The Specification for Road Lighting, Illuminated Traffic Signs and Bollards In Oldham & Rochdale

Produced By

E.ON Energy Services working for

Community Lighting Partnership (CLP)
Working in Partnership with Oldham Council and Rochdale Borough Council

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1.0 Introduction

1.1 Following the award of a 25-year PFI contract in April 2011, to Community Lighting Partnership, the responsibility for approval of all new street lighting schemes for adoption is now carried out on behalf of Oldham Council and Rochdale Borough Council by Community Lighting Partnership's service provider, E.ON Energy Solutions. This specification is to be used to ensure that the minimum requirements of the PFI Output Specification are met for Street Lighting, Illuminated Traffic Signs and Bollards for the throughout the boroughs of Oldham and Rochdale on New Developments.

2.0 Parties

2.1 For the purposes of this specification, the following definitions shall apply:

Service Provider: E.ON Energy Services Acting On behalf of CLP

Highway Authorities: Oldham Council or Rochdale Borough Council

Developer: Any person, persons or organisation developing a particular site or any person or persons working on their behalf.

The roles of the above organisations in relation to road lighting and electrical matters are defined as:-

Service Provider

- Responsibility for the preparation and updating of the road lighting specification.
- Checking and the authorisation approval of road lighting designs.
- Inspection of road lighting construction works.
- Maintenance of road lighting.

Highways Authority

- **Highway Authorities** with overseeing responsibilities including the monitoring of Street Lighting PFI Contract.
- Initial contact organisation for **Developers** unless the '**Service Provider**' is being commissioned directly by the **Developer**.

3.0 SITE CLEARANCE

3.1 The developer, subject to any instructions or contrary directions by the Service Provider, shall take all measures required by any statutory Undertaker, the management of other publicly owned services, or owners of privately owned services or supplies, for disconnection and proper sealing off of all redundant services and supplies.

3.2 All materials arising from site clearance shall remain the property of the Highway Authorities. The developer shall carefully dismantle and make fully available for inspection by the Service Provider, all materials arising from site clearance. Any materials that the Highway Authorities wish to retain shall be delivered to the Service Providers depot. All unwanted materials shall be safely disposed of by the developer. Documentation detailing the safe disposal will be submitted to the Service Provider.

3.3 All costs associated with the requirements of 3.2 above, shall be met by the developer.

3.4 Any voids left following the removal of any equipment, shall be permanently backfilled and reinstated in accordance with the appropriate clauses of the Specification for Highway Works series 600 with materials exactly the same.

4.0 PRIVATE SERVICE DUCTS AND ACCESS CHAMBERS

4.1 All installed underground cabling shall be contained within a service ducting system in accordance with the Service Providers standard detail drawings

4.2 Ducts for street lighting shall be of a thick walled (5 mm) low or medium density polyethylene with a small bore, **ORANGE** in colour with the words "**STREET LIGHTING**" printed at regular intervals of not more than 1.0 metre, in 6.0 mm - 9.0 mm high lettering throughout its length. When laid the wording shall be uppermost.

4.3 Ducts shall be impact resistant, impervious to water, capable of being laid at 10^0C and sufficiently flexible to follow undulations in trench bottom and minor earth movements.

4.4 Ducts and access chambers shall be solely used for street lighting cabling and must not be shared by other utilities.

4.5 The depth of excavation shall be such that ducts under verges, footways or open ground shall have a minimum cover of 450 mm and under carriageway of 750 mm or 300 mm below formation level whichever is the greater depth in accordance with the Service Providers standard detail drawings.

4.6 Ducts across carriageways and along footways and/or verges shall have internal diameters of 100 mm or 50 mm respectively.

The cross road ducts shall extend 600 mm beyond each kerb face and a suitable draw wire shall be installed. Each duct shall be position marked and stopped off until the cables are drawn in.

4.7 Where duct alignments differ from those of the trench the transition from one to the other shall not exceed 1:30 horizontally or vertically.

4.8 Access chambers shall be modular, available in a range of sizes and be stackable with predetermined points for duct entries in accordance with Service providers standard detail drawing. Manufactured from black 8mm thick high density polyethylene for strength, impact resistance and temperature stability.

5.0 CUT OUT UNITS AND FUSES FOR PRIVATE NETWORK

5.1 All road lighting units and lit traffic signs shall be provided with double pole, fused isolation, complete with lock-off facility and incorporating an earth terminal. The unit shall have a minimum IP42 rating manufactured by Lucy Lighting.

5.2 All units are to comply with BS 60947-1 as well as fully complying with the requirements of the Low Voltage Directive (LVD/73/223/EEC) and the Electromagnetic Compatibility Directive (EMC/336/EEC).

5.3 Cut out units and associated connections shall meet the requirements of the Service Providers standard detail drawings, dependent upon termination requirement.

5.4 Fuse Carriers shall be to BS 88 : Part 1 : 1975 and are to be complete with BS 88 fuse links, which shall be of a High Breaking Capacity type rated at 230 volts, category of duty AC33 for single phase supplies and 400 volts category AC80 for three phase supplies.

5.5 All sub-fuses, switch fuses and switches shall be clearly labelled with plastic labels to identify the equipment that they feed and shall be phase identified.

6.0 WIRING

6.1 Unless otherwise specified by the 'Service Provider', wiring between the terminal block in the luminaire and the cut out in the base of the unit of apparatus shall be PVC/PVC flexible cables to BS 6004 of 300/500 volt grade. The cable shall be complete with an integral earth continuity conductor. Earth conductors shall be PVC sleeved where exposed, colour green/yellow.

6.2 The minimum cable size for columns of 8, 10 and 12 metre mounting heights shall be 1.5mm^2 and 0.75mm^2 for 5 and 6 metre mounting height columns, traffic signs and bollards.

6.3 All cables shall be correctly colour coded as BS 7671: 2008, 17th Edition Table 51.

6.4 All wiring internally shall be installed with cable as specified in a neat and workmanlike manner. Cables shall be cut to proper lengths so as to prevent any loose cables fouling equipment and column doors. Any cable liable to cause fouling when cut to the correct length shall be clipped to the backboard.

6.5 All wiring will be subject to a site inspection by a Service Provider representative to ensure the required quality standards have been met.

7.0 EARTHING

7.1 All street lighting and other electrically supplied items of street furniture shall be earthed and bonded in accordance with BS 7430.

7.2 Circuit protective and equipotential conductors shall be green/yellow PVC or sleeved. Where bolted connections are required, these conductors shall be terminated in accordance with manufacturer's instructions in correctly sized purpose made lugs. Such connections shall be made with non-ferrous nuts, bolts and washers.

7.3 The circuit protective conductor shall be of equal cross sectional area to the associated circuit conductor.

7.4 A circuit protective conductor shall connect the earth terminal on each luminaire to the main earth terminal associated with the service cut-out unit.

7.5 A separate circuit protective conductor of not less than 2.5 mm² cross sectional area shall connect all metal enclosures of all electrical components to the main earth terminal.

7.6 All extraneous conductive parts as described in BS 7671 shall be bonded to the main earth terminal using an equipotential bonding conductor of 6.0 mm² cross sectional area using PVC insulated single core copper cable, except for Protective Multiple Earthing (P.M.E.) systems where the minimum shall be 10 mm² Tri-rated earth cable, 600 volts grade conforming to BS 6004.

Connections shall be made to both the column and the access door, the length of the bonding conductor shall enable the removed door to be placed flat on the ground without the bonding conductor being stretched or in any way damaged. This will be 6.0 mm² mm Tri-rated earth Cable

7.5 A permanent label clearly marked with the words **"Safety Electrical Connection – Do Not Remove"** shall be fixed in a visible position at or near the point of connection of the main bonding conductor on all new work.

8.0 UNDERGROUND AND DUCTED CABLE

8.1 This section is to be read in conjunction with section 4 of this specification.

8.2 With the exception of any equipment contained within a road traffic island, pedestrian refuge, illuminated bollards and illuminated signs; all street lighting apparatus shall where ever reasonably practicable be connected to a DNO supply.

8.3 Ducts for DNO service shall be as per the DNO required specification.

8.4 Where it is not reasonably practicable to connect to a DNO supply, private cable networks will be considered.

8.5 Unless otherwise specified by the 'Service Provider' underground service cables shall be PVC insulated and sheathed, suitable for operation in an earthed system and of rated voltage 600/1000 volts grade at 50 Hz with steel wire armouring to BS 6346.

4mm^2 3core XLPE/SWA cable to be used for lit sign installations

The Developer shall provide to the 'Service Provider' evidence that each cable length delivered to Site has been tested at the place of manufacture and complies with the testing requirements of BS 6346.

8.5 Cables shall only be laid when the ambient temperature is above 0^{0}C, and the cable has been stored at a greater temperature than 0^{0}C for the previous 24 hours, unless agreed otherwise by the 'Service Provider'.

8.6 All cables shall be kept well clear of gas and water mains, service pipes, sewers, manholes and joint boxes belonging to other statutory undertakers. At least 150 mm clearance shall be given and in the case of telephone cables and cable television 300 mm.

8.7 Cables shall not be bent to an internal radius of less than 12 times the external diameter of the cable or less than the radius recommended by the manufacturer, whichever is greater.

8.8 A yellow, self-coloured PVC or polythene plastic tape for cable marking, not less than 0.1 mm thick and 150 mm wide with the wording **"STREET LIGHTING CABLES BELOW"** printed along the full length so as to occupy not less than 75% of its available length and occurring at least at 1.0 metre intervals, shall be laid approximately 200 mm below ground level. Where several cables / ducts are laid in one trench, only one line of marker tape need be installed, unless otherwise directed by the 'Service Provider'.

9.0 INSPECTION AND TESTING

9.0 The developer is reminded of his obligations under the following:-

- Electricity at Work Regulations 1989 and BS 7671, in connection with the provision of Electrical Test Certificates.

- New Roads and Street Works Act 1991 concerning the provision of accurate record drawings detailing all aspects of equipment located in the highway.

9.1 The works will be inspected by the Service Provider during the installation and on completion of the works. There will be a charge payable by the developer for this and it will vary dependant on the size of the scheme.

9.2 The Developer MUST carry out electrical testing of lighting equipment in accordance with the requirements of BS 7671.

All test results are to be recorded and presented to the Service Provider.

For the purpose of this Clause, the term 'Network' shall be determined as being the "Public Lighting Looped Cable Distribution System" supplying lighting columns, illuminated traffic sign poles and illuminated bollards.

9.3 The following tests shall be carried out in the sequence indicated below and recorded on a schedule.

A separate Certificate is to be provided by the Developer for each individual lighting unit, cable network etc. The Developer shall allow in his rates for the provision of Test Certificates, the format of which will be as directed by the Service Provider.

(i) For lighting units etc. tests (b), (d), (f), (g) apply.
(ii) For networks, tests b), (c), (e), (f), (g), (h), (j) apply.

Standard methods of testing are detailed in BS 7671.

(b) Continuity of protective conductors including main and supplementary equipotential bonding.
(c) Earth electrode Resistance
(d) Insulation resistance at a test voltage of 500 Volts to be not less than 1.0 M ohm.
(e) Insulation resistance at a test voltage of 500 Volts to be not less than 6.0 M ohm.
(f) Insulation of the site-built assemblies
(g) Polarity, including the continuity of circuit conductors
(h) Earth fault loop impedance at every fuse junction unit
(j) Operation of residual current devices where necessary.

10.0 SPECIFICATION FOR COLUMNS AND LUMINAIRES

10.1 The installation shall comply with EN 13201-1:2008. A scheme specific lighting class will be issued by the Highway Authority including design maintenance factor for calculation purposes.

10.2 Columns will be manufactured from galvanised tubular steel from Valmont Stainton Ltd to meet BS EN 40 having a 50 year design life structural and a 30 year design life base against corrosion. 'Oldham & Rochdale Specification' lighting columns will be sited to the rear of the footpath unless, due to the presence of services. Luminaires will be post top mounted unless otherwise agreed with the Service Provider. Column specification will be submitted to the Service Provider for approval two weeks prior to start of works.

10.3 Columns to be sited as per the table below

COLUMN POSITION	DOOR POSITION
Back of footpath	Facing away from oncoming traffic
Near kerb edge or on narrow footpaths	Facing away from oncoming traffic
Centre of central reserve	Facing oncoming traffic in a consistent direction
Near edge of central reserve	Facing away from oncoming traffic or facing distant side of reserve

10.4 Areas which preclude access to mobile elevated work platforms, shall utilize hinged columns in accordance with standard detail drawing (detail showing lowering)

10.5 Luminaires shall be as required by the lighting class. Luminaires for residential applications will generally be Urbis Evolo (2 or 3) CosmoPolis with Traffic Routes being SON-T. Luminaires shall be complete with electronic gear and a Harvard LeafNut remote monitoring node. Luminaires should be supplied for post top mounting. Ingress protection for both optic and gear compartment is to be IP66. Luminaires used shall be selected according to the following table:

Lighting category	Luminaire	Light sources	Watts
ME2,	Urbis 'Evolo'	SONTPIA	150/250
ME3b, Me3c,	Urbis 'Evolo'	SONTPIA	100/150/250
Conflict Zones	Urbis 'Evolo'	SONTPIA/CPO-TW	100/150/250 60/90/140
S1 – S5	Urbis 'Evolo'	CPO-TW	45/60/90/140

Column foundations will be constructed in accordance with Highway Works Standard Detail Drawing.

Where overhead power lines or other hazards exist, external warning labels should be fitted generally as referred to on Highway Works Detail Drawing 13.71

11.0 FEEDER PILLARS

11.1 Feeder pillars shall be constructed from sheet steel and shall be of Marine Grade 316 stainless steel. The pillar shall be manufactured specifically for the purpose of providing highway power supplies and shall be provided by a recognised manufacturer. They shall comply with IP 34 of BS EN 60529: 1992: Specification for Degrees of Protection Provided by Enclosures (IP Code). They shall include a full size backboard of minimum thickness 15 mm hardwood or other substantial non-hygroscopic material. The entry for cables shall be via the root.
As an alternative pillars made of stainless steel may be provided by agreement with the Appointed Contractor.

11.2 Root protection shall be afforded in the form of a bitumen coating applied over the stainless finish. The protection coating shall extend 250mm above the planted ground level.

11.3 The general arrangement of equipment to be provided and minimum dimensions are shown on drawings as follows:
For up to 2 outgoing circuits, pillar shall be type D. As per the Service Providers Standard Details
For up to 6 outgoing circuits, pillar shall be type C. As per the Service Providers Standard Details
For over 6 outgoing circuits, pillar shall be type B. As per the Service Providers Standard Details

The designer shall consider the use of three phase supplies and split distribution circuits even for small installations, particularly in sensitive areas such as roundabouts and major junctions so that not all lighting is lost if one phase of the REC supply fails.

11.4 Apart from pillar type D the distribution fuse boards shall have sufficient spare capacity to accommodate at least one extra circuit (one three phase way on a three phase distribution unit and one single phase spare way on a single phase distribution unit). The distribution unit shall be manufactured from either stainless steel or powder coated steel from an industrial/commercial range having a large enough area to allow direct termination of outgoing steel wire armoured cables. There shall be at least 25% spare capacity spacing on the back board.

11.5 The feeder pillar doors shall be fitted with tamper proof locks, all locks being identical in pattern and a minimum of two sets of keys shall be provided. All hinges and locks shall be of stainless steel.

11.6 Distribution boards shall be provided with an external earth, have a phase barrier and colour coded. They shall be fitted with the same number of live and neutral bus bar terminals as there are outgoing circuits.

11.7 All new feeder pillars shall be fitted with internal warning notices and labels in accordance with the Service Providers Standard Details and fully in accordance with BS 7671.
The circuit diagram shall be of adequate size to show all equipment and circuit details clearly and shall be enclosed in a plastic heat laminated wallet and fixed in a visible position within the pillar. An example of a suitable format is shown in the Service Providers Standard Details

11.8 The feeder pillars shall be mounted on a 150mm thick foundation of mix ST2 concrete and backfill materials shall be equivalent to an ST5 concrete mix. See relevant drawing reference detailed in 17.3 above. After completion of the cabling the feeder pillar base shall be filled to 25mm below the door with rounded aggregate, graded 14mm to 5mm, conforming with BS 882: 1992: Specification for Aggregates from Natural Sources for Concrete. Cable entry ducts entries shall be suitably sealed prior to back fill to prevent blockage by aggregates.

11.9 A durable warning sign indicating 'Danger 400 volts' or 'Danger 230 volts' as appropriate, shall be fixed to the front of the feeder pillar where applicable.

11.10 The position of the feeder pillars and direction of proposed door openings shall be as shown on the approved design drawings.

11.11 A suitable supply will be provided, installed and terminated in each pillar by the DLH. The developer will be responsible for the organisation and cost of this work.

11.12 Permanent galvanised metal shims may be used to align feeder pillars.

11.13 Feeder pillars shall be provided with a suitably sized level hard standing to the front of the pillar that is a minimum of 600mm depth and a minimum of full width across the front of the feeder pillar, or 600mm; whichever is the greater.

11.14 The whole of the installation shall be earthed according to the requirements of the current edition of BS 7671: 1994, BS 7430: 1991 and to the satisfaction of the DLH.

11.15 The feeder pillar main earth terminal block shall be connected to the DLH's earth terminal. The main earthing conductor size rating shall be according to Table 5 below.

11.16 All bare earth conductors shall be sleeved with green/yellow PVC sheathing. All earth connections shall be made between two brass washers.

TABLE 5: FEEDER PILLAR EARTHING CONDUCTOR SIZES

CSA of DLH Supply Neutral Conductor	Minimum CSA of corresponding protective conductor (Sp)
Up to 35 mm^2	10 mm^2
35-50 mm^2	16 mm^2
50-95mm^2	25 mm^2
95-150	35 ^{2}

12.0 DESIGN SUBMISSIONS

This section is currently subject to negotiation and will be forwarded in due course.

12.0 SUPPLIERS INDEX

Material	Material Description	Manufacturer	Catalogue / Reference numbers	Relevant Performance Standards	Projected Lifecycle (including
Feeder Pillars	3mm Mini Feeder Pillar, Sheet Steel hot dipped galvanized, 18mm thick exterior grade backboard. Height 787mm, Width 110mm, Depth 120mm Root 223mm	Lucy Lighting	4810 - 4816 (Fortress Range)	BS729	To be advised
Base Compartment Termination Units	Double Pole 1 fuse Cut Out with PVC gland plate and 6mm D/I tails	Lucy Lighting	NT06/TT/NG06/STAILS Type 1	BS7654	30 years design life
	Double Pole 2 fuse Cut Out with PVC gland plate and 6mm D/I tails	Lucy Lighting	NT08/TT/NG06/STAILS Type 3	BS7654	30 years design life
	Double Pole 1 fuse Cut Out with brass gland plate	Lucy Lighting	NT06/TT/NG12 Type1 P	BS7654	30 years design life
	3 module Isolator with DP switch 1 fuse with brass gland plate	Lucy Lighting	NTM02/EB1/NG12 Type 2P	BS7654	30 years design life
	3 module Isolator with DP switch 2 fuse ways with brass gland plate	Lucy Lighting	NTM03/EB1/NG12 Type 4P	BS7654	25 years design life
	3 module Isolator with DP switch 2 fuse with PVC gland plate and 6mm D/I Tails	Lucy Lighting	NTM03/EB1/NG02/S TAILS and FUSES Type L15 (Type4)	BS7654	25 years design life
	3 module Isolator with DP switch 1 fuse with PVC gland plate and 6mm D/I Tails	Lucy Lighting	NTM02/EB1/NG02/TAILS and FUSES Type L5 (Type 2)	BS7654	30 years design life

Material	Material Description	Manufacturer	Catalogue / Reference numbers	Relevant Performance Standards	Projected Lifecycle (including
Lanterns – Back Streets	Hammerhead IP68 LED luminaire. Operating ELV driver with superior optical performance	Advanced LED Ltd	Hammerhead 1or Marlin	BS EN 60698	Design life of 30 years. LED's design life circa 15 years.
Lanterns - Standard Residential	Cosmopolis 45w, 60w 90w, 140w lamps and electronic control gear	Urbis Lighting Ltd	Evolo (Preferred) / 2 Tone / Iridium SGS252 (Secondary Options)	BS EN 60598	Body and optic design life 30 years
Lanterns - Standard (ME Classes)	SON-T 100w 150w 250w electronic control gear up to 150w,	Urbis Lighting Ltd	Evolo (Preferred), ARC or Iridium SGS252 (Secondary Options)	BS EN 60598	Body and optic design life 30 years
Lanterns - Enhanced Standard / Heritage	CosmoPolis 45w, 60w 90w, 140w lamps and electronic control gear	Urbis	Cabrio 2	BS EN 60598	Body and optic design life 30 years
Lanterns - Regeneration	CosmoPolis 45w, 60w 90w, 140w lamps and electronic control gear. SON-T 100w, 150w & 250w electronic control gear	Urbis	Alliance	BS EN 60598	Body and optic design life 30 years
Lamps	45w, 60w, 90w and 140w Philips CosmoPolis lamps. 100w, 150w and 250w Philips SON-T PIA Plus lamps	Philips	Various	BS EN 62035	CosmoPolis 12,000 / 16,000 hours. SON-T PIA Plus 16,000 hours
Photo-electric Control Unit	55 lux (1: 0.5) Miniature Cell factory fitted by lantern manufacturers	Zodion Ltd	SS12A	BS 5972	Guaranteed life - 8 years
Remote Monitoring System	Fully functional switch, dim, monitoring and control system	Harvard Engineering	LeafNut Brochure LeafNode Data Branch Node Ballast		Nodes and Master Nodes design life 15 years
Illuminated Sign - Small	Externally illuminated sign manufactured from aluminium. 2 x 11w PL-L lamps	Signature Ltd	Exlite Delta	BS 873, prEN12889-1	Sign light design life 30 years
Illuminated Sign – Large	Externally illuminated sign light manufactured from aluminium. T8 lamps, up to 1800mm in length	Signature Ltd	Majorlite T8	BS 873, prEN12889-1	Sign light design life 30 years

Material	Material Description	Manufacturer	Catalogue / Reference numbers	Relevant Performance Standards	Projected Lifecycle (including
Illuminated Bollard	illuminated Bollard rotational moulded shell with aluminium base box complete LED lamps	Glasdon	Signmaster LED	BS 873, prEN12889-1	Base light design life 30 years, shell design life 10 - 15 years
Non-illuminated Bollard	Non-illuminated high reflective bollard with self correcting base unit	Glasdon	Rebound Signmaster	BS 873, prEN12889-1	Design life 10-15 years
Floodlights	High impact resistant multi-functional miniature floodlight 70w to 150w HID sources	WRTL Exterior Lighting Ltd	Metroflood Mini	BS EN 60598	Design life 30 years for the housing
Floodlights	High impact resistant multi-functional miniature floodlight 150w to 400w HID sources	WRTL Exterior Lighting Ltd	Metroflood Midi	BS EN 60598	Design life 30 years for the housing
Cable	PVC SWA Cable XLPE insulated copper	AEI cable		BS 5467	Design life 40 years
Subway / Surface mounted / Underpass lighting	Slimline fluorescent underpass luminiare sealed to IP65 with ultra impact resistant cover to IK10	WRTL Exterior Lighting	Flow	BS EN 60598	Design life 30 years

5m R&L Lighting Column	Valmont Stainton	139mm	76mm	Back Alleys	Hot Dip Galv, Glass Flake Route
6m Lighting Column	Valmont Stainton	139mm	76mm	Residential	Hot Dip Galv, Glass Flake Route
6m Paint Lighting Column	Valmont Stainton	139mm	76mm	Town Centre, Conservation	Hot Dip Galv, Paint, Glass flake Route
6m Passive Safe Lighting Column	Jerol Industri AB	139.7mm	88.9mm	High Speed Roads	Fibre Reinforced Polymer Composite
8m Lighting Column	Valmont Stainton	168mm	89mm	Residential, traffic routes, industrial / commercial	Hot Dip Galv, Glass Flake Route
8m Paint Lighting Column	Valmont Stainton	168mm	89mm	Town Centre, Conservation	Hot Dip Galv, Paint, Glass flake Route
8m Passive Safe Lighting Column	Jerol Industri AB	168.3mm	114.3mm	High Speed Roads	Fibre Reinforced Polymer Composite
10m Lighting Column	Valmont Stainton	168mm	114mm	Residential, traffic routes, industrial / commercial	Hot Dip Galv, Glass Flake Route
10m Paint Lighting Column	Valmont Stainton	168mm	114mm	Town Centre, Conservation	Hot Dip Galv, Paint, Glass flake Route
10m Passive Safe Lighting Column	Jerol Industri AB	219.1mm	168.3mm	High Speed Roads	Fibre Reinforced Polymer Composite

12m Lighting Column	Valmont Stainton	168mm	139mm	Residential, traffic routes, industrial / commercial	Hot Dip Galv, Glass Flake Route
12m Paint Lighting Column	Valmont Stainton	168mm	139mm	Town Centre, Conservation	Hot Dip Galv, Paint, Glass flake Route
12m Passive Safe Lighting Column	Jerol Industri AB	219.1mm	168.3mm	High Speed Roads	Fibre Reinforced Polymer Composite