

Part 8 ▶ Street Lighting



8.1 Introduction

This part of **The Warwickshire Design Guide** provides guidance on the specification for developers and designers as to Warwickshire County Council's requirements for street lighting.

If in any doubt about the following, please contact WCC's Street Lighting team directly at streetlighting@warwickshire.gov.uk as it is better to resolve issues at the design stage than at time of adoption.



8.2 WCC Policy Approach

General specification for lighting on adoptable highways, cycleways, and footways.

The County Council's stock of apparatus is maintained on a contract. The Operating Sub-Contractor is Balfour Beatty.

This guidance document summarises the Development Standards for WCC and ensures compliance with the Adoption Required Standards.

Committed Sums will apply to any non-standard apparatus. Specification details of all such apparatus must be agreed in consultation with WCC's Street Lighting Team prior to installation.



8.3 Definitions and Abbreviations

Adoption	When applied to any item of Apparatus, Apparatus which has become the responsibility of the Warwickshire County Council under the terms of its Street Lighting Maintenance Contract.
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Apparatus	Street lighting and off-highway lighting installations and materials which, for the avoidance of doubt and without limitations includes:- lighting points, lighting columns, posts, straight posts (only to the extent used as an additional support for an illuminated traffic sign) together with their respective attachments, luminaires, lanterns, shields, control gear, control devices, switches, relays, meters, illuminated traffic signs, subway lighting, illuminated traffic bollards, Belisha beacons, illuminated pedestrian refuge beacons, school crossing patrol warning lights, flood lighting of monuments and buildings, surface car park lighting systems, wall mounted connection boxes, conduits, surface mounted wiring/cablings, feeder pillars, Authority owned Private Cable Networks and all associated components.
Authority Attachment(s)	Any Authority owned street or traffic signs or sign plate or notices or other equipment and items authorised by the Authority to be attached to Apparatus including (and in the case of illuminated items only) to other structures.
SDD	Standard Detailed Drawings
WCC	Warwickshire County Council
De-Adopted	When applied to any item of Apparatus, Apparatus which is no longer the responsibility of Warwickshire County Council under the terms of its Street Lighting Maintenance Contract.
DNO and IDNO	(a) a distribution network operator and/or (b) an independent distribution network operator within the meaning of Part 1 of the Electricity Act 1989 as amended by the Utilities Act 2000.
Developer	Developer refers to any person or organisation installing lighting or traffic management equipment that it is proposed to maintain at public expense, upon completion of the previously mentioned works.



8.4 Technical Requirements – Planning and Design



8.4.1 Planning of Developments

Developers and their consultants need to consider street lighting at the earliest opportunity and should consider:

- a) Sustainability - Public realm lighting must minimise CO2 emissions and future maintenance costs. Efficient lighting is not incompatible with a pleasing street scene. Incorporating advice early in the planning of any development will enable the achieving of correct lighting levels.
- b) Design Codes - Development Design Codes should incorporate a site-specific lighting design brief issued by the Highway Authority. All design briefs will be based on the advice contained in this document. WCC's Street Lighting Team will specify lighting classes for every street and should be consulted early in the process so that detailed advice can be incorporated in the design.
- c) Street Layout - If footpaths and cycle paths are routed separately from the road then they may require separate systems of lighting, with attendant increased energy and CO2 emissions.
- d) Highway Trees - Integration of street lighting, tree planting and landscaping; these aspects should be developed harmoniously by developers, their design consultants, Local Planning Authorities and the Highway Authority. The height and spread of some trees may conflict with efficient lighting solutions. Combined arboriculture and lighting advice should be obtained at an early stage from all parties before tree positions are agreed.
- e) Ecology and Lighting - Advice on the mitigation of lighting and its ecological impacts should be included in all designs and will be incorporated in development planning briefs.

- f) Non-standard apparatus - Any departure from standard materials will require specific approval by the WCC's Street Lighting Team as part of the technical design approval process. Non-standard apparatus will always incur commuted sum charges.



8.4.2 BS5489 and BS EN13201

Lighting designs should be based on the advice given in the current BS 5489-1-2020 *Code of Practice for the Design of Road Lighting (Part 1: Lighting of Roads and Public Amenity Areas)* and the associated current BS EN 13201 Standards.



8.4.3 Institution of Lighting Professionals (ILP) Guidance

Designs are to take guidance from the Institution of Lighting Professionals' (ILP) technical reports, professional lighting guides and guidance notes.



8.4.4 Environmental Zones and Light Intrusion

Developments should be categorised by Environmental Zones in accordance with ILP *Guidance Note for the Reduction of Obtrusive Light*.

Light intrusion (e.g., into windows) is to be avoided and any apparent issues are to be monitored by the developer in accordance with ILP *Guidance Note for the Reduction of Obtrusive Light*. Lighting designers should produce vertical illuminance calculations where appropriate.



8.4.5 Construction, Design and Management Regulations (CDM)

Lighting design must be carried out by appropriately qualified competent persons in accordance with current CDM regulations. See ILP guidance on competencies.

A clear note must be appended to the street lighting layout drawings detailing which of the Highway Electrical Design Procedures was used by the designer – see the HEA Guidance Note "CDM 2015 Regulations /

Applicability to Highway Lighting Design.

If a site involves changes to the existing highway network, a solely desktop indicative lighting design is not acceptable. **Desktop designs are not acceptable for Section 278 or changes to the existing highway.**



8.4.6 Hazard Elimination and Management List (HEML)

As defined within current CDM regulations, all risks at construction, maintenance, decommissioning and replacement must be assessed as an integral part of the design process. Guidance on risk assessment and the use of risk matrices is provided by the Health and Safety Executive. Hazards may include, but not be limited to, highway features and users, underground services, overhead power and telecoms, fuel pipelines, mobile phone masts, waterways, aerodromes, rail infrastructure, etc.

An HEML (Hazard Elimination and Management List) that considers all relevant factors must be submitted with all detailed lighting designs.

A Hazard Elimination and Management List must be submitted with all detailed lighting designs.



8.4.7 HSG47

Designers are to ensure that designs are viable, and the developer should ensure that underground service locations are identified to the designer and designs are based on up-to-date information. Designers are to 'design out' risks where practicable and to ensure that any significant residual hazards are documented and noted on layout drawings - ref HSG47 *Avoiding Danger from Underground Services*.



8.4.8 G39/1

Designers are to ensure compliance with relevant clearances and processes as detailed in G39/1 Model Code of Practice Covering Electrical Safety in Planning, Installation, Commissioning and Maintenance of Public Lighting and Other Street Furniture.



8.4.9 Approach to Lighting Design

New designs need to be prepared in sympathy with the local environment.

- a) Site-specific design brief – Designs should be based on a site-specific design brief in liaison with WCC's Street Lighting Team.
- b) New sites (e.g., Section 38) - These designs may be derived solely from desktop activity.
- c) Existing roads (e.g., Section 278) – Where a site involves changes to the existing highway network a solely desktop indicative lighting design is not acceptable.
- d) Tying-in with existing highway lighting - The lighting design calculations should demonstrate compliance and consistency in the transition area from the old lighting to the new lighting.
- e) Efficacy of design – Designers need to show the optics chosen have the optimal distribution pattern and flux for the predominant road geometry to light the target area with efficacy in mind, and to minimise unwanted spill light.
- f) Viability of design – Designers should make every effort to ensure designs are viable for construction. For example, with works on existing roads the availability of DNO LV mains supply cables for proposed columns should be ascertained along with the identification of hazards and obstructions (utilities, services, trees, etc.).
- g) Street clutter – Proliferation of street clutter is undesirable. Where possible sign plates may be located on appropriately positioned lighting columns. However, the designer **MUST** check that columns are designed to accommodate the loading from the additional weight and windage of any Authority Attachments **AND** that residual capacity for additional 0.3m² signage remains.



8.4.10 Column Height Constraints

Column heights should be considerate of the scale of the street scene whilst allowing energy-efficient design. Column heights are constrained by the road type and environmental context. WCC's Street Lighting Team can advise on each site-specific design brief.



8.4.11 Lighting Layout Drawing

Design drawings are to be supplied at scale of 1:500 and are to be a maximum size of A1, and are to include:

- a) Statement of the design procedure used
- b) Summary of target lighting class(es)
- c) Boundary showing adoptable area and any easements required
- d) Tree planting layout
- e) Vehicular crossovers and driveways
- f) Significant residual hazards
- g) Clearance from columns to hazards to be highlighted
- h) Environmental constraints relevant to lighting
- i) Positions of highway electrical apparatus with lantern aiming
- j) Key/legend – including materials specification with quantities. For each LED lantern these attributes need to be identified: luminaire body, CCT, optic, flux output, system wattage, quantities. Non-standard columns will require accompanying detail drawings
- k) Existing and new unit ID numbers
- l) A schedule of illuminated apparatus, summarising clearance from kerbs, supply cable service type
- m) Where 'private' (non-DNO/IDNO) cable systems are to be used all cable and duct routes are to be shown on detailed design drawings, along with schematic circuit diagrams (supporting calculations will also be required)
- n) Private lighting installed on housing developments in areas adjacent to highway lighting is to be indicated along with a note of the responsible maintenance management companies

As-built drawings should include a summary schedule of revisions.



8.4.12 Maintenance Factors (New Equipment)

Overall maintenance factors are derived from BS5489 methodology. For an WCC approved luminaire, such as TRT Aspect/Mini, the overall maintenance factor will be + 0.84.



8.4.13 Lighting Design Calculations

These should be from Lighting Reality with file names that clearly describe the location and should include:

- a) 'User notes/title page notes' – These should describe the target lighting class, include a commentary on the design constraints; explain any deviations from design standards (if necessary, a separate 'designer narrative' document may be produced)
- b) 'Roadway' calculations – These are required to demonstrate compliance, determine optimal spacing and optimal optic choice for the site's predominant road geometries; the original RTMR files are required.
- c) 'Outdoor' calculations – These are also required for illuminance of irregular areas; multiple calculation grids should be provided, with grids confined to relevant discrete areas to minimise any distorting effects on average illuminance values. Luminaires should generally be aimed perpendicular to the adjacent kerb or road centre line. To demonstrate the correlation of design calculations and column positions, the lighting layout drawing with relevant topographic information is to be used as the base drawing within Lighting Reality e.g., when the lighting calculations have been completed the subsequent layout drawing should be re-imported into the RTMA file.
- d) PDF and 'read-only' files (supplied additionally as a record) - These should exclude greyscale, points and unnecessary Isolux contour lines. Masks should not be hidden, and the results should be displayed.



8.4.14 Conflict Areas, Crossings, Traffic Calming, Cycleways

WCC's Street Lighting Team's approach to the guidance in ILP document PLG02 – *Application of Conflict Areas* is that context is paramount, with each site to be assessed on a case-by-case basis. A conflict area may be limited to the actual conflict and its immediate surroundings:

- a) Roundabouts or complex junctions - The design may be deconstructed into multiple calculation grids, with each conflict area limited to include the area of conflict ahead of the driver and the adjacent area where a conflicting body might approach from.
- b) Zebra crossings – Supplementary lighting should generally be provided to give positive contrast of pedestrians on the crossing as delineated in ILP document TR12 *Lighting of pedestrian crossings*.
- c) Signalised crossings - Are generally not considered to need additional lighting if the existing road lighting is of an appropriate standard. Where crossings are situated within larger conflict areas, designers should create an additional calculation grid to ensure that average illuminance levels at the crossing 'carpet' are not lower than the approaches.
- d) Uncontrolled/Informal crossings – For example new refuge islands – designers should create an additional calculation grid to ensure that average illuminance levels at the crossing 'carpet' are not lower than the approaches; it may be desirable to light these with some element of positive contrast through the standard road lighting, with columns placed equidistant from and in advance of the island (as viewed by the driver).
- e) Traffic calming – Guidance on the lighting of traffic calming features is outlined in ILP document TR25 *Lighting for traffic calming features*.
- f) Cycleways and shared surface paths – Guidance on the lighting of shared surface cycleways is outlined in ILP document TR23 *Lighting of cycle tracks*. Designers should assess cycleways as routes and should aim for good uniformity (≥ 0.25); establishing adjacent visibility zones may not always be practicable.



8.4.15 Column Positioning and Clearances

Apparatus positioning should be in accordance with good industry practice to avoid restricting pedestrian movement whilst ensuring the lighting unit can be safely maintained.

- a) Apparatus is to be sited within the highway – easements will be required where equipment is sited on private land (easement size will as minimum 1.0m x 1.0m concrete mowing block and connected to the highway).
- b) Clearance from carriageway – are to be not less than the *minimum* defined in Table 8.1. Greater clearances may be desirable. All clearances are to be itemised on detailed design layout drawings. In some situations, where it is necessary to place columns at less than the recommended clearances, a project - specific risk assessment should be carried out.

Speed Limit (mph)	Minimum horizontal clearance
Less than 30	0.8m
40 to 50	1.0m
60 to 70	1.5m
1 - Table derived from BS5489-1:2020, Table-1 (please note that this table refers to 'speed limit' not 'design speed')	
2 - Clearance is subject to other factors, e.g., passive safety risk assessment	

Table 8.1 - Horizontal Clearance from Carriageway

- c) Footways – columns should generally be sited at the rear of the footway.
- d) Verges – where verges are provided between carriageway and footway then columns may be sited in the verge, provided that minimum horizontal clearances are maintained (see Table 8.1)

- e) Clearance from crossovers/driveways – minimum lateral clearance of 1.0m to the path of any vehicle crossover should be maintained.
- f) Shared surfaces - residential roads with shared surface arrangements will require careful consideration of column positions; there is currently no framework whereby WCC can adopt columns that are not protected by conventional kerb upstand and clearance from carriageway.
- g) Clearance from buildings – such clearance as necessary to avoid disturbance to foundations or structures.
- h) Hazards – columns are to be positioned to avoid conflict with hazards and to allow safe maintenance; working widths for barriers and road restraint systems should be noted.
- i) Door alignment – column doors should be ‘downstream’ from adjacent traffic flow (such that opening a door requires a person to face the oncoming traffic)
- j) Boundaries - ideally columns are to be sited on property boundaries.
- k) Trees – clearance to trees must be maintained (see Section 8.4.16 below).
- l) Footpaths – raise and lower columns are to be used where access via MEWP (Mobile Elevated Working Platform) cannot be guaranteed and to be positioned so that apparatus can be safely maintained in the future.
- m) Cycle paths – columns should be set back a minimum 0.5m clear of cyclepaths such that they do not obstruct overhanging handlebars. As per reference LTP2. Critical distance to fixed objects from Table 8.1 minimum clearances will not be less than 0.75m.
- n) Wall-mounted lanterns - may be considered. Minimum vertical clearances above highway must be maintained. On new developments wall-mounted apparatus requires a Deed of Dedication, not a Wayleave Agreement.



8.4.16 Highway Trees and Lighting

At an early stage of development planning there should be detailed integration of tree planting layouts and lighting designs; the potential for foliage ‘blocking’ light distribution should be considered when deciding what species to plant.

- a) Energy efficacy - of lighting requires that optimal design spacings are achieved and the development of planting plans should be coordinated with lighting design.
- b) Horizontal clearance - maximum growth of a tree canopy should be >5m from any lantern.
- c) Vertical clearance - in some cases (e.g., with mature trees) it may be possible to locate columns beneath the tree canopy provided that $\geq 1.6\text{m}$ clearance is kept above the lantern.
- d) Base compartments - and their access doors should not be encroached upon by undergrowth restricting maintenance access.



8.4.17 Ecology and Lighting

Lighting design of any previously unlit area must consider ecological impacts. All new developments will have an environmental ecology report with Planning Conditions. Lighting proposals should avoid or minimise the potential for impacts on existing or created habitats.

The ILP have resources that assist in ensuring best practice. Lighting designers shall summarise their decisions in relation to significant environmental constraints and in response to Environmental Impact Assessments.

Lighting designers should choose apparatus that has the optimal light distribution pattern for the road geometry, thus, to illuminate only the target area and minimising unwanted spill light in accordance with the *ILP Guidance Note for the Reduction of Obtrusive Light*.

Detailed design drawings should show environmental constraints relevant

to lighting (e.g., hedgerows frequented by bats); where constraints apply the detailed design drawings should show appropriate Isolux contour lines (suggested 1.0 lux & 0.2 lux) to demonstrate the extent of spill light. It may be possible to mitigate lighting impacts through other measures, such as:

- a) Louvres or back shields may be specified.
- b) Light sources may be altered to different colour temperature and spectral distribution.
- c) Reducing the mounting height of lanterns sited near environmentally sensitive areas.
- d) Excluding lighting from areas separated from the road network, from areas at site periphery or from private communal areas.
- e) Positioning lights sensitively – e.g., by avoiding positions at intersecting hedges, bat flight paths etc.



8.4.18 Non-Standard Apparatus and Commuted Sums

In conservation areas, non-standard apparatus may be deemed to be appropriate by Local Planning Authorities. Departure from standard materials will require the specific technical approval by the WCC's Street Lighting Team. Non-standard apparatus may incur commuted sum charges.

Power supplies should be provided via mains DNO or IDNO networks; with few exceptions private cable networks are considered to be nonstandard and will incur commuted sum charges



8.4.19 Power Supply

The developer is to procure unmetered low voltage electricity supplies for all apparatus (single-phase 230v earthed mains power supply) DNO - by preference, the supply should be from the local/host DNO. Western Power Distribution is the Distribution Network Operator within Warwickshire. Developers are advised to allow sufficient time for liaison with the DNO in

advance of works (email wpdnewsuppliesmids@westernpower.co.uk).

- a) IDNO – some developments are served by an electricity supply cable network that is owned by an IDNO (Independent DNO). In this case WCC must be advised of the identity of the IDNO.
- b) Private cable networks – may be specified where mains supply cables cannot be provided – e.g., for apparatus such as illuminated signs sited on traffic islands or for passively safe apparatus (see Section 8.4.28 below). Supporting calculations should be provided. Private cable networks proposed in other circumstances will be likely to incur commuted sum charges (see Section 8.4.18 above).

To commission lighting units, developers will first need to sign an Unmetered Connection Agreement (UmCA) with the host DNO (WPD) and sign-up with an electricity supplier – for more information see www.ssen.co.uk/ConnectionsYouHaveaChoice/ and www.ssen.co.uk/UnmeteredConnectionsFlowchart/



8.4.20 Electrical Test Data

The developer shall carry out electrical testing of apparatus in accordance with the requirements of the current edition of BS 7671 (the IEE Wiring Regulations) which identifies the electrical testing required for recording results and standard methods of testing.

Notwithstanding the requirements of BS 7671, the test certificate for each lighting unit **must be no more than 12 months old** at the time of the initial adoption inspection request.

All test results are to be recorded and presented to the Highway Authority before adoption.

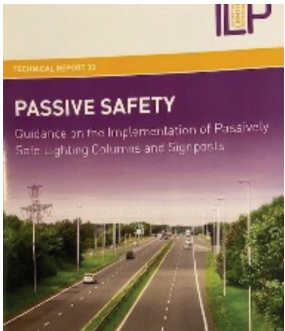
- a) BS 7671 tests for new apparatus shall be in the recommended format for new electrical equipment and include a 'Initial Certification of new installation': recommended e.g., HEA/HERS or IET GN3 Inspection and Testing.

- b) BS 7671 tests for private cable networks shall additionally include:
Cable Sheath Insulation Test.
Earth Electrode Resistance.

Electrical test certificates should be referenced against a named as-built drawing and the column/sign numbers should correlate.



8.4.21 Passive Safety Risk Assessment



For guidance on passive safety Lighting Designers should refer to the *WCC Passive Safety Procedure (Annex 4.2)* and the ILP TR30 'Guidance on the Implementation of Passively Safe Lighting Columns and Signposts' for guidance on passive safety classifications and electrical safety standards.

For risk assessments, Lighting Designers should not always use the 'Passive Safety Flowchart' from ILP TR30 (please note, TR30 is not intended to provide the definitive answer to every scenario on local authority roads).

For risk assessment of the need for protection of roadside features (and whether passively safe lighting equipment might be appropriate) WCC uses the UK Roads Liaison Group (UKRLG) document 'Provision of Road Restraint Systems on Local Authority Roads' – this uses speed limit and traffic flow criteria to determine which risk assessment method to use.

Traffic Flow (AADT)	Speed Limit (MPH)	Guidance to use	Risk assessment method
>5000	≥50	TD19	RRRAP / TR30 flowchart
>5000	<50	UKRLG	Relevant UKRLG method (A, B, C as appropriate)
<5000	≥50	UKRLG	
<5000	<50	UKRLG	

(Table derived from UKRLG)

Table 8.2 Applicable methods for determining when a RRS is required

For **street lighting only** schemes on existing roads – e.g., where the Lighting Designer is the Principal Designer – risk assessment should be as follows:

- a) Lighting Designers may use the TR30 flowchart
- b) Where criteria show the URRLG framework applies - use 'Method A – Accident Assessment' from the UKRLG document. If the KSI return is above the value described in Table 3.1 of the UKRLG document, then the designer may consider changes to the existing configuration so that columns/signs are not placed in areas with a high risk of strike.
- c) Other evidence for run-off accidents may also be considered – including site survey and examination of maintenance records for data of historic RTC damage to assets.
- d) The Lighting Designer's risk assessment should list the appraisal factors considered and assumptions made and should include a narrative of decisions taken.

In summary, the design approach should be:

- a) Apparatus is not to be placed in areas with a high risk of strike.
- b) Apparatus at high risk of strike that cannot be protected by a road restraint system (RRS) - or where it is advantageous - may be specified as passively safe type (provided this does not create an additional hazard).



8.4.22 Switching and Telensa Remote Monitoring System

New lighting will need to be fitted with Telecell nodes to enable their correct switching remotely. WCC specification requirements:

- a) Before adoption, all lanterns are to be commissioned by the Authority with Telensa CMS nodes which allow individual streetlights to be monitored and switched and for light output to be dynamically controlled.
- b) Individual 5PIN Telensa CMS nodes fit into a 7-pin nema socket built into each road lighting lantern. For some specialist lanterns (e.g., subway lighting units) internal nodes are fitted inside the lantern.
- c) The 7-pin nema-socket can accommodate a standard NEMA-type

photocell, which could be fitted *temporarily*, allowing installation of the Nodes (if required) at a later date (pre-Adoption); any conventional photocells fitted temporarily should be set to switch on at 35 lux and to switch off at 18 lux.

- d) Each Node is identified by a unique sixteen-digit barcode number. Telensa provides barcode stickers with the apparatus: one sticker is to be mounted in the base of each column (suggested that the top of the supply cut-out should be wiped clean and the sticker affixed) and one sticker on a plan/column NODE installation sheet which the Developer must present to Warwickshire County Council prior to adoption.

For further details contact: Telensa Limited, Iconix 3, London Road, Pampisford, Cambridge, CB22 3EG

Email support@telensa.com. Telephone +44 (0)1799 399200.



8.4.23 Standard Detail Drawings

Details of all current WCC standard detail drawings (SDD) can be provided by the WCC Street Lighting Team (streetlighting@warwickshire.gov.uk).



8.4.24 Materials – Lighting Columns

WCC's specification for lighting columns is as follows (please note, for passively safe column requirements see Section 8.4.21)

- a) Column types will either be aluminium specified or steel galvanized with protective factory finish plascoat finish to WCC standard detail drawings.
- b) Steel galvanized columns are to be manufactured in accordance with BS EN 40 and PD6547, and with a design life of 50 years.
- c) Steel galvanized columns painting to be Plascoat factory-finish. Finish colour to be RAL7016 Grey- unless otherwise specified. In some areas the use of 'black' or different colour may be specified by WCC.
- d) Aluminium columns to have 76 mm spigot. Columns shall have the following minimum base tube diameter to facilitate electrical

equipment to be fitted internally and equipped with a locking flush fitting door complete with separate earth connection to the door and the pole

- Up to 6 metres - 135-145mm
 - 8 metres and above - 165mm –250mm
- e) All columns shall comply with BS EN40-1, 3 and 6 including Guidance Notes PD 6547 and where specified by the Roads Authority's Representative with the requirements of The Highways Agency Department Standard BD 94/07.
 - f) Where there is a requirement for Passive Safety then the documents TD26/04 TA89/05 BD2/05 and EN12767 should be considered.
 - g) Columns will be 'post-top' style; outreach brackets may only be specified in agreement with WCC's Street Lighting Team.
 - h) Column base-boards at least equivalent to the door size and made of treated hardwood of sufficient size to accommodate all control equipment and service cut-outs; boards shall be positively secured to the column by two flush fitting screws.
 - i) Earthing terminal to be 8mm diameter brass terminal with brass washers and nuts.
 - j) Where access via MEWP is not guaranteed columns should be mid-hinged.
 - k) Standard columns shall be designed to be capable of accepting the loads indicated in this table (if greater loads are required then 'heavy-duty' column design will need to be confirmed with detail drawing and manufacturer's design certificate at the design stage):

Column height/type	Lantern weight	Lantern windage	Sign area	Sign weight	Sign eccentricity	Sign drag coefficient
5/6m post-top	10kg	0.13m ²	0.6m ²	5.0kg	0.4m	1.8
8m post-top	11.5kg	0.145m ²	0.6m ²	5.0kg	0.4m	1.8
10m post-top	21kg	0.22m ²	1.0m ²	5.0kg	0.4m	1.8
12m post-top	21kg	0.27m ²	1.0m ²	5.0kg	0.4m	1.8
5/6m post-top "raise & lower"	9.5kg	0.055m ²	0.3m ²	5.0kg	0.3m	1.8

Table 8.3 Wind Loading

- l) Columns to be supplied with manufacturer-applied ground-level / planting depth marker tape affixed to the root/base, and marker tape to be remain attached after installation.
- m) Any sign attachments agreed are to be centred up to 3m above ground level, maximum eccentricity as shown in Table 8.3. No attachments shall be fitted to mid-hinged columns.
- n) Attachments to columns, where agreed, shall be fixed with circumferential clamps of stainless steel AISI Grade 201 with neoprene strips placed under the clamps to prevent damage to the column or its protective coating.
- o) Where planted root columns are not viable a flange base with designed foundation may need to be specified.
- p) The column foundation details shown on WCC standard detail drawings assume poor soil conditions; column manufacturers detail drawings should be cross-checked to ensure all requirements are met.
- q) Column data sheets and manufacturer's standard detail drawing to be provided before adoption.



8.4.25 Materials – Illuminated Signs

Signing requirements as per the current edition of TSRGD and BS EN 12899-1.

Refer to SDD – Signs and Bollards

WCC specification for illuminated road signs is as follows:

- a) Hot-dip galvanised steel wide base post (in Conservation Areas the finish should match the lighting columns e.g., Black Plascoat colour).
- b) Base-boards at least equivalent to the door size and made of treated hardwood of sufficient size to accommodate all control equipment and service cut-outs and secondary isolators; boards shall be positively secured to the column by two flush fitting screws.
- c) Earthing terminal to be 8mm diameter brass terminal with brass washers and nuts.
- d) Illuminated sign plates to class RA2 BS EN 12899.
- e) Sign light units to be Simmons signs integrated LED LUA or LUB with diecast aluminium body (or similar approved).
- f) Sign light output determined by size of sign plate, as follows: 600mm Ø sign plates 3x1w integrated LUA; 750mm Ø sign plates 6x1w integrated LUA; >750mm sign plates LUB 10x1w LED.
- g) Sign lighting units require an electronic ballast.



8.4.26 Materials - Road Lighting Luminaires

All new developments will use LED TRT Aspect and Aspect Mini luminaires. These will generally be of neutral white colour temperature (4,000°k) though there may be environmental mitigation applications where warm-white (3,000°k) is required. The optimal configuration of lantern body, flux and total LEDs for optimal lifetime energy efficiency is the principal factor in specification.

Notes:

1. Lantern body and canopy to be powder coated.

2. Standard colour RAL9006 Light Grey unless otherwise specified. In some areas the use of 'black' may be specified.
3. Ballast to be electronic and fully dimmable via DALI protocol.
4. Switching – all lanterns to be fitted with Telensa 7-pin nema socket and external 5-pin Telecell node (except Subway and Underpass lighting units and some specialist lanterns which are to be fitted with Telensa internal node).
5. Where asymmetric luminaires are specified (e.g., at a zebra crossing) these are to be of CCT a single step cooler than the adjacent roadway lighting (to be 5700K).



8.4.27 Materials - Internal Wiring of Columns and Signs

Refer to SDD SL400_1, SL400_2 and SL400_3.

DNO supply cables to be terminated in single-phase.

Internal wiring to lantern to be multi-core PVC flexible Artic Grade 2.5mm² 3-core outer sheath blue.

Earthing conductor to be 6mm² PVC insulated coloured green/yellow; connections to be by bolted crimped terminations.

Internal cabling to be neatly clipped to the base board; all fixing screws to be stainless steel.

Base boards to be securely fixed to column base.



8.4.28 Materials - Passively Safe Equipment

For the risk assessment process to determine the need for passive safety see Section 8.4.21 above and the *WCC Passive Safety Procedure in Annex 4.2*.

Apparatus is to be selected in accordance with the requirements of BS EN 12767:2007 (Table NA1) and as outlined in the ILP's TR30 'Guidance on the Implementation of Passively Safe Lighting Columns and Signposts'.

Columns are to be installed in retention sockets (such as NAL) with

foundations in accordance with manufacturer's instructions.

Electrical disconnection system to be NAL SIS system. SIS impact sensor to be installed in each item of passively safe apparatus. SIS monitoring unit to be fitted in an above-ground location (lamp column, wide-base signpost or feeder pillar) located outside the clearance zone.

Mains DNO/IDNO supply **may not** be provided with passively safe equipment. For private cable systems, see Section 8.4.29.



8.4.29 Private Cable, Ducting and Feeder Pillars

Refer to WCC 'SDD' - Standard Detail Drawings.

Pillars, ducts and cables are to be used exclusively for street lighting and illuminated signs.

Private cables to be laid in road internal 100mm diameter orange PVC ducts (DNO/IDNO cables only in black duct). Refer to SDD.

Private cables to be laid internal 50mm diameter orange PVC ducts (DNO/IDNO cables only in black duct). Refer to SDD.

Ducting systems to include necessary chambers/draw pits.

Cable ducts below footways to be >450mm below finished level; ducts below carriageways to be >600mm below finished level.

150mm-wide yellow heavy gauge PVC tape marked 'street lighting' to be placed over private cables/ducts.

Cable ducts to be installed with draw cords.

Private cables to be XLPE\SWA\PVC.

All DNO cut outs shall have HRC fuse in pull-out carrier and provision for Live, Neutral and Earth cable connections including a PME link.

All outgoing circuits are to be labelled by an encapsulated schematic drawing detailing the outgoing cable route and the population of lighting units on each circuit.

Feeder pillars to be installed with a minimum of 1.0m² hard-standing provided at ground-level in front of the pillar door.

For electrical testing see Section 8.4.20.



8.5 Process – Design, Construction, Inspection and Adoption



8.5.1 Preliminary Enquiry

The developer is to provide drawings showing site location, highway adoptable areas, development phasing, other relevant information including: site specific planning constraints/conditions; LPA (Local Planning Authority) design codes; environmental impact assessments (EIA) and ecology report, presence of amenities such as shops, schools, sports or medical facilities; existing or predicted traffic flow and speed limits, night-time accident data, presence of traffic calming features; confirmation of road surface materials (including reflectance characteristics), etc.



8.5.2 Site-Specific Design Brief

On receipt of relevant information (see 8.5.1) WCC's Street Lighting Team will liaise with the designer and confirm the designers' proposed site-specific design brief indicating a target lighting class and information relevant to achieving the Adoption Required Standard.

Developers and their designers are encouraged to liaise with WCC's Street Lighting Team to ensure designs are progressed in accordance with the site-specific design brief and this design guidance.



8.5.3 Lighting Design

The developer is to arrange for the design to be undertaken using the guidance contained in this document and the site-specific design brief.



8.5.4 Detailed Design Submission

The following information is to be supplied to WCC with a document register; documents are to be clearly named to identify their contents:

- a) Location plan – to show phases of development (can be included on layout drawing).
- b) Layout drawing – PDF format required, at scale 1:500 maximum size A1.
- c) Hazard elimination and management list (HEML).
- d) Lighting design calculations – full RTMA and RTMR files from Lighting Reality to be supplied complete with design commentary.
- e) Site clearance drawing – to show any apparatus (including ID numbers) affected by the works (can be incorporated into the main layout drawing).
- f) Network owner – statement confirming identity of LV supply network owner, whether DNO or IDNO.
- g) Private cable calculations if applicable, output from Amtech software, or similar.
- h) Illuminated sign details (if applicable) - details may be shown on the street lighting layout (to include a schedule of sign faces and dimensions, specification of sign light).
- i) Special column requirements (if applicable).
- j) Initial Inventory Information – Inventory Template document will be provided from WCC's Street Lighting Team.
- k) Written confirmation that the submission complies with the *Adoptable Required Standards* e.g., the materials meet the Development Standard current at the agreement date.



8.5.5 Ongoing Liaison

The developer will need to incorporate WCC's comments from design appraisal into revisions, as required, resubmitting proposals for further scrutiny, as necessary. If the proposed highway features are altered, then lighting column positions may need to be reconsidered by the designer.



8.5.6 Certificate of Technical Approval

When the design documents meet the required standards a Certificate of Technical Approval will be issued by the WCC's Street Lighting Team.



8.5.7 Changes to the Design

Any subsequent changes to the agreed design need to be agreed with WCC's Street Lighting Team. In these instances, the developer must supply revised design calculations and drawings.



8.5.8 Customer Liaison

The developer shall ensure prospective purchasers are informed a plan of the street lighting scheme is displayed in the sales office so that purchasers, and existing residents, can be made aware of the impact of lighting units on adjacent properties.



8.5.9 HEA Contractors

Following WCC's certificated approval of the lighting design the developer is to identify to WCC which accredited (HEA, NICEIC) contractor has been appointed for the street lighting and illuminated sign installation and maintenance works.



8.5.10 Existing Apparatus Within the Works – De-adoption

Any existing apparatus due to be removed or altered will need to be de-adopted from the WCC maintenance contract. The developer must inform WCC's Street Lighting Team no less than 30 business days before the works programmed date by emailing streetlighting@warwickshire.gov.uk

Any existing apparatus which is temporarily made inaccessible for maintenance (e.g., barriered-off) will need to be suspended from the WCC

maintenance contract. The developer must inform WCC's Street Lighting Team no less than 30 business days before barriers are installed.

The developer is responsible for maintenance of all apparatus (de-adopted or suspended) within their works until it is formally inspected and handed over to WCC. Maintenance should be in accordance with industry good practice with full records to be kept of any works.



8.5.11 Temporary Lighting/Signing

Where alterations to the existing highway are proposed the sequencing of works should ensure that the highway remains appropriately illuminated, i.e., that existing lights shall be maintained correctly, and any new lights shall be commissioned before the disconnection and removal of existing lights.

In the event new road alignments are opened to traffic before the commissioning of the new approved lighting, temporary lighting shall be installed.

Temporary lighting shall illuminate the road to the appropriate design class and should not cause adverse impacts to nearby residents or road users.



8.5.12 Column Verification

To ensure compliance with materials specification the developer should present WCC with column data sheets and ID batch numbers of the columns installed.



8.5.13 Labelling of Apparatus

All apparatus should be numbered as agreed with WCC's Street Lighting Team - sequentially by named road. If works affect existing roads, then sequential re-numbering of existing apparatus may be required after any road naming and numbering of the adjacent properties is completed.

Where appropriate (e.g., within the 'vicinity zone' of overhead power

cables) an 'overhead warning' label should be applied to column shaft. See standard detail drawing.

Where a lighting column or illuminated sign holds the isolation point for an outgoing private sub-circuit then internally on isolator to be marked by indelible ink to identify the apparatus supplied via the private sub-circuit. All SWA private looped sub-circuit to have labelling tags identifying column/sign ID number supplied and ID column/sign number that the looped cable supply feed.



8.5.14 Cable Schematics

Isolation points for any private networks (e.g., feeder pillars or columns and signs with additional outgoing sub-circuits) must have enclosed in the base compartment an encapsulated waterproofed schematic drawing (A3 minimum) detailing the outgoing cable routes and the lighting units on each circuit along with as-laid cable routes.



8.5.15 Electrical Testing

As per the latest edition of BS7671, to include all items of highway apparatus i.e., road lighting, illuminated signs, feeder pillars and private supply cable networks.



8.5.16 Telensa Switching

Lanterns for adoption shall be controlled by the 'Telensa' remote monitoring system – the developer shall liaise with Telensa.



8.5.17 Maintenance before Adoption

The developer's duty of care includes maintenance of lights within the works in accordance with good industry practice and shall include:

- a) Reactive repairs - prompt identification and repair of operational faults, emergency repairs as necessary, and maintaining records of these activities.

- b) Electrical testing – to the requirements of BS7671 all apparatus is to be tested every 6 years. Notwithstanding the requirements of BS7671 the developer will be asked to re-test if a test certificate for each lighting unit is over 12 months old. All test certifications **must be no more than 12 months old** at the time of the initial pre-adoption inspection request.



8.5.18 Records Required Before Pre-Adoption Inspection

The following information is to be supplied with a document register to WCC **prior to inspection**. Documents are to be clearly named to identify their contents:

- a) As-built layout drawing – revised to include agreed changes.
- b) HEML - Hazard Elimination and Management List and/or Designers Risk assessment in accordance and to comply with the requirements of CDM.
- c) Illuminated sign schedule - as appropriate.
- d) Electrical test results – tests to be compliant with BS7671.
- e) Column data sheet or column batch number – including manufacturer, protective system and detail of any Authority attachments.
- f) Telensa node schedule – the reference numbers of the Telensa nodes are to be detailed on a schedule of illuminated apparatus, listed by road and maintenance ID no. – or this may be included on the layout drawing.
- g) Pre-adoption inventory information – blank template provided by WCC's Street Lighting Team.
- h) Confirmation the handover complies with the Adoption Required Standards (e.g., that the materials meet the Development Standard current at the agreement date and are in a satisfactory defect-free condition).



8.5.19 Pre-Adoption Inspection

WCC will arrange a thorough initial inspection of apparatus to be offered for adoption. Repeat inspections (after second inspection) will be charged separately. Requests for inspection should be accompanied by the electrical test certificates, node schedule and as-built drawings (in PDF format).



8.5.20 Energy

Following adoption, the developer is to inform their energy supplier the development is now within the scope of the WCC energy contract.



8.5.21 Document Submissions

At each stage of the process, developers are to provide the appropriate information, along with a document register (electronic documents should be clearly named to reveal their content). Checklist as follows:

a)	Before WCC provides a Technical Approval Quotation	<input type="checkbox"/>
	Site location plan	
	Draft layout drawings showing the highway adoptable areas clearly indicating extents of scheme, detail of adjoining schemes, site phasing plan	
	Other relevant information – e.g.: ecology reports, design codes, planning conditions, predicted daily traffic flow, etc	

b)	Detailed design submission	<input type="checkbox"/>
	Location plan	
	Lighting layout drawing and specification	
	Hazard Elimination and Management List and/or Designers Risk Assessment incorporating CDM compliance.	
	Lighting design calculations with designer narrative/commentary	
	Site clearance drawing (if applicable; may be in layout drawing)	
	Confirmation of LV supply network owner - host DNO / IDNO	
	Private cable calculations (if applicable)	
	Illuminated sign details (if applicable)	
	Special ('heavy-duty') column requirements (if applicable)	
	Relevant contract documents, schedules and appendices	
	Written confirmation that the design submission complies with the Adoption Required Standards	

c)	Pre-construction	<input type="checkbox"/>
	Confirmation of the identity of the HEA-approved subcontractor(s) engaged by the Developer to carry out street lighting / illuminated sign installation works	
	Confirmation of commencement date of street lighting installation works	

d)	Pre-adoption inspection	<input type="checkbox"/>
	'As-built' version of the lighting layout drawing	
	Hazard Elimination and Management List	
	Illuminated sign details (if applicable)	
	Electrical test results (Date no longer than 12 months old)	
	Column data sheets/batch numbers	
	Telensa node schedule	
	Pre-adoption inventory information (Blank Template provided by WCC Street Lighting Team)	
	Written confirmation that the installation complies with the <i>Adoption Required Standards</i>	



8.6 Additional Further Guidance

For any queries about implementing the WCC Street Lighting guidance to your project, please contact the WCC Street Lighting Team at:
streetlighting@warwickshire.gov.uk