



ENVIRONMENT DIRECTORATE

STREET LIGHTING

Design Specification for
Street Lighting and
Illuminated Signs

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Lighting Design Guide and Specification

Introduction

This Lighting Design Guide and Specification has been jointly prepared by and for use in the following Councils:

- Conwy County Borough Council
- Denbighshire County Council
- Flintshire County Council
- Gwynedd Council
- Isle of Anglesey County Council
- Powys County Council
- Wrexham County Borough Council

Minor variations or additions to this standard Specification may exist in each of the individual Councils and these will be detailed in Appendix 2.

Developers should note that this Lighting Design Guide and Specification applies to highway electrical equipment on roads on residential developments, industrial estates and retail parks where the speed of vehicles is not expected to exceed 30 m.p.h. [50 k.p.h.] Whilst the specification of equipment to be used on roads for higher vehicular speeds will generally comply with this document, it is recommended that the design of street lighting on roads for higher vehicular speeds should be discussed with the County Street Lighting Engineer before detailed design commences.

The materials suggested for use in the installation of street lighting on roads in this document are those which contribute to the County's preferred option for a street lighting system on roads for adoption. Developers who wish to utilise alternative designs or materials should liaise with the Street Lighting Engineer to ensure that adoption will not be prejudiced.

The granting of planning permission or building regulations approval does not mean that the Highway Authority will adopt the proposed street lighting or necessarily that the highways as proposed will be suitable for adoption. It is vital that developers consult with the Highways Development Control Officer **before** submission for planning permission or building regulations approval to ensure that what is proposed will be acceptable for adoption.

The term "developer(s)" has been used throughout this document to identify the person or organisation who should comply with this design guide and specification. Within this document "developer" also includes "designers" and "contractors".

Part A Design and Adoption

1 *General*

1.1 *General Procedures*

- 1.1.1 The preferred procedure for adoption will be in accordance with the provisions of Section 38 of the Highways Act, 1980 and developers are encouraged to enter into a formal agreement with the Highway Authority.
- 1.1.2 Where works associated with new road construction involve work within an adopted highway which cannot be included in a Section 38 agreement, a further agreement under Section 278 of the Highways Act, 1980 should be obtained. These agreements should be arranged with the appropriate Highway Authority Officer.
- 1.1.3 Where works associated with construction involve electrical work being undertaken within an area which is maintained by the Highway Authority Street Lighting Section and such work is being carried out by a Section or Department of the Council or any other authority which cannot enter into a Section 38 or 278 agreement and who are not normally involved with the maintenance of such equipment, the works shall be designed, approved and constructed in accordance with this document.

2 *Design of Lighting Installations*

2.1 *General*

- 2.1.1 The design of lighting installations shall be in accordance with the latest edition of the following publications, incorporating any amendments issued:
- ❖ British Standard and British Standard European Specifications.
 - Code of Practice for the Design of Road Lighting BS 5489 :2003
 - Road Lighting (Performance Requirements) BS EN 13201–2:2003
 - Requirements for Electrical Installations BS 7671
 - Supply of Materials [various British or European Standards as referred to below]
 - ❖ The Institution of Lighting Engineers publications.
 - Code of Practice for Electrical Safety in Highway Electrical Operations, as amended within this Specification
 - Guidance Notes for the Reduction of Light Pollution
 - Technical Report No. 12 – Lighting for Pedestrian Crossing
 - Technical Report No. 23 – Lighting of Cycle Tracks
 - Technical Report No. 25 – Lighting for Traffic Calming Schemes
 - ❖ The Health and Safety at Work Act, 1974.

- ❖ The Electricity at Work Regulations.
 - ❖ Construction (Design and Management) Regulations 2007
 - ❖ Engineering Recommendations 'G39' of the Electricity Association.
- 2.1.2 After design and before applying for a Section 38 agreement, the proposed installation shall be submitted for approval to the Street Lighting Engineer. The submission shall comprise:
- ❖ A 1:2500 scale location plan of the development and its surrounding area.
 - ❖ 2 copies of a 1:500 scale general layout plan(s) showing:
 - The detailed layout of the development.
 - The dimensioned widths of carriageways, footways, link paths, cycle routes and service margins.
 - The location of street lighting columns and lighting feeder pillars, any existing lighting installations together with the positions of any existing or proposed tree planting which might affect the illumination of the road.
 - Numbered building plots, existing streets/roads and properties, named or numbered.
 - Any proposed traffic calming measures.
 - ❖ 2 copies of a completed schedule of equipment as shown in Appendix 1.
 - ❖ Copies of any lighting design calculations and where necessary, cable size design calculations.
 - ❖ Where the design information is supplied in the form of a site drawing showing Isolux contours, any minimum point or average values shall relate to each road and not to the site as a whole.
 - ❖ Where a private cable network is necessary and has received the prior approval of the Street Lighting Engineer, a copy of the Distribution Network Operator [DNO] drawing showing the mains cable layout.
- 2.1.3 When dealing with the limitation of obtrusive light from the proposed lighting installation in accordance with the Institution of Lighting Engineers guidance notes, the Street Lighting Engineer shall be consulted before any design is undertaken if there is doubt as to which Environmental Zone is applicable to the development.
- 2.1.4 In exceptional circumstances, lanterns provided to illuminate the highway and which, because of limitations of space, or for aesthetic reasons, are fixed to buildings or structures, may be considered for adoption. Adoption will be subject to the securing of a suitable wayleave, the form of which is to be authorised by the Street Lighting Engineer who will also require written confirmation from the designer of the building or structure or an independent structural engineer of the suitability of the building to support the weight of the lantern and bracket. A copy of an approved Wayleave Agreement is given in Appendix 3.
- 2.1.5 The luminaire maintenance factor used in the design calculations shall be taken from Table D1 in BS 5489-1:2003 and shall equate to the cleaning interval and pollution level as

advised by the Council's Street Lighting Engineer. The lamp flux maintenance factor shall be obtained from the manufacturer of the lamp and shall be based on the figure quoted for lumen maintenance after 8000 burning hours. The Maintenance Factor to be used in the design calculations shall be the product of the luminaire maintenance factor and the lamp maintenance factor.

- 2.1.6 Electricity supplies to lighting columns shall, unless stated in Appendix 2, be provided individually from the DNO main and early contact should be made with the DNO to ascertain the locations of their mains.
- 2.1.7 Where it is necessary to provide underground cables, the proposed locations of the lighting columns shall be agreed with the Street Lighting Engineer prior to any cable design being undertaken. The overall scheme shall be submitted to the Street Lighting Engineer for approval on completion of any underground cabling layout and design.
- 2.1.8 In designing the street lighting installation, particular attention should be given to the requirements of Section 5 of BS 5489-1:2003 concerning the siting of columns.
- 2.1.9 If new lighting is to be installed near to a railway line or in any other sensitive location, as defined in Section 12 of BS 5489-1:2003, the appropriate Authority must be consulted at an early stage about possible interference from the lighting. Copies of consultation correspondence must be provided with the submission to the Street Lighting Engineer.
- 2.1.10 The lighting installation for car parks may be considered for adoption although, the car parks themselves, will not be considered for adoption by the Highway Authority. The lighting of such features shall be designed in accordance with Section 10.7 of BS 5489-1:2003 and, in general, lighting within these areas shall not involve the use of low-pressure sodium lamps.
- 2.1.11 Any proposed tree or shrub planting within the highway boundary shall be located no closer than 5 metres from any street light or illuminated traffic sign and no closer than 2 metres from any feeder pillar. Where the developer provides landscaping or planting on land adjacent to the highway the minimum distances stated above should be complied with in order to avoid obstruction of highway electrical equipment.

2.2 *Lighting of Estate Roads and Retail Parks*

- 2.2.1 The lighting installation on estate roads in villages or other rural locations shall be designed having regard to the recommendations contained in the document "Lighting in the Countryside – Towards Good Practice" which can be obtained from The Stationery Office.
- 2.2.2 The lighting installation for the Urban Road Network including industrial estates and retail parks shall generally be designed to meet the requirements of Section 7 of BS 5489-1:2003 and a usual mounting height of either 8m or 10m is expected. Information on the selection of an appropriate lighting class is given in Annex B of BS 5489-1:2003 however, prior to any design being undertaken the developer should discuss the particular requirements for the site under consideration with the Street Lighting Engineer.
- 2.2.3 The lighting installation for the Estate Road Network shall generally be designed to meet the requirements of Section 9 of BS 5489-1:2003 and a usual mounting height of 5m or 6m is expected. Information on the selection of an appropriate lighting class is given in Annex B of BS 5489-1:2003. If there is any doubt as to the standard to be applied having regard to the road's location and anticipated usage, this must be agreed with the Street Lighting Engineer prior to any design being undertaken.

- 2.2.4 The lighting of conflict areas ie. road junctions, roundabouts and pedestrian crossings shall be designed in accordance with Section 11 of BS 5489-1:2003. Information on the selection of an appropriate lighting class is given in Annex B of BS 5489-1:2003.
- 2.2.5 The locations and types of illuminated signs, where required, shall be approved by the Traffic Engineer prior to the submission for a Section 38 agreement. The Street Lighting Engineer shall be consulted as to the type of illumination to be used on those signs which are required to be illuminated, see Clause 6.2.
- 2.2.6 The positions of all columns and illuminated signs and bollards will be shown on the approved plan, however before installation the exact positions shall be agreed with the Street Lighting Engineer on site. Care shall be taken over the location of the column door to ensure that maintenance operations can be carried out safely and easily.
- 2.2.7 Columns shall generally be sited at the rear of the footway so as to avoid obstruction to pedestrian movement. In all cases the minimum clearance from the edge of carriageway to the face of the column shall comply with that recommended in Section 5 of BS 5489-1:2003. On residential developments, columns sited in service margins or grassed areas may be erected with a clearance of 800mm. In cases of doubt, the developer should seek clarification from the Street Lighting Engineer.

2.3 *Lighting of Cycle Routes*

- 2.3.1 Cycle routes shall be lit in accordance with the Institution of Lighting Engineers Technical Report No. 23 – Lighting of Cycle Tracks and shall have regard to the Environmental Zone in which the route is located. In Environmental Zones E1 and E2, or where after-dark usage is not likely to be high and a suitable alternative route is available which is lit, it is recommended that the cycle route should be unlit. It is further recommended that the lighting of any cycle route should be discussed with the Street Lighting Engineer prior to the design being undertaken.

2.4 *Non-Standard Installations*

- 2.4.1 Whilst there is some flexibility to allow choice in the type of materials to be used, the Council must impose some restriction in order that future maintenance costs, including the necessity to stock a multitude of replacement parts, are reduced to a minimum. Notwithstanding this, the Council is prepared to consider schemes which utilise non-standard highway lighting fittings where the developer considers that on aesthetic, or other reasonable grounds, a decorative or heritage-style lantern and/or column should be used. In all such cases the developer should make early contact with the Street Lighting Engineer to discuss the proposal.
- 2.4.2 The Council will require the payment by the developer of a commuted sum, which will be calculated by the Street Lighting Engineer, to cover the increased maintenance and/or energy costs of the non-standard items over a 15 year period.

3 *Procedure for Adoption of Street Lighting*

- 3.1 Prior to adoption of the highway the developer must submit the following to the Street Lighting Engineer in respect of the street lighting installation:
- ❖ The original completion and test certificates must be submitted as required by BS 7671.

- ❖ When several lighting units with similar particulars are offered for adoption, one test certificate, together with a schedule of test results for each lighting unit may be submitted.
 - ❖ Test certificates which are current must be provided, i.e. the tests must have been carried out not more than 3 months before the roads are submitted for adoption and must show actual values measured during electrical tests.
 - ❖ A specific layout plan at 1:500 scale showing the position and identifying number of each street lighting unit and the routes and depths of any underground street lighting cable network must be provided. The unit identification numbers must be cross-referenced to the test certificates.
 - ❖ The developer will remain fully responsible for the public lighting installation, including payment of energy charges and continuing maintenance, until the date of formal adoption.
- 3.2 Following receipt of the documents listed in 3.1 the Street Lighting Engineer will arrange to inspect the installation to ensure that it fully complies with the Specification. Failure on the part of the developer to comply with any requirement under clause 7.1 may prejudice adoption. The developer will then be required to verify the adequacy of the works undertaken entirely at his own expense and to the satisfaction of the Street Lighting Engineer.
- 3.3 When the Street Lighting Engineer considers that the installation fully complies with the approved drawings and this specification he shall issue a completion certificate. If the installation is covered by a Section 38 or Section 278 Agreement the completion certificate will be sent to the Council Officer responsible for the Agreement, otherwise a copy of the completion certificate will be sent to the developer.
- 3.4 Appendix 2 indicates the stage at which the Council will adopt the highway electrical equipment and pay any charges for electricity consumed.

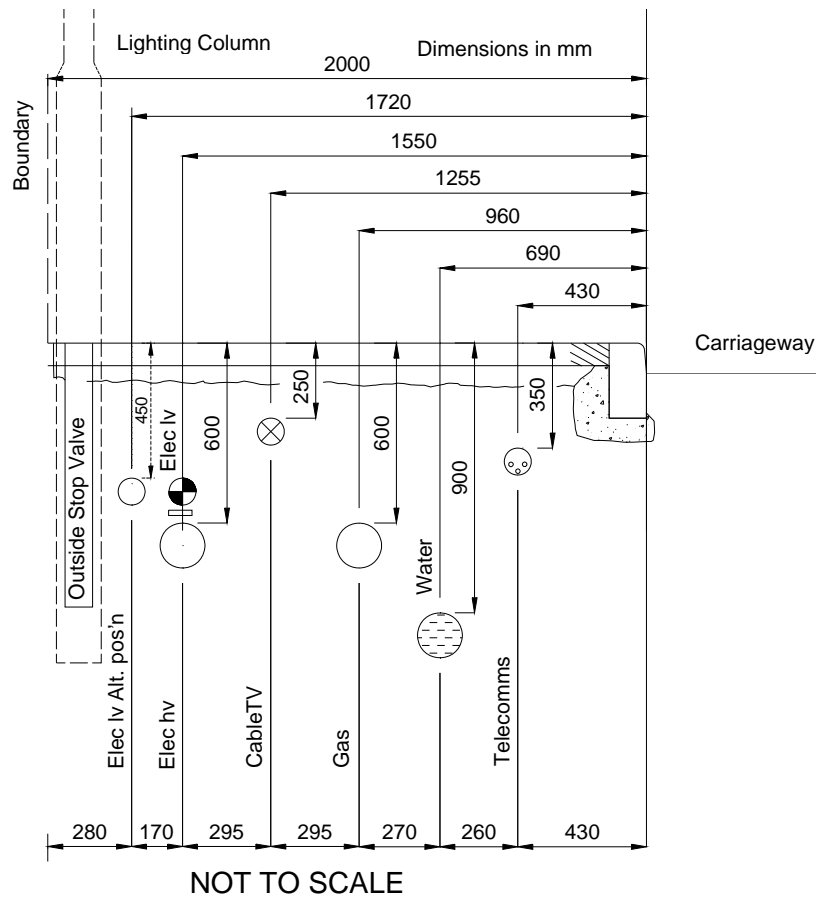
4 Statutory Undertakers and Service Utilities

4.1 Location of Plant/Apparatus

4.1.1 Public utility mains and services shall be laid within the highway boundary but not within the carriageway, unless there is no viable alternative.

4.2 Arrangement of Mains in a 2m Wide Footway

4.2.1 The preferred arrangement of mains in a footway is illustrated below and developers are requested to adhere to this arrangement wherever possible.



The recommended positions shown above result from an analysis of utility needs and the lateral clearances should be considered as a minimum.

The following points should be noted:

- ❖ Industrial estate footway/link path widths may need to be increased to achieve the minimum lateral spacing when larger mains are used.
- ❖ Lighting columns are to be sited at the rear of the footway as required by BS 5489.

4.2.2 Where a service margin is to replace a footway, the layout of mains must be agreed with the Private Street Works Engineer before the completion of a Section 38 agreement.

5 Programme and Inspections

5.1 Programme

- 5.1.1 In addition to any requirements within the Section 38 Agreement for the submission of a programme of work for road construction the developer shall advise the Street Lighting Engineer when he intends to install any highway electrical equipment.

5.2 Inspections

- 5.2.1 The Street Lighting Engineer shall be advised by the developer at least 7 days in advance of his intention to install highway electrical equipment, in particular any installations below ground level, in order to allow the Street Lighting Engineer the opportunity to undertake an inspection of the installation before it is covered. The developer shall confirm that the installation will take place by giving at least 24 hours notice of the installation of any works which will not be visible above ground. Failure to comply with this Clause may result in the developer having to excavate trial holes at his expense in order to confirm that the installation fully complies with this Specification.

6 Traffic Signs

6.1 General

- 6.1.1 Where works affect traffic movement on the existing highway network and where it is necessary in the interests of public safety elsewhere, then traffic safety measures for road works shall be implemented in accordance with Chapter 8 of the 'Traffic Signs Manual'.

6.2 Permanent Traffic Signs

- 6.2.1 In all cases, the provision of appropriate traffic signs on new developments will be a requirement for adoption. Any provision must comply with the 'Traffic Signs Regulations and General Directions (Statutory Instrument No. 3113, 2002)' and be to the satisfaction of the Highway Authority Traffic Engineer, who will advise whether signs need to be illuminated.
- 6.2.2 Where traffic signs are required to be illuminated, details of the method of providing the electricity supply shall be submitted to the Street Lighting Engineer for approval.
- 6.2.3 The developer shall consult the Street Lighting Engineer regarding the type of illumination i.e. internal or external, to be used.

Part B Specification

7 *Introduction*

7.1 *The Application of This Specification*

7.1.1 This Specification shall apply to highway electrical equipment installed on any road, link path, cycle route, or any element thereof, constructed or installed as part of a residential development, industrial estate, retail park or any area which is intended for adoption by the Council as Highway Authority. Throughout Part B of this document references to 'The Street Lighting Engineer' shall include any other officer designated to act on behalf of the Street Lighting Engineer.

7.2 *British Standard and British Standard European Specifications*

7.2.1. The current British Standard or British European Standard Specifications shall apply in respect of all materials referred to in this Specification, including their storage and installation. Materials shall, where appropriate, be stamped with a third party verified product certification mark e.g. CE mark, together with the appropriate reference number.

7.3 *Testing*

7.3.1 Testing of the electrical installation is deemed to be the responsibility of the developer and shall be carried out in accordance with the current, relevant, British Standard or British European Standard Specifications by a competent person.

7.3.2 Where a British Standard or British European Standard Specification requires that materials are tested to ensure compliance with the relevant specification then an approved independent testing laboratory shall carry out such testing.

7.4 *The Effects of the Works on Existing Highways*

7.4.1 Wherever electrical works associated with a new road, link path or cycle route are to be carried out in an existing highway the developer shall establish, in advance of the commencement of works, the full requirements of the Highway Authority. It is advisable to undertake this exercise at least 8 weeks in advance of the intended starting date so that, if required, agreements under Section 278 of the Highways Act, 1980 can be prepared otherwise delays may be experienced. Concurrently, the Highways Department can advise on the Highway Authority's requirements in respect of the method of working, traffic control and signing.

7.4.2 The developer's attention is drawn to the need, on his part, to ensure compliance with the requirements of the New Roads and Street Works Act, 1991. Before excavating in any existing highway, developers shall obtain any necessary licence(s) and must establish whether there is any existing statutory undertaker's plant which will be affected. Developers are advised of the need to comply with the requirements contained in the publication "Health and Safety at Work Act – Avoiding Danger to Underground Services" [HS(G)47]. Any apparatus located is to be protected at the developer's expense and no pipe or cable shall be disturbed without the approval of the statutory undertaker. Traffic management, incorporating appropriate safety measures, shall be carried out in accordance with Chapter 8 of the Traffic Signs Manual.

- 7.4.3 Highways in the vicinity of the works shall be kept free from mud, dust and debris as far as is reasonably practicable. Where contamination of a highway is unavoidable, appropriate signage and regular cleaning will be required.
- 7.4.4 Noise and vibration caused by the works shall be minimised by the best practicable means. It shall be the developer's responsibility to ascertain and ensure compliance with any specific requirements in this regard.
- 7.4.5 Existing public highways shall not be used for the stockpiling and storage of materials and plant.
- 7.4.6 Blasting operations will not normally be permitted where they will have an effect on an existing adopted highway but where the developer has no practicable alternative to the employment of such techniques; the prior approval of the Highway Authority must be obtained through the Private Street Works Engineer. Adherence to any, and all, requirements imposed shall be strictly observed. The developer will remain entirely responsible for ensuring compliance with all statutory requirements in respect of blasting operations.
- 7.4.7 In the event of default on the part of the developer in respect of any of the foregoing sub-sections, or any damage caused to an existing adopted highway, the developer shall be entirely responsible for the costs of rectifying the results of such default or damage and for meeting the costs of any claims which may result from the default, damage or rectification and/or repair.
- 7.4.8 The developer shall hold public liability insurance cover to a minimum of £5,000,000 in respect of any one third party claim. Where work is to be carried out in a highway maintainable at the public expense, the Private Street Works Engineer may require a copy of the developer's safety policy and insurance certificate.

7.5 *Non-compliance with the Specification*

- 7.5.1 If the developer fails to comply with **any** requirement of this specification, adoption of the works will be prejudiced unless and until the non-compliance is rectified.
- 7.5.2 Where the developer has entered into a Section 38 agreement, non-compliance may result in the default procedures being invoked.

8. Street Lighting Specification

8.1 General

- 8.1.1 All materials and workmanship shall be in accordance with this specification and to the satisfaction of the Street Lighting Engineer.
- 8.1.2 The installer of the lighting installation must be NICEIC or ECA registered, be experienced in the installation of public lighting equipment and qualified to provide official completion and test certificates.
- 8.1.3 Where works are carried out to an adopted lighting installation e.g. as part of works under a Section 278 agreement, any new lighting units installed must be brought into use before the disconnection and removal of any existing lighting units. Where this is not practicable the developer shall arrange for some form of temporary lighting to be installed in order to maintain the existing lighting levels.

8.2 Lighting Columns and Brackets and Traffic Sign Posts for Illuminated Signs

- 8.2.1 Columns and brackets shall:
- ❖ Comply with all relevant parts of BS 5649 and BS EN 40 and the particular requirements of this specification.
 - ❖ Only be purchased from manufacturer's who are registered with either BSI Quality Assurance or Lloyds Register Quality Assurance Ltd., for the manufacture, supply and verification of lighting columns and bracket arms under their Quality Management Schemes (QAS5020/304, QSS 5020) to BS EN IS 9002. Certificates of Conformity may be required in support of all columns used.
- 8.2.2 All columns and brackets shall carry a unique identification mark which indicates the name of the manufacturer, year of production and manufacturer's batch number. The identification mark shall be permanent, legible and clearly visible and shall be located within the base compartment of the column.
- 8.2.3 Unless stated in Appendix 2, in residential roads the preferred method of mounting lanterns is post top however where brackets are required they shall be integral with the column ('hockey stick' type). On other road types where a separate bracket is fixed to a column, the assembly of the column shaft and bracket shall incorporate a mechanical locking system in addition to high tensile socket headed securing screws and it shall be possible to fix the bracket in any of 4 x 90° positions relative to the door opening. When correctly fixed, the design of the bracket shall not allow any movement of the bracket either vertically or horizontally with respect to the column. At the point of interconnection, the cross-section of the bracket shall, preferably, equal that of the column shaft. Brackets shall blend with their columns, in material, finish and colour and shall be as short as practicable.
- 8.2.4 Columns and brackets shall be designed by the manufacturer to meet the following parameters. The developer shall insert where appropriate the required site specific information as shown in Appendix 2 to enable the manufacturer to design the columns in accordance with BS EN 40 and shall when requested submit standard column data sheets to the Street Lighting Engineer.
- 8.2.5 Base compartments shall afford easy access to cable terminations and wiring. All electrical equipment mounted in the base compartment shall be securely fixed to a 15mm minimum

thickness backboard which shall be of a non-hygroscopic material of sufficient size to accommodate any control gear and cable termination units. Doors, which shall be sealed to minimum IP33, shall be provided with a substantial and positive, triangular-headed, tamper proof lock. The locking mechanism shall be lubricated with grease immediately following installation and if necessary prior to adoption. Two keys per 10 columns, with a minimum requirement of two keys shall be provided to the Street Lighting Engineer prior to adoption of the road. The earthing terminal provided for steel columns and their doors shall comprise a brass or stainless steel bolt, size M8, complete with nuts and washers. The column shall have a cable entry slot 75mm in width.

8.2.6 Columns and brackets shall be manufactured from Steel or Aluminium as detailed below and as stated in Appendix 2:

❖ Circular tubular steel manufactured from cold-formed hollow sections without heat treatment with constant shaft diameter above the base compartment.

❖ Continuously tapered steel with either circular or polygonal cross-section (minimum 8 sides). Multisided tapered columns shall be press-folded then submerged arc welded down the joint.

❖ Circular hollow tubular aluminium extruded from a solid block of alloy AlMgSi0,5 with a satin brushed finish

Where road conditions require the use of passive safe lighting columns discussions should be held with the Council Street Lighting Engineer to agree the material to be used.

Steel Columns and Brackets

8.2.7 Steel columns and brackets shall be protected against corrosion at the fabricator's works by the following system:

❖ Surface preparation: the complete column and/or bracket shall be hot-dip galvanised to comply with the requirements of BS EN ISO 1461, the minimum coating thickness to all faces is to accord with Table 2.

❖ Further treatment - after hot-dip galvanising:

- Internal and external surface of planted root only, to 250mm above ground level to be degreased and treated with 'T' wash.
- 2nd coat: item 150 Pitch Epoxy (2 packs) AS, mdf, 100microns, black [As D.O.T./W.A.G. approvals]

8.2.8 In general, galvanised steel columns shall be left unpainted; however, where columns require painting the developer shall submit details of the proposed paint system to be used to the Street Lighting Engineer for approval before undertaking any work.

Aluminium Columns and Brackets

8.2.9 The bases of aluminium columns, up to a minimum of 250mm above the proposed ground level, shall be protected by a factory applied system approved by the Council Street Lighting Engineer.

8.2.10 Door openings shall be reinforced in accordance with BS EN 40-3-1. Flush fitting doors, which shall be sealed to minimum IP44, shall be provided with two stainless steel triangular-headed locks. The locking mechanism shall be lubricated with grease immediately following installation and if necessary prior to the end of the defects correction period. The earthing terminal provided for aluminium columns and their doors shall comprise a stainless steel bolt, complete with nut and two washers. The copper earthing wire shall be installed between the two washers to ensure that the copper cable does not come in contact with the aluminium

Traffic Sign Posts for Illuminated Signs

8.2.11 Posts for illuminated traffic signs shall generally comply with the requirements stated for lighting columns. Posts shall conform to BS873 and BS EN 10210.

General

8.2.12 The developer shall excavate and provide concrete ST2 mix complying with BS 5328 – 1:1997, foundations of sufficient thickness to firmly locate the column in the ground having regard to the ground conditions encountered and the column manufacturer's recommendations. Any concrete foundation shall be finished 150mm below finished surface level. See Standard Detail drawing.

8.2.13 Where ground conditions are poor or where agreed with the Street Lighting Engineer the developer shall install a sleeve foundation comprising a pipe set vertically in the ground into which the column is set. See Standard Detail drawing.

8.2.14 50mm dia. PVC service ducting tubes shall be incorporated in all lighting column foundations terminating at the cable entry slot to enable the supply cable to enter the column. The ducts shall be black for a DNO service or orange for a private supply service. A stranded polypropylene or equivalent rot-proof material draw rope of 5KN breaking load shall be left through the ducting tube to enable the electricity supply cable to be drawn through.

8.2.15 Lanterns and brackets (where required) shall not be attached to the column until 24 hours after the concrete foundations are laid.

8.2.16 Any damage caused during installation to the protective system applied by the column manufacturer shall be made good immediately following column erection or when the lantern is fitted.

8.2.17 Where it is necessary to provide flanged base rather than rooted columns, the developer shall submit details of the concrete foundation and fixing details to the Street Lighting Engineer for approval prior to any work being undertaken on site.

8.2.18 All columns shall be provided with identification numbers as detailed on the approved plan. The number shall comprise a 50mm (75mm on roads subject to a speed limit greater than 40mph) high black numeral on a white square or rectangular background. The number shall be located approximately 3m above ground level (2m on roads with little pedestrian usage) and facing onto the carriageway.

8.2.19 Columns sited on footpaths, or in any area which does not have vehicular access, shall be of the hinged or folding type, as stated in Appendix 2, in order that the column can be lowered into a safe area and maintained at ground level. The developer shall submit to the Street Lighting Engineer for approval details of the type of folding column he proposes to use.

8.3 Lanterns

8.3.1 Lanterns shall be:

- ❖ Manufactured from marine grade aluminium, totally enclosed and shall conform to BS 4533 and BS EN 60598 and have a minimum degree of protection rating of IP 65 to BS EN 60529. Where a separate gear compartment exists, this shall have a degree of protection of at least IP 43. Where heritage or decorative lanterns are proposed the type of material used shall be approved by the Street Lighting Engineer.
- ❖ Fitted with a photo-electric control unit (Photocell or PECU) socket located on the canopy for the installation of a one-piece electronic PECU or be drilled to accept a miniature two-part electronic PECU.
- ❖ Fitted with integral electronic control gear and complete with fuse holder and an appropriately rated cartridge fuse located adjacent to the terminal block which shall be capable of accepting a conductor of 2.5mm².
- ❖ Installed in accordance with the manufacturer's instructions with no gap between the lantern and the shoulder of any bracket arm. The lantern shall also be installed at the correct design tilt and horizontal alignment and to ensure that the design 'IP' rating is maintained. All fixing bolts shall be mechanically tight. Where a torque setting is recommended for the fixing screws/bolts, a torque wrench shall be used to ensure that the requirements are met.
- ❖ Provided with vandal-resistant (polycarbonate or similar) glazing for those lanterns mounted below 8m.
- ❖ Of the side entry or direct column mounting type wherever possible. However, consideration may be given to the use of post top decorative lanterns in certain installations subject to compliance with the light output restrictions and the prior approval of the Street Lighting Engineer.

8.3.2 All SON lanterns shall be fitted with anti-cycle ignition control gear.

8.3.3 Side entry lanterns shall have a positive locking device so as to prevent the lantern turning on its axis.

8.3.4 The lamps, reflectors, refractors and bowl shall be clean and free from obscuring film after installation and the lamp shall be correctly positioned within the lantern. The bowl or any access panel should be seated uniformly on the gasket seal and the toggle catches secured so that the whole of the unit is dust and weatherproof to the appropriate IP rating.

8.3.5 The upward wasted light ratio [UWLR] of lanterns shall not exceed the recommended maximum for the environmental zone within which the development is located.

8.3.6 Lanterns installed within 3km of the coast shall be fitted with an approved anti-seagull device to prevent seagulls from settling on the lantern.

8.3.7 In order to assist with future maintenance, the Council requires that the lanterns used on roads which are covered by this specification shall be chosen from the approved list of lanterns given in Appendix 2.

8.4 Traffic Sign Luminaires

- 8.4.1 Traffic Sign luminaires shall comply with BS EN 60598-1, BS 4533-102.1 and EN 60598-2-1 and shall provide a light distribution in accordance with BS EN 12899.
- 8.4.2 Control gear shall be suitable for operation on either an electrical supply of 230 Volts, 50Hz ac or 24 Volt dc as required by the Street Lighting Engineer.
- 8.4.3 Gear trays shall be provided with a means of electrical isolation and/or disconnection by means of a cable restrained plug and socket which ensures that the earth terminal is the last to disconnect and the first to reconnect without removal of the gear tray.
- 8.4.4 Control gear for the lamps shall be securely attached to a galvanised steel gear tray, by means of stainless steel nuts, bolts and shake proof washers to ensure sound earth continuity and easy replacement.
- 8.4.5 In twin lamp units, the control gear shall be independent and separate so that in the event of a lamp failing, at least one lamp should continue to function.
- 8.4.6 Type 'A' luminaires shall be supplied complete with a miniature one-piece electronic photocell unit as stated in Clause 8.6.1.
- 8.4.7 Traffic sign luminaires shall be obtained from Manufacturers approved by the Street Lighting Engineer.

8.5 Lamps.

- 8.5.1 Highways which are considered to be traffic routes shall generally be lit using High Pressure Sodium (SON) lamps complying with BS EN 60662. Where these routes pass through commercial areas the Street Lighting Engineer may require the use of "white light" in order to improve facial recognition in the adjacent pedestrian areas. This change of lamp type also reinforces to the motorist the change in character of the highway at that location.
- 8.5.2 Highways which are located in residential areas should be lit using "white light" sources.
- 8.5.3 Preferred "white light" sources are shown in Appendix 2.
- 8.5.4 All lamps shall comply with the appropriate British or European Standard i.e. BS or BS EN and shall be manufactured within the E.U. by a manufacturer approved by the Street Lighting Engineer.
- 8.5.5 All lamps shall be marked to show their suitability for operation at the standard supply voltage provided by the DNO.
- 8.5.6 Lamps used in traffic sign luminaires shall be either PL or LED as stated in Appendix 2.
- 8.5.7 All lamps shall be from an approved manufacturer as stated in Appendix 2.
- 8.5.8 Lamps shall be guaranteed for at least 2 years or 8,000 hours of operation. All SON lamps shall be guaranteed for at least 5 years or 20,000 hours of operation. Where lamps have been in service for a period in excess of 2 years, the developer shall install a replacement lamp prior to adoption.
- 8.5.9 Lamps shall be compatible with the lantern used and must not be fitted in the lantern until the lantern has been correctly fixed to the column/bracket.

8.6 Control Gear

8.6.1 Photo-electric control units (PECU's) shall:

- ❖ Be provided for all lighting units including traffic signs.
- ❖ Comply with BS 5972 and be manufactured to a quality level of ISO9002 or equivalent.
- ❖ Provide class 2 protection against electric shock and shall be either:
 - A one-part unit to fit a NEMA socket or grommet fixing.
 - A two-part unit with a separate detector and controller incorporating a test switch.

In either case the detector unit shall be constructed to provide protection to IP67 against the ingress of dust and moisture and shall be secured to the lantern with an effective weatherproof seal of at least IPX4.

- ❖ Be fully electronic with a switching mechanism capable of controlling a reactive lighting load of 10 amps on a 240V 50 Hz supply.
- ❖ Be designed, in so far as is practicable, to fail in the on mode. If a triac or other semiconductor switching device is fitted, a method of ensuring that the load remains switched to the on state must be provided in the event of an overload destroying the device.
- ❖ Have a minimum guaranteed life of 6 years from their date of manufacture and this date shall be indicated on each individual unit to the Street Lighting Engineer's satisfaction. The guarantee shall not be insurance based and shall be based on testing and component mean time between failure rates. The supplier shall, when requested, provide such supportive testing records and/or written evidence, to support such life-expectancy claims. Any units failing within the guarantee period shall be replaced, free of charge, by the developer, on a one-to-one basis inclusive of all costs associated with their replacement.
- ❖ Be manufactured by a manufacturer approved by the Street Lighting Engineer, see Appendix 2.

8.6.2 The switching regime shall be as stated in Appendix 2. All units must be indelibly marked with the switch setting, the manufacturer's identification mark, model number and the date of installation

8.7 Electronic Ballasts

8.7.1 Electronic ballasts shall be:

- ❖ From a manufacturer approved by the Street Lighting Engineer, see Appendix 2, for use in highway electrical equipment and shall be suitable for operation at the standard supply voltage provided by the DNO.
- ❖ Suitable for use with the lamp used. The terminals to which the lamp and supply connections are made shall be clearly marked.

- ❖ Mounted in the gear tray fitted to the lantern with terminals shrouded so that no live metal parts are exposed.

8.7.2 All electronic ballasts shall have the ability to be dimmed and remotely monitored.

8.8 Cut-Outs, Isolators, Fuse Holders and Fuse Links

8.8.1 A list of approved manufacturers may be stated in Appendix 2.

8.8.2 Cut-outs and fuse holders shall have moulded drip-proof housings.

8.8.3 Cut-outs for cable terminations shall:

- ❖ Comply with BS 7654
- ❖ Have sufficient separate terminals for all live, neutral and earth conductors. They shall be clearly labelled to differentiate circuits and phases.
- ❖ Incorporate a fuse carrier and be designed primarily for use in street lighting columns and suitable for terminations or looped services.
- ❖ Be complete with any necessary extension box, glands or clips to enable the cable to be terminated and the steel wire armouring to be properly fixed and connected.

8.8.4 Cut-outs on private supply cables shall incorporate a lockable double pole isolator. In all other cases a lockable double pole isolator shall be incorporated within or installed immediately after the DNO cut-out.

8.8.5 Fuse links shall be cartridge fuses complying with the requirements of BS 88, BS 646 or BS 1361. They shall be of high breaking capacity type and be of a value appropriate to the circuit requirements.

8.9 Wiring and Earthing

8.9.1 Wiring within the electrical unit shall have copper cores and shall be PVC/PVC sheathed 300/500V grade to BS 6004 unless otherwise agreed with the Street Lighting Engineer.

8.9.2 Conductor sizes shall be in accordance with the recommendations contained in the ILE Code of Practice for Electrical Safety in Highway Electrical Operations. The connection between the REC cut-out and the double pole isolator shall be made using double insulated 'tails' – minimum 2.5mm² csa.

8.9.3 Circuit protective and equipotential conductors shall comply in all respects with the requirements of BS 7671.

8.9.4 A circuit protective conductor shall connect the earth terminal on each luminaire to the main earth terminal block mounted on the column back board.

8.9.5 An earth terminal block shall be fixed to the baseboard adjacent to the cut-out and shall be a three-way type capable of accepting a cable size up to 25mm².

8.9.6 A main protective bonding conductor shall have a cross-sectional area not less than half the cross-sectional area required for the earthing conductor of the installation and not less than 6 mm². (BS7671, Section 544.1.1).

Where PME conditions apply the earthing conductor of a street electrical fixture shall have a minimum copper equivalent cross-sectional area not less than that of the supply neutral conductor at that point or not less than 6 mm². (BS7671, Section 559.10.3.4).

- 8.9.7 All exposed conductive parts, as described in BS 7671, shall be bonded to the main earth terminal using an equipotential bonding conductor of not less than 6 mm² cross sectional area. This shall be increased, if necessary, to conform to the DNO's requirements. Access doors shall be bonded using flexible or tri-rated cable.
- 8.9.8 All earth conductors shall be insulated with green and yellow PVC.
- 8.9.9 All street lighting and other electrically supplied street furniture shall be earthed and bonded in compliance with BS 7430.
- 8.9.10 A permanent label to BS 951, with the words "Safety Electrical Connection – Do Not Remove" shall be permanently fixed in a visible position as stated in BS 7671 Section 514-13.

8.10 Electricity Supplies

- 8.10.1 Unless stated in Appendix 2 lighting units shall, wherever possible, have individual phase supplies from the DNO. The supply service at nominal 230V, AC 50Hz, single – phase shall terminate at a cut-out which complies with Electricity Supply Industry Standard 12-19.
- 8.10.2 Where columns are remote from DNO mains **and** following approval by the Street Lighting Engineer, supplies shall be taken at convenient points (feeder control pillars) and distributed to lighting units by private cables. The DNO will provide a supply within the highway boundary but not to a central reserve or traffic island. Lighting units (either columns or signs) sited in these areas will require a private cable supply which can be readily isolated in the near vicinity.

8.11 Private Underground Cables.

- 8.11.1 When authorised for use by the Street Lighting Engineer, private underground cables shall:
 - ❖ Be PVC or XPLE insulated, steel wire armoured, PVC sheathed with stranded plain copper conductors, 600/1000V grade to BS 6346, or split concentric cable as agreed with the Street Lighting Engineer. All conductors shall be of equal cross sectional area and of such size as to carry the designed load and ensure that the voltage drop at the lamp column terminals shall not exceed 3% of the voltage at the supply points. The minimum conductor size for adoption is stated in Appendix 2. Where a 24 volt supply cable is installed to feed bollards or traffic signs the minimum conductor size may be reduced to 2.5mm² subject to the approval of the Street Lighting Engineer.
 - ❖ Unless agreed with the Street Lighting Engineer all cables shall be 3 core (live, neutral and earth). The cable shall be special "Street Lighting Cable" and shall be marked as such and shall have the cores coloured as brown (live), blue (neutral) and yellow/green (earth).
 - ❖ Be manufactured by a 'BASEC'-registered manufacturer.
 - ❖ Loop between lighting units, feeder pillars, illuminated signs etc. with no underground jointing being permitted. Illuminated signs or bollards shall be fed by cables from lighting columns or feeder pillars. Under no circumstances must cable feeding a lighting column be looped through a sign or bollard.

- 8.11.2 No more than three cables shall terminate at a lighting unit and no more than two at an illuminated sign or bollard.
- 8.11.3 Private 5 core, three-phase sub mains may be laid between feeder pillars.
- 8.11.4 All cables and cable ducts shall be laid on a bed of sand 100mm deep and covered with a sand layer of equal depth. A yellow, self-coloured PVC or plastic tape, not less than 0.1mm thick and 150mm wide with the wording "STREET LIGHTING CABLE" printed along the full length occupying not less than 75% of its available length and occurring at least at 1m intervals, shall be laid within the backfilling material approximately 250mm vertically above the cable or duct line.
- 8.11.5 The Street Lighting Engineer shall be advised, at least 7 days in advance, by the developer of any proposed installation of cable or cable ducts in order that inspection of the cable or duct may be undertaken before it is covered.
- 8.11.6 Cables shall be individually terminated and secured at switches, cut-outs and other electrical apparatus by means of an armour securing clamp or an aluminium compression-type gland complying with BS 6121 or BS EN 50262 and a gland plate. The armour securing clamp or compression gland and plate assembly shall incorporate at least one non-ferrous earthing terminal. All glands shall be shrouded overall with PVC sleeves and CET system terminations shall be suitably protected.
- 8.11.7 All cable terminations shall be provided with a non-ferrous label or tag onto which is indelibly marked the cable size and the origin or destination of the cable run.
- 8.11.8 Earth electrodes shall be provided at the penultimate unit of each private circuit and if necessary at additional points in order to obtain the necessary test results. They shall comply with Engineering Recommendation G12/2 published by the Electricity Association. The earthing system components shall comply with BS7430; the rods shall be cast gun metal with phosphor bronze bolts. The terminal point shall be protected by a purpose-made inspection pit complete with a heavy duty cover and frame.

8.12 Ducting System – Refer to Standard Details

- 8.12.1 The type of ducting system to be installed i.e. ducted or fully ducted together with approved manufacturers shall be stated in Appendix 2.
- 8.12.2 In order to facilitate future maintenance all private cables shall be installed in a ducted system which shall have draw chambers installed at major changes of direction and at the ends of each road crossing.
- 8.12.3 In fully ducted systems the arrangement of ducting and cable access chambers shall be so constructed that any cable can be installed or replaced without the need for any further excavation in the carriageway or footway.
- 8.12.4 Unless stated in Appendix 2 cable ducts shall be a minimum of 100mm nominal diameter for road crossings and 50mm in footways and sized in accordance with the recommendations in BS 7671. They shall be pliable, non rigid, plain, high or medium density, smooth bore polyethylene with a minimum wall thickness of 5mm or twin wall duct to BS EN 50086.2.4 and coloured orange with the words "STREET LIGHTING" painted in 9mm lettering along the length of the duct at intervals of not more than 1m. When laid, the wording shall be uppermost and all lengths will be jointed or sleeved to give a continuous smooth bore.

- 8.12.5 Ducts should be impervious to water, impact resistant, capable of being laid at temperatures down to -10°C and sufficiently flexible to follow undulations in the trench bottom. They shall be of sufficient strength to not require concrete surround or granular or selected backfill at the depths laid.
- 8.12.6 Where ducts are installed for use by the DNO they shall be installed generally in accordance with this section however the duct shall be coloured red and no intermediate chambers are required between the DNO main or supply point and the cable termination point.
- 8.12.7 Ducts shall be swabbed through prior to drawing-in the cable(s). On completion of the cabling the duct shall be left with a pigmented stranded polypropylene or equivalent, rot-proof material draw rope of 5KN breaking load and having a design life of not less than 20 years. Ends of ducts not terminated at an access chamber shall be sealed to prevent the ingress of water.
- 8.12.8 Access chambers (minimum dimensions 450 x 450mm) shall be modular and of sufficient size to enable easy access to the cables having regard to their depth. The units shall be manufactured from high-density polyethylene, stackable and with preformed cut-outs for the cable duct entries. The developer shall submit details of the type/manufacturer of the access chambers he proposes to use for approval by the Street Lighting Engineer.
- 8.12.9 Chamber covers and frames shall be manufactured from ductile iron to BS EN 124 and shall be at least class C250 (please refer to Standard Detail for alternatives, depending on the location of the cover and frame). All covers and frames shall be designed to carry the loading appropriate to the installed location. Cover frames shall be fully bedded on mortar and accurately set for level and position, if necessary on a 225mm thick brickwork plinth, and aligned with the nearest adjacent kerb or building.
- 8.12.10 Excavation around chambers and manholes shall be backfilled with fill material complying with BS 1377 Part 2, properly compacted. Where mechanical compaction is impracticable, the excavation shall be backfilled with mix ST2 concrete complying with BS 5328 – 1:1997 and of 150mm minimum thickness

8.13 Trenches for Cables and Cable Ducts - Refer to Standard Details

- 8.13.1 All excavations shall be made with vertical sides unless otherwise approved by the Private Street Works Engineer. The sides of trenches and pits shall be adequately supported at all times so as to maintain the stability of the adjacent ground. Support shall conform to CP 2003 Earthworks Part 2 - Trenches, Pits and Shafts.
- 8.13.2 Trenches shall be excavated to the depth shown on the standard detail in order to give a depth of cover of approximately 450mm in verges, footways and open ground and 750mm under carriageways. The width of the trench shall be kept to a minimum.
- 8.13.3 Adequate precautions shall be taken to prevent water collecting in excavations. Whenever water collects in an excavation it shall be pumped out and the bottom of the excavation allowed to dry before cable or duct laying commences.
- 8.13.4 Backfilling shall be undertaken immediately after the laying, inspection and surrounding of cables or cable ducts using fill material complying with BS 1377 Part 2.
- 8.13.5 The reinstatement of all trenches shall conform to the appropriate section of the New Roads and Street Works Act, 1991 Specification for the Reinstatement of Openings in

Highways and the requirements of this document in respect of trench reinstatement except that the first 200mm depth of backfill shall not contain any material having a nominal size exceeding 40mm and that the developer shall spread and compact the backfill material evenly so as not to dislodge, disturb or damage the cable or cable duct. No power rammers shall be used within 300mm of any cable or cable duct.

8.14 Feeder Pillars

- 8.14.1 A list of approved manufacturers may be stated in Appendix 2.
- 8.14.2 The location of feeder pillars shall be agreed with the Street Lighting Engineer on site prior to installation. Where the feeder pillar is sited in soft landscaping areas and it is not possible to park a vehicle immediately adjacent, the Street Lighting Engineer may require the construction of a hard standing for use by maintenance vehicles.
- 8.14.3 Feeder pillars shall be constructed from not less than 3mm thick steel. They shall be sealed to minimum IP65 on the doors and IP45 on the vent louvres. They shall include a full size backboard of varnished marine plywood at least 15mm thick or other approved non-hygroscopic material. Alternatively, a purpose-designed equipment mounting system may be used. The entry for cables shall be via the roof.
- 8.14.4 Doors shall be fitted with tamper-proof "O locks", all locks being identical in pattern. The locking mechanism shall be lubricated with grease immediately following installation. Two sets of keys shall be provided to the Street Lighting Engineer prior to the adoption of the installation.
- 8.14.5 Where directed by the Street Lighting Engineer, ventilation shall be provided to prevent the build-up of condensation and in such cases the feeder pillar shall be protected by vermin-proof screens.
- 8.14.6 Protection against corrosion shall be by hot-dip galvanising to BS EN ISO 1461, the minimum coating thickness to be in accordance with Table 2 thereof.
- 8.14.7 All doors are to be provided with an earthing strap in accordance with clause 8.10.7, above.
- 8.14.8 The developer, designer shall submit details of the feeder pillars which are proposed for use in the installation to the Street Lighting Engineer for approval before work on the installation commences.
- 8.14.9 Feeder pillars shall be mounted on a 250mm thick foundation of concrete ST2 mix complying with BS 5328 – 1:1997. They shall be rooted or provided with fixing bolts to enable the unit to be securely located. Unless stated in Appendix 2, after completion of the cabling, any void under the feeder pillar base shall be filled to 25mm below the door with rounded aggregate, maximum size 14mm, and sealed overall with a cold pour compound of an approved type to prevent the ingress of moisture from below. A spare 100mm diameter cable duct shall be provided through the concrete surround from the base of the feeder pillar.
- 8.14.10 For feeder pillars sited in grassed areas, a 600mm width of hard surfacing shall be laid with the surface flush with the ground across the width of the feeder pillar in front of the door. The other sides of the feeder pillar shall be similarly surrounded with hard surfacing 200mm. in width. All hard surfaced areas shall slope away from the feeder pillar.
- 8.14.11 The feeder pillar shall be a minimum of 110mm x 150mm x 700mm size but shall be sufficient to accommodate:

- ❖ The incoming supply cable including cut-out.
- ❖ A lockable double pole isolator [if not included in the cut-out].
- ❖ Any contactor and/or photocell relay.
- ❖ A distribution board for all highway electrical feeds including sufficient spare capacity to accommodate at least one extra circuit.
- ❖ All necessary fuses and the like.
- ❖ At least 25% spare space on the backboard upon completion.

8.14.12 Where larger (double door) feeder pillars are required the following additional equipment shall be installed:

- Heater
- RCD
- Interior light
- 13A Socket

8.14.13 Distribution fuse boards of the HRC type shall be provided with an external earth, phase barred and colour coded. They shall be fitted with the same number of live and neutral bus bar terminals as there are outgoing circuits plus at least one spare way.

8.14.14 A circuit diagram and labelling showing details of interconnection of equipment and the connection of cables to and from the pillar, all indelibly drawn or engraved on a material not subject to damage by the environment or normal use, shall be securely fixed internally to each feeder pillar after completion of the installation.

8.14.15 An earthing system shall be provided in each feeder pillar. It shall accept the incoming earth facility from the supply authority onto an earthing bar or terminal strip and interconnect all outgoing cable earth connections and the bonding of the feeder pillar. The earthing facility shall accommodate up to 25mm² conductors. Where required by the Street Lighting Engineer, a suitably rodded external earthing system as specified in Clause 8.12.10, shall also be provided, independent of and in addition to, any earthing system provided by the incoming supply authority/company.

8.14.16 All feeder pillars shall be fitted with a durable warning sign, fitted externally and in a prominent position, indicating "DANGER 415 VOLTS" or "DANGER 240 VOLTS" as appropriate and a 'lightning flash' in black on yellow.

8.15 Electrical Equipment Fixed to Buildings

8.15.1 Where approval has been given under Clause 2.1.4 for highway electrical equipment to be fixed to buildings the following Clauses apply.

8.15.2 Cables fixed to the surface of a building shall be PVC sheathed cables or 'Hituf' cable or other alternative approved by the Street Lighting Engineer. The colour of the cable sheath shall be such as to blend with the colour of the building or structure. In environmentally sensitive areas, cables may need to be painted to match the colour of the building. Surface cables shall be protected by means of galvanised steel conduit or cable shield up to 2.5m

above ground level. Mains supplies shall be terminated in mini feeder pillars sited in the highway and the conduit made off into this.

- 8.15.3 All terminations of surface cable are to be completed using glands of approved manufacture. The making-off of such glands shall only be carried out by suitably qualified personnel.
- 8.15.4 The use of junction or termination boxes shall be restricted to those locations adjacent to the wall brackets where it is necessary to terminate the surface cable and to provide a heat resistant flexible cable [within a flexible conduit if necessary] from the box to the lighting unit.
- 8.15.5 Cables shall be supported on the building surface using approved saddles, the spacing of which shall conform to the recommendations of BS 7671.
- 8.15.6 The dimensions of the base plate of wall brackets must be kept to a minimum having fixed centres generally not greater than 200mm in the vertical or horizontal planes. All brackets shall be fixed with 4 bolts of sufficient size for the anticipated loadings. Fixing details and calculations of loading from a Structural Engineer must be submitted to the Street Lighting Engineer prior to approval being given for the installation to take place and independent test certificates for the fixings shall be submitted after installation.
- 8.15.7 The internal surfaces of all fixing holes drilled into walls or other structures shall be sealed with an approved silicone sealant prior to the insertion of the fixing bolts.
- 8.15.8 All wall brackets shall be installed to provide the designed mounting height of the lantern above ground level.
- 8.15.9 Electricity supply cables shall be terminated in a weatherproof control box of minimum size to accommodate the cut-out and any control or isolation equipment.
- 8.15.10 Wiring between the control box and the wall bracket shall be carried out using cables specified in clause 8.10.1 above and they shall have a minimum conductor size of 1.5mm². All cable glands shall be fitted with PVC shrouds.
- 8.15.11 Control boxes shall be constructed of galvanised steel or corrosion resistant alloy or ABS or GRP. They shall be sealed to a minimum IP54. Doors shall be fitted with tamper-proof locks, if possible, of the same pattern as used for columns. The control box shall incorporate a backboard of hardwood or other non-hygroscopic material onto which the control equipment, service cable and cut-out can be firmly fixed.

**Appendix 1 – Schedule of Proposed Lighting Equipment
(To be completed by the Developer for approval)**

Proposed Development at: _____

Developer: _____

Address: _____

Agent / Contractor: _____

Address: _____

DETAILS OF PROPOSED PUBLIC LIGHTING INSTALLATION

1. Does this development form part of a larger development? _____
2. Will the street lighting on this development be installed in phases? _____ No. of Phases _____
3. No. of lights: on this phase _____ on whole development _____

COLUMNS

Mounting Height	Material	Manufacturer's Name	Catalogue Name / Ref.	Bracket Type	Outreach

LANTERNS

INTERNAL WIRING

Type (Side Entry etc.)	Manufacturer's Name	Catalogue Ref	Bowl Material	Cable Size	Type

LAMPS

ELECTRONIC BALLAST

Type	Wattage	Manufacturer	Manufacturer	Model / Cat. No.

SWITCHING CONTROL

Group or Individual	P.E. Cell	Type	Manufacturer	Cat. No.	Location of Switch Points if Group Control

LOCKABLE DOUBLE POLE ISOLATORS

Manufacturer	Model / Cat No	Rating

ELECTRICITY SUPPLY

No. of Lights on Direct Mains	No. of Feeder Pillars	Type and Size of Loop Service Cable		No. of Lights On Circuits	Material of Feeder Pillar	Manufacturer of Feeder Pillar
		Circ. 1				
		Circ. 2				
		Circ. 2				

SIGNED _____ **ON BEHALF OF** _____ **DATE** _____

**FLINTSHIRE COUNTY COUNCIL
DESIGN SPECIFICATION FOR STREETLIGHTING AND ILLUMINATED SIGNS**

APPENDIX 2

**Flintshire County Councils preferred Lanterns, Illuminated Traffic Signs,
Bollards, Centre Island Lamps and Traffic Signs**

All Son lanterns to be fitted with Electronic ballasts

In order to assist with future maintenance, the Council requires that the lanterns used shall be chosen from the current approved list of lanterns or unless approved from by the Street Lighting Manager.

Functional and Modern Lanterns

Residential Roads, Industrial Estate Roads, Primary Roads, Principle Roads, Town Centres and Public Areas

Thorn (Oracle S, Philips Gearing) with Cosmopolis illumination.

Thorn (Oracle S, Philips or SELC Gearing) with Son illumination.

Functional and Modern Lanterns

Paths and Footways

Thorn (Oracle S, Philips Gearing) with Cosmopolis illumination.

Alternative Functional and Modern Lanterns

To be approved by the Street Lighting Manager.

1930's Lantern or Heritage Lantern and Other Lanterns

All Areas

To be approved by the Street Lighting Manager.

Dimming or Remote Monitoring Equipment

All Areas

To be approved by the Street Lighting Manager.

Type A and B traffic Sign Lighting, Bollard and Other Traffic Sign Lighting

All Areas

LED

**FLINTSHIRE COUNTY COUNCIL
DESIGN SPECIFICATION FOR STREETLIGHTING AND ILLUMINATED SIGNS**

APPENDIX 3

Flintshire County Councils preferred mounting height and type of Columns

Residential Roads and Subsidiary Roads

6 Meters steel galvanised, tubular column

Paths and Footways

5 or 6 Meters steel galvanised, drop down, tubular column

Industrial Estate Roads and Car Parks

6 or 8 Meters steel galvanised, tubular column

Main Traffic routes

8, 10 and 12 Meters steel galvanised, tubular column

High speed and Dual carriageways

12 and 15 Meters steel galvanised, tubular column

Miscellaneous and other locations

To be submitted for approval by the Street Lighting Manager.

Alternative Column Sizes

To be submitted for approval by the Street Lighting Manager.

**FLINTSHIRE COUNTY COUNCIL
DESIGN SPECIFICATION FOR STREETLIGHTING AND ILLUMINATED SIGNS**

APPENDIX 4

Energy and Maintenance

- 1 Prior to adoption by the County Council, the Developer will place with Flintshire County Council a commuted sum equivalent to 10 years of energy consumption for the system being adopted and for maintenance of the system for a period of 10 years. These commuted sums will be communicated to the Developer during the pre-adoption process..
- 2 The Developer shall otherwise remain responsible for the whole installation including three yearly cleaning and lamp changing (evidence to be retained and made available on request) replacement in the event of accident or vandal damage, etc., until the date of formal adoption of the installation.
- 3 In the event of an emergency situation arising prior to adoption, such as vehicular accident damage, column doors missing etc, and when the Developer cannot be contacted within 15 minutes, the Council reserves the right at its sole discretion to arrange for its Street Lighting Department to be dispatched to make safe and to recharge the Developer with the costs incurred.

**FLINTSHIRE COUNTY COUNCIL
DESIGN SPECIFICATION FOR STREETLIGHTING AND ILLUMINATED SIGNS**

APPENDIX 5

Painting

When required painting shall comply with the following:

Any access doors shall be removed to enable the edges of the door and the exterior of the item normally covered by the door to be painted. All removable attachments to items to be painted shall be removed prior to painting and replaced upon completion of painting. Generally these will comprise column number plates, litter bins, banding tape and small signs and notices. The correct unit number plate must be replaced within one working day of completion of painting.

Preparation

All surfaces to be painted must be free of dampness, grease, frost etc, and shall be cleaned down by scrubbing using a stiff bristled brush, clean cold water and a detergent and finally rinsed down with clean cold water. All areas of rust, scaled and flaking paint must be scraped, wire brushed and abraded to bright metal, if necessary using mechanical tools to firm a tight edge and a patch prime coat applied before the two main coats. All preparation work shall be completed to the satisfaction of the Council's Representative before the application of a further coat of paint.

Paint Application

All paint shall be applied by brush only and should be well brushed into the surface of the metal and all parts shall be completely covered with a film of the specified systems and thickness. Application shall be as recommended in the paint manufacturer's Product Data Sheets. Product data sheets are to be submitted at the time of formal adoption or on request. Paints shall comply with the appropriate British or European Standard. All work involving a particular coat of paint shall be completed to the satisfaction of the Council's Representative before the application of a further coat of paint. Each coat of paint shall be of a different colour but the same colour shall be consistently used for any particular coat.

FLINTSHIRE COUNTY COUNCIL
DESIGN SPECIFICATION FOR STREETLIGHTING AND ILLUMINATED SIGNS

APPENDIX 6

Competence and Accreditation

- 1 The installer of the lighting installation must be NICEIC or ECA registered, National Highways Sector Scheme accredited and experienced in the installation of highway electrical equipment and qualified to provide official completion and test certificates. *
- 2 Supply method statements including risk assessments and copies of the relevant cards to the Street Lighting Manager before any works be undertaken for proposed adopted civil, electrical and illuminated works within Flintshire.

Note:-

- * For an interim period of two years from July 2010, provided installers can demonstrate their intention to move towards Sector Scheme accreditation, then they will be approved. With effect from 1 August 2012, installers will have to have accreditation to the National Highways Sector Scheme for the Installation of Highway Electrical Equipment and Supporting Works (www.ukas.com)

**FLINTSHIRE COUNTY COUNCIL
DESIGN SPECIFICATION FOR STREETLIGHTING AND ILLUMINATED SIGNS**

APPENDIX 7

**Remote Monitoring System, New Technologies and
Energy Saving Equipment**

- 1 Dimming is to be installed in all new developments where appropriate.
- 2 Further details will be provided by the Council when the design is submitted or upon request from the Street Lighting Manager.
- 3 New technologies and energy saving equipment may / be installed only after discussion and acceptance from the Street Lighting Manager.

**FLINTSHIRE COUNTY COUNCIL
DESIGN SPECIFICATION FOR STREETLIGHTING AND ILLUMINATED SIGNS**

APPENDIX 8

Sign Plates and Banners

- 1 Sign plate(s) with a total projected windage area in excess of 0.3 sq.m shall not be affixed to lighting columns unless approval has been sought from the Street Lighting Manager.
- 2 Banners shall not be affixed to lighting columns unless approval has been sought from the Street Lighting Manager.