

# **Highways Act 1980**

## **Section 38 Agreement**

### **SECTION – C**

# **STREET LIGHTING STANDARD SPECIFICATION FOR ROADS, STREETS AND FOOTPATHS**

**Issue Date: January 2014**

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## 1 Design Philosophy

- 1.1 The Road, Street and Footpath lighting design and specification shall incorporate, wherever possible use of modern materials, energy saving devices and proven innovation in lighting provision. As a result design and specification may vary and therefore further advice should be obtained from the Council prior to the commencement of lighting design.
- 1.2 This section of the design guide provides current Council standards for lighting and use of innovative materials. As such, deviation from the current standards would attract a commuted sum to cover the additional maintenance costs. **Refer to Section D** of the document for further details on commuted sum payments.

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## 2 General Requirements

All Road and Street Lighting Installations shall comply with all relevant BS EN 13201:2003 Standards and BS5489-1:2013 Standards and BS7671:2008 and revisions thereof.

Any revisions of BS EN or BS Standards thereof, whether mentioned or not in this Specification must be complied with at the Developers cost.

All unless otherwise agreed by the Network Lighting Manager columns shall be supplied with an individual Electricity Supply Company's 230 Volt 50 Hz PME type 24 Hour Live Service, it is the responsibility of the Developer to arrange for and pay for services to be provided.

Unless otherwise agreed by the Network Lighting Manager Signposts, Reboundable Bollards and the like shall be sub fused from the nearest column.

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## 3 Design Service

Rhondda Cynon Taff County Borough Council is able to offer a complete Road/Street Lighting Design Service, details of which may be obtained from the Network Lighting Manager on application, Tel (01443) 494700, E Mail - <mailto:Streetlighting@rctcbc.gov.uk>

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## **4 Equipment Specification**

All equipment shall be new, unused and substantially recyclable.

### **4.1 Luminaires**

LED luminaires shall be used in all locations unless otherwise agreed by the Network Lighting manager.

LED luminaires shall have integral dimming as standard set to reduce the output at times to be agreed with the Network Lighting Manager, luminaires shall be suitable for use with a specified CMS system and in all instances the luminaire shall be able to accommodate a complete range of mini cell, node and control gear.

Particular attention is drawn to the use of Dimmable LED luminaires at conflict areas as defined by BS5489-1:2013, dimming levels are to be subject to approval of the Network Lighting Manager.

The aluminium body and LED driver compartment shall be rated at IP66, a complete choice of optics shall be available as standard, the body shall be manufactured from die cast aluminium and be painted Grey.

The luminaire body shall be so designed to disperse excess heat produced by the operation of the lantern so as to maintain the output and life of the LED's.

All LED luminaires shall be suitable for post top or side entry mounting; two locking screws shall be fitted as standard.

Where circumstances dictate other luminaires may be considered for use with the approval of the Network Lighting Manager all such luminaires shall have a complete Manufacturers Specification and Photometric data available as standard.

Decorative luminaires will only be considered if LED's and optic control is fitted as standard, the Network Lighting Manager may attach additional conditions to their use which may or may not be identified in this Specification.

#### 4.2 **Luminaire Control**

All luminaires shall be controlled by a Computer Management System (CMS) the Authority operates the Harvard LeafNut System this CMS system shall be specified .

Each LED luminaire shall be fitted with a LeafNut enabled driver, Leaf Node and one column shall be fitted with a Branch Node.

The Developer shall be responsible for the operation and maintenance of the CMS system on a stand alone basis to include the energy bills and maintenance costs until such time the Developer meets the required installation standard to enter into the maintenance period. It is the responsibility of the Developer to liaise direct with Harvard Engineering to operate the CMS system.

The use of photocells and drivers with alternative switching regimes may be considered and are subject to the prior approval of the Network Lighting Manager.

#### 4.3 **Light Source**

The preferred light source shall LED unless otherwise approved by the Network Lighting Manager.

The LED output is to be suitably chosen so as to comply with this Specification and the luminance/illuminance requirements of BS EN 13201:2003 and BS5489 -1:2013.

#### 4.4 **Securing of Components**

All components other than those mounted by the Manufacturer shall be secured by means of suitably sized round headed brass screws.

#### 4.5 **Lubrication of Mechanical Parts**

All movable mechanical parts such as hinges, door locks and the like shall be lubricated by means of Coppergrease anti - seize lubricant or similar approved.

#### 4.6 **Columns and Bracket Arms**

The required durability is no maintenance other than a clean down before adoption using the cleaning chemicals specified by the manufacturer. Columns and bracket arms shall be of a tubular Aluminium construction designed to:-

EN 40-3-3-2003, BSEN 40-3-1-2000, ENV 1999-2.4 and ENV 1999-1-1.

Generally all columns shall be a minimum of 6.0 Metres and above dependent on their location and road category unless otherwise approved by the Network Lighting Manager.

Columns shall be one piece extruded aluminium complete with double flush fitting vandal resistant doors fitted with anti-vandal stainless steel M8-8mm centre pin recessed socket screw lock door bolts as the Aluminium Lighting Company or similar approved. Columns may be:

<b>Mounting Height</b>	<b>Outreach Arm</b>	<b>Ref No</b>	<b>Drawing No</b>
6 Metre	0.4 Metre	RCT6HS42A	MA-5S-16655-010100-02
8 Metre	1.00 Metre	RCT8HS42A	MA-5S-16655-010100-05
10 Metre	1.00 Metre	RCT10HS42A	MA-5S-16655-010100-03
6 Metre	Post Top	RCT6PTA	5NS-79126-010200-09
8 Metre	Post Top	RCT8PTA	5NS-78815-010200-11
10 Metre	Post Top	RCT10PTA	MA-8S-21484-010100-01
12 Metre	Post Top	RCT12PTA	MA-8S-21419-010100-02
6 Metre	Hinged	RCTEHC6A	MA-8S-21419-010100-01

Other manufactures types of aluminium column may be used subject to the prior approval of the Network Lighting Manager.

A one metre concrete "mowing strip" shall be provided around street lighting columns where installed in a verge.

Spare keys shall be provided to the Network Lighting Manager upon request.

In areas where vehicular access is difficult, Aluminium 6.0 Metre mid hinged raising & lowering type columns with a double lock mechanism shall be used, restraint cords or mechanical leverage apparatus must be provided as standard equipment.

Crank root or flange-based columns may only be used subject to the prior approval of the Network Lighting Manager.

Where ground conditions dictate, columns may be erected in suitably sized pots subject to the prior approval of the Network lighting Manager.

If period or decorative columns are to be used, the Developer shall provide the Manufacturers Specification for approval.

Where decorative columns are used the Network Lighting Manager may impose additional conditions that may or may not be identified in this Specification.

All columns shall be erected in accordance with the Manufacturers Specification.

Wall brackets may be used subject to the prior approval of the Network Lighting Manager.

All bracket arms are to be erected in accordance with Manufacturers Specifications.

No attachments shall be made to any column without prior approval.

#### **4.7 Illuminated Road Traffic Signposts**

Traffic Signposts to be illuminated must be of a tubular steel large base type to BS 873 Part 7:1984 and be capable of passing the tests described in BS 873.

The posts shall be hot dipped galvanised and shall comply with BSEN 1461:1999 and shall be manufactured from steel complying with the requirements of BS 4360 1986 Welded Steels, complete with double lock flush fitting vandal resistant doors, fitted with anti-vandal stainless steel M8-8mm centre pin recessed socket screw lock door bolts.

Each post shall be factory primed and undercoated to G2A prior to erection with a black bituminous base as standard, after erection they are to be painted Grey RAL 693 (aircraft grey). The ground section shall remain as black bitumen with at least 150mm visible above ground level.

Large base posts shall be of a steel gauge not less than 3.2mm thick and shall be cylindrical with a base diameter of not less than 139.7mm and a shaft diameter of not less than 76.1mm as a minimum.

An internal backboard of dimensions not less than 450mm x 95mm x 12mm, manufactured from a substantial non-hygroscopic material, shall be fixed in the housing and an earth bolt shall be provided. The opening to the housing shall be not less than 450mm x 95mm and shall be positioned to afford easy access to the control equipment.

An access slot of not less than 75mm x 150mm high for cabling purposes shall be provided approximately 300mm below ground level.

Each signpost shall be suitably sized to accommodate all necessary attachments including numbering below the sign face to ensure the clearance to the finished ground level is an absolute minimum of 2.1 metres but 2.3 to 2.45 metres is preferred. However where certain signage is associated with “roundabouts, splitter islands etc” mounting heights used are to be as deemed appropriate. Signposts in the same location shall be of the same material and height unless otherwise approved by the Network Lighting Manager.

A concrete "mowing strip" shall be provided around signposts, 300mm offset from sign assemblies, where installed in verge areas.

Flange based signposts may be used subject to the prior approval of the Network Lighting Manager.

Where ground conditions dictate, signposts may be erected in suitably sized pots subject to the prior approval of the Network Lighting Manager.

Signpost Luminaires shall be Signature Exlite Delta or similar approved PTS or PTD type with an ingress protection rating of IP66, each luminaire shall be complete with LED's and 0.25 watt, 35/18 lux miniature electronic type photocell. These luminaires are generally suitable for sign faces of up to 1.0M x 1.0M.

For sign faces up to 1.5 x 1.5 Metres luminaires shall be Simmons signs or similar approved LUB/PTS or PTD type with an ingress protection rating of IP56, each luminaire shall be complete with LED' s and 0.25 watt, 35/18 lux miniature electronic type photocell.

For sign faces up to 1.5 x 2.5 Metres luminaires shall be Simmons signs or similar approved LUB/PL type with an ingress protection rating of IP56, the luminaires shall be fitted with a fused PL 36 Watt compact fluorescent lamp and shall be fitted with a 0.25 watt, 35/18 lux miniature electronic type photocell.

Illumination for sign faces in excess of 1.5 x 2.5 Metres shall be subject to the prior approval of the Network Lighting Manager.

Where approved by the Network Lighting Manager LED internally illuminated sign may be used they shall be mounted NOT CLAMPED to an approved suitably sized signpost in accordance with this Specification.

Signpost electrical supplies shall be sourced from the nearest lighting column and are to be sub fused at 10 Amp unless otherwise agreed by the Network lighting Manager.



#### 4.8 **Internally Illuminated and Non Illuminated Rebound Bollards.**

Internally Illuminated rebound bollard bases shall be rated at IP68 and shall be manufactured from a corrosion resistant and impact resistant material, where approved by the Network Lighting Manager Non Illuminated rebound bollards may be used.

All rebound bollards are to be installed in accordance with the Manufacturers Specification nil aspect rebound bollards do not require illumination provided there are constructed of a suitable reflective material. Full Specification Drawings are available from the manufacturers.

Generally lit bollard bases shall be of the Rebound Signmaster Type as manufactured by Glasdon or similar approved, the unit is to be fitted with LEDs and shall be complete with a low light, infra red type photocell fitted as standard equipment.

Rebound bollards shall be fitted with flexible shells as manufactured by Glasdon or similar approved, with inlaid graphics as required, non illuminated rebound bollards shall be black in colour.

Rebound bollard electrical supplies shall be sourced from the nearest lighting column and are to be sub fused at 10Amp unless otherwise agreed by the Network lighting Manager.

Armoured 6.0mm Sq 3 core XLPE/SWA/PVC cables shall enter the base compartment through the waterproof cable gland and be properly sealed in accordance with the Manufactures Specification to prevent the ingress of moisture.

The armoured cables shall then be terminated in the base compartment to a double pole cut-out fixed to the plywood fuse board base; the LED driver compartment shall be connected using the lead provided.

#### 4.9 **Feeder Pillars**

Feeder Pillars including small service types are only to be used with the prior approval of the Network lighting Manager.

Feeder pillars shall be manufactured with 2.5mm Stainless Steel, grade 3CR12 or similar approved and have a brushed finish complete with bolt on bitumen root. The doors shall have embedded durable hazard warning sign and earth fly lead, the backboard shall be treated 12mm exterior ply.

The required durability is no maintenance other than a clean down before Adoption using the cleaning chemicals specified by the manufacturer.

Every feeder pillar shall be vandal proof, have a minimum ingress protection rating of IP54 and IP65 for the door gasket complete with an inbuilt 'Secret' ventilation system as standard.

The door hinges shall be lube for life maintenance free Stainless steel and Phosphor Bronze.

The door locks shall be quarter turn, captive, heavy duty stainless steel with anti vandal socket screws and security plugs as standard.

Each feeder pillar shall have an A4 document pocket fitted as standard.

All ducts entering the feeder pillar base shall be suitably sealed with a waterproof material, a layer of sand is then to be laid into the base, care shall be taken not to block ventilation grills.

Where excessive condensation within a feeder pillar shell is found the Developer with the approval of the Network Lighting Manager is to take all necessary measures to alleviate the problem. Any damages caused by condensation shall be made good at the Developers cost.

The feeder pillar shall be suitably sized to accommodate the Local Electricity Supply Company cutout, isolator and Authority switchgear.

All feeder pillars are to be erected in accordance with the Manufacturers Specification a one Metre wide concrete "mowing strip" shall be provided around feeder pillars installed in a verge.

One number spare key shall be provided to the Network Lighting Manager. Separate feeder pillars are to be provided for Main Estate/Spine Roads on Residential Sites.

Each Developer shall provide their own feeder pillar unless otherwise agreed to by the Network Lighting Manager.

The minimum acceptable dimensions are: -

Height	1030mm
Internal Width	550mm
Working Depth	220mm

#### 4.10 Feeder Pillar Wiring

Each feeder pillar shall be provided with a Local Electricity Supply Company's 230 Volt or 230/400 Volt 50 Hz PME type 24 Hour Live Service as required.

The provision of the Mains Service(s) as are required shall be the responsibility of the Developer and shall be adequate to meet the expected maximum demand of the Road/Street Lighting Installation up to a maximum of 500 Watts unless otherwise approved.

The Network Lighting Manager prior to their installation must approve all Mains Services.

Where applicable provide PVC Insulated/PVC Sheathed 10.0mm Sq minimum Brown and Blue mains tails and PVC Insulated 10.0mm Sq minimum Green/Yellow equipotential earth bonding conductor between the Local Electricity Supply Company's cut-out and Local Authority's stainless steel consumer unit. These tails must enter through a knock out in the base of the consumer unit and must be protected by a rubber grommet.

A separate single core 10.0mm Sq minimum PVC Insulated, Green/Yellow earth bonding conductor between the stainless steel consumer unit and feeder pillar shell and door.

A separate single core 10.0mm Sq minimum PVC Insulated, Green/Yellow earth-bonding conductor between the stainless steel consumer unit and the compression gland earth continuity brass rings fitted to the outgoing XLPE/SWA/PVC 600/1000 Volt Local Authority owned cables.

The cross sectional area and rating of the mains tails and equipotential earth bonding conductor is relevant to the size and rating of the largest outgoing XLPE/SWA/PVC Local Authority owned cable.

#### 4.11 Sub Main Feeder Pillar Wiring Details

All sub-mains are to be adequately designed to comply with voltage drop and earth loop impedance requirements in order that the final sub circuits under full load conditions meet the requirements of BS7671: 2008 and revisions thereof.

#### 4.12 Identification of Circuits

All circuits are to be correctly identified in ink or indelible marker on the consumer board fuse indicator panel or on a fuse chart placed in a sealable wallet fixed to the feeder pillar door.

Road/Street Names, column numbers, sign post numbers or rebound bollard numbers must be identified.

A copy of the circuit schematic must also be provided and be placed in a sealable wallet secured to the inside of the feeder pillar door.

#### 4.13 **Circuit Protective Devices and Switchgear**

Individual circuits shall be protected either by BS88 (parts 2 & 6) HBC fuses, BS1361 fuses or Type B, Miniature circuit breakers to BS EN 60898 or with the prior agreement of the Network Lighting Manager RCBO's to BS EN 61009.

Generally individual circuit protective devices shall be mounted in a suitably sized stainless steel consumer grade 304 or similar approved the unit mechanically tested to BS EN 60439 with a minimum ingress protection rating of IP31 and integral 100 Amp minimum double pole switched isolator tested to BS EN 60947.

Pre-wired panels may be used with an ingress protection rating of IP55 and shall be mechanically tested to BS EN 60439/BS EN 60947. Their use is subject to the prior agreement of the Network Lighting Manager.

Other mains switchgear, fuse panels and the like shall have an ingress protection rating of IP41 and shall be mechanically tested to BS EN 60439/BS EN 60947. Their use is subject to the prior approval of the Network Lighting Manager.

Consumer units or fuse panels must allow for a minimum of 25% spare ways, blank covers are to be provided to any unfused spare ways and a fixed protective hinged cover is to be fitted over the fuses or MCB's as standard.

The maximum number of units, on any one circuit, subject to acceptable voltage drop and earth loop impedance values shall be no more than 12 unless otherwise agreed to by the Network Lighting Manager. Care shall be taken to ensure that under fault conditions that not all lighting in one area is extinguished by the operation of one protective device.

The use of Residual Current Devices to BS EN 61008 shall only be allowed in exceptional circumstances subject to the prior approval of the Network Lighting Manager.

#### 4.14 **Underground Cables**

Underground cables shall be 3 core XLPE/SWA/PVC 600/1000 volt grade Black cable with copper conductors with Brown, Blue and Green /Yellow sheathed inner cores, outer sheath to be embossed 'STREET LIGHTING' to BS5467/with a minimum C.S.A of 10.0 mm Sq unless otherwise identified in this Specification.

All cables are to be glanded to a double pole cut-out, with brass compression glands, brass locknuts and PVC shrouds made off into a brass cable entry plate. XLPE cable compression glands shall be manufactured to BS6121 PT 1 2005.

Unused brass cable entry plate holes shall be fitted with blanked rubber grommets or plastic inserts.

The use of cable joints will not be allowed unless otherwise agreed by the Network Lighting Manager.

All underground cables shall be laid in Twinwall Ducts as follows:-

- a) Bitmac Footway 595mm cover below wearing course level.
- b) Paved Footways 545mm cover below finished level.
- c) Driveways etc 595mm cover below wearing course level.
- d) Carriageways 845mm cover below wearing course level.
- e) Verge 495mm cover below finished level.

#### 4.15 **Existing Underground Authority Cables**

Where existing underground cables are exposed during excavation works the Developer is to immediately notify the Network Lighting Manager. Any remedial works required to the exposed cable are to be at the Developers cost.

Only with the permission of the Network Lighting Manager are cables that are redundant to be pot ended, cables that are to remain energised are to be ducted through a split twinwall duct provided that the cable can be laid in at the required depth.

Cables that cannot be laid in at the required depth are to be replaced the method of replacement is to be agreed with the Network Lighting Manager. Under no circumstances are cable joints to be used.

Where old and new wiring is connected together the wiring shall be terminated in accordance with BS 7671:2008 the section shall be suitably labelled at the supply point with the specified caution label. The method for termination of these cables is subject to the approval of the Network Lighting Manager.

Where the Local Electricity Supply Company cables are exposed and damaged the Developer must contact the Supply Company, any costs incurred are the Developers responsibility.

#### **4.16 Internal Column, Signpost and Rebound Illuminated Bollard Wiring**

Generally columns, signposts and Rebound bollards shall be internally wired using cables manufactured to BS6500.

Please note some internal Rebound bollard wiring details are not shown in this Specification, please contact the Network lighting Manager for more information.

#### **4.17 Internal Cable Details, Columns and Signposts**

Flexible Blue Arctic Grade cable-3183Y PVC Insulated/PVC Sheathed Circular 3 core 2.5mm sq minimum cable between cutout and each lantern, with a drip loop of at least 0.5 metres at the cutout.

A separate single core, 10.0mm sq minimum PVC Insulated, Green/Yellow earth bonding conductor between cable entry gland plate and column/signpost and between the cable entry gland plate and E3 earth block.

A separate 16.0mm sq minimum PVC Insulated, Green/Yellow earth bonding conductor between cable entry gland plate or column/signpost and earth electrode where required.

Where applicable, PVC Insulated/PVC Sheathed 10.0mm Sq minimum Brown and Blue mains tails and PVC Insulated 10.0mm Sq minimum Green/Yellow earth bonding conductor between the Local Electricity Supply Company cut-out and Local Authority's double pole cut-out and column/signpost shaft.

#### 4.18 **Street Lighting Column Supplies**

Each Street Lighting column shall be provided with an individual Local Electricity Supply Company's 230 Volt or 230/400 Volt 50 Hz PME type 24 Hour Live Service as required installed in a Black duct.

The provision of the Mains Service/s as are required shall be the responsibility of the Developer and shall be adequate to meet the expected maximum demand of the Road/Street Lighting Installation.

The Network Lighting Manager prior to their installation must approve all Mains Services.

Where applicable provide PVC Insulated/PVC Sheathed 10.0mm Sq minimum Brown and Blue mains tails and PVC Insulated 10.0mm Sq minimum Green / Yellow equipotential earth bonding conductor between the Local Electricity Supply Company's cut-out and Local Authority's double pole cut out.

Double pole cut outs shall be used in every column and any other street lighting apparatus connection point.

The cut-out shall be rated at 25 Amp, designed, manufactured and tested to BS7654 and IEC 947 Part 1, with an ingress protection rating of IP43.

The terminal blocks shall be able to accept circular conductors up to 25 mm CSA and the terminal block cover shall be moulded in red, the thermoplastic construction shall meet the requirements of BS7654.

Plastic cable entry plates are to be used where DNO supplies are connected direct to the cut-out unless an outgoing fused sub circuit is required.

Individual lighting units shall be protected by a BS88 part 1, AC6 Tag Type 6 Amp HBC fuse, cable seals must be utilised.

Double pole single phase, twin fuse, fused units or similar may be used for particular applications subject to the prior approval of the Network Lighting Manager.

Double pole cut-out shall be fitted with an internal earth block as standard.

The Lucy Trojan Festive Lighting type unit or similar may be used for relevant applications subject to the prior approval of the Network Lighting Manager.



The use of Residual Current Devices to BS EN 61008 shall only be allowed in exceptional circumstances subject to the prior approval of the Network Lighting Manager.

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## **5 Earthing**

The installation earthing arrangements shall be of TN-C-S configuration (PME).

The minimum cross sectional area of the main equipotential bonding conductor shall be 10.0mm Sq.

Copper earth electrodes (1200mm x 20mm) with a suitable copper clamp shall be installed at the end of each circuit in specified earth pits where required.

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## **6 Erection and Installation**

### **6.1 General**

The whole of the installation shall be situated within Highway limits.

The recommended minimum desirable clearances from edge of the carriageway to the face of Street Furniture must be in accordance with BS EN 13201:2003 and BS5489 -1: 2003.

The vertical clearance of Street Furniture erected over a carriageway shall be 5.7 Metres. Where Street Furniture is installed in verges and the like they shall incorporate a concrete surround as specified.

During development work all existing lighting is to remain in full operation during the hours of darkness. Temporary lighting may be provided which is of equal standard to that of the existing and in all aspects is to be in compliance with the relevant parts of BS EN13201:2003 and BS5489 -1:2013.

### **6.2 Columns and Feeder Pillars**

Columns and feeder pillars shall be situated at the rear of the footpath and on the party line between adjacent properties wherever possible.

Columns shall be located so that access doors always face away from approaching traffic.



Where columns are situated in a cul-de-sac or at a turning head and the like access doors must always be situated so as to give maintenance staff a clear view of approaching or reversing traffic.

Columns and feeder pillars are to be installed at least 450mm behind any traffic barriers.

### 6.3 **Signposts**

Generally signposts shall be situated at the rear of the footpath and located so as not to cause obstructions to the general public, private property and traffic.

Where applicable the absolute minimum clearance between the signpost face and or attachments from the kerb edge should be 450 mm.

Signposts are to be installed at least 450 mm behind any traffic barriers.

Signposts shall be located so that access doors always face away from approaching traffic.

### 6.4 **ReBound Bollards**

Where practicable the minimum clearance between each rebound bollard face and the kerb edge should be 450 mm.

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## 7. **Ducts**

The use of Street Lighting duct is subject to the approval of the Network Lighting Manager, all ducts shall be installed in accordance with the Manufacturers Specification and shall be inspected before being backfilled by the Authority's Engineer. Ducts shall not be installed in soft verges. Cables shall be marked with PVC marker tape laid 150mm above cable.

All ducts shall be marked with PVC marker tape laid 150mm above the duct.

Where approved all cables shall be run throughout their length inside twinwall duct with a ribbed MDPE outer profile and smooth LDPE inner bore with a draw wire inserted as standard.

Ducting must meet the requirements of BS EN 50086-2-4.

The twinwall duct is to be Orange in colour with 9mm high White lettering legend 'Street Lighting'. The lettering shall be upper most at all times and shall be shown at intervals of not more than 1.0 Metre.

The twinwall duct to be used may be general purpose twinwall duct with an outside diameter of 110mm, an inside diameter of 94mm and 6.0 Metres in length, or flexible twinwall duct with an outside diameter of 110mm, an inside diameter of 94mm, continuous from a 50 Metre coil.

Lengths of twin wall duct are to be connected together and be connected to the relevant access chambers using the specified adapters to give a smooth continuous bore.

Ducting shall be bedded on and surrounded with 100mm of stone dust and the trench backfilled with a suitably graded material.

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## **8. Access Chambers**

Access chambers shall only be used in exceptional circumstances and their use is subject to the approval of the Network Lighting Manager.

Access chambers shall be installed in accordance with the Manufacturers Specification unless otherwise stated in this Specification and shall be inspected by the Authority's Engineer before being back filled.

Access chambers are to be located at each column, sign post, bollard and feeder pillar position adjacent to the cable entry side of the particular unit, also at each change of direction of the cable route and both sides of road crossings.

Each access chamber shall be 450mm x 450mm sq and consist of High Density Polyethylene (HDPE) sections or rotationally moulded Polyethylene sections with pre-trepanned duct entry holes, both resistant to shock, chemicals, UV exposure, corrosion and weathering. Chambers may either be assembled in sections or in complete units and are designed to provide a minimum cover to the uppermost part of duct walls suitable for footways, drives, carriageways and verges. Please note that upon exiting the chamber the duct shall be laid at the depths previously specified in this specification.

Where access chambers are located in a verge and the like they shall incorporate a concrete path/surround as shown in the Standard Drawings.

Each access chamber is to be mounted on a 100mm deep ST4 concrete base with a 225 mm round plastic pipe set into the base, this pipe is to be a minimum of 200mm in depth, 14mm clean gravel infill 200mm in depth is then to be laid into the base of the pipe to act as a soakaway. The assembled sections are then to be surrounded with 100mm of ST4 concrete.

Generally unless otherwise stated each access chamber is to be 450mm x 450mm fitted with a Class B125 ductile iron cover and frame to BS EN 124. The cover must be secured with greased stainless steel fixing screws, Kite Marked and preferably badged 'Street Lighting' and be Black in colour. The Manufactures name, loading details, Kite Mark and BS EN number must be stamped on the cover. Two lifting bars shall be provided to the Network Lighting Manager upon request.

B125 lockable composite anti slip covers with galvanised steel frames to BS EN 124 may be used subject to the approval of the Network Lighting Manager. These composite covers are to be badged 'Street Lighting' must be Black in colour and indicate the Manufactures name and loading details on the cover. The frames are to be secured by means of two stainless steel screws the threads of which are to be greased.

Access chambers installed on an Industrial Estate or in a Carriageway must be 600 mm x 600 mm fitted with a Class D400 ductile iron cover and frame to BS EN 124. The cover must be Kite Marked an preferably badged 'Street Lighting' and is to be Black in colour. The Manufactures name, loading details, Kite Mark and BS EN number must be stamped on the cover. Installation must be in accordance with this Specification as previously detailed. Two lifting bars shall be provided to the Network Lighting Manager upon request.

Columns and signposts are to be ducted to access chambers by means of 63mm flexible twinwall duct at a depth of 450mm with lettering and legend 'Street Lighting' as previously detailed. The end of the duct is to be pushed up inside the column to the base of the back board.

Where columns or sign posts are installed in pots, from the access chamber provide a 110 mm twinwall duct as previously listed through an aperture in the pot and into the cable entry hole as provided by the Manufacturer, 63mm twinwall duct may be used subject to the approval of the Network Lighting Manager.

Where applicable earth electrode inspection chambers are to be installed adjacent to the final column in each circuit or sub circuit and be connected to the relevant access chamber by means of an Orange flexible twinwall duct. The duct shall be of a diameter of not less than 63mm and legend 'Street Lighting' as previously detailed.

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## 9. Reinstatements

Please refer to the Carriageway and Footway construction details shown in the Main Specification.

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## 10. Testing and Inspection

Upon completion of the installation the following tests shall be carried out in accordance with BS7671: 2008 IEE Regulations for Electrical Installations unless otherwise stated below.

- a. Continuity of protective conductors including main and supplementary equipotential bonding.
- b. Insulation resistance at a test voltage of 1000 Volts DC for individual units reading to be not less than 1 Meg Ohm.
- c. Insulation resistance at a test voltage of 1000 Volts DC for networks reading to be not less than 20 Meg Ohm.
- d. Insulation of site built assemblies.
- e. Polarity.
- f. Earth electrode resistance.
- g. Earth fault loop impedance at every unit.
- h. Prospective short circuit current.
- i. Operation of residual current devices where applicable.

The tests listed shall be undertaken taking into consideration the type of installation.

A test form shall be provided for all electrical works prior to any inspection being carried out by the Network Lighting Manager.

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## **11 Numbering and Labels**

### **11.1 Numbering Requirements - Columns**

The numbering system to be used is that as supplied by Multi Sign Systems, telephone number 01736 757975.

Column identification numbers shall comprise of 75mm high Black numerals and or lettering on a White background. The Authorities logo, telephone number and a bilingual message shall also be shown.

On columns numbering shall be mounted at 3.0 Metres above the finished footway level facing approaching traffic.

All numbering is to be installed and secured in accordance with the Manufactures Specification

Each column shall be numbered, if more than one luminaire is attached to a column they are to be numbered separately on that column for example 1A, 1B.

### **11.2 Numbering Requirements - Signposts.**

On signposts in the footway numbering shall be painted on at 2.0 Metres above the finished footway level facing oncoming traffic. The numerals/lettering shall comprise of Black 75mm high numerals/lettering on a White background, suitably sized to accommodate the numbering and or lettering.

In non-pedestrian areas signposts shall be numbered below the sign face, facing approaching traffic.

Each signpost shall be numbered, if more than one luminaire is attached to that signpost they are to be numbered separately on that signpost with the letter S before the number, for example S1A, S1B.

### **11.3 Numbering Requirements - ReBound Illuminated Bollards**

Rebound Illuminated bollards shall be numbered with Black 50 mm high numerals/lettering on a White background. Numerals/lettering is to be applied to the bottom of the rebound bollard shell using adhesive or painted numerals and letters facing on-coming traffic.

Each rebound bollard shall be numbered with the letter S before the number, for example S1.

#### 11.4 Numbering Requirements - Feeder Pillars

Feeder pillar identification numerals/lettering shall comprise of 75mm high Black numerals/lettering on a suitably sized White background on the uppermost side of the feeder pillar shell facing approaching traffic, the letters FP shall be provided before any identification number for example FP1.

#### 11.5 Hazard Warning Labels

Hazard warning labels as required by the ESQC Regulations 2002 shall be attached to all Authority electrical street lighting furniture in the highway. Please contact the Network Lighting Manager for details.

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## 12. Lighting Levels

### 12.1 Traffic Routes

All traffic routes shall be lit in accordance with BS EN 13201:2003/BS5489 -1:2013 switching regimes and dimming levels are to be agreed with the Network Lighting Manager at the design stage.

### 12.2 Residential Sites.

All residential sites shall be lit to BS EN 13201:2003/BS5489 -1:2013 switching regimes and dimming levels are to be agreed with the Network Lighting Manager at the design stage.

### 12.3 Conflict Areas.

Conflict areas shall be lit in accordance with BS EN 13201:2003/BS5489 -1:2013 and shall not be dimmed unless otherwise agreed by the Network Lighting Manager.

### 12.4 Infill Lighting.

Where it is deemed appropriate by the Network Lighting Manager it is the responsibility of the Developer to provide improved or additional infill lighting between the proposed lighting installation and any existing lighting installation at the Developer's cost. Switching regimes and dimming levels are to be agreed with the Network Lighting Manager at the design stage.

### 12.5 **Outdoor Car Parks.**

Car parks shall be lit in accordance with BS EN 13201:2003/BS5489:-1:2013. Switching regimes and dimming levels shall be agreed with the Network Lighting Manager at the design stage.

### 12.6 **Cycle Tracks**

Cycle tracks shall be lit in accordance with BS EN 13201:2003/BS5489:-1:2013. Switching regimes and dimming levels shall be agreed with the Network Lighting Manager at the design stage.

### 12.7 **Footbridges, Stairways, Ramps and Subways**

These areas shall be lit in accordance with BS EN 13201:2003/BS5489:-1:2013 and are subject to the approval of the Network Lighting Manager.

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## 13 **Design Appraisal**

Please note the Local Authority reserves the right to request amendments and or additions to any design submitted for Approval whether or not those amendments or additions are mentioned within this Specification.

The Developer shall provide the Network Lighting Manager with plans and documentation indicating the following information listed below including the complete Manufacturers part reference numbers and index protection rating where applicable.

Part and category of BSEN 13201:2003/BS5489-1:2013 to which the proposed scheme is designed with calculations using a maintenance factor of 0.9.

- Column positions and location in the footway.
- Column type, door lock option, Manufacturer mounting height and bracket arm projection.
- Double pole cutout type, with complete Manufacturers reference.
- Lantern type, Manufacturer, light source and wattage.
- Type and Manufacturer of luminaire control device.



- Feeder Pillar location and Manufacturer.
- Local Electricity Supply Company Service Details.
- Switch gear and earthing arrangements.
- Underground cable size/s and routes.
- Ducts, inspection chambers, earth electrode chambers and locations thereof. Full cross sectional details of the Street Lighting ducted system.
- Means of connection between columns and the ducted system.
- Circuit schematic detailing voltage drop and earth loop impedance calculations, which are to comply with BS7671: 2008 and revisions thereof.
- Existing circuit schematic detail where existing installations are to be altered or added to in any way detailing voltage drop and earth loop impedance calculations, which are to comply with BS7671: 2008 and any revisions thereof.
- Maximum demand of the installation.
- Approved signpost schedule including bollard details where applicable, showing positions, mounting heights, bracket, sign face and aspect details.

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## 14 Location of Services

It is the responsibility of the Developer to identify all existing and proposed Utility, Communication, Drainage and Sewer Services on documentation sent for approval and to identify such services visually on site prior to any excavation work being carried out.

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## 15 As Laid Drawings and Documents

The developer shall not deviate from the approved layout plans without the authority of the Network Lighting Manager.

Upon completion of the installation the developer shall provide the following documentation as listed below, please note that **No Final Inspection** of the installation will take place until the information requested has been provided to the Network Lighting Manager.

2 No. signed copies of the "as-laid" drawings to include column, signpost, bollard and feeder pillar locations together with details of the cable route/s (with dimensions).

2 No. signed completed copies of the Authority's Street Lighting Inventory Sheet as detailed in this document.

1 No. signed copy of the Standard Test Form and Continuation Sheets as set out in Appendix 6 of BS7671: 2008. IEE Regulations for Electrical Installations.

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## 16 Maintenance Period

Upon satisfactory completion of the installation and the issuing of the relevant Certificate, the Local Authority shall assume responsibility for Energy, Routine Maintenance and Minor Non Routine Maintenance charges.

Any Major Non-Routine Maintenance items such as underground cable faults; column 'knock downs' driver or LED failure etc occurring up to the date of final Adoption shall remain the responsibility of the Developer.

Attention is also drawn to the fact that the Developer will also be responsible for the payment of all energy charges for lighting incurred up to the date of the issuing of the Part 2 Certificate. To this end the Developer is to enter into a (Short Term Connection Agreement) with the Regional Electricity Company, an extract of which is detailed in this document. Energy costs can be monitored with the approved CMS system.

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## 17 Site Supervision.

Prior to the commencement of any street lighting work the Developer must arrange a site meeting between the Site Manager, the Installer and Network Lighting Managers representative, it is the developers responsibility to supervise and monitor the works of the installer and bring to the attention of the Network Lighting manager any matters considered to be detrimental to the approval of the street lighting installation.

The Developer is required to provide the installer with the correct Road/Street Lighting Specification and Approved Road/Street Lighting Installation Drawings. The Local Authority will upon request inspect the scheme prior to the issuing of a Part 2 Certificate and draw up a comprehensive defects list provided that the installation is in a safe and well constructed condition.

The Developer is strongly advised to ensure that the Electrical Contractor commissioned to install the Road/Street Lighting Installation is suitably qualified to do so and is fully conversant with the requirements of the Specification and all other relevant BS EN Standards.

The Developer shall ensure that the Road/Street Lighting Contractor employed shall be suitably qualified and experienced in the installation of Road/Street Lighting Works.

The Contractor employed **Must** be registered with the National Inspection Council for Electrical Installation Contracting (NICEIC) and preferably also be a member of an appropriate Trade Organisation for example the Association of Signals, Lighting and other Electrical Contractors (ASLEC) or the Electrical Contractors Association (ECA).

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**Rhondda Cynon Taff**  
**Road/Street Lighting Inventory**

DATE : \_\_\_\_\_

Road	Route No.	Classification	Name	Town	Map Ref									
Authority		D.N.O Account Number					General Location of Road							
Location of Unit	Lamp		Column		Bracket	Cable	Lantern	Gear	Fuse	Control	B A N D	Control Charge	Control Position	Proximity to E/B Services
	No.	Type	Type	Owner										