, Derbyshire Green (RAL6006).

When specifying final colour finishes the whole site or specific phase should be considered i.e. sites shall not have different finishes on the same road, for instance, if in doubt, confirmation and prior approval should be obtained from the Street Lighting Engineer or their representative.

Final colour finishes may differ in specific areas for heritage or conservation considerations which should have written confirmation or be detailed on approved drawings, if in doubt, confirmation and prior approval should be obtained from the Street Lighting Engineer or their representative.

'Table 4' provides details of general colour standards. Others shall be considered with prior approval of the Street Lighting Engineer or their representative.

Table 4 General colour standards

Standard	BS4800		BS381C		RAL	
	Name	Number	Name	Number	Name	Number
Colour						
Derbyshire Green					Grey Olive	6006
Grey	Flint Grey	00 A 09	Aircraft Grey	693	Concrete Grey	7023
Black	Black	00 E 53			Jet Black	9005
White	White	00 E 55			Traffic White	9016

Luminaires

Luminaires shall be manufactured within a quality and environmental management systems typically this will be ISO 9001 and ISO 14001, complying with all relevant British and European standards, be CE/UKCA Marked for the entire luminaire, must be guaranteed for a minimum of 6,000 hours and warrantied overall for a minimum of 8 years, have an approved ELEXON/UMSO code and shall be compatible for post top/side entry attachment to all street lighting columns and bracket arrangements within Derbyshire.

The luminaire shall be integral gear having a minimum impact resistance of IK08, IP66 sealed construction with a minimum life expectancy of 20 years for the luminaire housing, which shall be accessible for maintenance via a hinged canopy and secured by means of a maintenance safety catch. It shall be wired as standard for 7-pin ‘NEMA’ Socket, or miniature-photocell with prior approval by the Street Lighting Engineer or their representative, in accordance with approved drawings.

Purchase orders placed with luminaire manufacturers shall state compliance with Derbyshire County Council’s agreed specification framework.

All luminaires will have an external identification label attached legible from ground level stating:

- Manufacturer
- Wattage
- Lighting Class
- Dimming Regime

For example, a 100W Derbyshire lantern implemented for lighting to BS EN 13201 lighting class M2 with a pre-set dimming profile would be:

‘ **D100M2D** ’

Light Source

The light source shall be LED module technology with a minimum life expectancy of 100,000 hours, ingress protection of IP66, ‘Cool White’ colour temperature of 4000K with a colour rendering index (CRI) of 70 or greater, white lighting source designed to maintain good uniformity.

LED modules with a ‘Warm White’ colour temperature of 3000K shall be utilised for new residential developments, heritage applications and for environmental mitigation with the approval of the Street Lighting Engineer or their representative.

Zebra crossings with dedicated luminaires having a specific optic, normally know as left-hand distribution shall have a colour temperature of 5700K, to provide a visual distinction of the crossing within the system of normal road lighting.

The module must be capable of limiting output in a specific direction, compliant with photo-biological risk group 0 or 1, provide a minimum glare class of ‘G3’ as referenced in BS EN 13201-2 Annex A, be capable of

being shielded which can be retrofitted on site with simple tools and must be easily upgradable to utilise the latest LED technology.

Louvres & Shields

General use of shields within lighting design would not be expected with modern lantern technology, so wouldn't be permitted without prior approval from the Street Lighting Engineer or their representative. The use of lantern louvres or shields for environmental considerations may be permitted with prior approval from the Street Lighting Engineer or their representative.

Further guidance on environmental considerations can be found in the design section under 'Environmental Impact'.

Internal louvres or shields which are an integral part of the luminaire would be preferable over external types. When the use of this type of control has been authorised the modified photometric data, obtainable from the relevant manufacturer, shall be utilised within the design and evidenced through lighting calculations i.e. road and area calculations.

Manufactures datasheets & installation technical documentation shall be provided under the design submission and identified on drawings accordingly.

Control Gear

The control gear compartment shall have a minimum IP65, be easily accessible via tool-less operation with a 7-pin 'NEMA' Socket installed as standard, or miniature-photocell with prior approval by the Street Lighting Engineer or their representative, in accordance with approved drawings.

The luminaire shall have a programmable constant current driver either Constant Light Output (CLO) or Full Power (Non-CLO) 'DALI' enabled (e.g. Philips) with a minimum life expectancy of 8 years, surge protection at 5kA & 10kV and ELEXON/UMSO code, pre-programmed to ELEXON/UMSO step-less incremental Switch Regime 'F02' unless stated otherwise on approved drawings.

Zebra crossings with dedicated luminaires shall be 'non-dimming' unless stated otherwise on approved drawings.

For surge protection device (SPD) requirements refer to 'Surge Protection Devices' in this section.

Switching

Photocells shall be manufactured in accordance with BS5972, be certified to BS EN 61000, have a minimum ingress protection of IP65, capable of switching 230V / 50Hz electricity supply and be clearly marked with the date of manufacture and setting.

One part fully electronic solid-state photocell with filtered photodiode; power consumption to be ≤100mW and shall be specifically approved by the local electricity company as ELEXON/UMSO code '94 0000 0001 100' and shall have a 12 year warranty.

Switch on/off level to be 20 LUX 1:1 as ELEXON/UMSO Switch Regime '806' dusk to dawn and Zebra crossing luminaires shall switch on/off level to be 35 LUX 1:1 as ELEXON/UMSO Switch Regime '807' dusk to dawn, unless stated otherwise on approved drawings.

Photocells shall be mounted to the lantern via a 7-pin 'NEMA' socket sealed to maintain lantern integrity. Miniature-photocells shall be mounted through the equipment body, sealed to maintain its integrity and capable also of switching 24V / 50Hz electricity supply etc. for signage applications where specified.

Miniature-photocells or alternate controls will be considered but must be approved by the Street Lighting Engineer or their representative. Any alternate submission must include an approved ELEXON/UMSO code for the device.

Table 5 Regime requirements

Regime	Switch	Period					Burning Hours	Location
001	Continuous - No switching	24 Hour Burning					8766	East Midlands
806	Electronic (20 lux on 20 lux off)	Electronic PEC 20/20 (Dusk to Dawn)					4089	East Midlands
807	Electronic (35 lux on 35 lux off)	Electronic PEC 35/35 (Dusk to Dawn)					4117	East Midlands
F02	Variable Power Switch Regime - 20/20 (GMT)	PECUS	21:30	00:00	05:00	06:00	2971	East Midlands
	Dimming % Energy	100	75	50	75	100		

Sign Lanterns

Sign lanterns shall be manufactured in accordance with BS EN 12899-1 and with 'Scheme 9A' of the 'National Highways Sector Schemes (NHSS)', either be of an external or internal type, be of robust construction with vandal and tamper resistant features, with low wattage LED gear trays, have an approved UMSO code, continuously lit, as per approved drawings, in accordance with the Traffic & Safety Engineer requirements.

External sign lanterns shall have a total power consumption of ≤1 Watt.

Luminaires shall have a minimum impact resistance of IK08, Ingress Protection of IP56 and life expectancy of 12 years minimum for the luminaire housing, 8 years for the driver, with a guarantee and warranty for a minimum of 5 years.

The LED module shall be high quality technology designed to maintain good uniformity with a neutral/cool white colour temperature, with a colour rendering index (CRI) 60 or greater, and life expectancy of 50,000 hours.

Control equipment shall incorporate a driver which shall be electronic, terminals shall be shrouded and clearly and indelibly marked in English indicating all wiring connections and operating voltages capable of operating the LEDs.

The driver shall operate the LEDs with a power factor of at least 0.90 when operating at full lumen output and connected to an electricity supply operating at 24V SELV or 230V, 50Hz A.C. and incorporate an automatic resetting thermal cut-out.

Internal wiring shall be in accordance with the latest edition of the IET Wiring Regulations. All plug and sockets shall engage in the order Earth, Neutral, Live and disengage in the reverse order.

Mounting brackets either post top or direct attachment (including double aspect) shall have all necessary fitments for fixing to 76mm, 89mm or 114mm OD posts as specified, shall have provision to prevent rotation and be of suitable corrosion resistant materials to withstand the weight and wind loads which the lantern might be subjected to in Derbyshire.

If mounting brackets are separate from lantern bodies, they must be capable of interchanging between different lanterns of the same type. Adaptors/spacers will be permitted for mounting arrangements.

When required lanterns must be wired for miniature-photocell operation as specified under 'Switching' in this section.

Bollards

Bollards shall be manufactured in accordance with BS EN 12899-2 and with 'Scheme 9A' of the 'National Highways Sector Schemes (NHSS)', with low wattage LED gear trays, have an approved UMSO code, continuously lit, as per approved drawings, in accordance with the Traffic & Safety Engineer requirements.

The base light casing and hinge frame shall be manufactured from LM6-M marine grade aluminium with a minimal internal fuse-board capacity of 275mm square. It shall incorporate a fully surrounding highly robust

roof flange for securing it to the sub foundation and shall be supplied with 4 No M10 x 100mm corrosion resistant indented foundation bolts, nuts and washers. A physically defined ground line shall be displayed for accurate installation of the bollard base. The base light shall clearly show the manufacturers name and model identification in a permanent format.

The base shall be supplied with a non-hygroscopic 12mm thick, plywood fuse-board treated with clear water repellent, bolt-fixed to the base light bottom and large enough to cover the entire base area. The lens shall be made from 5mm thick U.V. stabilised domed polycarbonate incorporating a rebated seal which shall be capable of simple on-site replacement without special tools. The lens and base light structure shall be capable of resisting 18 tonnes 6-wheel vehicles rolling over it without damage and shall also be highly resistant to vandal impact if exposed.

The base shall have a cast aluminium hinged pivot frame which shall be so designed as to provide a positive horizontal fitting and seating for the bollard top shell. It is to be retained to the base via a single solid stainless-steel rod, which rotates within a corrosion-proof bearing system requiring no maintenance and being incapable of seizure. The pivot spindle shall be incapable of being tampered with when the hinge frame is closed. However, it should allow easy replacement of the attached hinge frame in the event of irreparable damage. The frame shall be hinged so that the bollard top shell hinges towards oncoming traffic. Fixture of the bollard top shell to the hinged frame shall be integral to the frame using Nyloc bolts/nuts to prevent premature removal.

Access to the electrical enclosure shall be possible with the bollard top shell still attached to the hinged frame. This shall be gained via a single captivated and rebated M8 stainless steel triangular headed thread fixing, which shall positively disengage from a female M8 stainless steel fixing physically cast-in to the base light casing. This is to be positioned on the rear of the base assembly away from oncoming traffic. On release of the tri-head fixing, it shall be possible to hinge away the bollard top shell to reveal the base light lens, which shall remain in situ covering the enclosed electrical control gear. It shall then be possible to undertake internal bollard top shell inspection, internal cleaning, or re-attachment of new bollard top shell, without disturbing the shrouded control gear and light unit.

The base shall incorporate a fully detachable non-corrodible gear tray with compatible pre-wired control gear and LED's suitable for correct operation on a 24V SELV or 230V, 50Hz A.C. supply as specified. The LED module and optics shall be high quality technology designed to maintain good uniformity of the attached bollard shell, with a neutral/cool white colour temperature, with a colour rendering index (CRI) 60 or greater, and life expectancy of 50,000 hours. Internal wiring including pre-wired gear trays shall be in accordance with the latest edition of the IET Wiring Regulations. If plug and sockets are utilised, they shall engage in the order Earth, Neutral, Live and disengage in the reverse order.

Installation of 230V units must have prior approval from the street lighting engineer or their representative.

All electrical equipment, materials and components associated with the bollard is to be housed within the sealed base enclosure, which shall be designed and manufactured to provide a maintainable water-tight and dust-tight seal to prevent damage to the electrical gear and optics. The base shall have a guaranteed ingress protection rating under BS EN 60529 of at least IP67.

Cable access shall be made available by fitting two IP68 nylon variable concentric stuffing glands on the face of the base light opposite to the bollard mounting frame hinge to provide cable entry for cables of between 9mm and 15mm diameter. A blank plug is to be provided to seal the cable entry hole should only one cable entry be required. Alternatively, one of the glands shall be provided with a sealing stub to maintain IP68 protection, which can be removed if cable looping from the base lighting is required.

Refuge Beacon

Refuge beacons shall be in accordance with Traffic Signs Manual: Chapter 4 ‘Warning Signs’, BS EN 12767, HESD ‘Refuge Island’, HESD ‘Retention Socket’ and HESD ‘SELV Supply and Termination Layouts’, as per approved drawings, in accordance with the Traffic & Safety Engineer requirements.

Beacon posts shall be passively safe in accordance with ‘non-energy’ (NE) absorption category. Typically, these shall comply to ‘100:NE:NR:NR:SE:MD:0’ class of conformity.

The complete length of the post shall be 5m with 114mm Ø which shall be mounted within 115mm Ø retention socket having 750mm planting depth, allowing it to be fully demountable. The post shall have a door aperture to assist internal wiring, including installation and removal.

Posts shall be capable of mounting two internally illuminated signs back-to-back with a weight of approx. 9kg each, plus a post top mounted refuge beacon with a weight of approx. 4.1kg. They shall be finished in ‘Aircraft Grey’ with two white bands added, each band being between 275mm and 335mm in depth, separated by a gap of the same dimensions. The top white band should be between 275mm and 335mm below the white globe, in accordance with Traffic Signs Manual: Chapter 4 ‘Warning Signs’. For guidance on protection systems and final finishes requirements refer to ‘Protection System’ in this section.

Beacon globes shall be white, have a diameter 275-335mm, with low wattage LED gear trays, have an approved UMSO code, continuously lit to operate from a 24V SELV 50Hz A.C. supply. Power converters or reducers will be permissible. Final height of beacons shall be in accordance with the Traffic Signs Manual: Chapter 4 ‘Warning Signs’, 3.8m (min) to 5m (max) from the carriageway surface to the beacon globe centre.

Where non-illuminated bollards are employed on refuge islands, two internally illuminated keep left Dia.610 sign lanterns having low wattage LED gear trays, with an approved UMSO code, continuously lit via a 24Vac SELV supply, having a minimum diameter of 600mm shall be mounted back-to-back at 2.4M to the bottom of the plates from the carriageway surface. For guidance on sign lantern requirements refer to ‘Sign Lanterns’ in this section.

Where non-illuminated bollards replace existing illuminated bollards, they shall be installed within a retention socket and all electrical equipment shall be removed from site.

Belisha Beacon

Belisha beacons shall be in accordance with The Traffic Signs Regulations and General Directions, Traffic Signs Manual: Chapter 6 ‘Traffic Control’, BS EN 40, HESD ‘Pedestrian (Zebra) Crossing Beacon’, as per approved drawings, in accordance with the Traffic & Safety Engineer requirements.

Zebra crossings normal layout shall have combined belisha beacon constructed as a standard 6m lighting column and fitted with a post top luminaire, structurally designed to accept the additional weight and windage of the beacon and, offset bracket (300mm) as required, including drilled hole for the supply cable.

Signpost post top mounted version may be permissible with prior approval and in accordance with the Traffic & Safety Engineer requirements.

Beacon posts shall be finished in alternate black and white bands, the lowest band being coloured black, with bands not less than 275 mm nor more than 335 mm wide except that the lowest band may be up to 1 metre wide, in accordance with The Traffic Signs Regulations and General Directions. For guidance on protection systems and final finishes requirements refer to ‘Protection System’ in this section.

Beacon posts shall normally be positioned on the near side closest to approaching traffic, as per approved drawings, in accordance with the Traffic & Safety Engineer requirements. This will mean combined belisha beacon luminaires shall have lefthand distribution optics to provide a continuous band of light across the carriageway, ensuring the crossing point is adequately illuminated. Any deviation from the normal beacon post arrangement, luminaire optics shall be altered accordingly.

Beacon globes (Dia.4007) shall be yellow, have a diameter 275-335mm with an LED halo and a weight of approx. 4.1kg. They shall have low wattage LED gear trays, have an approved UMSO code and, continuous synchronised flash with other beacons, to operate from a 230V, 50Hz A.C. supply. Power converters or reducers will be permissible. Final height of beacons shall be in accordance with the Traffic Signs Manual: Chapter 6 ‘Traffic Control’, 2.1m (min) to 3.1m (max) from the footway surface to the bottom of the beacon globe.

Beacon globes shall be capable of mounting post top direct or on an offset bracket or, wrap around version direct to the shaft of the belisha beacon. Globes shall be capable of being covered with a shroud whether half or full.

Flashing Amber Warning Lights (FAWLs)

Flashing Amber Warning Lights (FAWLs) shall be in accordance with The Traffic Signs Regulations and General Directions, Traffic Signs Manual: Chapter 6 'Traffic Control', as per approved drawings, in accordance with the Traffic & Safety Engineer requirements.

When utilised for a school safety zone they shall also be in accordance with HESD 'School Safety Zone Sign with Flashing Amber Warning Lights'.

They shall be provided in accordance with the Authorities current contract specification i.e. for the sign unit and remote communication specification requirements.

Further guidance and prior approval should be obtained from the Street Lighting Engineer or their representative.

Wiring

All wiring shall be compliant to the Electricity at Works Regulations and IET Wiring Regulations: BS7671 Requirements for Electrical Installations. All exposed wiring shall be insulated & sheathed, and connectors shall not be used in any wiring circuit.

All wiring within the electrical installation e.g. base compartment etc. shall be insulated and sheathed (i.e. double insulation / double insulated) with the sheathing taken into all electrical accessories e.g. isolators / cut-out housing, enclosures etc. except for the green/yellow tri-rated sheathed protective conductor. Door bonding shall be long enough to allow the door to rest on the ground when removed. Insulated ring terminals shall be used to terminate this cable to the earth points.

Internal wiring from DNO/IDNO cut out to secondary isolator shall be 618Y Single or stranded copper cables 600/1000 volt grade to BS6004 PVC insulated and sheathed with harmonised colours.

Wiring to luminaires shall be flex cable in accordance with BS6004 of 300/500V grade with phase, neutral and earth copper conductors not less than 1.5mm² cross-sectional area up to 10m mounting height (2.5mm² at 12m and above mounting height) with harmonised colours.

Cables

All cables shall be compliant to the Electricity at Works Regulations, IET Wiring Regulations: BS7671 Requirements for Electrical Installations and BASEC approved.

All underground cables shall be protected within a fully ducted system in accordance with HESD 'Chambers and Underground Service Ducts', HESD 'Feeder Pillar Base and Chamber Connection' and approved drawings. Refer to 'Service Ducts & Chambers' in this section.

Low Voltage (LV) underground electrical cable shall be minimum 6mm² Armoured 3-Core XLPE/PVC/SWA/PVC complying with BS5467 and have stranded copper phase, neutral and protective conductors in single phase harmonised colours brown, blue, green/yellow and of equal cross-sectional area.

Circuits supplying passively safe lighting columns shall have a separate trip circuit configured as per the approved drawing for the specific scheme. All trip circuit cables shall have orange outer sheathing and be minimum 1.5mm² Armoured 2-Core XLPE/PVC/SWA/PVC with stranded copper phase and neutral conductors in single phase harmonised colours brown, blue complying with BS6346.

Separated Extra Low Voltage (SELV) underground electrical cable supplying a 24V system shall be 2-Core copper harsh environments H07RN-F to BS50525-2-21.

Cables for use on surface of buildings, bridges and walls shall be PVC insulated and sheathed 3-Core copper cable type 'Hi-Tuff' or similar approved to BS5467 and supported to surfaces using approved

supports and enter control boxes from the bottom using suitable glands. When placed in reach they shall be protected by cable capping or galvanised steel conduit.

Terminations

Armoured cables shall be individually terminated and secured using appropriately sized BWL brass compression type gland to BS6121 and single brass gland plate in accordance with HESD 'Armoured Cable Terminations'.

Cable Earth Termination (CET) Glands / cable terminations using jubilee clamps or similar are not acceptable for terminating Steel Wire Armoured (SWA) cables into ANY item of highway electrical street furniture.

The cable inner cable sheath shall be taken into the cut-out housing through appropriately sized grommets maintaining IP2X protection and cores terminated directly into the cut-out terminals in accordance with HESD 'Termination Layouts'.

Identification labels shall be attached to all Authority cables, individually to 'incoming' and 'outgoing' cables including supply, passively safe sensor and SELV circuits, as close to the termination as practicable, using self-locking plastic cable ties in accordance with HESD 'Cable Identification and Electrical Labels' and approved drawings.

Joints

Underground cable joints shall only be used with prior approval obtained from the Street Lighting Engineer or their representative.

Cable joints shall be cold pour resin type and made up in accordance with the cable and joint manufacturer's instructions, carried out when all materials to be used in the joint are free from moisture. Joint bays shall be kept free from water and a fully enclosing joint-tent shall be erected over the joint bay if jointing is carried out in, or immediately after, wet weather.

The contractor shall ensure that correct phasing is maintained with cables joined colour to colour. In the event of cables of old and harmonised colours being joined they shall be coupled in accordance with IET Wiring Regulations: BS7671 Requirements for Electrical Installations.

Armour cables shall be bonded at all joints without any increase in resistance as compared with that of an un-jointed cable run.

The detailed location of cable joints shall be recorded, included on 'as-built' drawings and notification sent to the Street Lighting Engineer or their representative. Contact details are provided in 'TA05'.

Surge Protection Devices

Surge Protection Devices (SPD) shall be provided for service critical Highway electrical installations, in accordance with the IET Wiring Regulations: BS7671 Requirements for Electrical Installations.

All highway electrical luminaires / signage including, Lighting Columns / Wall Mounted / Pole Brackets / Subway Lighting, Pedestrian (Zebra) Crossings (including the beacon & lantern) / School Safety Zone Signs (FAWLs Dia.4004), shall be protected by an SPD, including feeder pillars servicing the equipment.

Other highway electrical assets such as, Refuge Beacons / Signs / Bollards / Bus Shelters and RTI poles & equipment) – would not require an SPD, including feeder pillars servicing the equipment; unless the feeder pillar is also supplying service critical equipment as defined above.

Surge protection devices shall be manufactured to BS EN 61643-11, incorporating end of life indicator and, a remote link contact which could be connected to CMS would be preferable.

Supply points shall have a Type 1 & 2 SPD installed at the origin of the installation, including:

- Feeder Pillars
- Sub-Circuits

The SPD within a feeder pillar or street furniture installation shall be an integrated Type 1 & 2, DIN rail mountable for use in distribution boards and enclosures.

They shall be connected in accordance with BS7671 Connection Type 2 (CT2) to live conductors with 6mm² and to the main earthing terminal or the protective conductor with 16mm² minimum conductors with wiring length not exceeding 0.5m.

SPD's shall only be connected to the supply side i.e. after the main isolator and rated with the following minimum values:

	Single Phase	Three Phase
Impulse Current (I_{imp})	≥12.5kA (L-N) / 25kA (N-PE)	≥12.5kA (L-N) / 50kA (N-PE)
Nominal Discharge Current (I_{nspd})	≥5kA (L-N) / 10kA (N-PE)	≥5kA (L-N) / 20kA (N-PE)
Voltage Protection Level (U_p)	≤1.5kV	≤1.5kV

Highway electrical luminaires / signage shall have a Type 3 SPD, rated at 10kV / 5kA, installed as an integral part of the equipment control gear, including:

- All highway lighting luminaires including, Lighting Columns / Wall Mounted / Pole Brackets
- Subway Fittings
- Pedestrian (Zebra) Crossings (including the beacon & lantern)
- School Safety Zone Signs (FAWLs Dia.4004)

Accessories

Where applicable all accessories shall be capable of withstanding 6000A prospective fault current, i.e. breaking capacity rated at 6kA. However, if actual electrical readings as part of the inspection and testing process render accessories non-compliant e.g. PSCC >6kA, then this must be referred to the Designer, Street Lighting Engineer or their representative, to ensure correct selection of accessories.

Low-voltage single-phase street lighting cut-out assemblies shall be manufactured to BS7654.

Low-voltage switchgear and control gear including switches, disconnectors, switch-disconnectors and fuse-combination units shall be manufactured to BS EN 60947-3.

Fuse isolator units/cut-outs shall be designed specifically for use in street lighting columns, consist of substantial moulded plastic drip-proof enclosure and have terminals for live, neutral and earth conductors protected to IP 2X, sufficient to accommodate 25 mm² cables. Cut-outs fitted to double arm columns shall contain two fuses in accordance with HESD 'Termination Layouts'.

230V/24V transformers shall be manufactured to BS EN 61558 have an integral safety isolating feature with thermal and short circuit protection. Output will disconnect on fault detection and reconnect when fault is cleared.

BS88-2 fuse link is required for each single luminaire or sub-circuit operating from a 230V supply.

MCB's shall be manufactured to BS EN 60898-1 and have 'Type B' overcurrent trip characteristic and DIN rail mountable for use in distribution boards.

RCCB's shall be manufactured to BS EN 61008-1 and have 30mA residual current trip characteristic and DIN rail mountable for use in distribution boards.

RCBO's shall be manufactured to BS EN 61009-1 and have 'Type B' overcurrent and 30mA residual current trip characteristic and DIN rail mountable for use in distribution boards.

Enclosures for low-voltage switchgear and control gear assemblies shall be in accordance with BS EN 62208.

Degrees of protection provided by enclosures (IP Code) shall be in accordance with BS EN 60529.

Service Ducts & Chambers

The system of ducting and service duct chambers shall be for the sole use of highway electrical equipment and must not be used by any other utilities.

Service Ducts

Street lighting ducts shall be smooth bore manufactured from Medium to High Density Polyethylene, meet the requirements of BS EN 61386-24 normal duty and shall be sufficiently rigid to experience no deformation during backfill and compaction but be capable of bending to the radius required.

Ducts installed in verges or footways shall be 50mm Ø or 100mm Ø and installed 450mm depth to invert.

Ducts installed in carriageway shall only be 100mm Ø and installed 750mm depth to invert. All road crossings shall have a minimum of two rigid 100mm ducts, unless otherwise stated on approved drawings.

- Rigid ducts: shall be supplied in 6 metre lengths complete with couplings attached and have a minimum wall thickness of 3.5mm for 50mm Ø ducts and, 5mm for 100mm Ø ducts.
- Flexible duct: shall be twin walled with a smooth bore and have a minimum wall thickness of 6.5mm for 50mm Ø ducts and, 8mm for 100mm Ø ducts.

Ducts shall be installed practically routed avoiding other services and foundations of structures. They shall run continuously and access at each service point shall be made by means of flexible smooth bore duct from the main duct into the cable entry aperture of each electrical installation. Care should be taken to ensure ducts are correctly sized to the size of cable entry apertures and duct connections.

Duct runs shall not exceed 50m, so a chamber in accordance with ‘Chambers’ in this section shall be installed at 50m or equally along the ducting run to enable safe installation of cables.

All ducts shall be coloured orange throughout their length and shall be indelibly marked, by indentation, with the legend "Street Lighting" in 9mm high white characters at intervals of 1 metre. When laid the wording shall be visible from above. A warning marker tape shall be used to identify the presence of ducts.

Prior to the duct system being put into use a service duct alignment test shall be carried out by drawing a mandrel throughout it, in accordance with HESD ‘Chambers and Underground Service Ducts’.

Chambers

Service duct chambers shall be either in-situ concreate or brick construction with minimum dimensions 450mm x 450mm and depth of invert not exceeding 1 metre, with serviceable soakaway in accordance with HESD ‘Chambers and Underground Service Ducts’ and approved drawings.

They shall only be installed in footways or verges and have interlocking galvanised steel frames where all sides are supported by the chamber, with composite covers complying with Group 2 ‘Class B125’ which can be interchangeable and fixed down via use of a tool, in accordance with BS EN 124. Other scenarios and/or classifications may be considered with prior approval by the Street Lighting Engineer or their representative.

Chambers associated with ducts shall be in accordance with HESD ‘Chambers and Underground Service Ducts’ and where directly associated with a feeder pillar shall be in accordance with HESD ‘Feeder Pillar Base and Chamber Connection’.

When associated with road crossings, chambers shall be deep enough to allow road crossing ducts to maintain 750mm depth to invert (including road crossings to retention sockets in refuge islands), all other times they shall be deep enough to allow ducts to maintain 450mm depth to invert or, for the associated equipment such as a retention socket etc. as specified on approved drawings, with the approval of the Street Lighting Engineer or their representative.

Every passively safe highway electrical feature shall have an associated 450x450mm service duct chamber, practically positioned within a few metres of the asset. Service duct chambers associated with feeder pillars, road crossings etc. shall be utilised if compliant with this criterion, reducing the need for additional service duct chambers.

Retention Socket

The socket head shall be constructed of cast steel to ISO 3755 230-450 or ductile iron to BS2789 500-7, galvanised on all internal and external surfaces to BS EN ISO 1461.

The socket shall be capable of withstanding impact forces from vehicle impact to steel posts with wall thickness up to 6mm. All assembly screws shall be M12 A2 stainless steel. It shall contain two M16 A2 stainless steel lateral fixing setscrews inside a locking chamber. The chamber shall be covered with a locking cover, complying with Group 2 ‘Class B125’ in accordance with BS EN 124, fitted with RS worm lock.

The socket shall have a ‘duckfoot bend’ or ‘T bend’ base which will accept a 100mm duct and be able to swivel 360°. A shallow foundation base may be acceptable with prior approval of the Street Lighting Engineer or their representative, in accordance with approved drawings.

The socket shall contain a steel protective pressure plate and be supplied with a cover plate to enable the socket to be flush with ground level when street furniture is removed or not installed, with all operating components serviceable on site.

When retrofitting posts into existing wider diameter retention sockets a reducer sized to suit shall be obtained from the retention socket manufacturer.

Further guidance can be sought from HESD ‘Retention Socket’.

Earth Electrodes

Earth electrodes shall be provided as required in accordance with BS7430, DNO/IDNO standard technique guidance requirements and HESD ‘Earth Electrodes’.

If soil resistivity readings cannot be obtained or provided by the DNO/IDNO at the location of the installation, to calculate the size of electrode required. Then rather than carrying out specific ground resistivity testing which may result in unproportionate cost, one electrode be installed, and the resistance tested, and then additional electrodes added until a suitable earth reading can be acquired.

The use of rods, mats and horizontal electrodes are acceptable, however where the electrode installation requirement carries unacceptable risks due to the congested nature of the ground, in an urban environment for instance, the use of the other electrode types may be more appropriate.

An earth electrode shall be provided at feeder pillars or supply points which service more than one item of highway electrical street furniture and shall not exceed 20 ohms in accordance with BS7430.

An earth electrode shall be provided at the end of every circuit, servicing more than one item of highway electrical street furniture and shall not exceed 20 ohms in accordance with BS7430.

Earth electrodes shall not be considered for SELV circuits.

Electrical installations with loads greater than 500W which are not considered as street lighting or road sign installations, such as car charging points for instance, may also require earth electrodes. They shall fulfil the following resistance requirements based on the maximum demand as indicated in ‘Table 6’.

Table 6 Connection maximum demands and earth electrode resistance

Connection	Maximum Demand	Maximum Earth Electrode Resistance
Single or Three Phase	500W	100Ω
	1kW	60Ω
	2kW	20Ω
	3kW	14Ω
	4kW	11Ω
	5kW	9Ω

Jointing of earth electrodes shall be prohibited, as this introduces a weak point in the system.

The detailed location of earth electrodes shall be recorded, included on ‘as-built’ drawings and notification sent to the Street Lighting Engineer or their representative. Contact details are provided in ‘TA05’.

Wall Brackets
All wall or pole brackets must have prior approval and legal wayleave agreements in place organised as part of the Design phase.

Pole and Wall mounting brackets shall be manufactured from mild steel and galvanised to BS EN ISO 1461.

Wall brackets shall have a post top spigot (76mm) and pole brackets arm shall have 5-degree uplift, a minimum projection of 150mm and both be suitable for the attachment of the specified luminaire.

The bracket should be attached to the pole or wall by a minimum of four stainless steel anchors via a rag bolt anchor system or chemical or resin, based anchor system. The Contractor should ensure that the chosen system is suitable for the required application and should follow manufacturer’s installation advice.

Where luminaires are to be installed on existing buildings a mini-feeder pillar may be required to accommodate isolation equipment so the DNO/IDNO can provide a service point at ground level. For cabling requirements from the mini-feeder pillar refer to ‘Cables’ in this section.

Subway Lighting Units
Section under development. If required, seek further guidance from the Street Lighting Engineer or their representative.

Low Level Lighting
Section under development. If required, seek further guidance from the Street Lighting Engineer or their representative.

Illuminated Bus Shelters
Illuminated bus shelters shall be supplied and installed in accordance with the Authority’s bus shelter specification and highway electrical standard details, with full verification and approval from the Local Bus Team.

Further guidance can be obtained from the ‘Technical and Design Guidance for Bus Stops & Shelters’ available on the Authority’s website.

Parking Meters
Section under development. If required, seek further guidance from the Street Lighting Engineer or their representative.

TA04 - Protection Systems

This section provides guidance on protection systems for minor structures.

Steel structures shall be completely protected with Hot Dip galvanisation to BS EN ISO 1461, finishing preparation treatment applied e.g. ‘T’ Wash and factory finished as per specified protection systems below.

Aluminium and stainless-steel structures shall be factory finished as per specified protection systems below.

Glass reinforced fibre composite structures shall be coated with an outer layer of UV-resistant coloured polyethylene, which is an integrate part of the structure.

Any one system shall be obtained from the same manufacturer and shop applied to the manufacturers guidance and recommendations.

Protection System 1:

Application of Performance Polymer Alloy Coating ‘PPA 571 ES’ to internal/external surface of the column and door face including rear, colour shall be Derbyshire Green (RAL6006).

The metalwork must be either grit blasted or chemically pre-treated with a phosphate system e.g. ‘T’ Wash prior to coating and free from sharp corners or edges. Where a phosphate system has been used any previously applied resin based pre-treatment systems must be removed.

The coating must be continuous and free from exposed edges or pinholes. The coating thickness must be a minimum of 250 microns.

Protection System 2:

Application of Performance Paint System, one coat of 2 Pack Extended Cure Epoxy Micaceous Iron Oxide (Grey 90-270) to internal/external surface of the root to 250mm above ground level*, external overall and back of door, one coat of 2 Pack Glass Reinforced Epoxy (Black 79-489) to external surface of the root to 250mm above ground level* and a final coat of Polysiloxane finish to external surface of column upper section over lapping Glass Reinforced Epoxy and door face including rear, colour shall be Derbyshire Green (RAL6006).

Aluminium structures shall be suitably prepared for paint and have an overall aluminium epoxy primer coat applied followed by the Performance Paint System application.

*Ground level shall be taken as a minimum of 300mm below the door opening.

Performance Paint System (Steel)
EPA COMPLIANT PAINT SPECIFICATION SHEET

LIGHTING COLUMNS & BRACKETS PAINT SYSTEM TO BE APPLIED OVER GALVANISED STEEL				REQUIRED DURABILITY OF SYSTEM NO MAINTENANCE up to: 10 years MINOR MAINTENANCE from: 10 years MAJOR MAINTENANCE after: 20 years
DETAILS	First Coat External: Overall Internal: Root to 250mm above ground + rear of door	Second Coat External: Overall Internal: Root to 250mm above ground + rear of door	Third Coat External: To 250mm above ground Internal: Root to 250mm above ground	Fourth Coat External: Overall Internal: Rear of door
Registered Description (If Applicable)	"T" Wash	2 Pack Extended Cure Epoxy MIO	2 Pack Glass reinforced	2 Pack Polysiloxane finish
Item No. (If Applicable)	155	121	N/A	185
Colour	N/A	Approx 00A09	Black	Derbyshire Green (RAL6006)
Where applied	Shop	Shop	Shop	Shop
How Applied	Brush Wash Coat	Airless Spray	Airless Spray	Airless Spray
Min Required D.F.T.	N/A	100 microns	200 microns	75 microns
Required W.F.T	N/A	145 microns	225 microns	80 microns
SHOP/SITE APPLICATION: Shop: 2 EC MIO, 2 Glass reinforced, 2 Pack Polysiloxane Site: N/A				
RECOMMENDED TOTAL: D.F.T: Internal root 300 microns External (to 250mm above ground level) 375 microns External (from 250mm above ground level) 175 microns				

Performance Paint System (Aluminium)
EPA COMPLIANT PAINT SPECIFICATION SHEET

LIGHTING COLUMNS & BRACKETS PAINT SYSTEM TO BE APPLIED OVER ALUMINIUM				REQUIRED DURABILITY OF SYSTEM NO MAINTENANCE up to: 10 years MINOR MAINTENANCE from: 10 years MAJOR MAINTENANCE after: 20 years
DETAILS	First Coat External: Overall Internal: Root to 250mm above ground + rear of door	Second Coat External: From 250mm above ground	Third Coat External: To 250mm above ground Internal: Root to 250mm above ground + rear of door	Fourth Coat External: Overall Internal: Rear of door
Registered Description (If Applicable)	2 Pack aluminium Epoxy	2 Pack Extended Cure Epoxy MIO	2 Pack Glass reinforced	2 Pack Polysiloxane finish
Item No. (If Applicable)	115	121	N/A	185
Colour	Aluminium	Approx 00A09	Black	Derbyshire Green (RAL6006)
Where applied	Shop	Shop	Shop	Shop
How Applied	Airless Spray	Airless Spray	Airless Spray	Airless Spray
Min Required D.F.T.	100 microns	100 microns	100 microns	75 microns
Required W.F.T	140 microns	145 microns	115 microns	80 microns
SHOP/SITE APPLICATION: Shop: 2 HB Aluminium Epoxy, 2 EC MIO, 2 Glass reinforced, 2 Pack Polysiloxane Site: N/A				
RECOMMENDED TOTAL: D.F.T: Internal root 200 microns External (to 250mm above ground level) 275 microns External (from 250mm above ground level) 275 microns				

Performance Paint System (Stainless Steel)
EPA COMPLIANT PAINT SPECIFICATION SHEET

LIGHTING COLUMNS & BRACKETS				REQUIRED DURABILITY OF SYSTEM NO MAINTENANCE up to: 10 years MINOR MAINTENANCE from: 10 years MAJOR MAINTENANCE after: 20 years
PAINT SYSTEM TO BE APPLIED OVER – Stainless Steel which has been thoroughly abraded and painted within 4 hours				
DETAILS	First Coat External: Overall Internal: Root to 250mm above ground + rear of door	Second Coat External: From 250mm above ground	Third Coat External: To 250mm above ground Internal: Root to 250mm above ground + rear of door	Fourth Coat External: Overall Internal: Rear of door
Registered Description (If Applicable)	2 Pack ZP Epoxy	2 Pack Extended Cure Epoxy MIO	2 Pack Glass reinforced	2 Pack Polysiloxane finish
Item No. (If Applicable)	111	121	N/A	185
Colour	Red Oxide	Approx 00A09	Black	Derbyshire Green (RAL6006)
Where applied	Shop	Shop	Shop	Shop
How Applied	Airless Spray	Airless Spray	Airless Spray	Airless Spray
Min Required D.F.T.	75 microns	100 microns	200 microns	75 microns
Required W.F.T	110 microns	145 microns	115 microns	80 microns
SHOP/SITE APPLICATION: Shop: 2 HS Red Oxide, 2 EC MIO, 2 Glass reinforced, 2 Pack Polysiloxane Site: N/A				
RECOMMENDED TOTAL: D.F.T: Internal root 275 microns External (to 250mm above ground level) 275 microns External (from 250mm above ground level) 250 microns				

TA05 - Contact Details, General Enquiries & Management Plan

Contact Details

The address to send any documents required under this specification or any queries relating to the content of this specification should be referred to:

street.lighting@derbyshire.gov.uk

Street Lighting Engineer,

Place,

County Hall, Matlock, Derbyshire, DE4 3AG

Telephone: 01629 533190

Or via the Authority's general enquiries e-mail referencing the subject e.g. 'street lighting':

contact.centre@derbyshire.gov.uk

Further guidance can be found on the Authority's website:

www.derbyshire.gov.uk

General Street Lighting Enquiries

Further guidance on general 'Street Lighting' enquiries can be found on the Authority's website:

Including;

- New street lighting
- Reporting a street lighting fault
- Moving a street light
- Attachments to street lights
- LED street lighting
- Part night street lighting

Management Plan

Further policy guidance on the future management of street lighting can be obtained from the 'Highway Infrastructure Asset Management Plan for Street Lighting' available on the Authority's website.

TA06 - Network Hierarchy Flowchart

Network Hierarchy Group			Highway Class	Traffic Flow	Environmental Zone	Speed Class	Lighting Class		
NH7	Sections Assigned a Value of 4b and part of Cul-De-Sac		Subsidiary Road	Normal / Quiet	E3	≤40mph			P4
					E2	≤40mph			P5
NH6	Sections Assigned a Value of 4b and not a Cul-De-Sac				E1	≤40mph			P6
NH5	Sections Assigned a Value of 4a		Subsidiary Road	Busy	E3	>40mph	M4	C4	P2
						≤40mph	M5	C5	P3
					E2	>40mph	M5	C5	P3
NH4	Sections Assigned a Value of 2a, 3a or 3b					≤40mph			P4
					E1	>40mph			P4
						≤40mph			P5
NH3	AADT >=3000 and <8000		Traffic Route	Very Low (<7000)	E3	>40mph	M3	C3	P1
						≤40mph	M4	C4	P2
					E2	>40mph	M4	C4	P2
						≤40mph	M5	C5	P3
					E1	>40mph	M5	C5	P3
						≤40mph			P4
NH2	AADT >=6000 and <12000		Traffic Route	Low To Moderate (≥7000 ≤40k)	E3	>40mph	M2	C2	
						≤40mph	M3	C3	P1
					E2	>40mph	M3	C3	P1
NH1	AADT >= 9000					≤40mph	M4	C4	P2
					E1	>40mph	M4	C4	P2
						≤40mph	M5	C5	P3
Any	Mixed Vehicle and Pedestrian on Same Surface[2]	Primary Shopping	Town Centre	Normal Traffic Flow	E4	≤40mph	M1	C1	
					E3	≤40mph	M2	C2	
Any	Mixed Vehicle and Pedestrian with Separate Footways or Pedestrian Only[3]	Primary or Secondary Shopping	Town Centre	Normal Traffic Flow	E4	≤40mph	M2	C2	
					E3	≤40mph	M3	C3	P1

Lighting Class	Column Height	Tender Lot / Option			Optic	Max Wattage[1]	Lumens (Range)[1]	CCT
P5	5m	Lot 1	Option 1	Residential roads, cul-de-sacs and footpath links	Road	15	900 - 2100	3000K
			Option 3		360˚			
			Option 4		Flood			
	6m	Lot 2	Option 1		Road	15	1300 - 2600	
			Option 4		Flood			
P4	5m	Lot 1	Option 2		Road	20	1400 - 2600	
	6m	Lot 2	Option 2			25	2300 - 3000	
			Option 5		Flood			
P3			Option 3	Link roads and distributor roads	Road	38	3600 - 4600	4000K
	8m	Lot 3	Option 1			50	4900 - 6000	
M4			Option 2			65	6800 - 8800	
	10m	Lot 4	Option 1	Single carriageway main distributor roads		95	8900 - 9600	
M3	8m	Lot 3	Option 3	Link roads and distributor roads		85	9500 - 11900	
	10m	Lot 4	Option 2	Single carriageway main distributor roads		120	11800 - 12900	
	10m	Lot 5	Option 1	Dual carriageway strategic routes		80	8800 - 9800	
	12m		Option 3			90	10900 - 12100	
M2	10m		Option 2			90	7900 - 10600	
	12m		Option 4			105	13700 - 15600	
P1	6m	Lot 6	Option 1	6m columns with integral belisha beacon	LH	68	6000 - 7000	5700K

Access Road	Carriageway Width (m)	Footpath Width (m)	Highway Width (m)	Column Height (m)	Minimum Lighting Class
Residential	4.8	2	8.8	5 / 6	P5
Residential	5.5	2	9.5	6	P5
Minor Industrial	6	2	10	6	P4
Major Residential / Minor Industrial	6.75	2	10.75	8	P4
Major Industrial	7.3	2	11.3	10	P3

Environmental Zone			Area
E4	Urban - High district brightness	Town/city centres with high levels of night-time activity	Town Centre (Chesterfield, Glossop, Ilkeston, Long Eaton)
E3	Suburban - Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations	All Other Town Centres or Suburban Areas (Chesterfield, Glossop, Ilkeston, Long Eaton, Derby City Border)
E2	Rural - Low district brightness (SQM ~15 to 20)	Sparsely inhabited rural areas, village or relatively dark outer suburban locations	All Other Areas
E1	Natural - Dark (SQM 20 to 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc.	Peak District National Park / World Heritage Site (Bakewell Town Centre - Primary & Secondary Shopping - C3)
E0	Protected - Dark (SQM 20.5+)	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places	Peak District National Park ‘dark sky sites’

Notes

Note 1 Indicated max wattage and lumen range are ideal values, so may not suit every design scenario, a departure from standard may be granted with prior approval from the Street Lighting Engineer or their representative.

Note 2 No vehicle restrictions.

Note 3 With vehicle restrictions at certain times of the day.

TA07 - Skill & Care Certificate

We certify that reasonable professional skill and care have been used in the preparation of the public

lighting and electrical design of the scheme noted below.

Scheme title:……

Location:……

With a view to:

1. The design has been undertaken by competent designers as defined in BS5489-1, electrical installations defined as a Skilled Person in BS7671 and are measured against the Institution of Lighting Professionals (ILP) 'Competency for Lighting Professionals' framework document.

2. That reasonable professional skill and care were used to ensure that the street lighting & electrical design has been carried out in accordance with the Authority's requirements as detailed within:

   Derbyshire County Council's 'Street Lighting Specification'
   Derbyshire County Council's 'Highway Network Management Plan'
   Derbyshire County Council's Highways Development Control process
   BS5489-1, BS EN 13201 and appropriate Institution of Lighting Professionals guidance

3. It has been accurately translated into Contract Drawings, which have also been checked. The unique numbers of these drawings are:

……..……..

……..……..

……..……..

Name of Consultant [1]/ Contractor[1] …….

Name: ……..….. Signed:…….…….

(Design Team Leader[1], Partner[1] / Associates [1]/ Director [1])

Engineering Qualification[2] ……

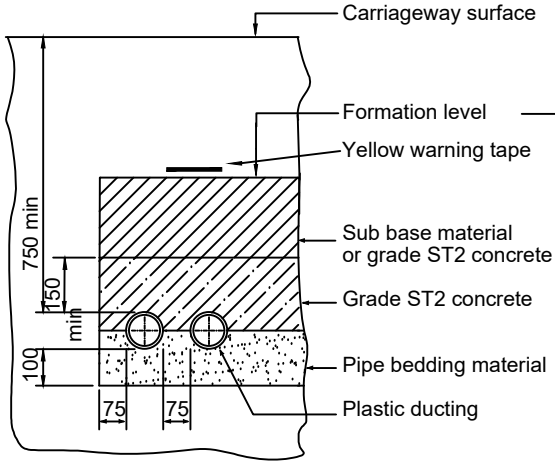
(Design Team Leader)

Notes 1 - Delete as appropriate

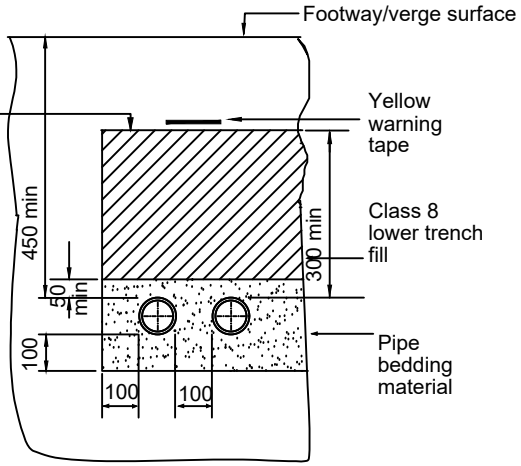
2 – AMILP EngTech / MILP IEng (or equivalent) and evidence record of competency

TA08 - Highway Electrical Standard Details (HESD)

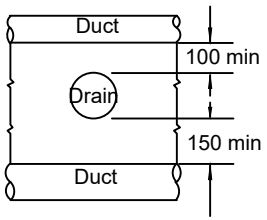
No.	Name
HESD01	Chambers and Underground Service Ducts
HESD02	Feeder Pillar Base and Chamber Connection
HESD03	Tubular Signpost
HESD04	Base Lit Traffic Bollard
HESD05	Retention Socket
HESD06	Refuge Island
HESD07	Pedestrian (Zebra) Crossing Beacon
HESD08	School Safety Zone Sign with Flashing Amber Warning Lights
HESD09	Tubular Columns
HESD10	Planting Details and Dimensions
HESD11	Positions of Columns, Brackets and Doors
HESD12	Warning Notices
HESD13	Foliage Clearances
HESD14	DNO / IDNO Isolation Arrangements
HESD15	Termination Layouts
HESD16	Armoured Cable Terminations
HESD17	SELV Supply and Termination Layouts
HESD18	Cable Identification and Electrical Labels
HESD19	Feeder Pillars
HESD20	Pillar Internals
HESD21	Electrical Enclosure for Attachments
HESD22	Column Reducers
HESD23	Earth Electrodes
HESD24	Passive Safety Mini System



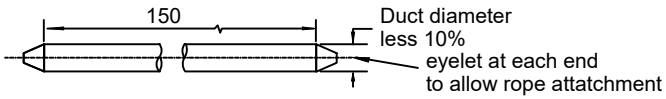
'TYPE A'
DUCTS LAID UNDER CARRIAGEWAY
(100mm Ø DUCTS)



'TYPE B'
DUCTS LAID UNDER FOOTWAY AND VERGES
(50/100mm Ø DUCTS)



MINIMUM CLEARANCE BETWEEN
DUCT AND DRAIN



DETAILS OF MANDREL

(REQUIRED TO PASS THROUGH THE WHOLE LENGTH
OF COMPLETED DUCTS WITH CURVED ENDS)

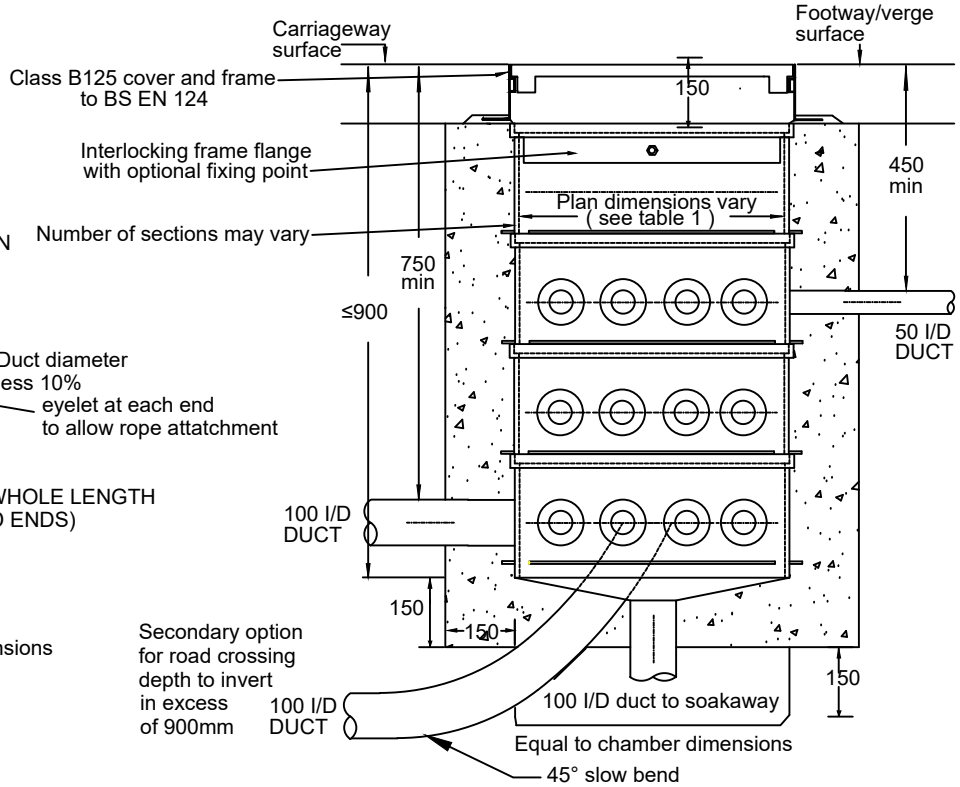


TABLE 1
Standard service duct chamber dimensions

TYPE	LENGTH	WIDTH
A	450	450
B	600	450
C	600	600
D	900	600

Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Service Duct Chamber - Permitted Construction

Brick Construction - Brickwork to comply with relevant sections of 'Specification for Highway Works' constructed in Class B engineering bricks to BS EN 771; surrounded by Class ST4 concrete - 150 thick.

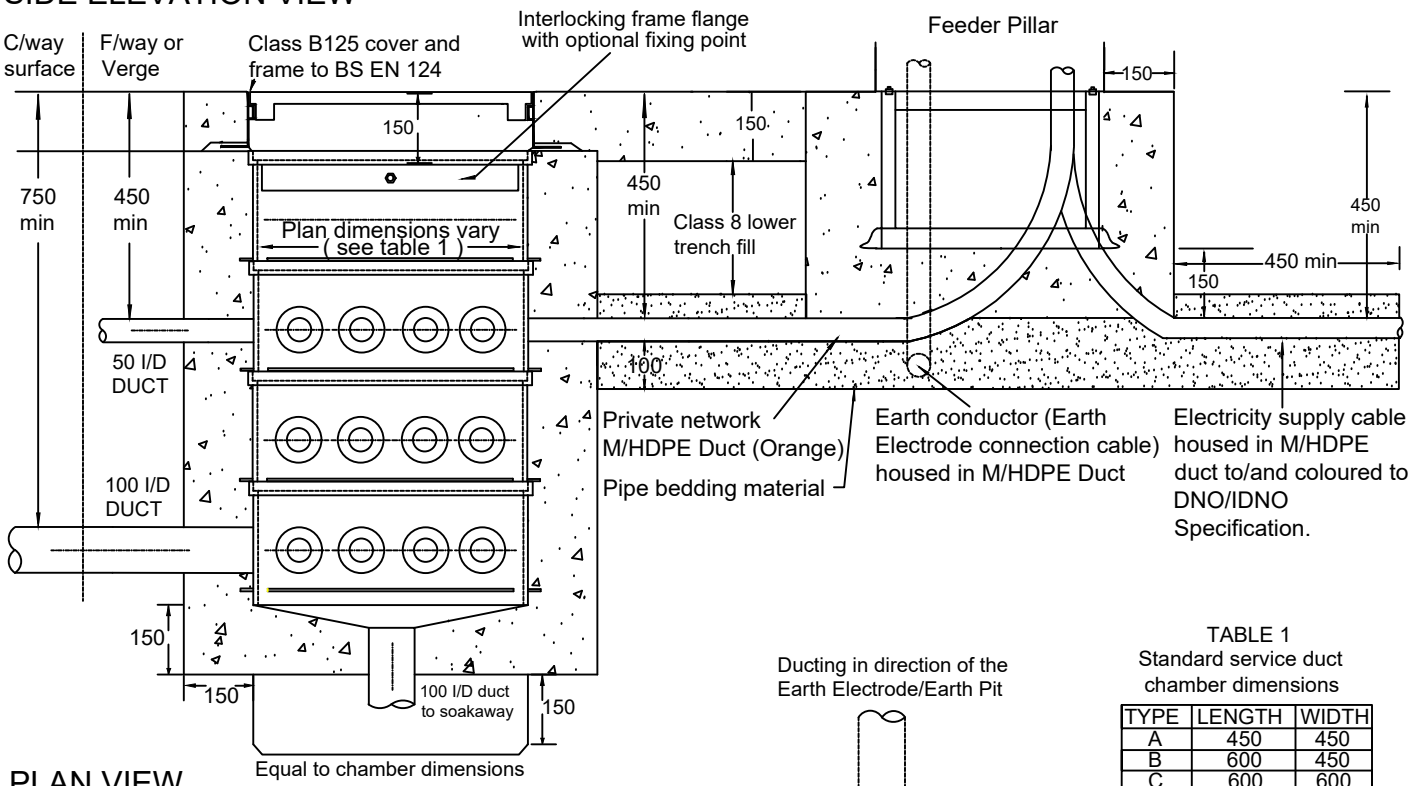
In-situ Concrete Construction - (Plastic units or similar approved) To comply with relevant sections of 'Specification for Highway Works'; surrounded by Class ST4 concrete - 150mm thick. Illustrated here as a guide only.

4. The type, construction and location of all chambers shall be agreed with the Engineer before installation.
5. Chamber and duct depth of invert not to exceed 1000mm.
6. Chamber soakaway to be 150mm deep filled with 6mm clean gravel of similar approved. Where a suitable 'soakaway' cannot be installed, the Engineer must be notified.
7. Chambers must be aligned with the closest structure - i.e. wall; kerb; pillar.
8. Class B125 covers and locking frames which are supported by all four walls of the chamber are to be used unless otherwise stated.
9. Composite covers must be supplied with centrally positioned key holes to accept standard lifting keys, be able to be secured with stainless steel counter-sunk fixings, and be interchangeable with any other of the same specification.
10. Flexi duct to be twin wall smooth bore with minimum wall thickness 6.5mm for 50mm and 8mm for 100mm in verge/footway.
11. The words "STREET LIGHTING" shall be embossed on the chamber cover and duct during manufacture.
12. Ducts can enter the chamber at any angle.
13. Spare ducts are to be installed and capped through the chamber wall and concreted as agreed with the Engineer. Minimum of one each side. These shall still maintain a minimum separation of 300mm between power and signal.
14. All street lighting ducts to be ORANGE coloured M/HDPE.
15. Pipe bedding material maximum aggregate size 2mm - e.g. washed sand.

DERBYSHIRE County Council

Drawing Title	Issue Date	Scale
Chambers and Underground Service Ducts	January 2025	NTS
HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines / Drawing No.: HESD01 / Issue: B	

SIDE ELEVATION VIEW



PLAN VIEW

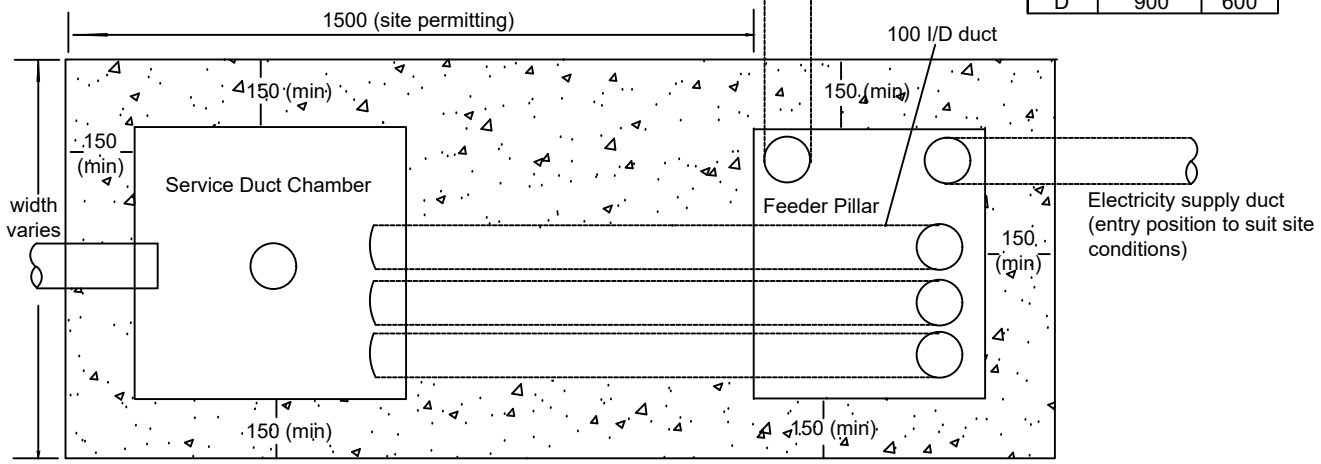


Illustration only - final arrangement to suit site conditions

TABLE 1
Standard service duct chamber dimensions

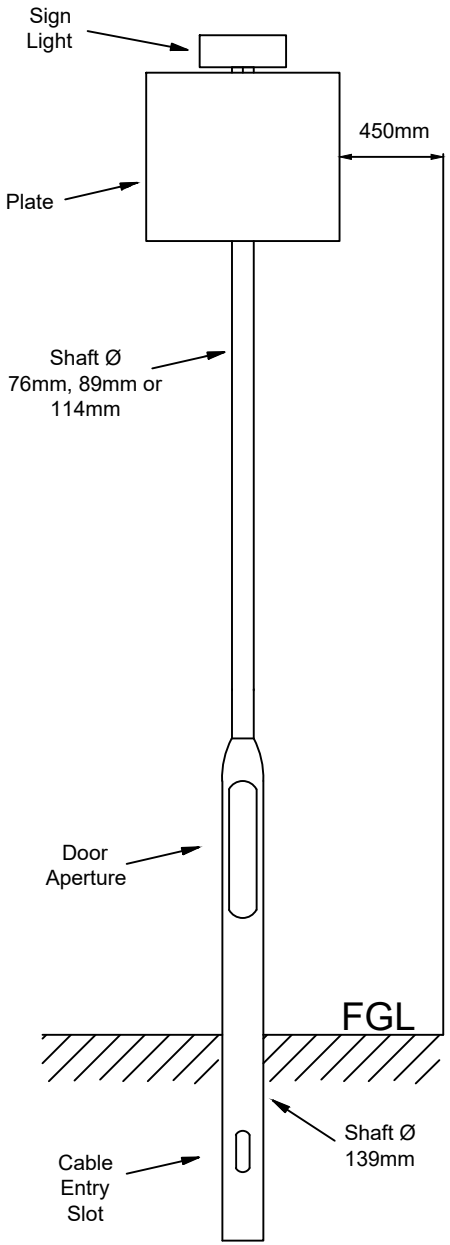
TYPE	LENGTH	WIDTH
A	450	450
B	600	450
C	600	600
D	900	600

Notes

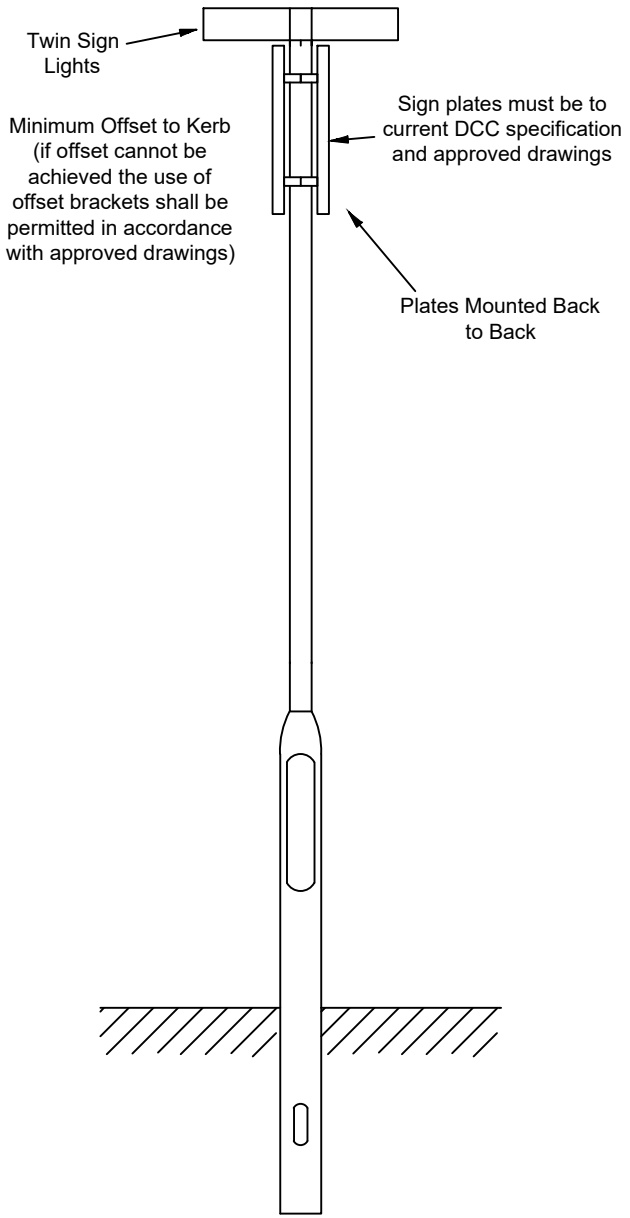
1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Feeder pillar sub-frame and fixings to be manufactured to County Council approved specification.
4. Concrete to be class ST4 with minimum cover of 150mm to sub-frame bottom and sides. Top to be flush with concrete.
5. All ducts to extend a minimum of 35mm above feeder pillar base.
6. Ducts to have a minimum of 50mm cover in pipe bedding material.
7. Position of duct for Electricity Supply to be advised by the Engineer.
8. Where 'Service Duct Chamber' cannot be cast as one with 'Feeder Pillar Base', 1500mm hardstanding shall be maintained.
9. The 'Service Duct Chamber' can be located at the sides or back of the feeder pillar subject to the approval of the Engineer.
10. The 'Feeder Pillar Base' shall be of a squared-off and level formation with pillar bolted in a vertical position (plumb) after completion, and the captive nut fixed to the base.
11. A footpath of no less than 600mm wide by 150mm thick shall link the hardstanding to the nearest footpath or road.
12. After cables are installed, ducts are to be sealed and the floor of the pillar coated with bitumen as per detail.
13. The design and location of the 'Feeder Pillar Base' and 'Service Duct Chamber' shall be agreed with the Engineer before installation.
14. Where part of the hardstanding falls within an existing footway, allowance will be made for matching the existing construction.
15. Drawing to be read in conjunction with HESD 'Chambers and Underground Service Ducts'.
16. Drawing to be read in conjunction with HESD 'Earth Electrodes'

DERBYSHIRE County Council

Drawing Title	Issue Date	Scale
Feeder Pillar Base and Chamber Connection	January 2025	NTS
HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines / Drawing No.: HESD02 / Issue: B	



Single Arm Sign Light

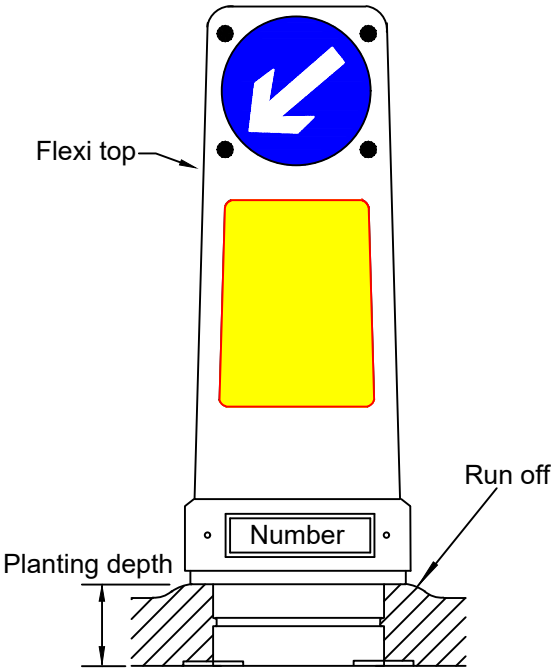


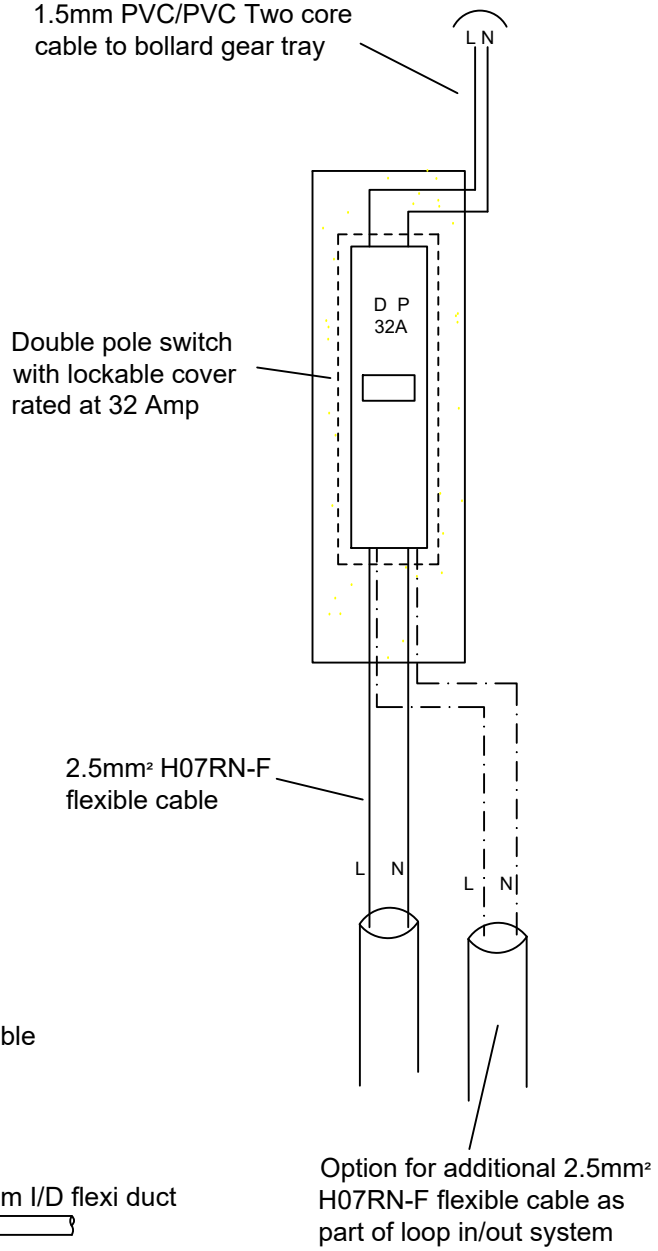
Double Arm Sign Light

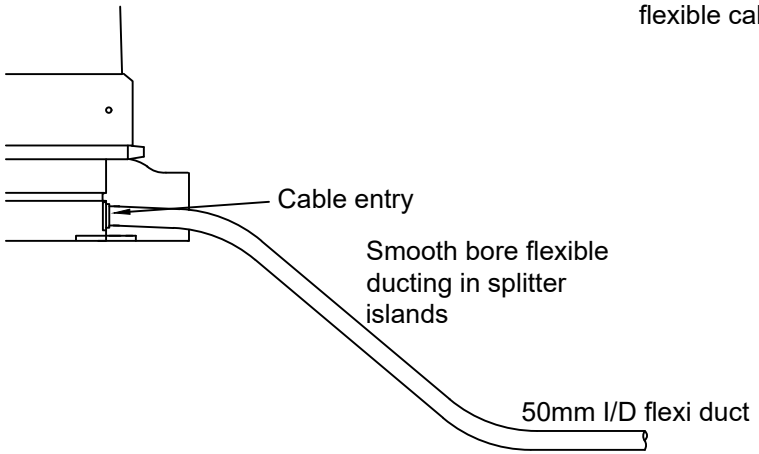
Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Signpost shall comply with the requirements of BS EN 40, BS EN 12899-1 and manufacturers shall be registered with National Highways Sector Scheme 6.
4. Signpost must be Hot-Dipped Galvanised complying with BS EN 1461 and shall be factory finished in Aircraft Grey BS 381C 693 in accordance with the SLS 'Protection Systems'. Passively safe signposts in Aluminium for example shall have natural finish unless otherwise stated, in accordance with the SLS 'Protection Systems'.
5. Passively safe signposts shall be issued with a manufacturers certificate of conformity with the signpost from the manufacturer in accordance with BS EN 12767.
6. Access to the base compartment shall be through a minimum opening of 500 x 100 for all signpost types.
7. Doors shall be fully interchangeable. Orientation of door aperture to be in conjunction with HESD 'Positions of Columns, Brackets and Doors'.
8. The door lock shall be of a non-corrodible clamping design operated by a greased triangular-headed stainless steel screw.
9. Backboards shall be 12mm-18mm non-hygroscopic marine ply treated with clear water repellent and shall not be less than the minimum aperture opening size.
10. Signpost shafts shall not be stepped.
11. The cable entry slot shall be 150 long x 75 wide.
12. All Signposts shall have an earth bolt made from brass where appropriate.
13. Sign plate details shall be found in the sign schedule or on approved drawing(s) in accordance with the Traffic & Safety Engineer requirements.
14. Minimum height to bottom of sign plates shall be when on or adjacent footpaths 2.1M, cycle tracks 2.4M.
15. Sign plates shall generally be externally illuminated or internally illuminated where suitable, for example when attached to a passively safe signpost.
16. Sign lights shall be low wattage, LED with approved UMSO code, either continuously lit or photocell controlled, as per approved drawings in accordance with the Traffic & Safety Engineer requirements.
17. Sign lights shall be able to connect to a 24V AC SELV or a 230V AC LV supply in accordance with approved drawings.
18. Drawing to be read in conjunction with HESD 'Planting Details and Dimensions', HESD 'DNO / IDNO Isolation Arrangements', HESD ' Termination Layouts', and HESD 'SELV Supply and Termination Layouts'.

DERBYSHIRE County Council	Drawing Title: Tubular Signpost	Issue Date: January 2025	Scale: NTS	
	HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines	Drawing No.: HESD03	Issue: B



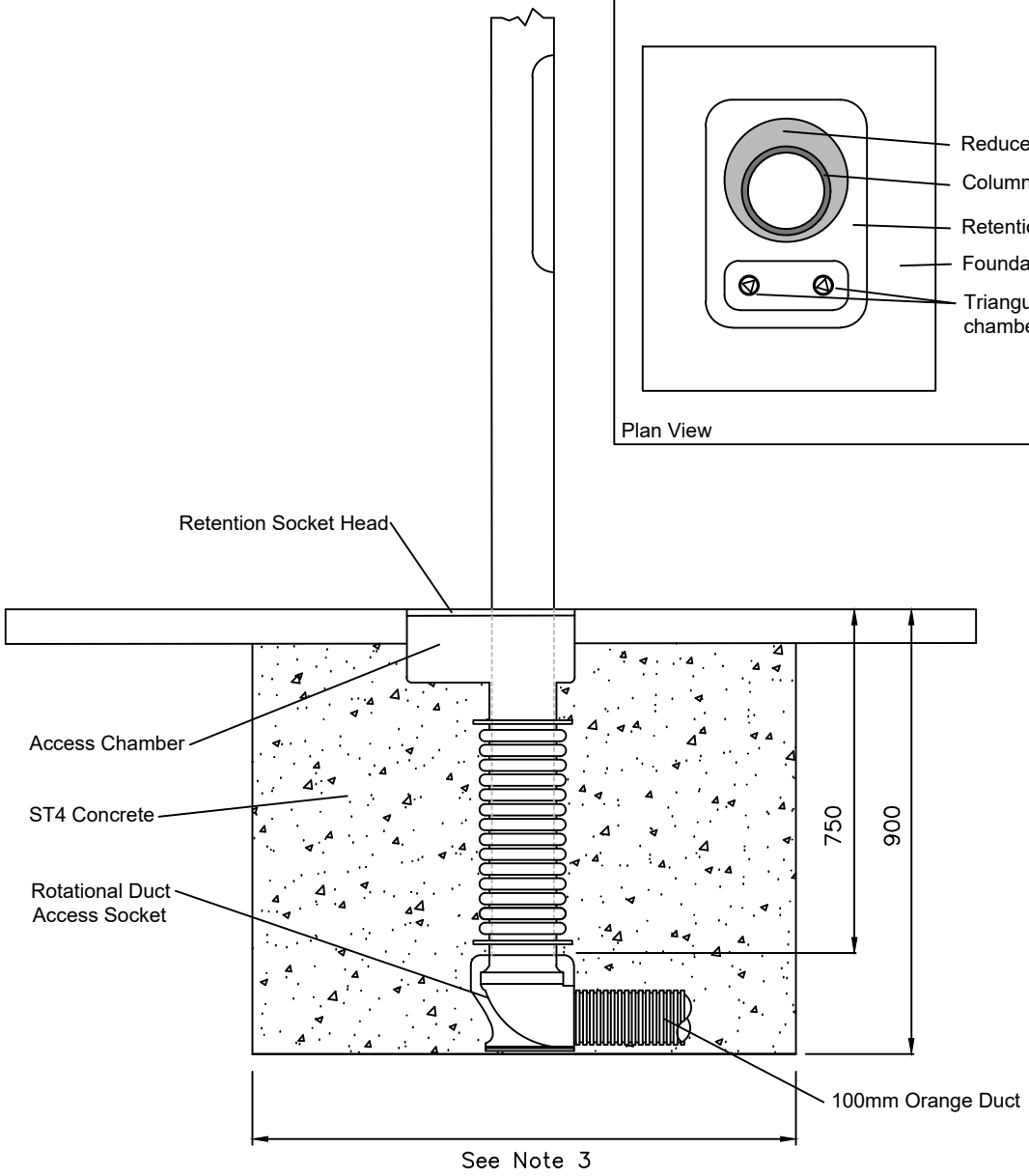


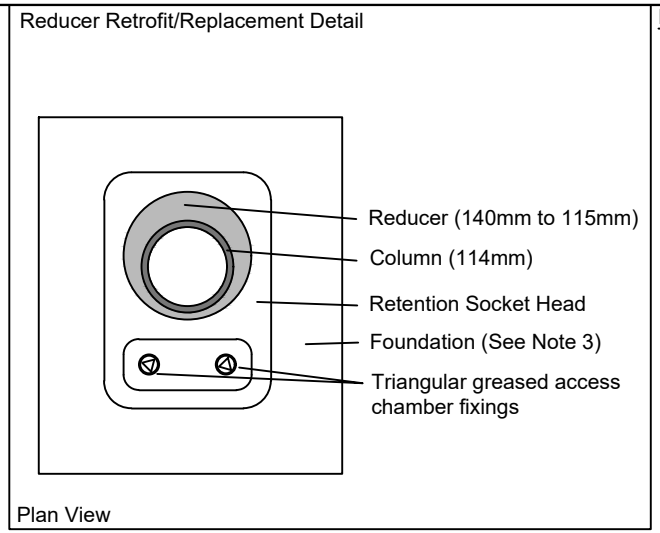


Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Bollards shall comply with the requirements of BS EN 12899-1 and BS EN 12899-2 and manufacturers shall be registered with National Highways Sector Scheme 6.
4. The foundation shall be 600mm x 600mm x 250mm deep concrete grade ST5; using formers or shuttering.
5. The base light must be sited with the sealed cable entry glands facing to the rear of the site. Backboards shall be 12mm-18mm non-hygroscopic marine ply treated with clear water repellent and shall not be less than the minimum aperture opening size.
6. The bollard foundation shall be as manufacturers specification. The level of the concrete foundation must not exceed the underside of the boxed seating collar.
7. All flexible bollard tops shall be fixed to the base using greased galvanised steel nuts & bolts.
8. All bollards shall be numbered using UV-stabilised, self adhesive numerals designed for outdoor use. Numbers to be positioned at the base of the bollard shell as per diagram.
9. Solar or non-illuminated bollards may be accepted but only with written consent from the Traffic & Safety Engineer.
10. All isolation units shall comply with H.S.E. Electricity At Work Regulations 1989, I.E.T. Wiring Regulations BS 7671 and I.L.P. Code of Practice.
11. Double-pole isolating switches shall comply with BS 60947-3.
12. A label with the words 'Caution 24 volt system' shall be permanently fixed to the baseboard in conjunction with HESD 'Cable Identification and Electrical Labels'.
13. Each isolator shall prevent unauthorised interference via a padlock; without the need of additional accessories and shall be clearly marked so as to show which equipment it relates to.
14. All cables to be double insulated into the enclosure.
15. Bollard lantern trays shall be 24V AC SELV, low wattage, LED with approved UMSO code, continuously lit, as per approved drawings.
16. The electrical installation shall be in accordance with HESD 'SELV Supply and Termination Layouts'.

DERBYSHIRE County Council	Drawing Title: Base Lit Traffic Bollard	Issue Date: January 2025	Scale: NTS	
	HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines	Drawing No.: HESD04	Issue: B

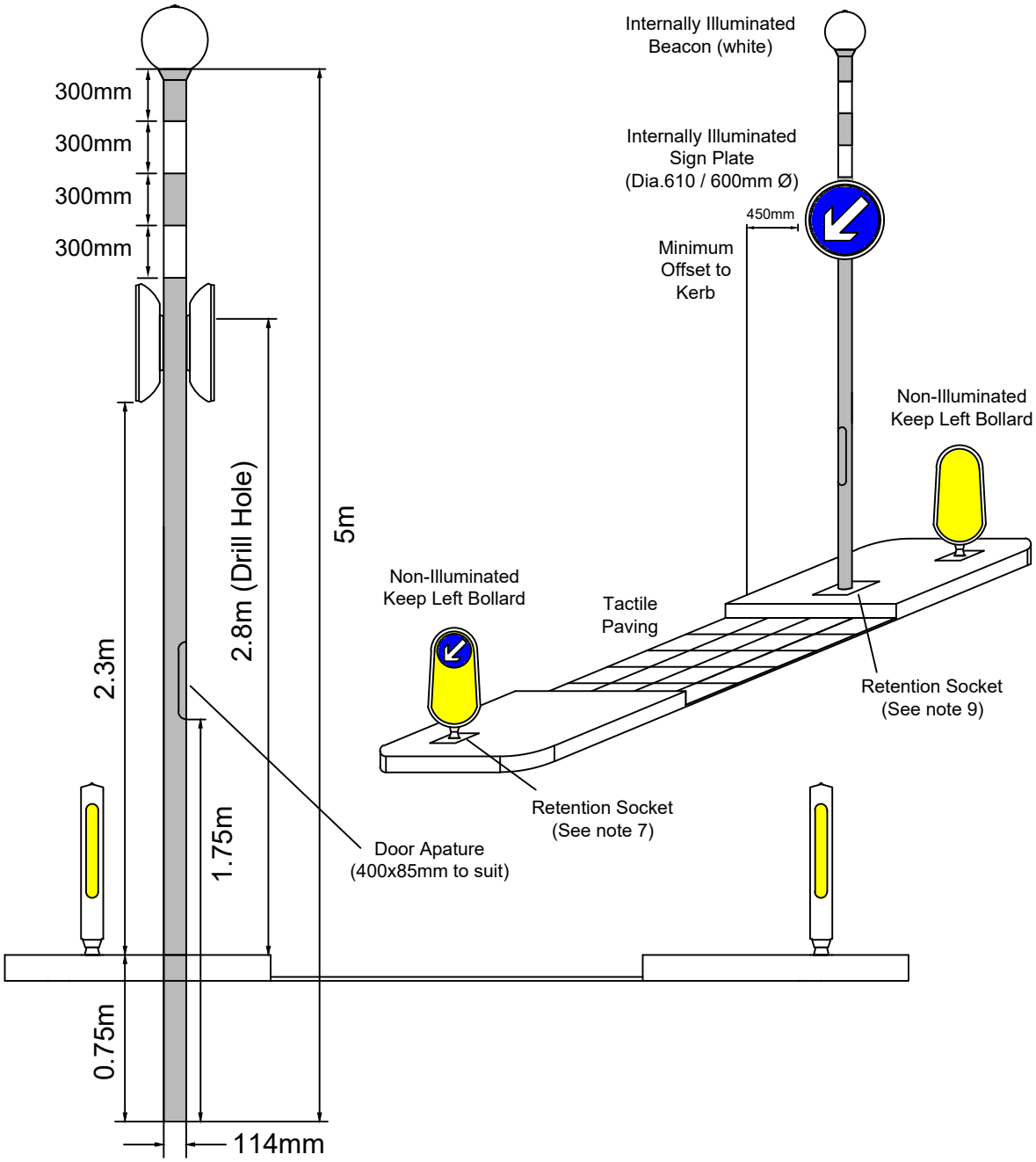




Notes

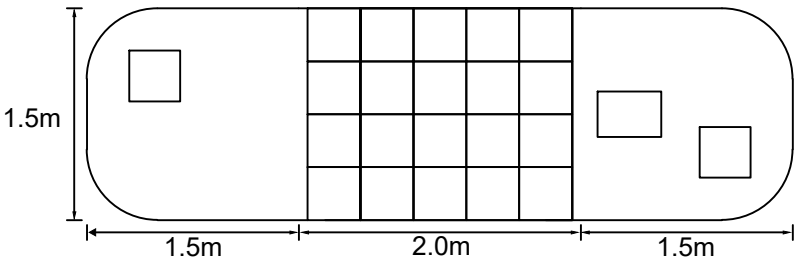
1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Retention socket foundation details to be used as a guide only and should be to manufacturer's specification and suitable for the type of soil.
4. Post planting depth to be in accordance with manufacturer's and retention socket manufacturer's specification.
5. Retention socket shall be capable of withstanding impact forces from vehicle impact to steel posts with wall thickness up to 6mm.
6. Retention socket head shall be constructed of cast steel to ISO 3755 230-450 or ductile iron to BS2789 500-7, galvanised on all surfaces to BS EN ISO 1461.9.
7. All assembly screws shall be M12 A2 stainless steel. With two M16 A2 stainless steel lateral fixing setscrews inside a locking chamber, covered with a locking lid with greased access fixings, EN124-B125 load rated fitted with RS worm lock.
6. Retention socket shall contain a steel protective pressure plate, and supplied with a cover plate to enable the socket to be flush to ground level, with all operating components serviceable on site.
7. The retention socket shall have a 'duckfoot bend' or 'T bend' base which will swivel 360 degrees and accept a 100mm duct, in accordance with approved drawings.
8. In-ground socket arrangement shall be installed with sufficient drainage to prevent standing water within electrical compartment, retention socket or ducting network.
9. When retrofitting into existing wider diameter retention socket a reducer sized to suit shall be obtained from the retention socket manufacturer.
10. All refuge beacon posts shall be passively safe complying with performance class '100:NE:NR:NR:SE:MD:0'.
11. Shallow foundation base may be acceptable with the Street Lighting Engineer or their representatives requirements, in accordance with approved drawings.
12. Detail is indicative of general scenario and shall be in accordance with approved drawings.
13. Ducting network shall be in accordance with HESD 'Chambers and Underground Service Ducts'.

DERBYSHIRE County Council	Drawing Title: Retention Socket		Issue Date: January 2025	Scale: NTS
	HIGHWAY ELECTRICAL STANDARD DETAILS		Approved By: R Baines	Drawing No.: HESD05 / Issue: C



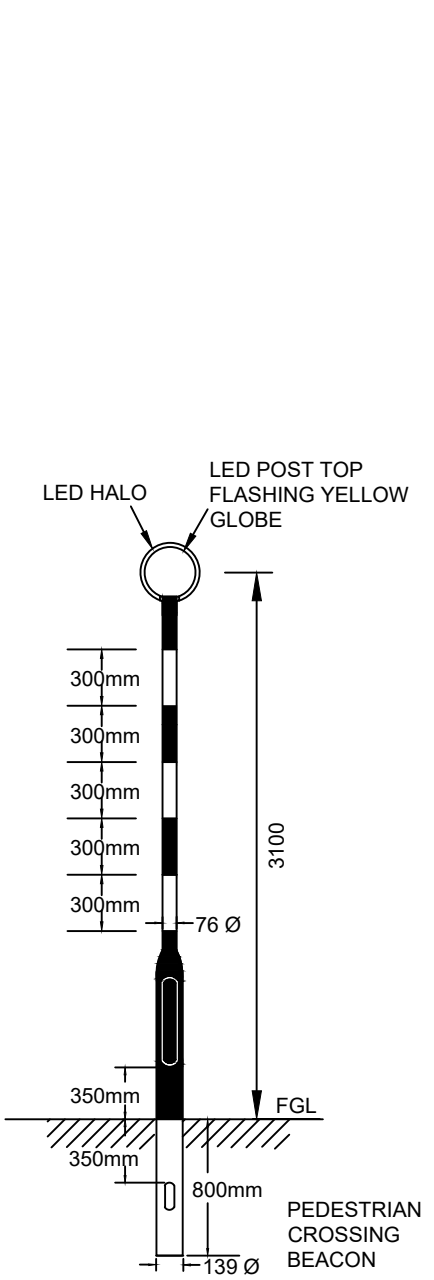
Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. The installation shall be in accordance with National Standards, the Traffic Signs Manual, BS EN 12899, the 'Highway Network Management Plan' and the Traffic & Safety Engineer requirements.
4. Manufacturers of materials shall be registered with National Highway Sector Scheme 6 and Sector Scheme 9A.
5. All foundations shall be to manufacturer's specification.
6. Bollards to comply with BS EN 12767 to 100:NE:A passively safe performance and BS 8442. Constructed of recyclable materials with diamond grade reflective sign face and yellow retroflective to all other faces.
7. Bollard to be installed within 50mm x 50mm retention socket.
8. Refuge beacon post shall comply with BS EN 12767, passively safe performance class '100:NE:NR:NR:SE:MD:0', with protection and final finish shall be Aircraft Grey (BS381C 693) with White (RAL 9016) bands in accordance with SLS 'Protection Systems'.
9. Refuge beacon post to be installed within 115mm Ø x 900mm depth retention socket in accordance with HESD 'Retention Socket'.
10. Refuge beacon post shaft shall not be stepped, aperture doors shall be fully interchangeable, with a door lock constructed of a non-corrodible clamping design operated by a greased triangular-headed stainless steel screw.
11. Backboards shall be 12mm-18mm non-hygroscopic marine ply treated with clear water repellent and shall not be less than the minimum aperture opening size.
12. Beacon and additional sign plate attachments shall be internally illuminated and shall be able to connect to a 24V AC SELV supply.
13. The electrical installation shall be in accordance with HESD 'SELV Supply and Termination Layouts'.

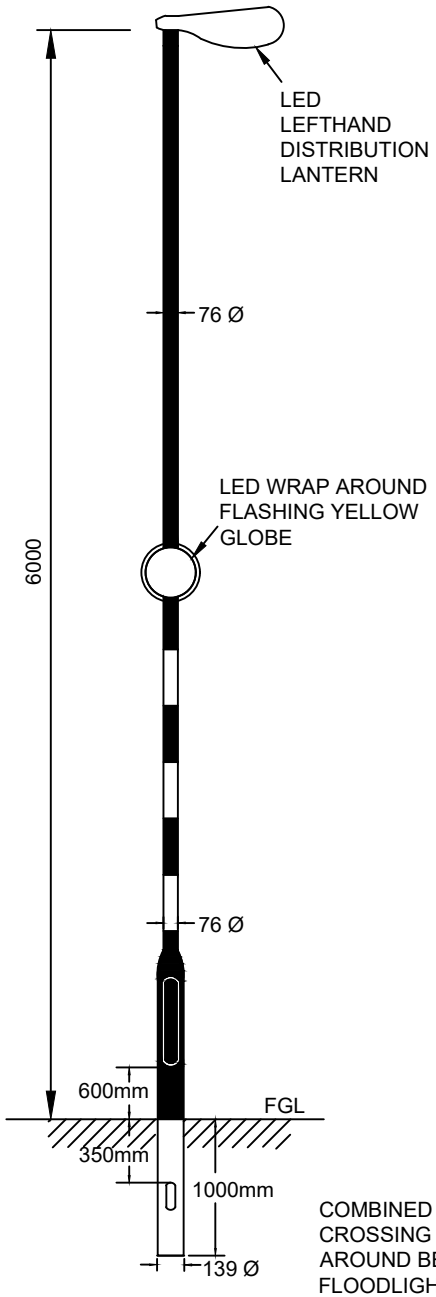


Minimum Refuge Island Dimensions

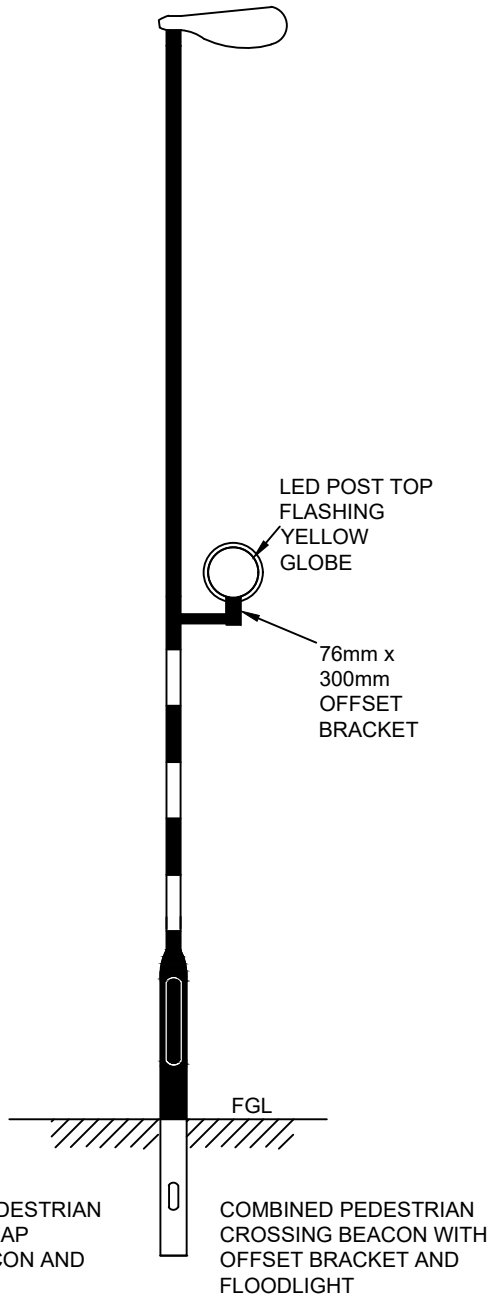
DERBYSHIRE County Council	Drawing Title: Refuge Island		Issue Date: January 2025	Scale: NTS
	HIGHWAY ELECTRICAL STANDARD DETAILS		Approved By: R Baines	Drawing No.: HESD06 / Issue: C



PEDESTRIAN CROSSING BEACON



COMBINED PEDESTRIAN CROSSING WRAP AROUND BEACON AND FLOODLIGHT

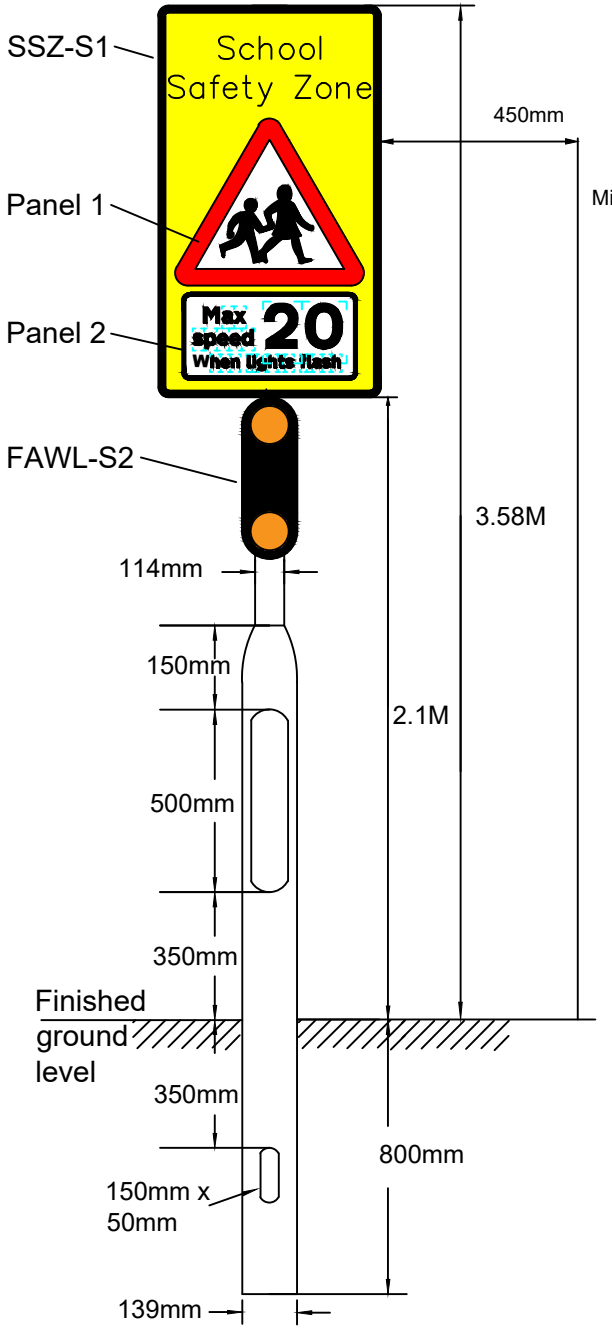


COMBINED PEDESTRIAN CROSSING BEACON WITH OFFSET BRACKET AND FLOODLIGHT

Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Manufacturers shall be registered with National Highways Sector Scheme 6.
4. Posts shall be tubular steel and comply with the requirements of BS EN 40, galvanised to BS EN 1461 and be factory finished in black RAL9005, with bands in white RAL9016 as shown in accordance with the SLS 'Protection Systems'.
5. Orientation of door aperture to be in conjunction with HESD 'Positions of Columns, Brackets and Doors'.
6. Doors shall be fully interchangeable.
7. The door lock shall be of a non-corrodible clamping design operated by a greased triangular-headed stainless steel screw.
8. Backboards shall be 12mm-18mm non-hygroscopic marine ply treated with clear water repellent and shall not be less than the minimum aperture opening size.
9. All posts shall have an earth bolt made from brass where appropriate.
10. Beacons shall be LED internally lit have an external LED halo and continuously flash unless stated otherwise on approved drawings in accordance with the Traffic & Safety Engineer requirements.
11. Beacons shall be positioned in alignment with white lining maintaining 450mm minimum clearance to the carriageway edge and 1.2M footway behind post in accordance with approved drawings.
12. Where 1.2M footway clearance cannot be achieved posts maybe positioned at back of footways utilising the offset bracket arrangement but only in accordance with approved drawings.
13. Drawing to be read in conjunction with HESD 'Planting Details and Dimensions'.

DERBYSHIRE County Council	Drawing Title: Pedestrian (Zebra) Crossing Beacon		Issue Date: January 2025	Scale: NTS
	HIGHWAY ELECTRICAL STANDARD DETAILS		Approved By: R Baines	Drawing No.: HESD07 / Issue: B



Sign Ref.	SSZ-S1
Diag No.	N/A
Text	Black
Background	Yellow
Border	Black
X Height	100 mm
Width	800 mm
Height	1410 mm
Area	1.13 SqM
Material	Class 1

Sign Ref.	Panel 1
Diag No.	545
Symbol	Black
Background	White
Border	Red
X Height	N/A
Width	600 mm
Height	N/A
Area	0.18 SqM
Material	Class 1

Sign Ref.	Panel 2
Diag No.	N/A
Text	Black
Background	White
Border	Black
X Height 1	100 mm
X Height 2	40 mm
X Height 3	32 mm
Width	635 mm
Height	315 mm
Area	0.20 SqM
Material	Class 1

Sign Ref.	FAWL-S2
Diag No.	4004
Casing	Black
Lights	Amber
Flashing	Alternant
Type	LED
Width	210 mm
Height	640 mm

Notes

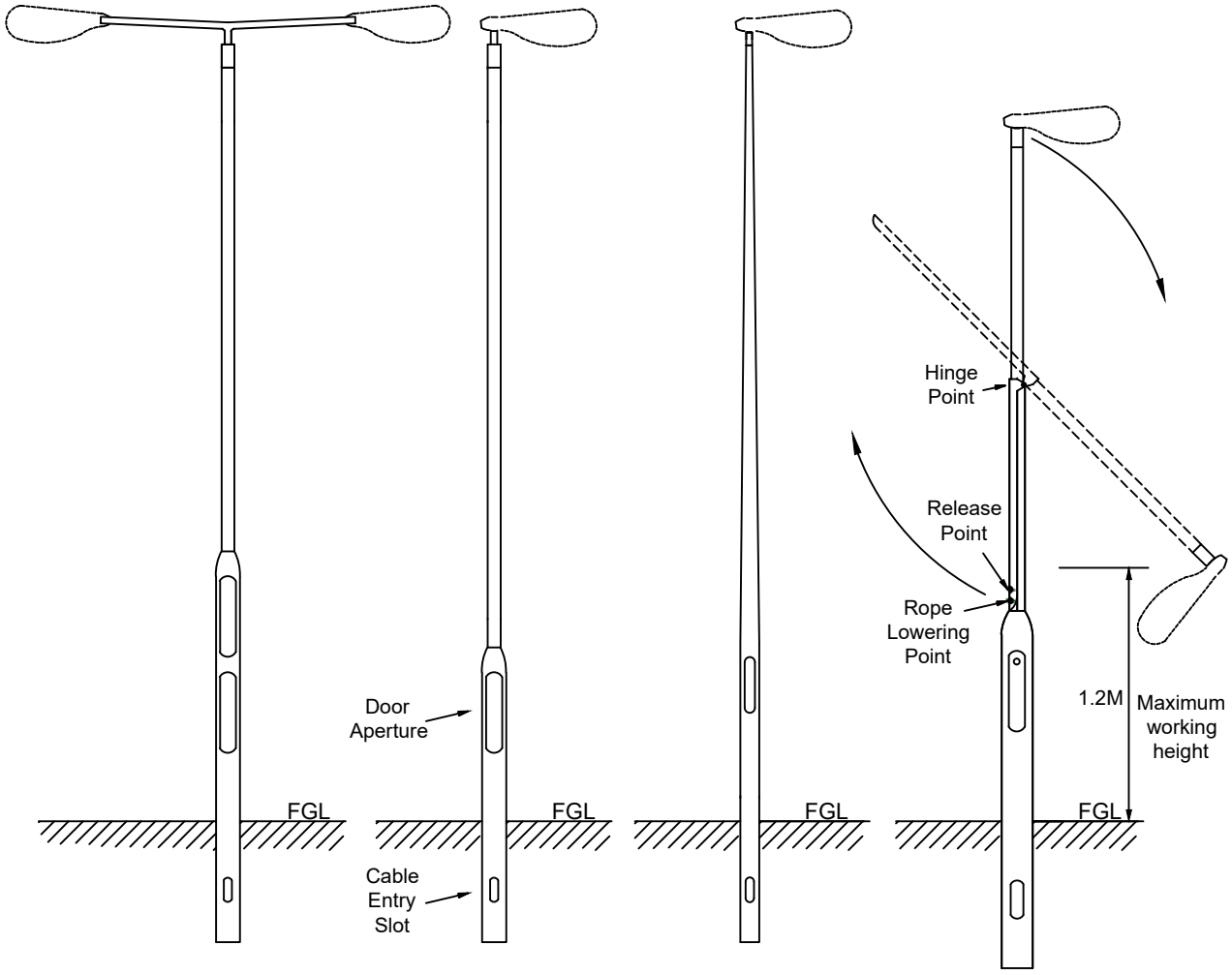
1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Signpost shall comply with the requirements of BS EN 40, BS EN 12899-1 and manufacturers shall be registered with National Highways Sector Scheme 6.
4. Signpost shall comply with HESD 'Tubular Signpost'.
5. Signpost must be Hot-Dipped Galvanised complying with BS EN 1461 and shall be factory finished in Aircraft Grey BS 381C 693 in accordance with the SLS 'Protection Systems'.
6. Orientation of door aperture to be in conjunction with HESD 'Positions of Columns, Brackets and Doors'.
7. Doors shall be fully interchangeable.
8. The door lock shall be of a non-corrodible clamping design operated by a greased triangular-headed stainless steel screw.
9. Backboards shall be 12mm-18mm non-hygroscopic marine ply treated with clear water repellent and shall not be less than the minimum aperture opening size.
10. Amber warning lights shall be controlled in accordance with the current DCC specification.
11. Sign plates must be to current DCC specification and approved drawings in accordance with the Traffic & Safety Engineer requirements.
12. Drawing to be read in conjunction with HESD 'Planting Details and Dimensions'.

DERBYSHIRE County Council

Drawing Title	Issue Date	Scale
School Safety Zone Sign with Flashing Amber Warning Lights	January 2025	NTS
HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines / Drawing No.: HESD08 / Issue: B	

Table 1

Design Lantern	Windage (m²)	Weight (kg)
12m column	0.29	18.5
10m column	0.25	18.5
8m column	0.25	12
6m column	0.15	8
5m column	0.15	8

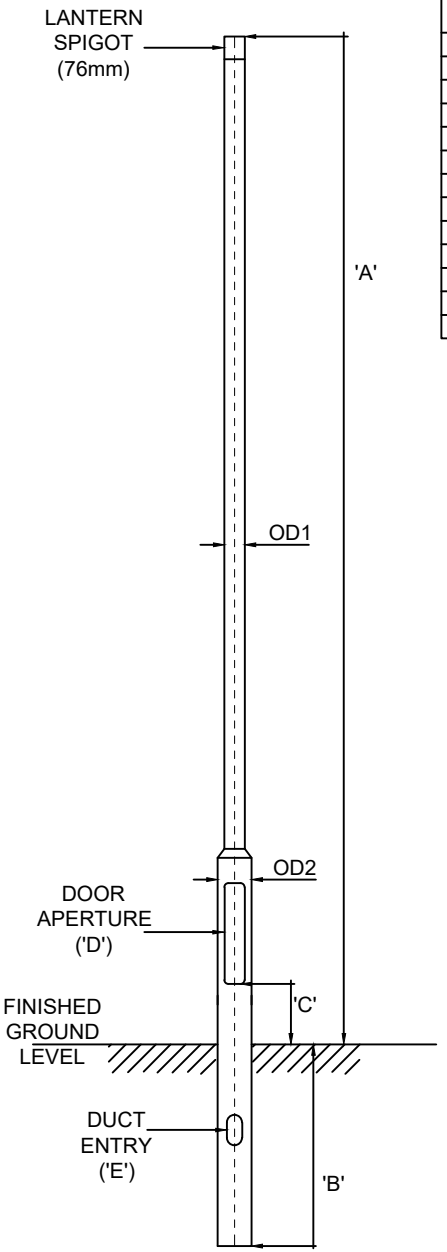


Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Columns shall comply with the requirements of BS EN 40 and manufacturers shall be registered with National Highways Sector Scheme 6.
4. Steel columns must be Hot-Dipped Galvanised complying with BS EN 1461 and shall be factory finished in Derbyshire Green RAL6006 in accordance with the SLS 'Protection Systems'.
5. Passively safe columns in Aluminium for example shall be factory finished in Derbyshire Green RAL6006 in accordance with the SLS 'Protection Systems' unless otherwise stated on approved drawings.
6. Doors shall be fully interchangeable, and door locks shall be of a non-corrodible clamping design operated by a greased triangular-headed stainless steel screw.
7. Backboards shall be 12mm-18mm non-hygroscopic marine ply treated with clear water repellent and shall not be less than the minimum aperture opening size.
8. Column shafts shall not be stepped.
9. All columns shall have an earth bolt made from brass where appropriate.
10. Column spigots shall be 76mm in diameter.
11. Twin arm brackets shall have 0.3M projection unless otherwise stated.
12. Twin arm columns shall have two base compartments.
13. All column / bracket combinations shall be fitted with a castelated or other approved anti-rotational device.
14. Passively safe columns shall be issued with a manufacturers certificate of conformity with the column from the manufacturer in accordance with BS EN 12767.
15. Base-hinged columns may also be acceptable with prior approval from the street lighting engineer
16. 'Table 1' shall be used in the 'Design of Columns' unless modified in the specification.
17. The size of the base compartment and cable entry slot shall be in accordance with HESD 'Planting Details and Dimensions'
18. Column positions and orientations shall be in accordance with HESD 'Positions of Columns, Brackets and Doors'.

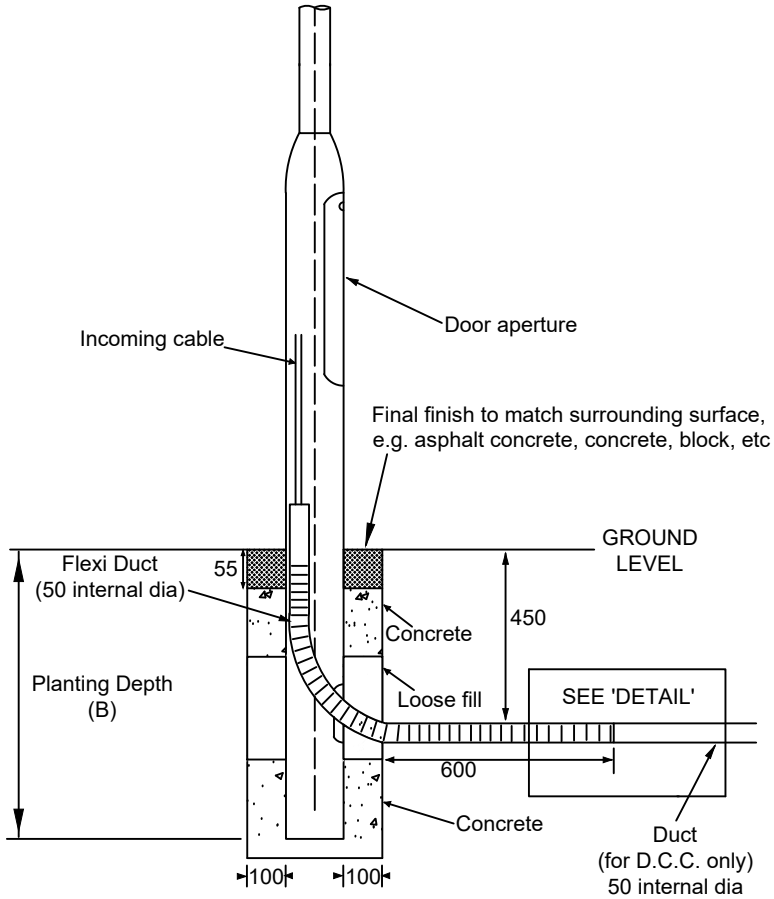
DERBYSHIRE County Council

Drawing Title	Issue Date	Scale
Tubular Columns	January 2025	NTS
HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines / Drawing No.: HESD09 / Issue: B	



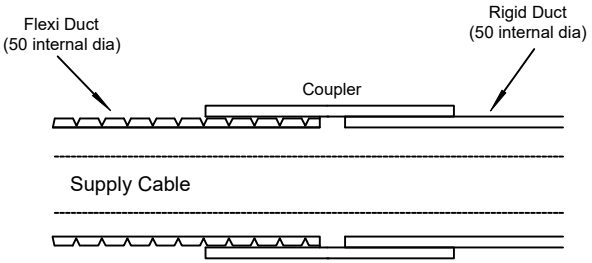
POST TOP DIMENSIONS (Guide Only - See Note 3)

TYPE	HEIGHT (M)	OD1	OD2	'A'	'B'	'C'	'D'	'E'
COLUMN	5	76	139	5000	800	600	500x100	150x75
COLUMN	6	76	139	6000	1000	600	500x100	150x75
COLUMN	8	89	168	8000	1200	600	600x115	150x75
COLUMN	10	114	168	10000	1500	1000	600x115	150x75
COLUMN	12	139	192	12000	1700	1000	600x115	150x75
MID HINGED	5	76	139	5000	1000	450	600x100	150x75
MID HINGED	6	76	139	6000	1000	450	600x100	150x75
SIGN POST	3.05	76	139	3050	800	350	500x100	150x75
SIGN POST	3.58	76	139	3580	800	350	500x100	150x75
SIGN POST	3.58	89	139	3580	800	350	500x100	150x75
SIGN POST	3.58	114	139	3580	800	350	500x100	150x75



Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Dimensions table to be used as a guide only; all columns or sign posts must be installed in accordance with manufacture's details.
4. Foundation details to be used as a guide only. Foundations should be suitable for the type of soil in accordance with manufacturer's guidance.
5. Orange rigid and flexible duct shall only be fitted where the service is on Highway Authority private network. It shall extend past the concrete footing with a draw rope installed and tied to both door fixing bar and duct end.
6. Joints between ducts e.g. the orange flexi and rigid duct shall be as 'Detail'.
7. Items 5 and 6 shall not apply if service connection works are by the Distribution Network Operator (DNO) or Independent Distribution Network Operator (IDNO).
8. Item 7 duct specification must be confirmed by the DNO or IDNO.
9. Sign post details shall be found in the sign schedule or on approved drawing(s) in accordance with the Traffic & Safety Engineer requirements.
10. Minimum height to bottom of sign plates shall be when on or adjacent footpaths 2.1M, cycle tracks 2.4M.



DUCT JOINT 'DETAIL'

DERBYSHIRE County Council

Drawing Title: Planting Details and Dimensions

Issue Date: January 2025

Scale: NTS

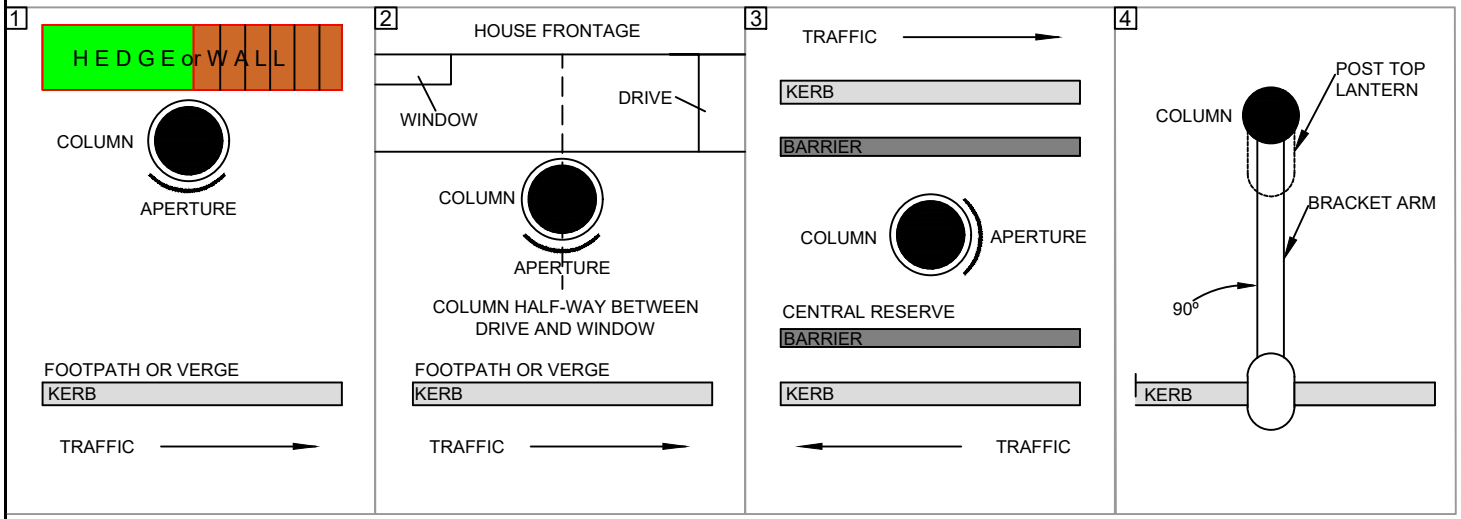
HIGHWAY ELECTRICAL STANDARD DETAILS

Approved By: R Baines

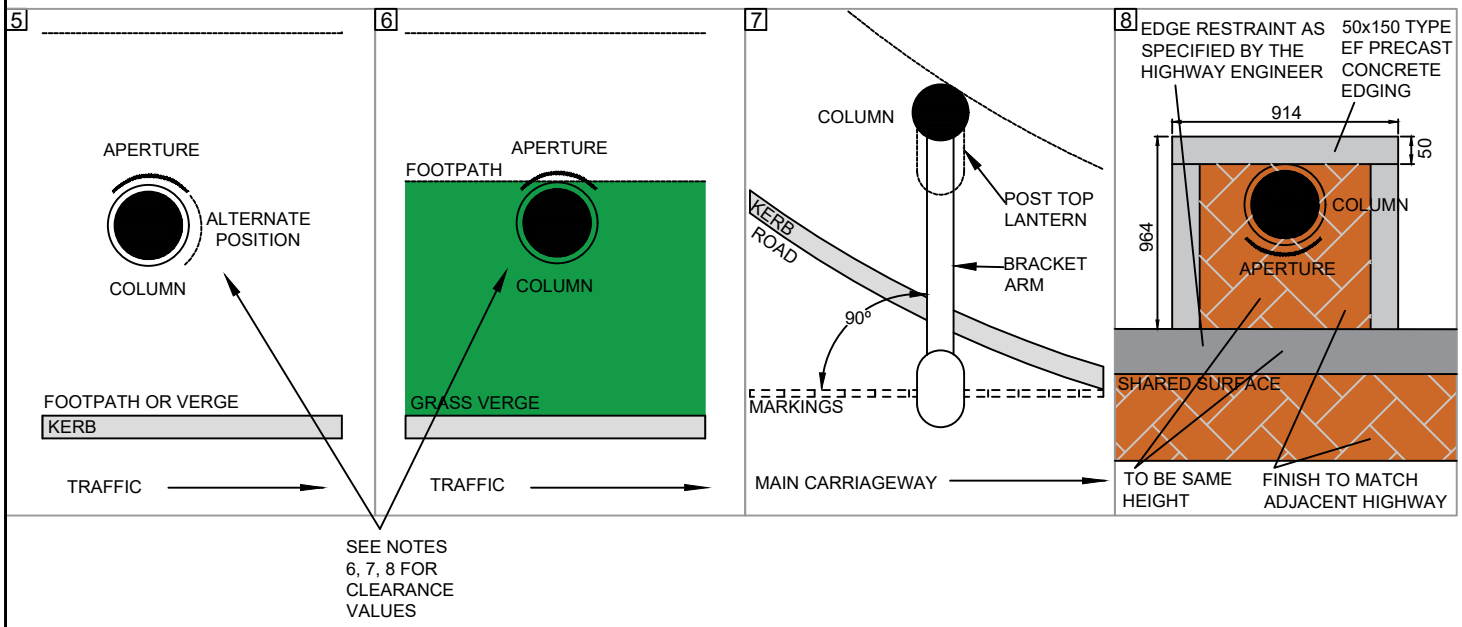
Drawing No.: HESD10

Issue: B

STANDARD POSITIONS - (1 to 4)



ALTERNATIVE POSITIONS - (5 to 8)



SEE NOTES 6, 7, 8 FOR CLEARANCE VALUES

CASTELLATION DETAIL

Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Erection of lighting columns along the roadways shall be such that the luminaries shall be located on a line parallel to the theoretical profile of the road.
4. The alignment of the columns both horizontally and vertically must be carried out to the satisfaction of the Engineer.
5. The position of column apertures illustrated are for guidance only and must be agreed with the Engineer before the columns are erected.
6. The orientation of column brackets must be agreed by the Engineer before columns are erected.
7. Recommended minimum clearances from edge of carriageway to face of lighting column; BS 5489: Table 1
8. In conjunction with note 7 where horizontal clearance to the carriageway edge is less than 1M column apertures shall be aligned away from oncoming traffic to allow an operative to work facing the oncoming traffic.
9. In conjunction with note 8 if solid objects block access column apertures shall be aligned facing the carriageway with approval from the Street Lighting Engineer or their representative.
10. Castellation detailed with minimum requirements. Application and alterations of Castellations shall be applied with approval of the Street Lighting Engineer or their representative.

TABLE 1

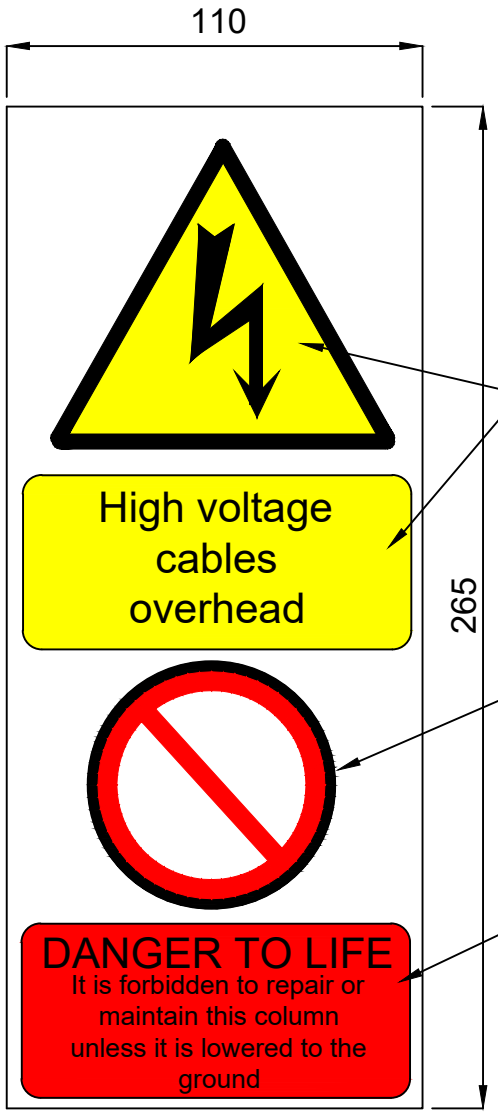
Design Speed mph	Horizontal Clearance M
≤30	0.8
40 to 50	1.0
60 to 70	1.5

DERBYSHIRE County Council

Drawing Title: Positions of Columns, Brackets and Doors		Issue Date: January 2025	Scale: NTS
HIGHWAY ELECTRICAL STANDARD DETAILS		Approved By: R Baines	Drawing No.: HESD11 / Issue: B

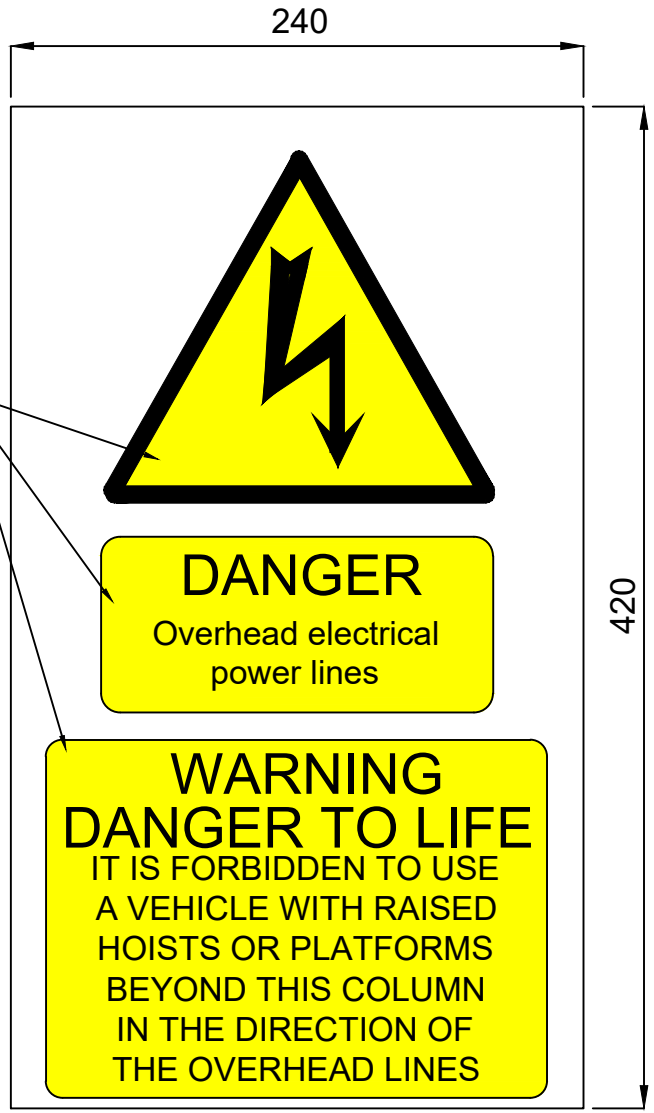
High Voltage

Sign type I



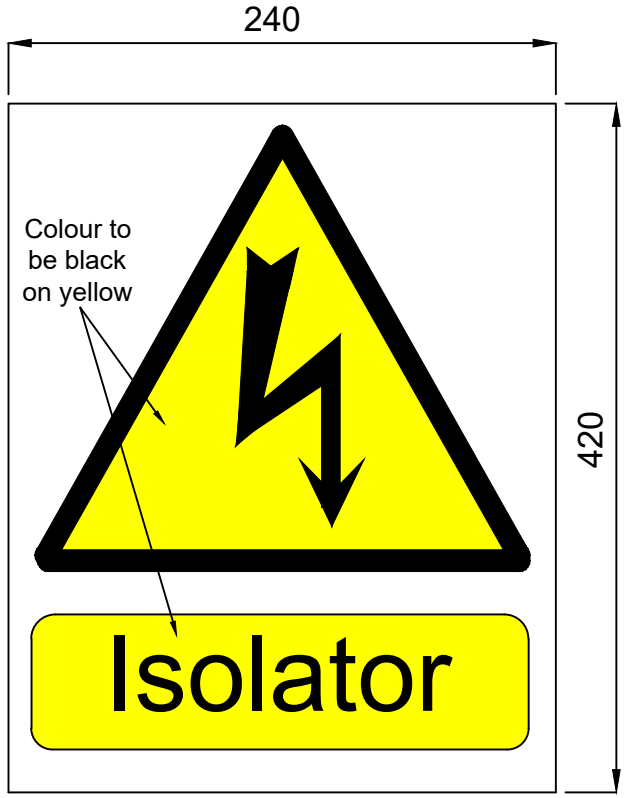
High Voltage

Sign type II



Notes

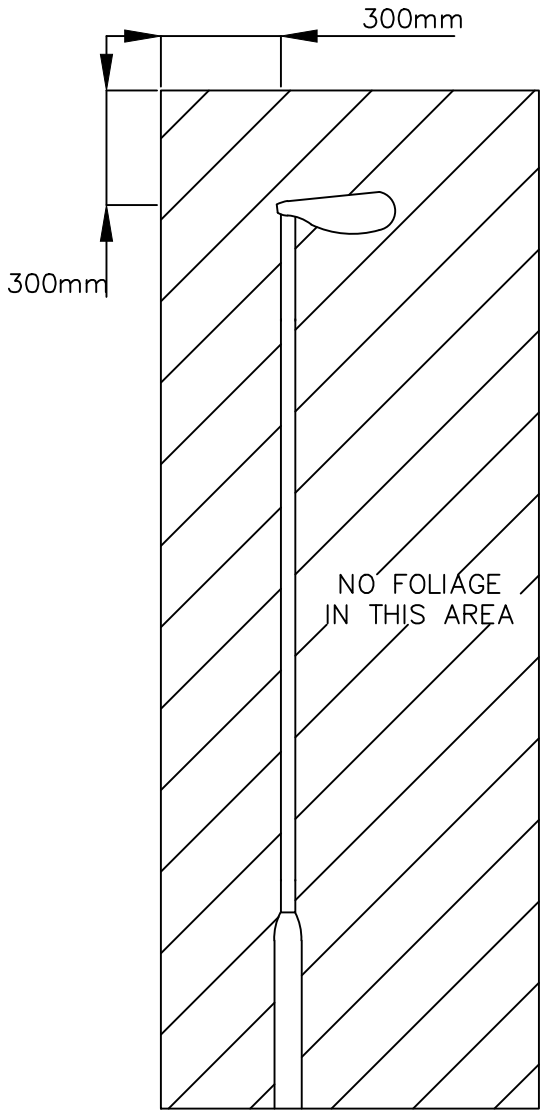
1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Background to be white.
4. Signs to be constructed of 3mm Aluminium plate with sign fix channel and faced with Class 1 traffic sign material bonded to it.
5. Each sign should be mounted 2.5m above ground level and facing the carriageway.
6. All metal fixings should be stainless steel.
7. Drilling of columns will not be permitted.
8. Sign shall be in accordance with BS ISO 3864: Part 1.



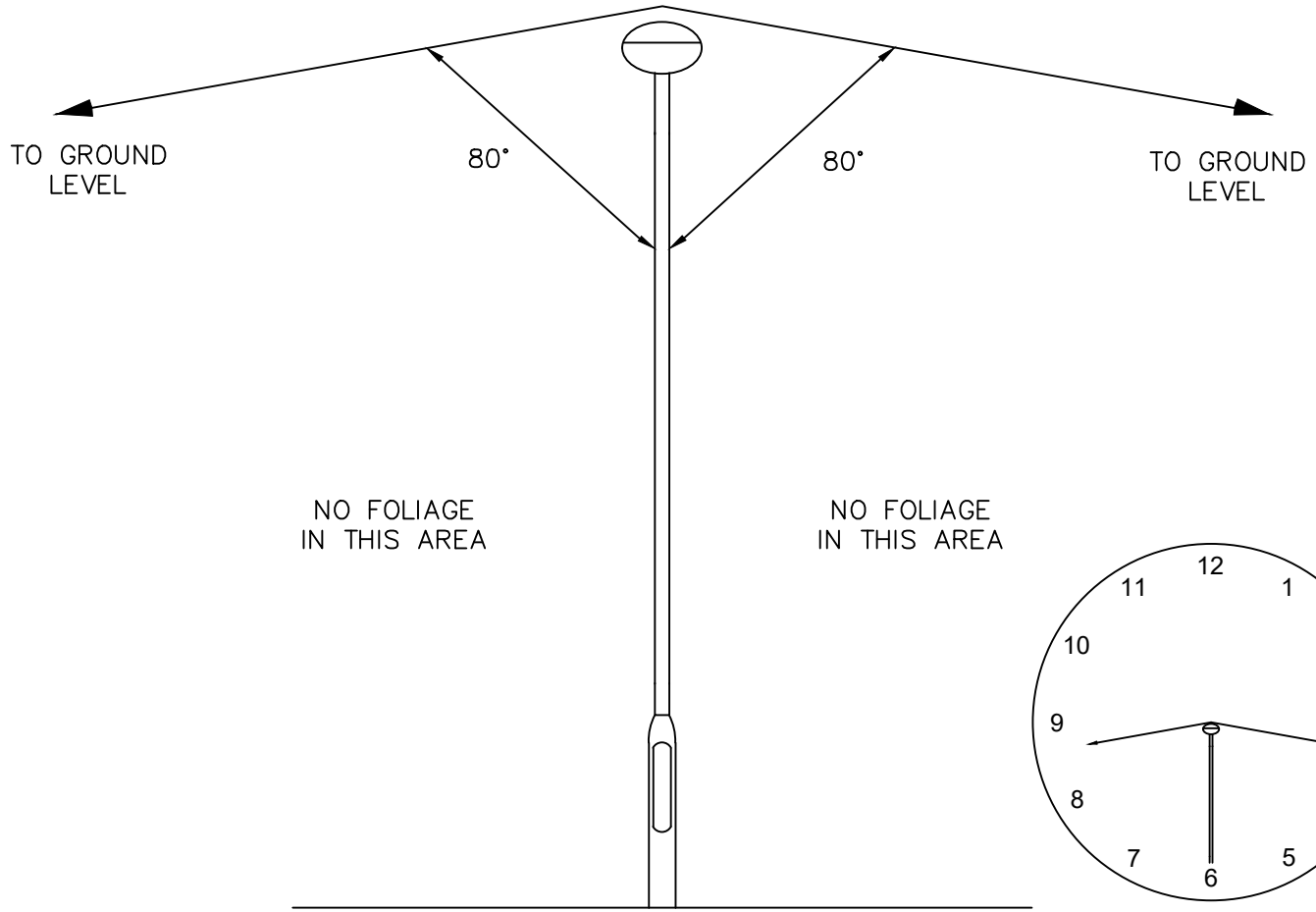
DERBYSHIRE County Council	Drawing Title: Warning Notices	Issue Date: January 2021	Scale: NTS
	HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines / Drawing No.: HESD12	Issue: A

Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. No trees or shrubs shall be planted in a position which will adversely affect either the operational capability or maintenance access of any street light or illuminated sign post, throughout the lifetime of the installation.



SIDE VIEW



FRONT VIEW

DERBYSHIRE County Council	Drawing Title: Foliage Clearances	Issue Date: January 2025	Scale: NTS
	HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines / Drawing No.: HESD13	Issue: B

Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. All isolation units shall comply with H.S.E. Electricity At Work Regulations 1989, BS 7671 I.E.T. Wiring Regulations and I.L.P. Code of Practice.
4. A label to BS 7671:514.13.1 & BS 951 with the words "Safety Electrical Connection - Do Not Remove" shall be permanently fixed at the earth terminal; as HESD 'Cable Identification and Electrical Labels'.
5. Double-pole isolating switches shall comply with BS 60947-3.
6. Each isolator shall prevent unauthorised interference via a padlock; without the need of additional accessories and shall be clearly marked so as to show which equipment it relates to.
7. Position of isolation shall be either external visible or clearly and reliably marked.
8. Fuse ratings for BS 88 fuses are required for a single lamp operating from a 230V supply, also in accordance with approved drawings and schematic diagrams.
9. Isolator sign shall be fixed to the column shaft 1.8m from ground level as HESD 'Warning Notices', where external sub-circuit is utilised.
10. Isolation arrangements shown can be utilised within a mini-pillar installation, refer to HESD 'Feeder Pillars' for pillar details.
11. All cables shall be double insulated into enclosures.
12. Where mini-pillar is utilised for external mounted equipment outgoing cable(s) should be 2.5mm² / 3 core Hi-Tuf, H07RN-F or similar impact resistant flexible cable and shall be protected to a height in excess of 2.5M with cable capping or galvanised steel conduit.
13. Earth block can be omitted if isolator earth terminal allows. A special earth block/terminal may be required to allow for earth electrode connection.
14. An earth electrode shall be provided at feeder pillars or supply points which service more than one item of highway electrical street furniture and, at the end of every circuit servicing more than one item of highway electrical street furniture and, shall not exceed 20 ohms in accordance with BS7430.

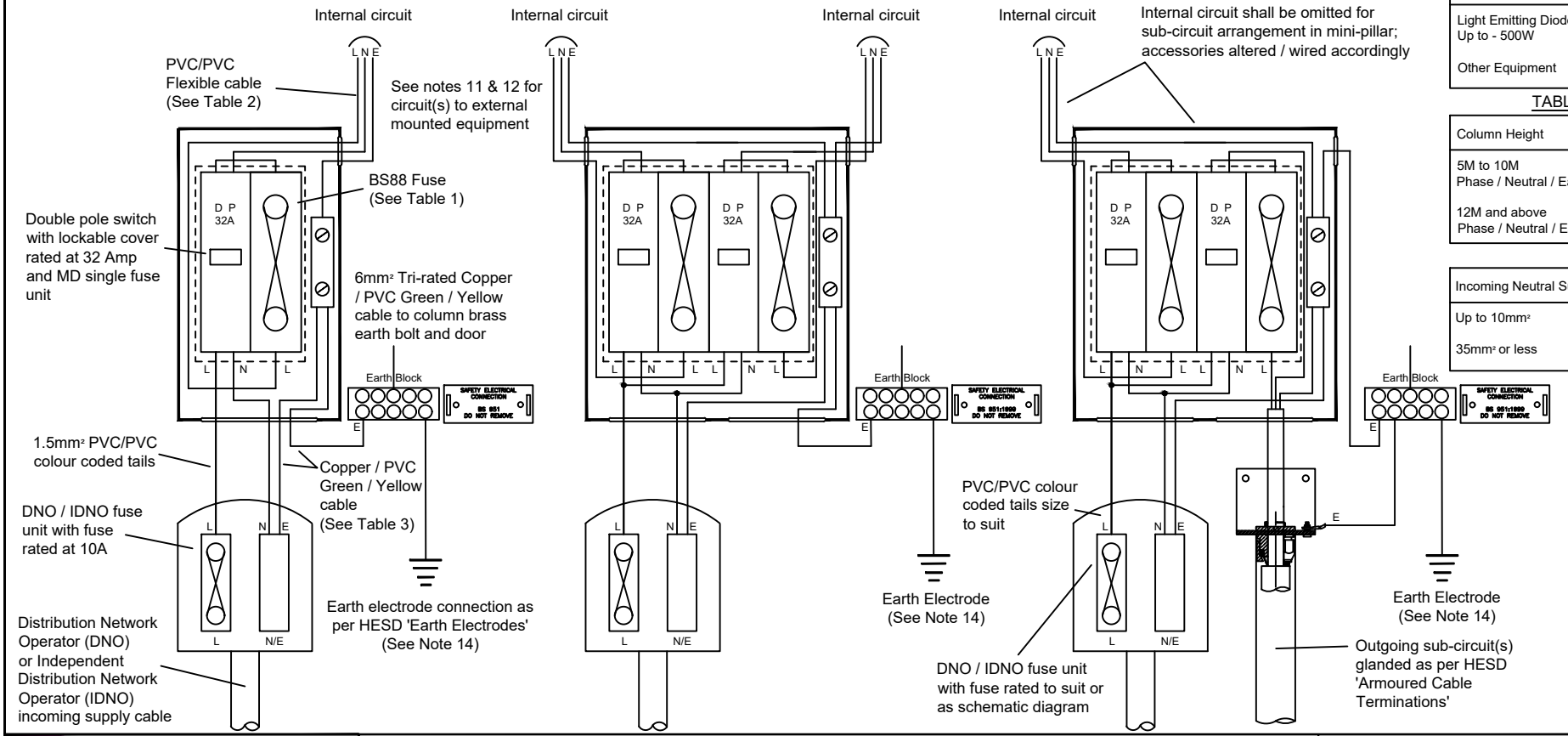


TABLE 1

Light Source Type	Fuse Rating
Light Emitting Diode (LED) Up to - 500W	4A
Other Equipment	To Suit

TABLE 2

Column Height	Cable Size
5M to 10M Phase / Neutral / Earth	1.5mm²
12M and above Phase / Neutral / Earth	2.5mm²

TABLE 3

Incoming Neutral Supply Cable Size	Earth Size
Up to 10mm²	6mm²
35mm² or less	10mm²

DERBYSHIRE County Council	Drawing Title: DNO / IDNO Isolation Arrangements	Issue Date: January 2025	Scale: NTS
	HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines / Drawing No.: HESD14	Issue: B

Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. All isolation units shall comply with H.S.E. Electricity At Work Regulations 1989, BS 7671 I.E.T. Wiring Regulations and I.L.P. Code of Practice.
4. Double-pole isolating switches shall comply with BS 60947-3.
5. Extension boxes, additional terminal blocks etc. may be fitted as required.
6. All cables shall be double insulated into enclosures.
7. All cables including passively safe sensor cables shall be terminated to 'Type I' on HESD 'Armoured Cable Terminations' and fixed to backboard and identified with labels in conjunction with HESD 'Cable Identification and Electrical Labels' and street lighting engineer or their representative's requirements. 'Type II' may be utilised for passively safe installations with prior approval from the street lighting engineer or their representative.
8. A label to BS 7671:514.13.1 & BS 951 with the words "Safety Electrical Connection - Do Not Remove" shall be permanently fixed at the earth terminal; as HESD 'Cable Identification and Electrical Labels'.
9. Each isolator shall prevent unauthorised interference via a padlock; without the need of additional accessories and shall be clearly marked so as to show which equipment it relates to.
10. Isolator sign shall be fixed to the column shaft 1.8m from ground level as HESD 'Warning Notices', where external sub-circuit is utilised.
11. Termination layouts shown can be utilised within a mini-pillar installation, refer to HESD 'Feeder Pillars' for pillar details.
12. Where mini-pillar is utilised for external mounted equipment outgoing cable(s) should be 2.5mm² / 3 core Hi-Tuf, H07RN-F or similar impact resistant flexible cable and shall be protected to a height in excess of 2.5M with cable capping or galvanised steel conduit.
13. Earth block can be omitted if isolator earth terminal allows. A special earth block/terminal may be required to allow for earth electrode connection.
14. An earth electrode shall be provided at feeder pillars or supply points which service more than one item of highway electrical street furniture and, at the end of every circuit servicing more than one item of highway electrical street furniture and, shall not exceed 20 ohms in accordance with BS7430.

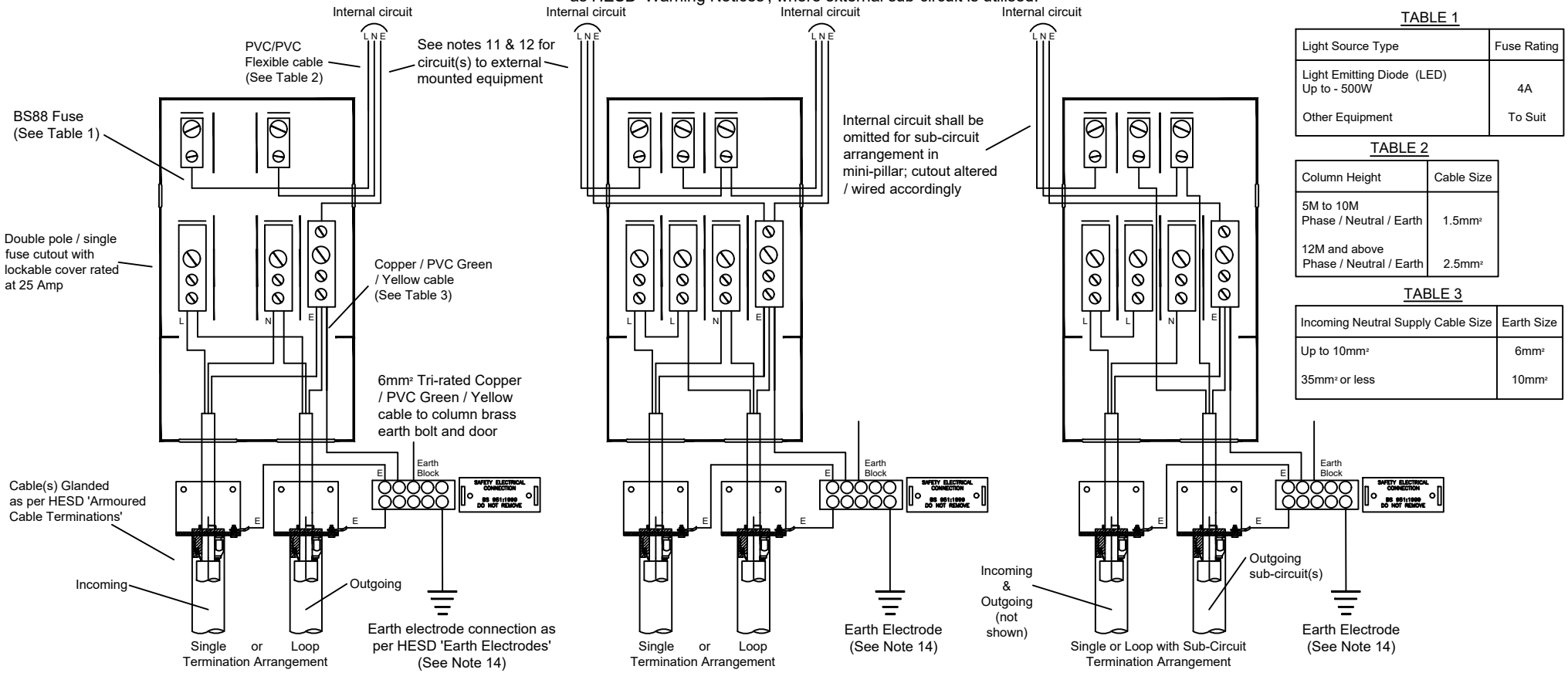


TABLE 1

Light Source Type	Fuse Rating
Light Emitting Diode (LED) Up to - 500W	4A
Other Equipment	To Suit

TABLE 2

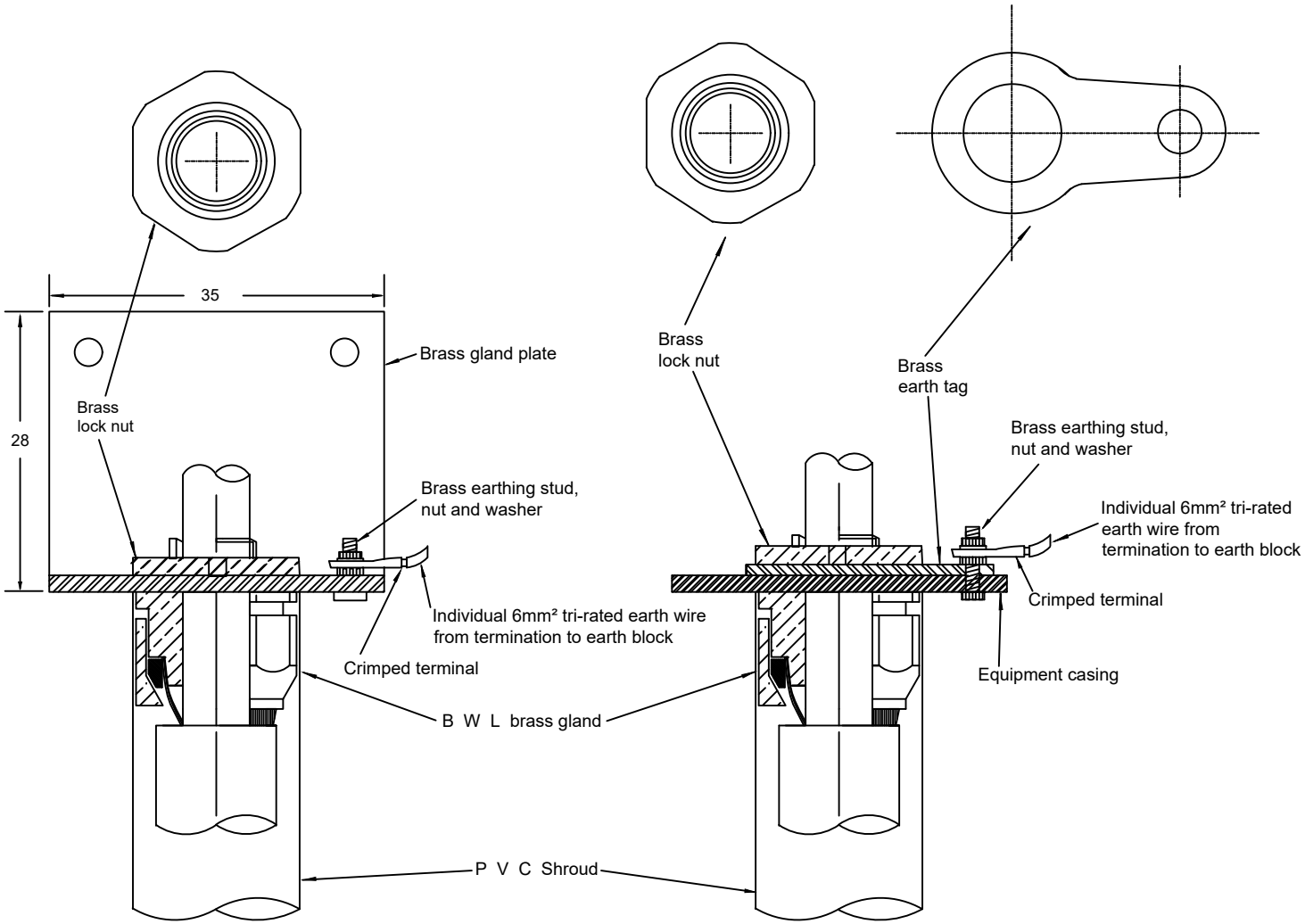
Column Height	Cable Size
5M to 10M Phase / Neutral / Earth	1.5mm²
12M and above Phase / Neutral / Earth	2.5mm²

TABLE 3

Incoming Neutral Supply Cable Size	Earth Size
Up to 10mm²	6mm²
35mm² or less	10mm²

DERBYSHIRE County Council

Drawing Title	Issue Date	Scale
Termination Layouts	January 2025	NTS
HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines / Drawing No.: HESD15 / Issue: B	



TYPE I

TYPE II

Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Termination glands shall be in accordance with BS6121-1 & BS EN 62444. Cable Earth Termination (CET) Glands / cable terminations using jubilee clamps or similar are prohibited.
4. 'Type I' to be normally used for terminating in the base of columns, signs, pillars etc.
5. 'Type II' to be used if adequate space is unavailable for 'Type I' terminations with prior approval from the street lighting engineer or their representative.
6. Labels to be fitted above lock nut on 'Type I' and below locknut on 'Type II'.
7. Each 'Type I' gland plate shall accommodate only one gland.
8. Depth of gland plate not less than 55mm.
9. PVC shroud to be a tight fit on cable sheath and gland.
10. If required, colour identification shall be achieved via sleeving of the exposed core as follows:

    Grey = Green / Yellow
    Black = Blue
    Brown = Brown

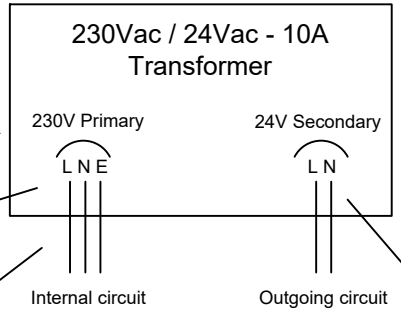
DERBYSHIRE County Council

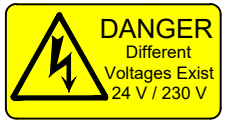
Drawing Title	Issue Date	Scale
Armoured Cable Terminations	January 2025	NTS
HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines / Drawing No.: HESD16 / Issue: B	

Supply Detail

Transformer to be positioned in suitable location generally at the top of backboard in column or mini-pillar; enclosure to be utilised in larger feeder pillars

Transformer to have built in thermal and short circuit protection



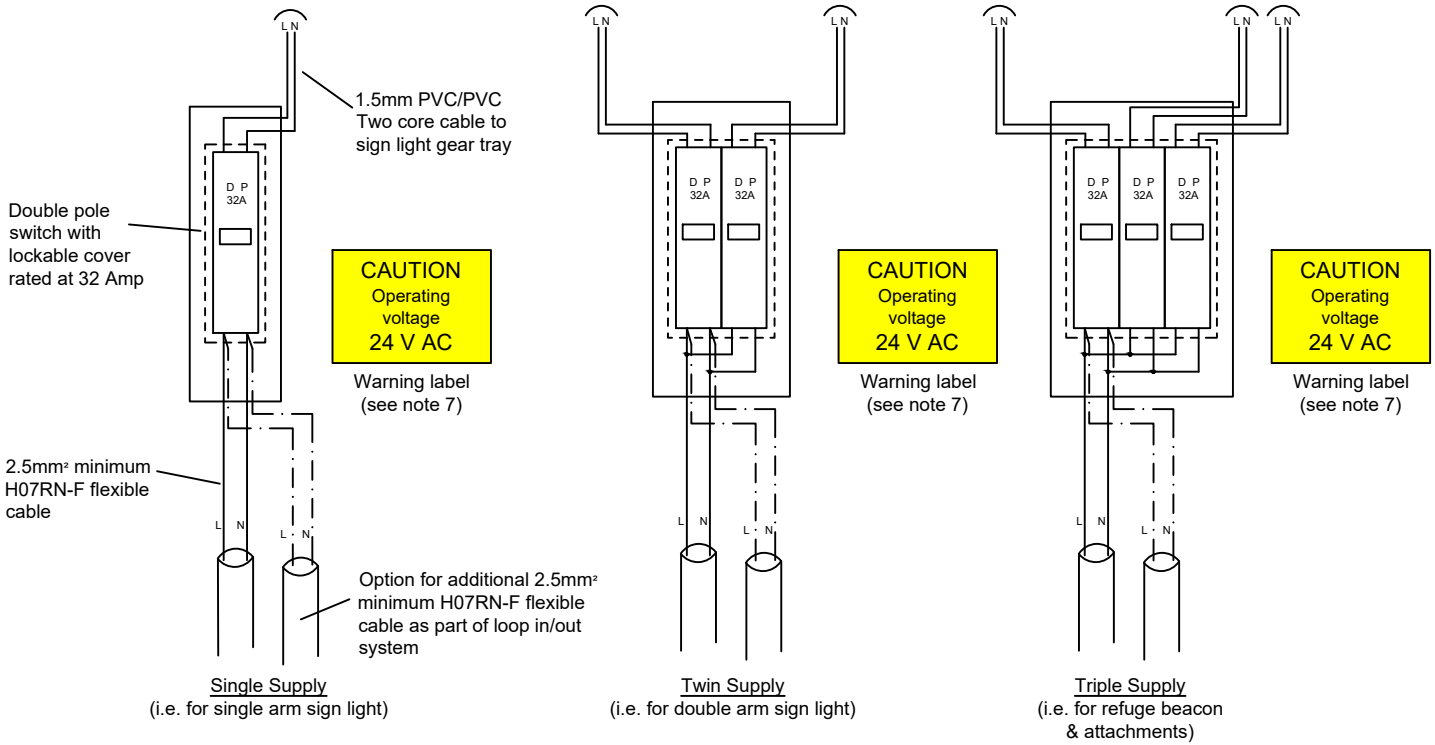


Warning label to HESD 'Cable identification and warning labels' shall be fixed near to or on the apparatus

Secondary side of transformer to be connected to outgoing 24v sub-circuit (2.5mm² minimum H07RN-F flexible cable) via additional 25mm terminal blocks contained in isolator or cutout enclosure

Internal circuit from isolator, cutout or pillar internals refer to relevant type of supply, i.e.
Third Party - HESD 'DNO / IDNO Isolation Arrangements'
Private - HESD 'Termination Layouts' or HESD 'Pillar Internals'

Termination Layout Details



Single Supply
(i.e. for single arm sign light)

Twin Supply
(i.e. for double arm sign light)

Triple Supply
(i.e. for refuge beacon & attachments)

Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. All isolation units shall comply with H.S.E. Electricity At Work Regulations 1989, I.E.T. Wiring Regulations BS 7671 and I.L.P. Code of Practice.
4. Double-pole isolating switches shall comply with BS 60947-3.
5. Each isolator shall prevent unauthorised interference via a padlock; without the need of additional accessories and shall be clearly marked so as to show which equipment it relates to.
6. All cables to be double insulated into the enclosure.
7. Termination layouts shall have a label with the words 'Caution 24 volt system' shall be permanently fixed to the baseboard, in conjunction with HESD 'Cable Identification and Electrical Labels'.
8. Outgoing circuits to be wired in 2.5mm² minimum H07RN-F flexible cable or to suit in accordance with approved drawings and manufacturer's guidance.
9. Plug and socket arrangement in electrical assets may be acceptable with prior approval from the street lighting engineer or their representative.

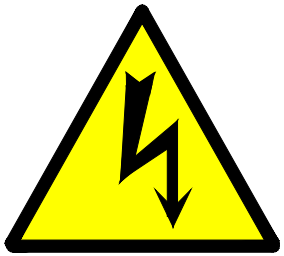
DERBYSHIRE County Council	Drawing Title: SELV Supply and Termination Layouts	Issue Date: January 2025	Scale: NTS
	HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines / Drawing No.: HESD17	Issue: B

ELECTRICAL LABELS TO BS7671

CAUTION
This installation has wiring colours to two versions of BS7671

Great care should be taken before undertaking extension, alteration or repair that all conductors are correctly identified

TO BE FIXED NEAR TO OR ON THE ISOLATION EQUIPMENT



DANGER
400 Volts

TO BE FIXED NEAR TO OR ON THE ISOLATION EQUIPMENT OF APPARATUS OPERATING AT 400 V (3–PHASE)

SAFETY ELECTRICAL CONNECTION
BS 951
DO NOT REMOVE

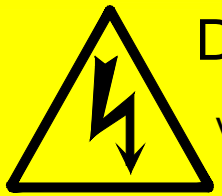
TO BE FIXED AT OR NEAR THE POINT OF CONNECTION OF EVERY BONDING CONDUCTOR TO AN EXTRANEOUS CONDUCTIVE–PART

WARNING
Surge Protection Device (SPD) Installed

TO BE FIXED NEAR THE ORIGIN OF THE INSTALLATION

CAUTION
Operating voltage
24 V AC

TO BE FIXED TO OR NEAR THE ISOLATION EQUIPMENT OF 24V APPARATUS



DANGER
Different Voltages Exist
24 V / 230 V

TO BE FIXED NEAR TO OR ON THE ISOLATION EQUIPMENT OF APPARATUS OPERATING AT DIFFERENT VOLTAGES

IMPORTANT

This installation should be periodically inspected and tested and a report on its condition obtained, as prescribed in IET Wiring Regulations BS7671 Requirements for Electrical Installations

Date of inspection.....

Recommended date of next inspection.....

TO BE FIXED NEAR THE ORIGIN OF THE INSTALLATION

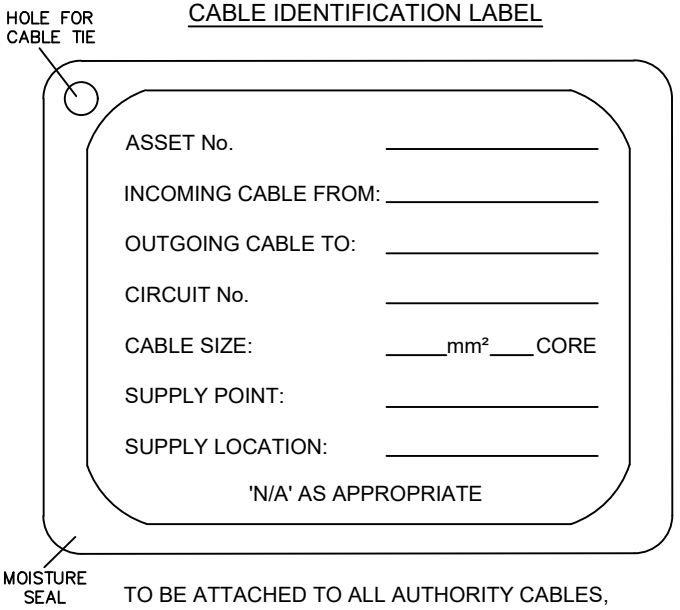
This installation, or part of it, is protected by a device which automatically switches off the supply if an earth fault develops.
Test six–monthly by pressing the button marked 'T' or 'Test'. The device should switch off the supply and should then be switched on to restore the supply. If the device does not switch off the supply when the button is pressed, seek expert advice.

TO BE FIXED TO OR NEAR THE RESIDUAL CURRENT DEVICE

Notes

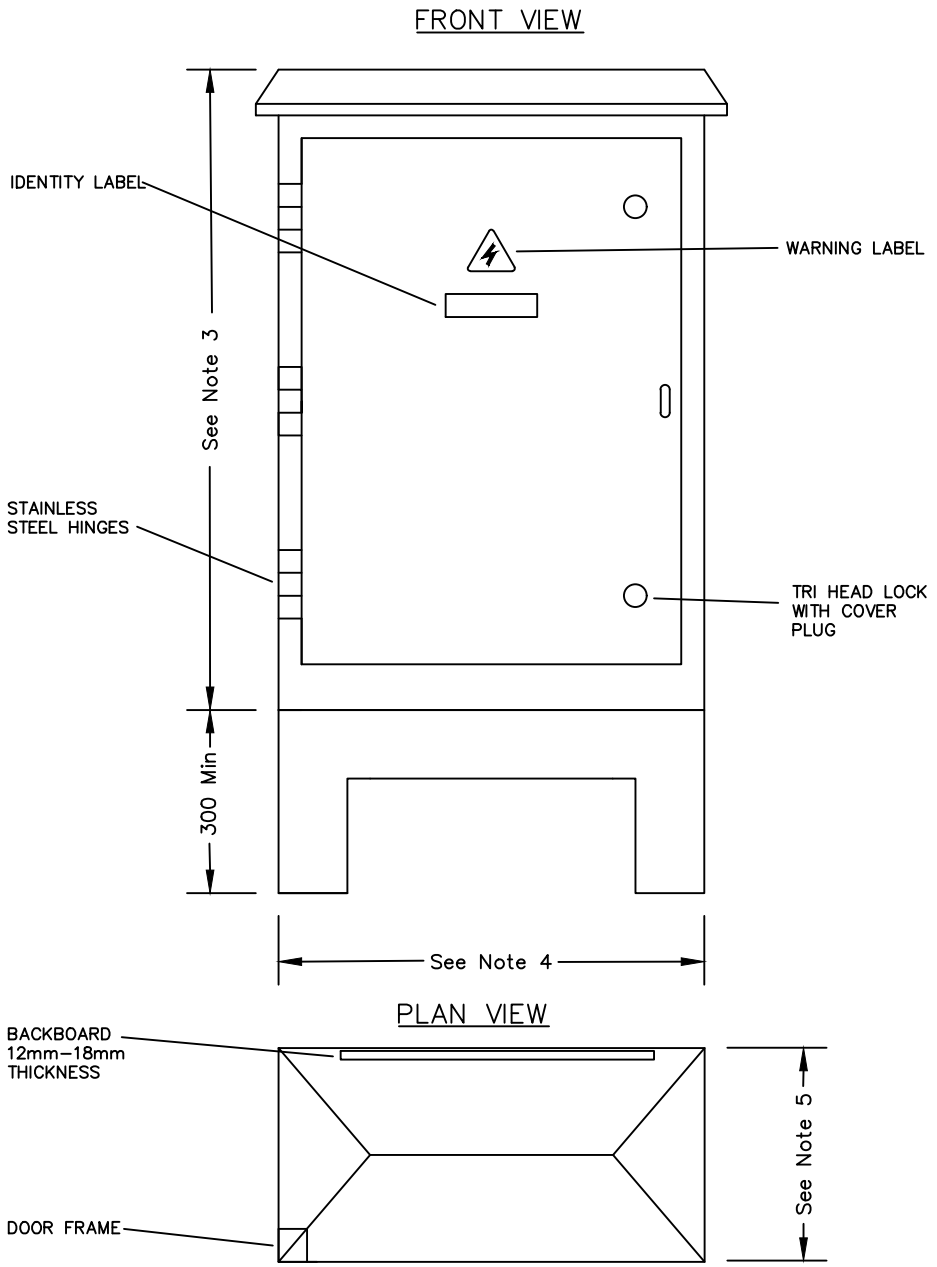
1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Cable labels shall be laminated using 85mm x 65mm laminations and attached to cables using cable ties fitted above gland plates. All relevant information shall be typed on the label prior to laminating, with a punch hole for the cable tie positioned as not to compromise the label information compartment or moisture seal.
4. All labels shall be fixed in a prominent and clearly visible location
5. Labels as applicable shall be in accordance with BS ISO 3864: Part 1.
6. Labels as applicable shall be in accordance with BS7671. In addition with safety electrical connection in accordance with BS 951.
7. A label to BS7671:514.10.1 shall be permanently fixed at or near the isolation point of apparatus that nominally exceeds 230V.

CABLE IDENTIFICATION LABEL



TO BE ATTACHED TO ALL AUTHORITY CABLES, INDIVIDUALLY TO 'INCOMING' AND 'OUTGOING' CABLES INCLUDING SUPPLY, PASSIVELY SAFE SENSOR AND SELV CIRCUITS.

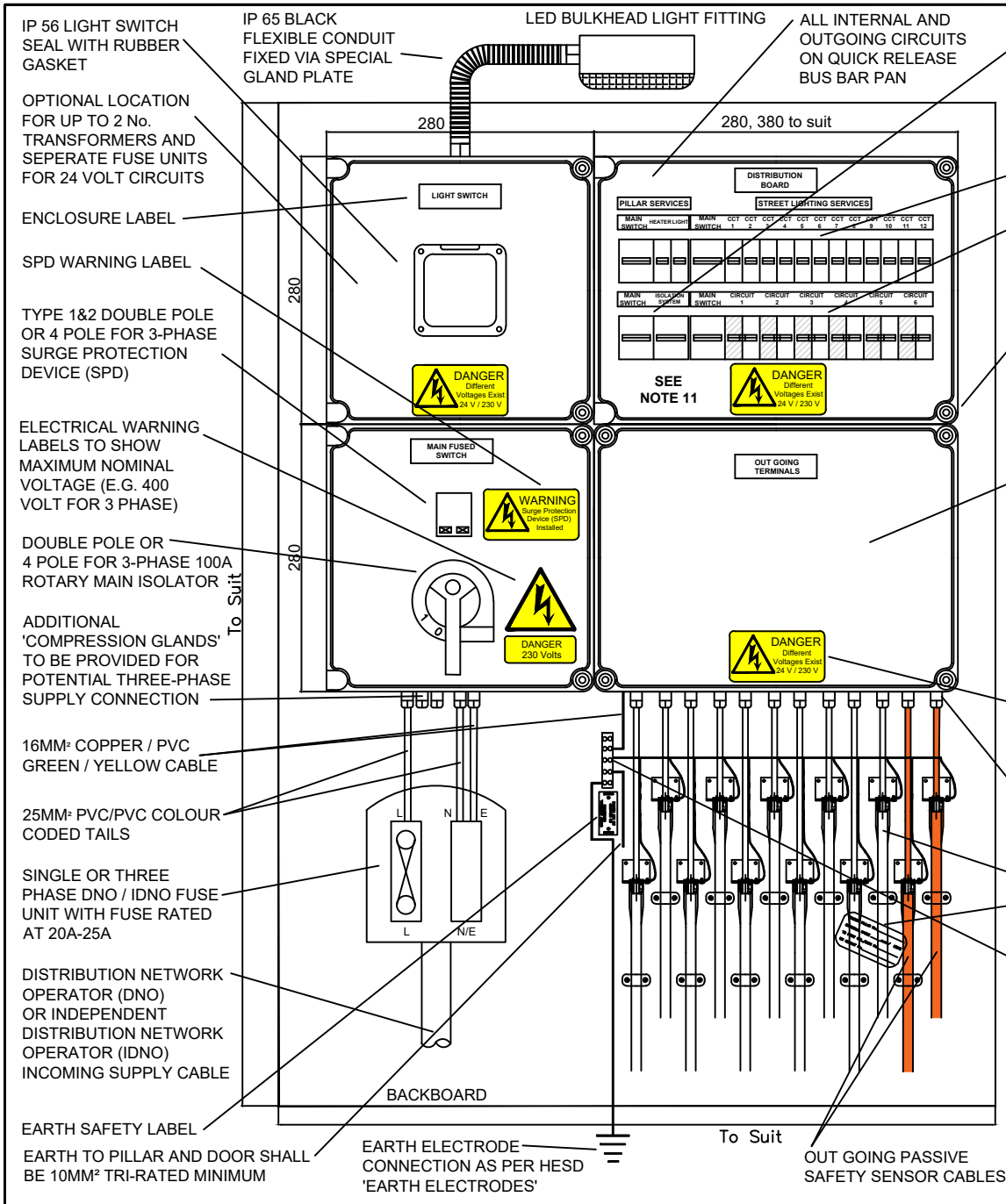
DERBYSHIRE County Council	Drawing Title: Cable Identification and Electrical Labels	Issue Date: January 2025	Scale: NTS
	HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines / Drawing No.: HESD18	Issue: B



Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Feeder Pillar minimum height dimension should not be less than 760mm.
4. Feeder Pillar width 150mm, 300mm, 450mm, 600mm or as per approved drawings.
5. Feeder Pillar depth measurement not less than 200mm. (Feeder Pillars 150mm wide will be 150mm deep)
6. Pillar shall be manufactured from 3mm Steel plate, 5mm over 450mm wide to BS EN 10111 and be Hot Dip Galvanised to BS EN ISO 1461, welds to BS EN 1011-1 or from Stainless Steel sheet to BS EN 10088 and welds to BS EN 1011-3.
7. Pillars shall give 'IP54' protection to BS EN 60529 and be factory finished in Derbyshire Green (RAL6006) in accordance with the SLS 'Protection Systems'.
8. Root section to be protected against corrosion to 100mm above ground level. Pillars above 450mm wide to have detachable root.
9. Door to be fitted with weather seal to give protection to IP65. Door hinges to be stainless steel; greased and fixed internally with stainless steel studs to allow door to open through 180 degrees. Door locks to be tri-head, greased and fitted with cover plugs.
10. Backboards shall have a 5mm air gap and be 12mm-18mm non-hygroscopic marine ply treated with clear water repellent and shall maximise available space on rear of the pillar and shall not be less than the minimum aperture opening size.
11. All pillars shall be fitted with a brass earth bolt.
12. Warning label of a semi-rigid PVC or polycarbonate construction fixed in position with stainless steel rivets to have: BS ISO 3864: Part 1 Hazard Signs with graphical 'Electrical Lightning Bolt' symbol; above the words: "Danger - Electric Shock Risk"
13. Identification label of a semi-rigid PVC or polycarbonate construction fixed in position with stainless steel rivets to read: Call Derbyshire 01629 533190.
14. A4 size wallet holder to be fitted inside door to house pillar schematics, for pillars over 300mm.
15. Drawing to be read in conjunction with HESD 'Feeder Pillar Base and Chamber Connection'.

DERBYSHIRE County Council	Drawing Title: Feeder Pillars	Issue Date: January 2025	Scale: NTS	
	HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines	Drawing No.: HESD19	Issue: B

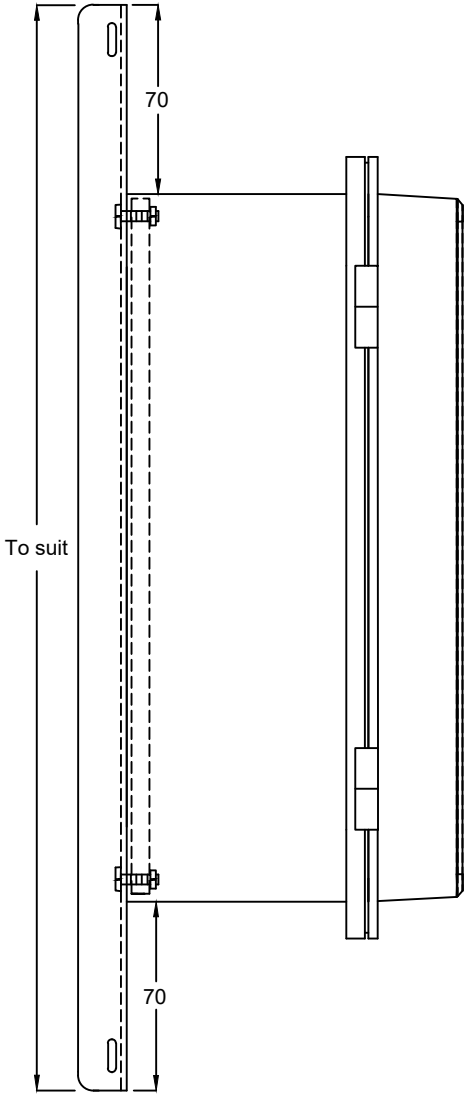


Notes

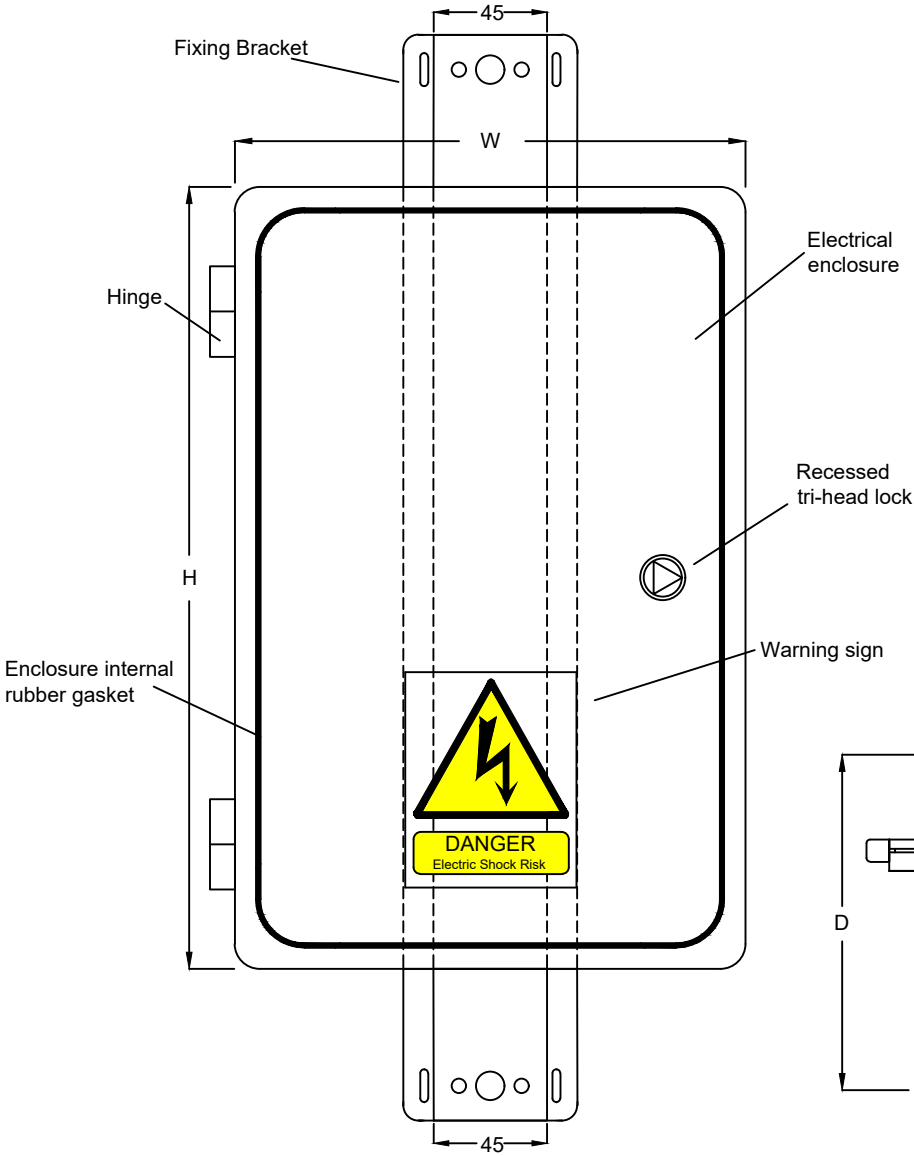
1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Feeder pillar and components shall be supplied, assembled and wired off-site within a workshop environment by a single supplier. All electrical equipment shall be in accordance with BS7671 and housed in modular polycarbonate enclosures to 'IP67' BS EN 60529, with a 10 year guarantee; bolted together and sealed with rubber gasket. The doors shall be double locked and operated by a tool.
4. The distribution board housing shall have a hinged clear plastic cover and cut out for bus bar rail mounted accessories. The main fused switch and light switch housings to have hinged cover. Distribution board and outgoing terminal housings depth to be 150mm, all others to be 100mm.
5. Isolators shall be lockable by padlock; without the need for additional accessories.
6. Tails from electricity board cutout to main isolator to be double insulated; all other internal wiring to be tri-rated singles and colour coded accordingly.
7. Din rail mounted 25mm terminal blocks to be provided for live, neutral and earth in outgoing terminals enclosure. Minimum 2.5mm live, neutral terminal blocks to be provided in cases where 24 volt circuits are required
8. LED bulkhead light to be fitted in a top - middle position on the internal face of the door. 10 watt heater and thermostat to be fitted internally within 'outgoing cables' enclosure.
9. All outgoing cables other than 24 volt circuits shall be terminated to 'Type I' on HESD 'Armoured Cable Terminations' and fixed to backboard as shown.
10. All equipment to be identified with warning and identification labels in accordance with HESD 'Cable Identification and Electrical Labels'. All outgoing circuits must be labelled to as-built schematics, which should be laminated and retained in pillar.
11. Illustrated distribution board layout including passive safety circuits are indicative only. Equipment shall be in accordance with scheme and manufacturers drawings with the Street Lighting Engineers or their representatives approval.
12. Drawing to be read in conjunction with HESD 'Feeder Pillars' and HESD 'SELV Supply and Termination Layouts'.

DERBYSHIRE County Council

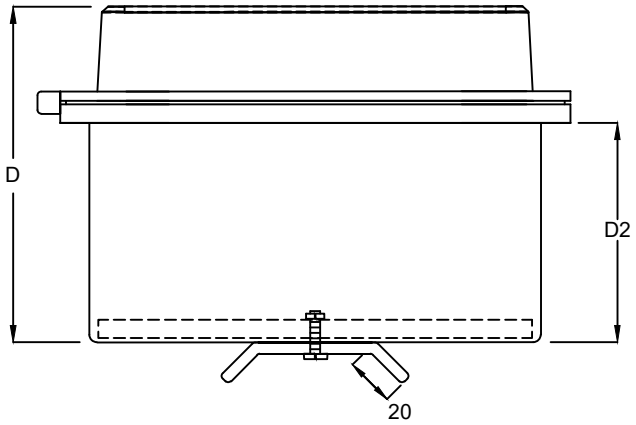
Drawing Title	Issue Date	Scale
Pillar Internals	January 2025	NTS
HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines / Drawing No.: HESD20 / Issue: B	



SIDE VIEW



FRONT VIEW



TOP VIEW

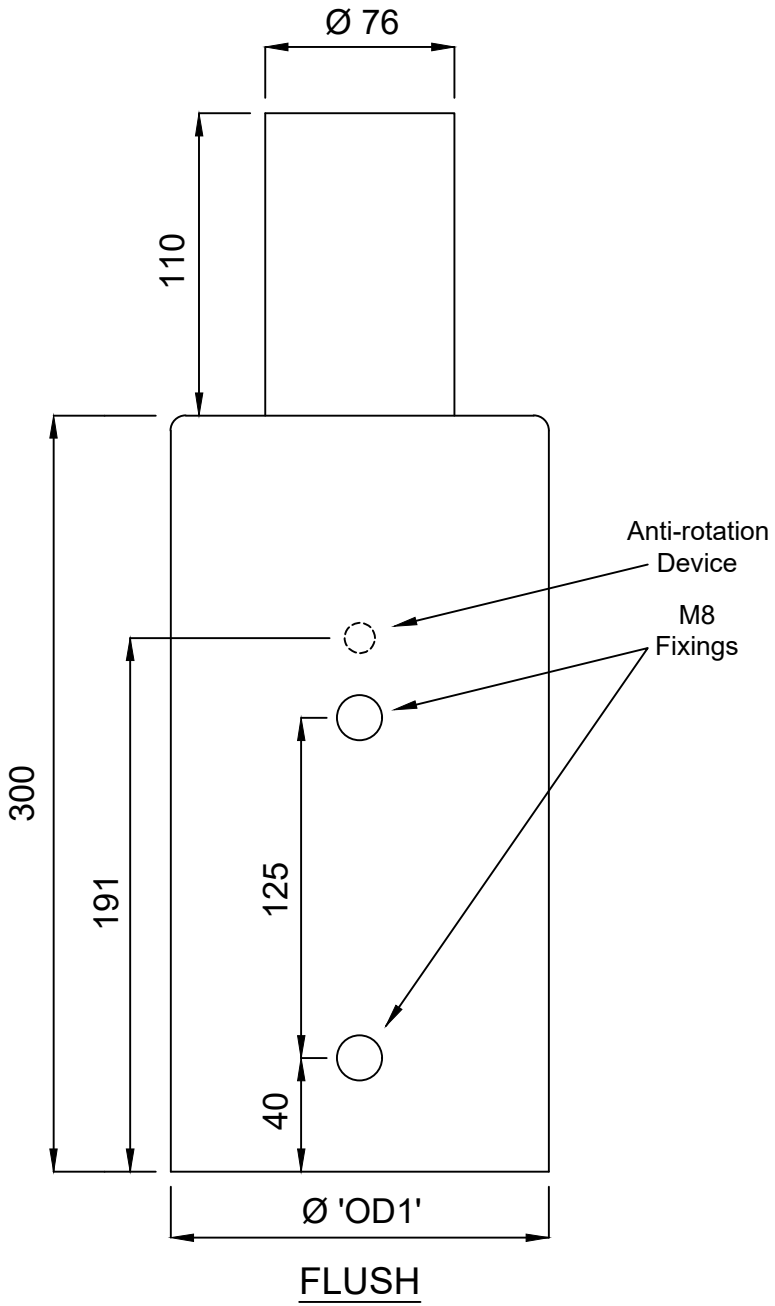
Notes

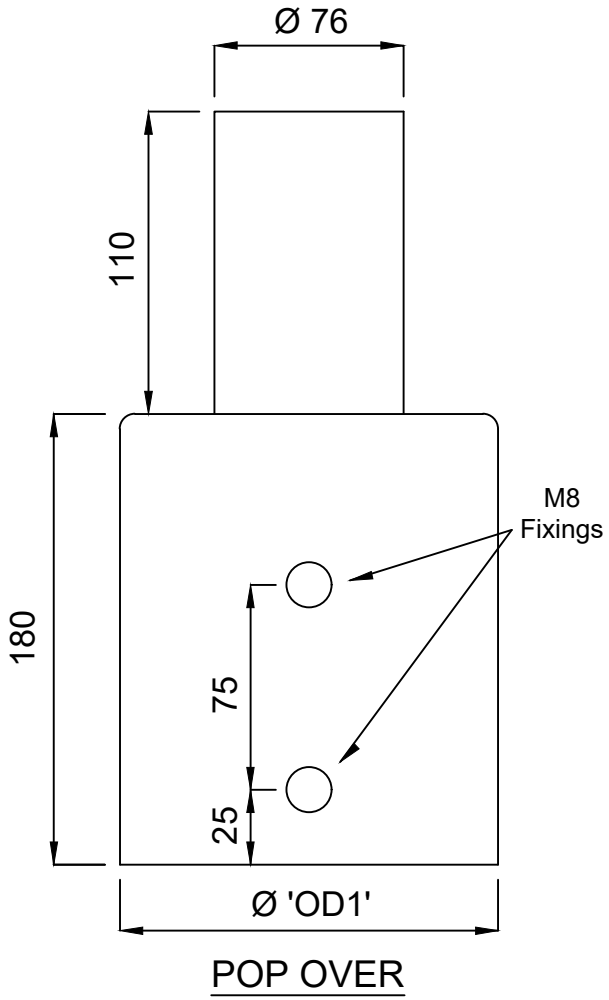
1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Enclosure to be modified accordingly to suit application requirements still maintaining IP rating of enclosure.
4. The door shall be hinged and locked and operated by a tool.
5. Bracket to be constructed from 2mm galvanised steel.
6. Bracket to have fixing points top & bottom for either bolting or clamping arrangements.
7. Backboards shall be 12mm-18mm non-hygroscopic marine ply treated with clear water repellent and shall not be less than the minimum aperture opening size.
8. Warning sign shall be in accordance with BS ISO 3864: Part 1.

Enclosure Dimensions (mm)						
H	x	W	x	D	x	D2
250	x	200	x	110	x	80
350	x	250	x	130	x	100

DERBYSHIRE County Council

Drawing Title		Issue Date	Scale
Electrical Enclosure for Attachments		January 2025	NTS
HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines	Drawing No.: HESD21	Issue: B





Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Column reducers shall comply with the requirements of BS EN 40 and manufacturers shall be registered with National Highways Sector Scheme 6.
4. Steel column reducers must be Hot-Dipped Galvanized complying with BS EN 1461 and shall be factory finished in Derbyshire Green RAL6006 in accordance with the SLS 'Protection Systems'.
5. Column reducer spigots shall be 76mm in diameter which shall include the reducer protection and final finish.
6. Flush column reducers shall be fitted with an internal anti-rotational device.
7. 'Table 1' shall be used in the 'Design of Reducers' unless modified in the specification.
8. The reducer shall fix via 2 rows of 4 number holes drilled and tapped for M8 grub screws equally spaced at 90°.
9. Fixings shall be M8 x 20mm stainless steel grub screws operated by an 4mm allen key.

REDUCER DIMENSIONS (Table 1)

Type	Height (M)	OD1	Lantern Windage (m²)	Lantern Weight (kg)
FLUSH	8	89	0.25	12.00
FLUSH	10	114	0.25	18.50
FLUSH	12	139	0.29	18.50
POP OVER	8	101	0.25	12.00
POP OVER	10	127	0.25	18.50
POP OVER	12	152	0.29	18.50

DERBYSHIRE County Council

Drawing Title: Column Reducers

Issue Date: January 2021

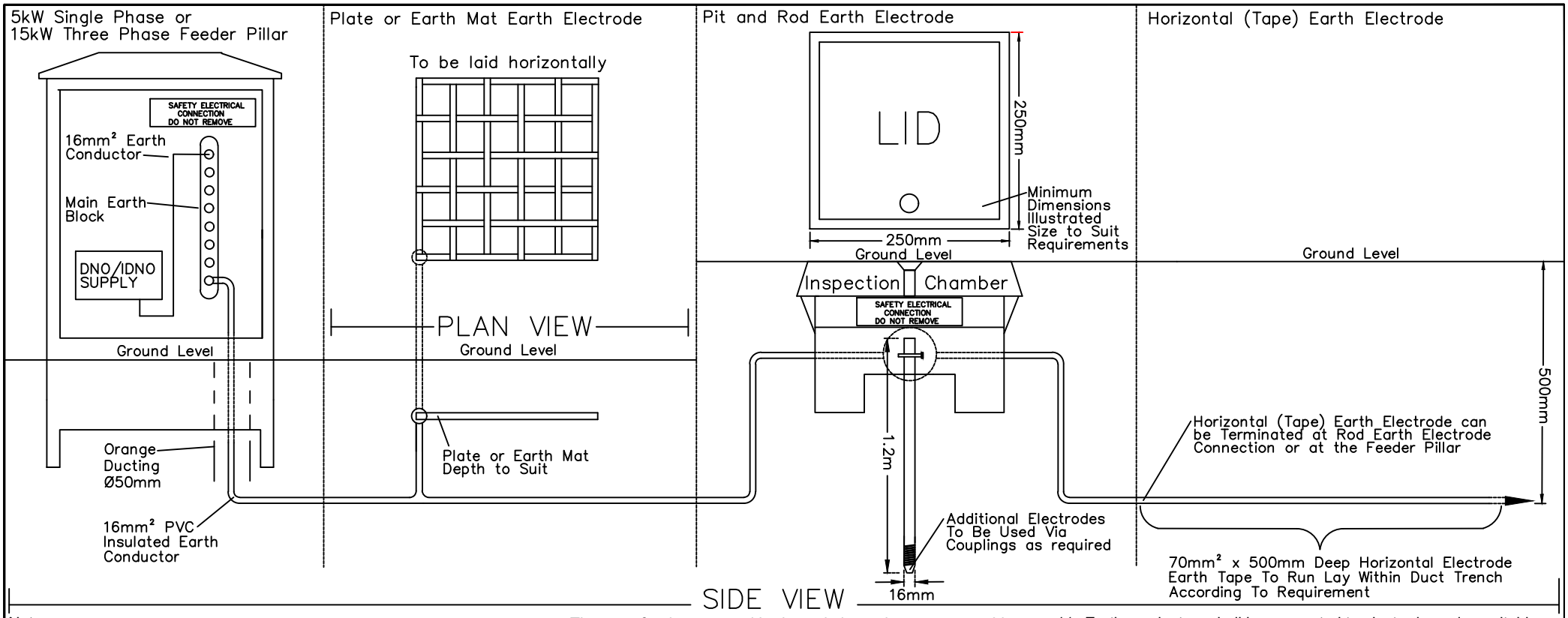
Scale: NTS

HIGHWAY ELECTRICAL STANDARD DETAILS

Approved By: R Baines

Drawing No.: HESD22

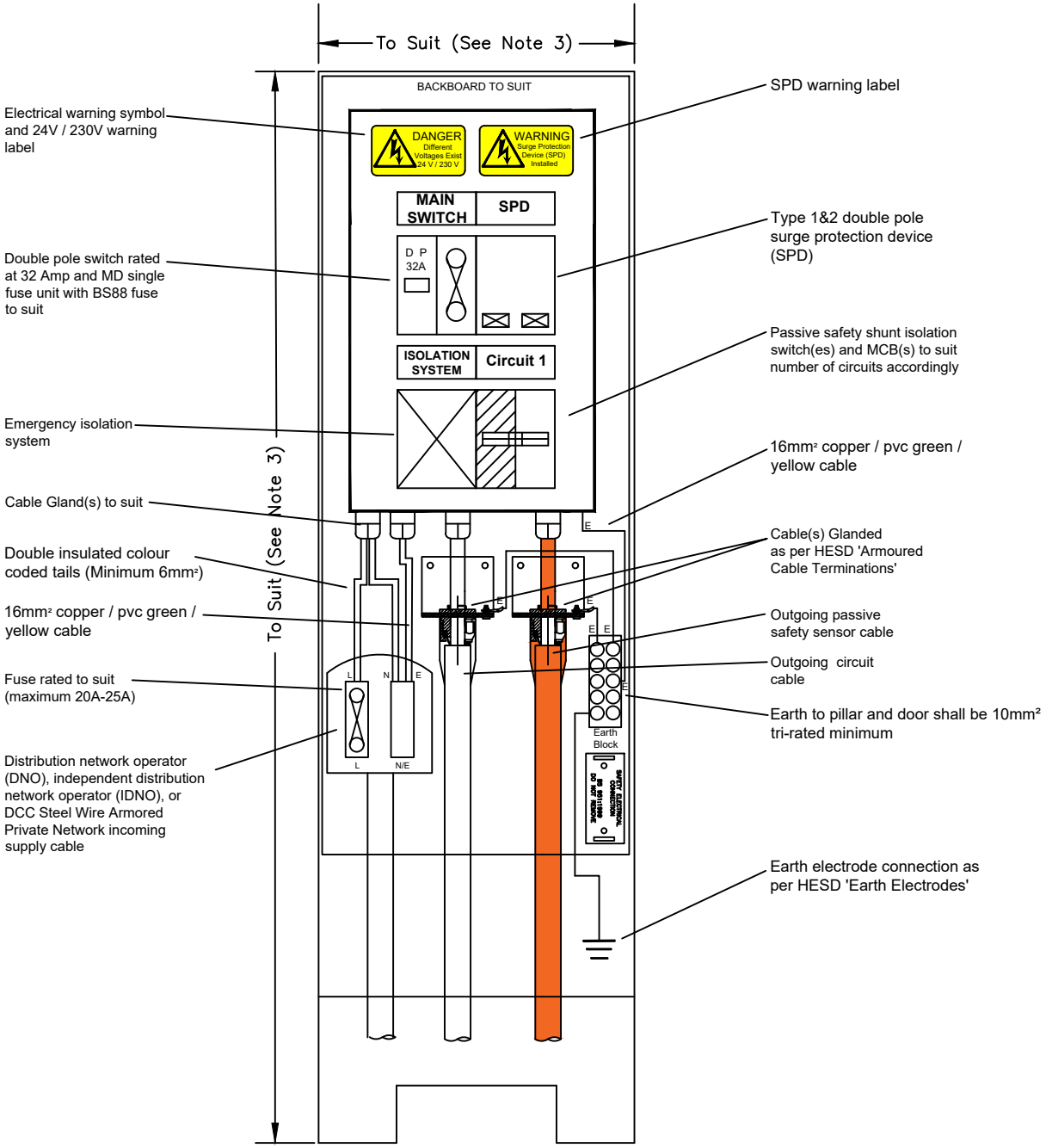
Issue: A



Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. Earth electrodes shall be provided as required in accordance with BS7430 and the DNO/IDNO standard technique guidance requirements.
4. If soil resistivity readings cannot be obtained or provided by the DNO/IDNO at the location of the installation, in order to calculate the size of electrode required. Then rather than carrying out specific ground resistivity testing which may result in unproportionate cost, one electrode be installed, and the resistance tested, and then additional electrodes added until a suitable earth reading can be acquired.
5. The use of rods, mats and horizontal electrodes are acceptable, however where the electrode installation requirement carries unacceptable risks due to the congested nature of the ground, in an urban environment for instance, the use of the other electrode types may be more appropriate.
6. An earth electrode shall be provided at feeder pillars or supply points which service more than one item of highway electrical street furniture and shall not exceed 20 ohms in accordance with BS7430.
7. An earth electrode shall be provided at the end of every circuit, servicing more than one item of highway electrical street furniture and shall not exceed 20 ohms in accordance with BS7430.
8. Earth electrodes shall not be considered for SELV circuits.
9. Earth rod or mat electrodes shall be installed within an electrically conductive aggregate material.
10. Earth electrode foundation shall be installed in accordance with manufacturers guidance/details
11. Earth conductors shall be connected to electrodes using suitable outdoor fixings, e.g. brass clamp.
12. Jointing of earth electrodes shall be prohibited, as this introduces a weak point in the system.
13. Electrical inspection and test certificates in compliance with BS7671 shall be supplied for all earth electrodes to the Street Lighting Engineer or their representative for approval, before completion of the construction phase
14. The detailed location of earth electrodes shall be recorded, included on 'as built' drawings and notification sent to the Street Lighting Engineer or their representative.
15. A label to BS 7671:514.13.1 & BS 951 with the words "Safety Electrical Connection - Do Not Remove" shall be permanently fixed at each earth connection; as HESD 'Cable Identification and Electrical Labels'.

DERBYSHIRE County Council	Drawing Title: Earth Electrodes	Issue Date: January 2025	Scale: NTS
	HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines / Drawing No.: HESD23	Issue: A



Notes

1. All dimensions in millimetres unless otherwise shown.
2. All works and materials to comply with 'Specification for Highway Works', unless a deviation has been specified by the overseeing organisation in accordance with the Street Lighting Specification, Highway Electrical Standard Details and/or the Street Lighting Engineer or their representatives requirements.
3. All electrical equipment shall be in accordance with BS7671 and housed in modular enclosures to 'IP67' and fit into a Feeder Pillar of minimum width and depth dimensions not less than 150mm and height dimensions not less than 760mm.
4. Isolators shall be lockable by padlock; without the need for additional accessories.
5. All equipment to be identified with warning and identification labels in accordance with HESD 'Cable Identification and Electrical Labels'. All outgoing circuits must be labelled to as-built schematics, which should be laminated and retained in pillar.
6. A label to BS 7671:514.13.1 & BS 951 with the words "Safety Electrical Connection - Do Not Remove" shall be permanently fixed at the earth terminal; as HESD 'Cable Identification and Electrical Labels'.
7. All outgoing cables shall be terminated to 'Type I' on HESD 'Armoured Cable Terminations' and fixed to backboard as shown. Including alternate DCC supply.
8. All cables shall be double insulated into enclosures.
9. Backboards shall be 12mm-18mm non-hygroscopic marine ply treated with clear water repellent and shall not be less than the minimum aperture opening size.
10. Electricity supply cable housed in M/HDPE duct to/and coloured to DNO/IDNO Specification. All outgoing cables including alternate DCC supply shall be housed in M/HDPE duct and coloured orange in accordance with HESD 'Chambers and Underground Service Ducts'.
11. Illustrated feeder pillar layout including passive safety circuits are indicative only. Equipment shall be in accordance with scheme and manufacturers drawings with the Street Lighting Engineers or their representatives approval.
12. Drawing to be read in conjunction with HESD 'Feeder Pillars'.
13. Drawing to be read in conjunction with HESD 'Armored Cable Terminations'.
14. Drawing to be read in conjunction with HESD 'Earth Electrodes'.

DERBYSHIRE County Council

Drawing Title	Issue Date	Scale
Passive Safety Mini System	January 2025	NTS
HIGHWAY ELECTRICAL STANDARD DETAILS	Approved By: R Baines / Drawing No.: HESD24 / Issue: A	