DATED 21/09/2010

COVENTRY CITY COUNCIL
STANDARD DEVELOPMENT SPECIFICATION

VERSION 5 (FINAL)

TERM	Definition
Adoption or Adopted	The transfer of ownership of Lighting Equipment on the satisfactory completion of a Developer Agreement from the developer to the Local Authority. Upon Adoption the Local Authority will accept responsibility for payment of the on-going energy charges and future maintenance costs at public expense. This can include Lighting Equipment for the Local Authority accepts responsibility for under the terms of a Commuted Sum.
Central Management System or CMS	Means an electronic system for transmitting, recording and analysing data to record electrical faults on street lighting apparatus and to control and switch light output and measure consumption.
CDM Lamp	Ceramic Discharge tube Metal-halide – Tubular discharge lamp (white coloured light)
Commuted Sum	A sum paid by the developer to the Local Authority for the extra-over through life cost of ownership associated with the installation of Lighting Equipment of a style or type that is a departure of the normal standard, not being a condition of the Local Authority as the Planning Authority. A commuted sum may also be applied where Lighting Equipment is transferred to the Local Authority, being installed in areas that are not Highway. In all cases, commuted sums shall be calculated by the Local Authority, such calculation being described in Appendix 4.
Compact Fluorescent Lamp	A compact fluorescent lamp, single ended connection and using electronic control gear (white coloured light)
Conflict Area	Means any of: i) road junctions where the roads are in Traffic Groups 2, 3a or 3b of Table 4.1; ii) complex road junctions; iii) pedestrian refuge island; iv) at the location of horizontal traffic calming features such as speed tables, build-outs and chicanes v) roundabouts and mini roundabouts; vi) the frontage and entrance of schools and hospitals to a maximum of 100 metres vii) the road junction to public car park entrances having a capacity for more than 20 vehicles,
Cosmopolis Lamp	High intensity discharge full spectrum light source using electronic control gear.
Design Brief	A document signed by Authority Project Representative outlining the standards to be achieved, the extents of the areas to be lit, the acceptable materials to be used and any requirements for alterations to existing Lighting Equipment

TERM	Definition
	affected by the development proposals.
Developer Agreement	An agreement between a developer and the local authority entered into under: i) Section 38 of the Highways Act 1980. ii) Section 278 of the Highways Act 1980. iii) Section 106 of the Town & Country Planning Act 1990
Environmental Zone	As defined in Institution of Lighting Engineers: 'Guidance Notes for the Reduction of Light Pollution' available at www.ile.org.uk
Full Spectrum Light Source	Shall have a colour-rendering index Ra 60, and the colour temperature shall be between 1950^0K and 6000^0K
Highway Authority	For the purpose of this Protocol the Highway Authority is Coventry City Council.
Highway or Adopted Highway	Roads, footways, footpaths and cycleways and other areas owned by the Local Authority as the Highway Authority as defined in the Highways Act 1980.
Lighting Equipment	Includes: i) Lighting on all roads, footways, footpaths and cycleways the responsibility of the Local Authority as the Highway Authority either now or as part of a Developer Agreement. ii) Amenity lighting, located in areas not defined as Highway for the purpose of lighting other public areas, access ways and footpaths etc., the responsibility of the Local Authority either now or as part of a Developer Agreement. iii) Internally and externally lit traffic signs and lit traffic bollards to meet the requirements of the Traffic Signs General Directions. iv) Subway and underpass lighting, surface water pumping facilities and switch rooms on or provided for roads and areas defined in a) and b). v) Pedestrian (zebra) crossings on the roads and areas described in a). vi) Feeder pillars and cable networks whose purpose is to supply electrical energy to a), b), c), d) and e).
Lighting Designer	A person satisfying the requirements of that title as described in the Institution of Lighting Engineers Competency and Occupations Matrix for Lighting Design Staff.
Lighting Design Team Leader	A person satisfying the requirements of that title as described in the Institution of Lighting Engineers Competency and Occupations Matrix for Lighting Design Staff.
Local Authority	Coventry City Council.
Ra	Colour Rendering Index Ra (sometimes called CRI), is a quantitative measure of the ability of a light source to reproduce the colours of various objects faithfully in comparison with an ideal or natural light source.
RCD	Residual Current Device

TERM	Definition
Residential Areas	Those areas contained within the city primarily serving residential properties.
Sensitive Areas	a) Countryside Heritage Areas b) Environmentally Sensitive Areas c) Areas of Outstanding Natural Beauty d) Sites of Special Scientific Interest e) Listed and Registered Historic Parks and Gardens f) Conservation Areas. g) City and District Centres • Statutory Conservation Areas, Scheduled Ancient Monuments, Listed and Registered Historic Parks and Gardens, Listed Buildings and areas abutting their boundaries. • Non-statutory historic or heritage areas and older urban renewal areas identified by the local authority as the Local Planning Authority. • Other local authority sponsored initiatives, such as the regeneration of older urban areas in initiative programmes, which will be the subject of special treatment and funding. These will generally operate within the categories described above but some will have their own requirements. • The city centre area which will be subject to individual assessment of the equipment design and lighting standard to form part of the local authority lighting strategy. • District centres
SON Lamp	High pressure sodium discharge lamp (golden coloured light)
SOX and SOXE Lamp	Low Pressure Sodium discharge lamp (yellow coloured monochromatic light)
Street Lighting Service Provider	Balfour Beatty, who is contracted by the Local Authority to maintain the street lighting and for whom the contact details will be provided by the Local Authority upon request.
Authority Project Representative	The Street Lighting PFI Contract Manager representing the Local Authority.
Urban Areas	Those areas contained within the boundary of the city including non-residential estates.

1. INTRODUCTION

1.1. **This document identifies the basic principles and standards applying to the provision of street lighting for the Local Authority and:**

(a) Where a defined term or word is used the initial letter(s) shall be capitalised;

(b) The meaning of the defined terms or words can be found in the definitions section; and

(c) The definition of street lighting shall encompass all items of Lighting Equipment provided on the Highway which can include public open spaces that either is, or is planned to be, maintained by the Local Authority under a Developer Agreement.

2. REQUIREMENTS FOR LIGHTING

2.1. **Determination of Whether or not Lighting Should be Provided or Improved**

(a) The Authority shall be entitled, in its absolute discretion, to determine whether or not lighting should be provided or improved on a particular length of highway and it is generally the case that:

(i) all roads in Sensitive Areas, including residential and non-residential estate areas are lit subject to special requirements regarding equipment choice;

(ii) all roads in Urban Areas, excluding residential areas (Environmental Zones E3 or E4) are lit;

(iii) all roads, cycle tracks and footpaths in Residential Areas including those in the outlying areas (Environmental Zone E3) are lit.

(b) When considering the provision of street lighting regard shall be given to the following aims:

(i) increased safety for all users of the highway with special consideration being given to vulnerable groups such as pedestrians, cyclists, elderly, disabled and children;

(ii) the reduction of night time accidents;

(iii) the convenience of all highway users and the enhancement of the night-time environment with special reference to lighting in sensitive areas;

(iv) increased personal security and the reduction of crime and the fear of crime;

(v) increased security to property including the deterrence of vandalism;

(vi) the reduction of both night time and day-time environmental intrusion;

(vii) the provision of cost effective lighting, which is energy efficient and takes account of whole-life maintenance and replacement costs;

(viii) choosing a design that is suitable for the context in question.

(c) Road safety benefits may be assessed using a cost benefit analysis technique to quantify the anticipated reduction in night time accidents by the installation or improvement of street lighting. Additional guidelines are given within the Highways Agency advice note TA 49/07 (ISBN 0115528972) and the main factors which should be considered whilst assessing the provision of lighting on personal safety grounds are:

(i) the volume of pedestrian traffic during the hours of darkness;

(ii) the proportion of pedestrians in vulnerable categories such as women, children, elderly and disabled;

(iii) the potential risk of the site such as a high personal crime rate;

(iv) secluded areas;

(v) potentially dangerous locations due to uneven surfaces or other hazards.

2.2. **Requirements for Lighting and Responsibility for Installation**

(a) Where lighting is provided, it shall be in accordance with the requirements set out in this Standard Development Specification;

(b) Where the Local Authority taking into account the provisions of paragraph 2.1 determines that lighting should be provided, extended or improved, the developer shall be responsible for the supply and installation of that Lighting Equipment unless explicitly agreed to the contrary with the Local Authority before commencement on site.

2.3. **Amendments to Existing Lighting Equipment**

(a) The developer will be responsible for undertaking any amendments to existing Lighting Equipment affected as a result of his proposals.

2.4. **Consultation & Development of the Design Brief**

(a) Prior to commencement of the lighting design process a Design Brief will be issued to the developer upon request by Authority Project Representative;

(b) Consultation shall be necessary, either undertaken by the Developer or by the Local Authority in the development of the Design Brief. In particular:

(i) the developer or person undertaking the works may be required to consult with the Local Authority Elected Members over the provision, type and style of Lighting Equipment or the timing of the works;

(ii) the views of the Ward and District committees shall be an essential part of the consultation process and in the prioritisation of improvements within their area;

(iii) there may be situations in popular locations heavily used at night, where tourist and visitor needs indicate a higher level of illumination. Authority Project Representative, the Local Authority Planning Departments and the Ward and District Committees must be involved in the consultation

process at an early stage, where higher levels of lighting are thought necessary for highways and personal safety reasons;

(iv) where lighting is to be provided in the City Centre or local District Centres, due regard of additional requirements shall be and consultations with the Local Authority officers may be necessary. Where these consultations are deemed necessary Authority Project Representative will advise the Developer accordingly;

(v) Authority Project Representative will consult with all relevant parties to ensure that historical styling and/or location of equipment is correct. In special or particularly sensitive locations it may be advisable to arrange for trial installations;

(vi) the Design Brief should take into account the view of interested outside bodies (e.g. historical societies) to ensure that the appropriate environmental and lighting design solutions are achieved.

2.5. **Design Approval**

(a) All new lighting designs shall be submitted to the local authority and the Authority Project Representative for approval;

(b) All new or adapted street lighting that is either Adopted or proposed to be Adopted by the Local Authority on completion shall be designed by a suitably qualified Lighting Designer whose work shall be verified by a Lighting Design Team Leader prior to submission for approval;

(c) In order for approval to be given lighting designs must demonstrate compliance with the requirements of the Design Brief and lighting scheme design approval must be obtained in writing from the Local Authority prior to commencement on site;

(d) Lighting design submissions shall be subjected to a maintainability assessment by Authority Project Representative. Schemes will be rejected where the maintainability assessment indicates excessive energy usage or increased through-life costs are identified associated with the equipment type or access;

(e) For approval, correspondence, draft layouts, Lighting Equipment details and the like necessary to achieve this must be sent to Authority Project Representative at the Local Authority. An electronic file of the lighting design proposals or at least 2 sets of the final lighting scheme printed layout drawings will be required together with all lighting and cable design calculation sheets, computer print-outs etc. demonstrating compliance with the Design Brief, and this Standard Development Specification;

(f) Once approved, the Local Authority will issue one complete set of printed approved drawings to the developer. Each drawing will be signed and dated on behalf of the Local Authority by Authority Project Representative or his representative, indicating its status as an approved drawing. Inspections and subsequent Adoption of the lighting scheme will be judged against the latest approved scheme drawings issued. Any alterations to the road layout, lighting column position or cable route that have in any way affected the approved

design must be re-submitted for approval prior to construction. The Local Authority reserves the right not to issue retrospective design approval;

(g) Prior to Adoption, the Local Authority will ensure that the lighting system provided by the developer has been supplied and installed in accordance with the approved design and that the equipment installed and the installation methods used are compliant with the specifications and policies in force at the time of the design approval. Upon satisfying itself that these parameters have been met, the equipment will be added to the Local Authority street lighting inventory at the earliest opportunity, becoming the property of the Local Authority as the Highway Authority;

(h) The Local Authority will not be responsible for the equipment prior to formal Adoption and part of the design approval for Developer Agreements will be the developer's proposals for dealing with energy payments, maintenance, out-of-hours contact details for the period from installation of the Lighting Equipment to the Adoption of the lighting by the Local Authority. Any lighting installed under a Developer Agreement will be the responsibility of the developer for all charges or costs relating to the maintenance or energy of the Lighting Equipment until partial or full Adoption are confirmed by the Local Authority.The Developer will be required to agree the arrangements for the payment of electrical energy with the local Distribution Network Operator prior to commencement on site;

(i) A flow chart demonstrating the Adoption procedure for Lighting Equipment is shown in Appendix 1.

3. LIGHTING SPECIFICATION

3.1. Considerations in Determining Levels of Illumination, Lighting Positions and Styles

(a) In determining levels of illumination, lighting positions and styles, the Design Brief and subsequent acceptance of design submissions will consider pedestrian and vehicular uses/needs in relation to the following identified matters:

(i) Areas of activity, theatres, shops, school entrances, bus and light rail stops, libraries, highways, paths etc, and areas other area of inter-modal conflict;

(ii) Listed buildings and historic qualities of the area;

(iii) Building heights;

(iv) The windows of domestic properties;

(v) Drives, lowered kerbs and accesses;

(vi) Trees and large shrubs;

(vii) Property boundaries. Wherever possible Lighting Equipment will be sited on boundaries;

(viii) Overhead and underground services;

(ix) Street features - crossing points, sitting areas, tree planting, traffic calming, materials/colours etc.;

(x) Existing lighting - positions, styles, heights, lighting levels, lighting type, lighting from shops, floodlights, etc. In assessing appropriate levels of illumination the existing and ambient lighting e.g. from shops, floodlighting schemes, etc, shall not be taken into account. Whilst, such lighting adds to the ambience of the area it should be recognised that the continued operation of ambient or privately owned lighting sources cannot be guaranteed for the life of the scheme;

(xi) Uneven surfaces (important to the handicapped), hazards, etc.;

(xii) Local knowledge, incidence of vandalism, accident blackspots, etc.

3.2. **Selection of Lighting Class**

(a) The Authority shall be entitled, in its absolute discretion, to determine the lighting classes which shall apply;

(b) The lighting requirements for a particular road are determined from Tables 1.1 to 1.4 contained in Appendix 2;

(c) Generally, the lighting requirements will be determined by the Carriageway Hierarchy, Footway Hierarchy and City and District Centre descriptions contained in “Well Maintained Roads – Code of Practice for Highway Maintenance Management – Roads Liaison Group 2005” which has been adopted as the Local Authority policy with local variations;

(d) The table in Appendix 3 shows the alignment between the Well Maintained Highways road hierarchy and the appropriate light levels as outlined in BS5489:2003 in respect of traffic routes, and the allocation of S class lighting for local access roads based on crime, colour rendering index (CRI), traffic flow and environmental zone;

(e) Where it can be demonstrated that a road or area has a high crime rate, compared with the average crime rate for the whole of the Local Authority administrative area, the lighting class indicated in Table 1.2 of Appendix 2 may be increased by one lighting class or, in exceptional circumstances, two classes. For the avoidance of doubt, where such a situation occurs and the indicated lighting class is S3, a one level increase would make the requirement S2.

3.3. **Glare**

(a) All new lighting shall be designed to minimise the effects of obtrusive light at night and to reduce its visual impact during daylight. To that end, compliance with ‘Guidance Notes for the Reduction of Light Pollution’, Issued by Institution of Lighting Engineers, will need to be demonstrated and any subsequent amendments as part of the lighting design approval process;

(b) All luminaires shall incorporate an optical system to direct the light onto the highway within the limits set by BS 4533. Requirements for the restriction of glare from lighting installations are described in BS EN 13201: 2003, Part 2. These recommendations shall be followed together with any specific amendments or requirements of this document;

(c) Luminaires for Traffic routes, lighting (the “ME” Classes prescribed in Appendix 2) shall have adequate optical control to minimise light pollution and obtrusive light to properties and to control glare. Installed intensities shall not exceed the limits of Class G4 and for roundabouts shall not exceed G5;

(d) Luminaires for residential roads, side streets, industrial and commercial road lighting (the “S” Classes prescribed in Appendix 2, tables 1.2 and 1.4) shall have adequate optical control to minimise light pollution and obtrusive light to properties and to control glare. Installed intensities shall not exceed the limits of Class G1 and the upward light output ratio (ULOR) shall not exceed 0.03;

(e) In undertaking the lighting design due account of the location of all publicly owned and operated Closed Circuit Television (CCTV) equipment shall be taken to minimise the effect of the lighting on the sight lines of the CCTV equipment and the consequence of glare into the cameras.

3.4. **General Requirements**

(a) Lighting Equipment installed in a grassed area shall have a haunched concrete collar surrounding the Lighting Equipment at ground level to protect the base from strimmer damage, forming part of the foundation. The concrete collar shall extend at least 150mm in all directions from the Lighting Equipment in all directions and the haunch shall be at least 75mm above ground level;

(b) In conservation areas, or other areas with high pedestrian movements, the use of wall mounted equipment should be considered;

(c) Where columns are used for the support of decorations, festive lighting, etc., those requesting the facilities will be responsible for funding the extra-over purchase costs associated with manufacturing and installing the enhanced Lighting Equipment;

(d) Decorative cast iron or cast aluminium columns or column embellishments shall be subject to a separate specification and shall be subject to approval by Authority Project Representative and may require the payment of a Commuted Sum the details of which can be found in Appendix 4;

(e) The use of “non-standard” traditional, heritage or contemporary style lighting columns, column embellishments or lanterns will only be accepted where it forms part of theme for the area and with the approval of the Local Authority Planning Department and Authority Project Representative. If such approval is obtained, the developer shall be required to pay a Commuted Sum in respect of extra-over through-life costs associated with additional maintenance and/or energy costs compared with “standard” Lighting Equipment;

(f) The lighting designs submitted to the local authority will need to demonstrate that the maximum height restriction indicated in Tables 1.1 to 1.4 in Appendix 2 have been adhered to unless the specific written approval of Authority Project Representative has been obtained;

(g) The floodlighting of landmarks and historic buildings together with the design and installation of special or temporary lighting shall be in accordance with BS EN13201: 2003, lighting for urban centres and public amenity areas;

(h) All Lighting Equipment shall complement and enhance the appearance of the area and every opportunity should be taken to extend the range of acceptable

equipment available through discussions with suppliers. Further information is available in “Lighting Places - a lighting strategy for the City Centre and Local Centres of Coventry;

(i) The retention of existing columns/lanterns, where these are of local historical importance is desirable, particularly, where they form a feature of the locality. However, this shall be at the discretion of Coventry City Council;

(j) The restoration of existing cast-iron and ornamental columns or lanterns, which are of architectural merit, will be encouraged but the age, electrical and structural safety requirements must be considered paramount when deciding whether to reuse units;

(k) Where modern equipment cannot be accommodated within such columns, then measures to supply a carefully sited, separate free standing unit may be an acceptable alternative to the loss of such features, always provided that electrical and structural safety and isolation can be achieved. New lanterns for such existing columns must be appropriate to the period of the column;

(l) Decorative luminaires and fittings, which do not form part of the main lighting system and are installed or retained purely for decorative effect, may not be adopted by the Local Authority. In such instances the developer will be responsible for making arrangements for their on-going energy and maintenance costs. In such situations the Local Authority shall calculate a commuted sum to be paid by the developer. The calculation for the amount of the commuted sum is described in Appendix 4;

(m) If “heritage” or "period” style lanterns are used, care should be taken to match historical periods. It is therefore advisable for the developer to consult with the Authority Project Representative and the Planning Department;

(n) Where modern style equipment is proposed this, together with the lamp control gear, must be recessive in design and colour and be sited so as to be "invisible" as far as possible during the daytime. This is of particular importance in areas where buildings are of diverse historical and architectural character. Such equipment should be simple and of appropriate shape, colour and scale to the architectural setting;

(o) Wherever possible/appropriate, lanterns and associated equipment should be affixed to buildings, particularly where footways are narrow and subject to high pedestrian traffic. The associated work in achieving wayleave agreements and listed building consents for such equipment must be taken into account when programming schemes which include lighting improvements. Such approval can require periods of six to eight months or more to complete. The siting of luminaires and all attendant equipment on buildings should be taken into account, as should the quality and elevation features of the individual buildings on which they are to be affixed;

(p) The proportion of lighting column to lantern for ornamental fittings must be carefully considered. As a general rule, the human "head to body" proportions are considered to be inherently attractive;

(q) Where lighting columns have to be used, they should be sited to avoid obstruction to the footway (particularly for the disabled). However, where this means that columns would be provided at the back of footways adjacent to

buildings, every effort must be made to install wall mounted fittings in lieu of columns.

3.5. **Specific Requirements**

(a) **Lighting columns, brackets and posts** shall comply with BS EN 40, be as specified within para. 1 of Appendix 6 and coated RAL 9005 (black), except:

(i) Lighting Columns in the city centre which shall be coated RAL 9006 (silver);

(ii) passively safe Lighting Columns and posts which shall be constructed of a material that is generally available in the market at the time of purchase and will be coloured RAL 9005;

(b) where coated, Lighting Columns, brackets and posts shall be protected and colour finished with a Plascoat factory applied corrosion protection system to a minimum dry film thickness of 300 microns applied to all external surfaces;

(c) the inherent properties of the material or system of corrosion protection shall provide a design life of not less than 30 years without further protective treatment in the normal street environment;

(d) **Lanterns and lamps** shall be as specified within para. 2 of Appendix 6 and luminaires shall meet the requirements of BS EN 60598, and BS EN 60529 1992 for ingress protection and class IP6x for the optical compartment. In addition:

(i) The contractor will install a curved tempered glass bowl on traffic routes treated with Philips DynaClean technology to optimise the frequency of cleaning. In subsidiary roads and residential areas, polycarbonate bowls may be used, with curved tempered glass bowls installed in areas where the stricter control of spill light is required. Flat glass Luminaires will be installed in sensitive areas such as elevated lighting positions on bridges, to meet glare class requirements.

(e) **Cut-Outs** shall be as specified within para. 3 of Appendix 6;

(f) **CMS nodes**; each lighting column, mains powered illuminated traffic sign and mains powered illuminated traffic bollard shall be fitted with a CMS node as specified within para. 4 of Appendix 6 and integrated into the Coventry City Council Central Management System. Contact must be made with the Street Lighting Service Provider prior to any installation of CMS nodes to ensure that the CMS node is correctly configured;

(g) **Photocells;** where CMS nodes are not to be fitted under direction of Authority Project Representative, each lighting point shall be fitted with a Photoelectric Cell Controller as specified within para. 4 of Appendix 6 and will comply with BS5972 and be of one-piece construction, either “plug-in” or miniature units;

(h) **Use of Brackets;** Post top columns will be used as the standard installation; however bracket arms may be employed where the surround ratio and uniformity on wide roads could be an issue. Bracket arms, where used, will form a complete lighting scheme and not contain a mixture of post top and brackets;

(i) For Lighting Columns with brackets, at the point of intersection of shaft and bracket, the cross section of the bracket will equal that of the shaft, and the

design of the connection will be such as to prevent the ingress of rain into the shaft;

(j) The assembly of the column shaft and bracket will incorporate a mechanical location system in addition to high tensile socket headed securing screws, and it will be possible to fit the bracket in any one of 4 x 90 degree positions relative to the column door opening;

(k) **Control Gear;** The contractor will fit CMS and Philips dimmable DALI electronic ballast across the entire range of lamps and lanterns.

3.6. **Sensitive Areas**

(a) new lighting in Sensitive Areas should be appropriate, particularly in relation to conservation or other historic areas whose tradition lies in a quiet atmosphere and where stark, night illumination can create an entirely alien environmental quality;

(b) Conservation area status does not establish a pre-requisite for period style lighting - good functional modern designs may be more appropriate and suitable. However, the particular character of an historic area may demand an unconventional approach or a blend of various lighting sources;

(c) Subject to ensuring the safety of the highway, the retention and enhancement of the architecture and the historic or landscape character of the area will take precedence in determining lighting requirements;

(d) Many areas have unique character and it is important that any lighting arrangements are tailored accordingly to enhance the area rather than being "standardised". This does not have to be achieved with traditional, heritage or contemporary style Lighting Equipment it could be achieved by subtle differentiation such as protective coating colours;

(e) Lighting improvements should form an integral part of all environmental enhancement schemes;

(f) In order to identify opportunities and constraints specific to the site under consideration, a detailed Design Brief shall be prepared by Authority Project Representative jointly in conjunction with the appropriate officers as necessary from the local authority Planning Department, the local authority Conservation Officer, the Ward and District Committees affected and, if necessary, the City Centre Manager;

(g) Every opportunity should be taken for considering lighting arrangements in environmental enhancement schemes. Lighting of areas with a high activity level after dark, together with improving the perception of hazards, e.g. level changes, changes in direction and road crossings, should form an integral part of any proposals.

3.7 **City Centre**

(a) The lighting requirements for the City Centre are contained within Appendix 2 and Appendix 6 of this document

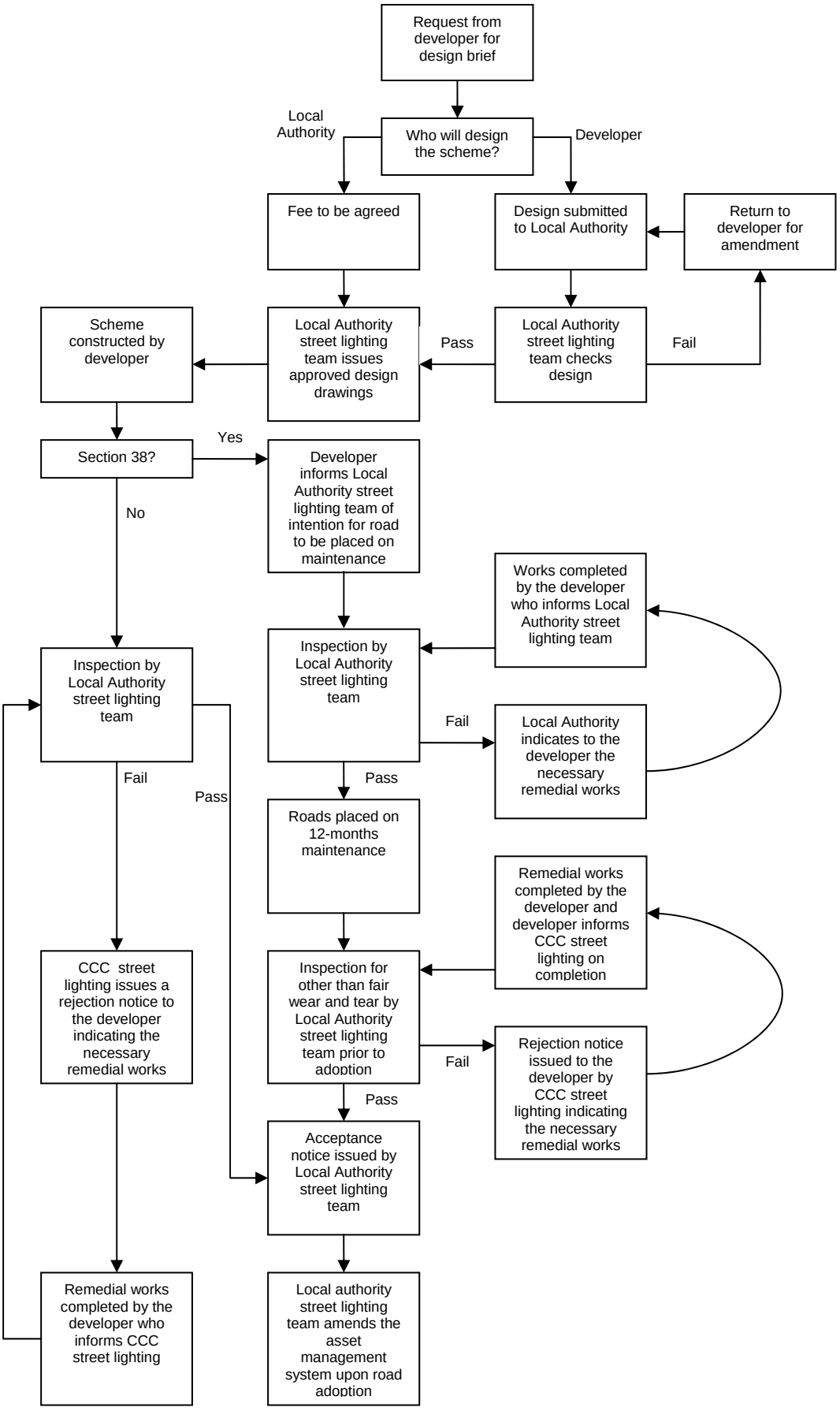
3.8 **High Mast Lighting**

(a) In complex road lay-outs high masts offer the best all round solution. However, they attract premium capital investment and annual maintenance costs, and the Local Authority strategy for the high masts is to:

- reduce the number of high mast lighting columns from therefore reducing capital and maintenance costs;
- reduce the overall energy consumption,
- employ a high mast dimming solution; ;
- incorporate the high masts lanterns into the CMS coverage of the City;
- simplify arrangements for power supply points;
- employ a fall arrest system for the lantern rings.

The lighting requirements for High Mast installations within the Local Authority boundary are contained within Appendix 2 and Appendix 6 of this document

Appendix 1 - Lighting Equipment Adoption Flow Chart



Appendix 2

Selection of the Lighting Level to be Provided on a Public Highway

1 General

The following tables 1.1, 1.2, 1.3 and 1.4 provide an aid to the selection of the minimum level of lighting to be provided on an Adopted Highway, being based on the requirements of BS EN 13201: 2003, Parts 2 to 4, Selection of Lighting Classes and BS 5489: 2004, Part 1, Code of practice. However, the actual level of lighting shall be determined and confirmed by Authority Project Representative.

1.1. **Table 1.1: Traffic Routes**

Carriageway Hierarchy	Definition	Lighting Class	Conflict Area	Max. Mounting Height
2	Strategic routes	ME2	CE1	12
3a	Main distributor roads	ME3a	CE2	10
3b	Secondary distributor roads	ME3c	CE2	10
4a	Link Roads	ME4	CE3	10

1.2. **Table 1.2: Residential Roads**

Carriageway Hierarchy	Definition	Lighting Class		Max. Mounting Height
		Lamp $R_a < 60$	Lamp $R_a \geq 60$	
4b	High Crime Roads >12m EW High Crime Roads <12m EW	S2	S3	8 6
	Medium Crime	S3	S4	6
	Low Crime	S4	S5	6

1.3. **Table 1.3: City and District Centres**

Definition	Lighting Class
City and district centre mixed vehicular and pedestrian areas	CE1
City and district centre wholly pedestrian areas	CE2
City and district centre pedestrian subways	CE0
Residential and traffic route pedestrian subways	CE2

1.4. **Table 1.4: Footways and Cycleways**

Footway Hierarchy	Definition	Lighting Class		Max. Height
		Lamp R_a < 60	Lamp $R_a \geq 60$	
1	Heavily used, e.g. in city centre, pedestrian precincts, near very large schools, factories and offices. **High Crime**	S2	S3	6
2	Medium use, e.g. small shopping parade, near schools, factories and offices not included in Group 1. **Medium Crime**	S3	S4	6
3	In-Frequently used, e.g. in residential areas fronting houses. **Low Crime**	S4	S5	6

2. Traffic Routes, Residential Roads, City and District Centre Highways and Footways and Cycleways

2.1 The Traffic Routes, which form the Highway Network, have different roles depending on levels of traffic flow and their relative importance as communication links. The Carriageway Hierarchy, Footway Hierarchy and City and District Centre descriptions used in tables 1.1, 1.2, 1.3 and 1.4 above, correspond to the "Well Maintained Roads – Code of Practice for Highway Maintenance Management – Roads Liaison Group 2005". A table indicating the appropriate lighting levels associated with Well Maintained Roads is included at the end of this section;

2.2 The Hierarchy will be formally reviewed at regular intervals to take into account changes in the road network and traffic patterns. However, interim changes will be made where new construction or re-classification has taken place, or when changes in traffic flows or developments make it appropriate.

3. Other Requirements

3.1 Conflict Areas shall be lit to the standards set out in Table 1.1 and shall extend to include the radii of each road or traffic feature they are intended to cover and extend from the junction not less than 30 metres;

3.2 Conflict Areas shall include the area covering any footpaths and cycleways adjoining the highway;

3.3 Conservation areas and other special interest areas shall be lit to the appropriate lighting class for the particular traffic group, footway or cycleway as set out in Tables 1.1, 1.2, 1.3 and 1.4, and in accordance with the requirements of section 5;

3.4 Disability Glare and Threshold Increment (TI) (both as defined in BS EN 1320: 2003) shall not exceed 15% and may be reduced in Sensitive Areas to 10%. Other glare requirements are contained in Section 4;

3.5 For any S series Lighting Class the maintained average illuminance on the road surface between the two adjacent lighting units with the minimum spacing in any lighting System shall not exceed the minimum illuminance requirements of the next higher S series Lighting Class (where, for the avoidance of doubt, S1 is a higher Lighting Class than S2);

3.6 Except where a cycleway forms part of the adjacent highway or footway infrastructure, separate lighting should be provided in all urban and suburban locations. The level of lighting for cycleways shall be as for corresponding footway categories defined in Table 1.4.

4. Requirements which Cannot Reasonably be Met

4.1 If during the design process the Lighting Designer considers lighting requirements in Tables 1.1, 1.2, 1.3 and 1.4 of this Appendix 2 cannot reasonably meet in any of the following circumstances:

(a) following consultation with the Authority Project Representative, a higher or lower lighting standard than that prescribed in Tables 1.1, 1.2, 1.3 and 1.4 of this Appendix 2 or enhanced Lighting Equipment is proposed by the Authority Project Representative;

(b) The close proximity of overhead obstacles such as power lines adversely affects the position and/or mounting height of the Lighting Equipment;

(c) The lack of footways or verges restricts the positioning of Lighting Equipment;

(d) Multiple features designated as Conflict Areas are located less than 50 metres apart;

(e) The width of the area to be lit requires luminaire mounting heights in excess of those prescribed;

(f) Specific planning restrictions in designated conservation areas apply;

then the Local Authority and Authority Project Representative shall acting reasonably take this into account in the determination of the lighting class that shall apply.

Appendix 3

Carriageway Hierarchy

Cat	Hierarchy	Type of Road / General Description	Well Maintained Highways Description	BS 5489:2003		ADT	Lighting Class
				Desc.	Additional Criteria		
1	Motorway	Limited access motorway regulations apply	Routes for fast moving long distance traffic. Fully grade separated and restrictions on use.	For Motorways, Strategic Routes, Main Distributors and Link roads the road description used in BS 5489:2003 is aligned with that used in Well Maintained Highways.	Main carriageway in complex interchange areas		ME1
					Main carriageway with interchanges <3 km	>40,000	ME1
						<40,000	ME2
					Main carriageway with interchanges >3km		ME2
					Emergency lanes		ME4a
2	Strategic Route	Trunk and some Principal 'A' routes between primary Destinations	Routes for fast moving long distance traffic with little frontage access or pedestrian traffic. Speed limits are usually in excess of 40 mph and there are few junctions. Pedestrian crossings are either segregated or controlled and parked vehicles are generally prohibited.		Dual or single carriageways	>15 000	ME2
						<15 000	ME3a
3a	Main Distributor	Major Urban Network and Inter- Primary Links. Short – medium distance traffic	Routes between Strategic Routes and linking urban centres to the strategic network with limited frontage access. In urban areas speed limits are usually 40 mph or less, parking is restricted at peak times and there are positive measures for pedestrian safety.		Dual or single carriageways	>15 000	ME2
						<15 000	ME3a
3b	Secondary Distributor	Classified Road (B & C class) and unclassified urban bus routes carrying local traffic with frontage access and frequent junctions	In built up areas these roads have 30 mph speed limits and very high levels of pedestrian activity with some crossing facilities including zebra crossings. On-street parking is generally unrestricted except for safety reasons		Urban areas (Zone E3).	>15000	ME2
						>7000 <15000	ME3b
						<7000	ME3c
			In rural areas these roads link the larger villages and HGV generators to the Strategic and Main Distributor Network.		Rural areas (Zone E1/2).	>15000	ME3a
						>7000 <15000	ME3B
						<7000	ME4a

Cat	Hierarchy	Type of Road / General Description	Well Maintained Highways Description	BS 5489:2003					ADT	Lighting Class
				Description	Additional Criteria					
4a	Link Road	Roads linking between the Main and Secondary Distributor Network with frontage access and frequent junctions	In rural areas these roads link the smaller villages to the distributor roads. They are of varying width and not always capable of carrying two-way traffic.	For Motorways, Strategic Routes, Main Distributors and Link roads the road description used in BS 5489:2003 is aligned with that used in Well Maintained Highways.	Urban areas (Zone E3).				ANY	ME4b
			In urban areas they are residential or industrial interconnecting roads with 30 mph speed limits random pedestrian movements and uncontrolled parking						Any (with High ped. or cycle traffic)	S1 or S2
					Rural areas (Zone E1/2).				ANY	ME5
4b	Local Access Road	Roads serving limited numbers of properties carrying only access traffic	In rural areas these roads serve small settlements and provide access to individual properties and land. They are often only single lane width and unsuitable for HGVs. In urban areas they are often residential loop roads or cul de sacs.	For Local Access Roads, BS 5489:2003 uses crime, colour rendering index (CRI), traffic flow and environmental zone as criteria for lighting class selection.		**Low** traffic flow				
						E1/E2	E3/E4	E1/E2	E3/E4	
						Ra<60	Ra<60	Ra>60	Ra>60	
					High Crime	S2	S2	S3	S3	
					Medium Crime	S3	S3	S5	S4	
					Low Crime	S4	S4	S6	S5	
						Normal traffic flow				
					High Crime	S2	S1	S3	S2	
					Medium Crime	S3	S2	S4	S3	
					Low Crime	S4	S3	S5	S4	
						High traffic flow				
					High Crime	S1	S1	S2	S2	
					Medium Crime	S2	S1	S3	S2	
					Low Crime	S3	S2	S4	S3	

Appendix 4

Commuted Maintenance Payments

1. Commuted Maintenance Payments

1.1. a commuted maintenance payment will be required where a developer chooses to utilise materials or additional lighting installations for Lighting Equipment or general street furniture (including unlit signs) which, in the opinion of Coventry City Council, will require premature or more costly replacement or incur additional maintenance costs;

1.2. the extra-over cost of ownership shall be calculated by comparing the proposed equipment with that required during the notional whole life cost of ownership of more conventional road Lighting Equipment or street furniture. Thus, the required commuted sum represents the additional cost of ownership incurred by Coventry City Council compared with the maintenance or replacement expenditure it would otherwise have incurred if more conventional equipment had been used;

1.3. the calculation for all Lighting Equipment shall be made by the Authority Project Representative and shall include (but not necessarily be restricted to) the following:

(a) energy;

(b) maintenance;

(c) accessibility;

(d) replacement of a whole unit or component parts;

(e) vulnerability to wilful or vehicular damage.

Appendix 5

List of References and Regulations

- Well-lit Highways – Code of Practice for Highway Lighting Management – UK Lighting Board 2004;
- Well Maintained Roads – Code of Practice for Highway Maintenance Management – Roads Liaison Group 2005;
- Health and Safety at Work Act, 1974;
- Electricity at Work Regulations, 1989;
- BS 7671: 1992, Requirements for Electrical Installations;
- BS 4533: 1992, Luminaires - Section 102.3, Specification for Luminaries' for road and street lighting;
- BS EN 13201: 2003, Parts 2, 3 and 4, Road lighting;
- BS 5489: 2004, Part 1, Code of practice for the design of road lighting;
- BS EN 60529: 1992, Specification for Clarification of Degrees of Protection provided by Enclosures;
- BS 5649: Lighting Columns;
- Department of Transport Departmental Standard BD 26/86 - Design of Lighting Columns;
- Department of Transport Advice Note TA 49/86 - Appraisal of New and Replacement Lighting on Trunk Roads and Trunk Road Motorways;
- Traffic Signs Regulations and General Directions;
- Disabled Persons Act 1981;
- The Disability Discrimination Act October 1995;
- Road Hump Regulations 1990;
- Institution of Lighting Engineers and County Surveyors' Society: Code of Practice for the Installation and Operation of Seasonal Decorations on or Above the Public Highway, Second Edition, 2005;
- Institution of Lighting Engineers: Competency Requirements for Lighting Design Staff 2007;
- Institution of Lighting Engineers: 'Guidance Notes for the Reduction of Light Pollution' available at www.ile.org.uk.

Appendix 6

Equipment Specifications

1 General

1.1. Table 1.1: Lighting Columns

Manufacturer	Nom Height	Drg Ref No
Mallatite	6m	B5401
Mallatite	8m	B4879
Mallatite	10m	B6403
Mallatite	12m	B5650

1.2. City Centre Lighting Columns

(a) All lighting columns to be used within the City Centre shall be manufactured by Mallatite and shall be of a conical tapered shape. Lighting columns installed within the City Centre which do not comply with this requirement will not be Adopted.

1.3. High Mast Lighting Columns

(a) The developer shall contact The Authority, and in particular the Authority Project Representative and the Authority Planning Department, prior to the commencement of any high mast lighting design works in order to determine if a high mast lighting solution is the most appropriate for the location.

High Mast Lighting Columns shall be manufactured by CU Phosco.

1.4. Lanterns and Lamps

Luminaire Type	Lamp Type	EN13201 Lighting Category
Traffic Routes		
CU Phosco P655	150W SON-T PIA	CE3 CE2 CE1 ME4 ME3 ME2
CU Phosco P655	250W SON-T PIA	
CU Phosco P655	400W SON-T PIA	
Philips Iridium 254	250W SON-T PIA	
Philips Iridium 254	150W SON-T PIA	
Philips Iridium 253	150W SON-T PIA	
Philips Iridium 253	100 SON-T PIA	
Residential Roads		
Philips Iridium 253	140W CosmoPolis	S2 S3 S4 S5 CE2 CE3
Philips Iridium 252	90W CosmoPolis	
Philips Iridium 252	60W CosmoPolis	
Philips Iridium 252	45W CosmoPolis	
Philips Mini Iridium 451	90W CosmoPolis	
Philips Mini Iridium 451	60W CosmoPolis	

Philips Mini Iridium 451	45W CosmoPolis	
City Centre		
Philips Milewide	140W CosmoPolis	CE2 S3
Philips Milewide	90W CosmoPolis	
Philips Mini Milewide	60W CosmoPolis	
Philips Metronomis Porto	140W CosmoPolis	
Philips Metronomis Porto	60W CosmoPolis	
Philips Essential	7W LED	
Philips Optiflood	45W CosmoPolis	
Philips Optiflood	60W CosmoPolis	
Philips Optiflood	140W CosmoPolis	
Philips Optiflood	210W CDM Elite	
Philips MiniCube	140W CosmoPolis	
Philips MiniCube	90W CosmoPolis	
Philips Paxton Square Heritage	90W CosmoPolis	
Coventry Heritage Lantern	90W CosmoPolis	
Philips TUNLED	13W LED	BS 5489 Table 4
Subways		
Simmonsigns Safeway Subway Light Unit	55W PL-L	BS 5489 Table 4

1.5. **Cut-Outs**

Manufacturer	Ref	Description
Charles Endirect	**LDPFI 6**	DNO Feed, single fuseway
	LDPFI 8	DNO Feed, single fuseway and single Private Cable fuseway out
	LDPFI 1	Private Cable feed in and out, single fuseway
	LDPFI 2	Private Cable feed in and out, single fuseway with extension box for larger cables
TOFCO	**F72**	Compact single fuseway , latch type cut-out

1.6. **CMS Nodes & Photocells**

Photocells will be of a 0.25W latching design and factory calibrated to provide a switch-on level of 35 Lux and a switch-off setting of 18 Lux. The manufacturer will supply a certificate of calibration and compliance.

Manufacturer	Ref	Description
Royce Thompson	SC1000SAV	Nema Socket
Royce Thompson	MicroStar 2000	Mini Cell – fitted in Lantern
Telensa; contact to be made with Balfour Beatty - see para.	Combined Conduit Unit	Integral Dimming / Dali unit CMS Node

3.5(f)		

1.7. **Illuminated Beacons**

Manufacturer	Ref	Description
Simmonsigns	Modupost / Midubel	Combined pedestrian crossing beacon with Street Light.

1.8. **Illuminated Traffic Signs**

Manufacturer	Ref	Description
Reddilight	Enterprise sign light RH2	LED aluminium signlight for use with upto 600mm traffic signs

1.9. **Illuminated Traffic Bollards (Solar)**

Manufacturer	Ref	Description
TMP	Heritage Solalite	internally illuminated by a solar powered LED and as a reboundable reflective highway traffic bollard
Simmonsigns	Weebol	reboundable reflective highway traffic bollard for use in approved locations
Simmonsigns	SImbol / Global Baselight	Base lit Illuminated flexible Bollard