

GLASGOW CITY COUNCIL, LAND AND ENVIRONMENTAL SERVICES**Road Lighting Design Brief (Addendum to Roads Development Guide)**

July 2012

LIGHTING DESIGN

The **Lamp Design Lumens Table** indicates the Design Lumen package for the various lamp types (to be used when using lighting design software programmes).

Note that apart from the above table, the following parameters are to be used for lighting design.

Road Surface Type = C2

Road Surface Coefficient (Q0) = 0.07

Luminaire Maintenance Factor = 0.91

Luminaire tilt = 5 Deg

Lamp flux Maintenance Factor and **Initial Lamp Lumens** to be taken from Lamp Design Lumens Table 1 below.

TABLE 1 LAMP DESIGN LUMENS

Lamp Type	Colour Temperature	Max. Circuit Watts	Initial Lumens (K)	Lamp Flux Maintenance Factor @ 12,000Hrs
<u>SON-HC</u>				
250W SON/TP	2150K Ra65	270	23	0.86
Metal Halide				
250W HQI-T	4000K Ra65	270	17.5	0.8
400W HQI-T	4000K Ra65	430	33	0.8
Metal Halide				
				Lamp Flux Maintenance Factor @ 5,000Hrs
70W CDO-TT	2800K Ra83		6.3	0.8
100W CDO-TT	2800K Ra85		8.8	0.8
150W CDO-TT	2800K Ra85		13.5	0.8
Lamp Type	Colour Temperature	Max. Circuit Watts	Initial Lumens (K)	Lamp Flux Maintenance Factor @ 12,000Hrs
<u>MCF PL-L</u>				
55W PL-L	3000K Ra82	58	4.8	0.93
55W PL-L	4000K Ra82	58	4.8	0.93
80W PL-L	3000K Ra82	86	6	0.93
80W PL-L	4000K Ra82	86	6	0.93
<u>MCF PL-T</u>				
				Lamp Flux Maintenance Factor @ 10,000Hrs
57W PL-T	3000K		4.3	0.93
57W PL-T	4000K		4.3	0.93

Road Lighting Levels are to be to the selected Lighting Class as indicated in Table 2 below.

Table 2

(Local variations may justify an increase in class to cater for public amenity areas, schools, shops etc)

Road Type/Class	BS EN 13201-2-2003 Lighting Class	Comments
Motorway & Dual Carriageway ≥ 50 mph	ME1 (Table 1a)	
Primary & Main Distributor	ME2 (Table 1a)	
District Distributor	ME3c (Table 1a)	
Local Distributor	ME4b (Table 1a)	
Minor Traffic Routes	ME4b (Table 1a)	
Residential	S4 (Table 3)	S3 may be considered for some, discuss with local authority lighting engineer
City Centre	CE1/CE2/CE3 (Table 2)	Depends on amenity, pedestrian usage etc discuss with local authority lighting engineer.

Notes :-

- 1 Standard column mounting heights of 5, 6, 8 and 10m are to be used.
- 2 Residential roads, eg, 5.5metre carriageway with 2 metre footways, the 80 W Long Compact Fluorescent Lamp (PLL) is to be used at 6 metre height. When calculation widths exclude this due to demanding a much reduced spacing, 100 W CDO-TT at 8 metre height should be considered. (The smaller 55 Watt Long Compact Fluorescent Lamp (PL-L) is suitable for narrower “novel”shared surface roads).
- 3 Note that in many situations a single sided design will result in a similar design spacing as a staggered design. As the staggered design will contribute equally to the gardens/courts/frontages on both sides of the road whilst the single sided design will not, the staggered design is the preferred option in these situations.
- 4 57 W short compact fluorescent (PL-T) on hinged columns should be used on paths at 5 metre height.
- 5 For traffic routes the combinations of 8metre with 100/150 Watt CDO-TT or 10 metre with 250/400W CDO-TT/HQI-T Metal Halide sources are the pairings to be considered generally. The use of 250W opposite geometry is favoured over 400W staggered geometry due to energy considerations and wherever possible allowing for an economical design the use of 400W HQI sources is to be avoided.
- 6 5m mid hinged columns are to be used for footpaths.
- 7 Note that 5 and 6 metre columns are not to have brackets.
- 8 Note that 8 metre and 10 metre columns are to have max 0.75 and 1.0 metre brackets at 5 deg incline, respectively.
- 9 Conflict Areas and Residential roads, there has been a relaxation of the layout of columns at road junctions with only position A (the one at the head of the junction) now being a requirement. Refer to BS 5489-1, 2003 9.4. The first column into the side road should still be on the same side as position D used to be but the spacing is to suit light levels rather than a prescribed position. Conflict Areas on Traffic Routes, The prescribed positions at various junction layouts are to be as BS 5489-1, 2003 Annex J. For other conflict areas on Traffic Routes refer to BS 5489- 1, 2003 B3.2
- 10 A street lighting unit should be positioned directly at traffic calming features, such as road hump, speed table etc.
- 11 Computer generated lighting design calculation information demonstrating compliance with all the relevant quality characteristics indicated for the respective Lighting Class (refer Table 1 for guidance) must be provided. These must be in accordance with BS EN13201 Part 3 2003, Calculation of Performance. This information must be provided for each variation of the calculation field, eg bends, irregular shapes, etc, and each one must be referenced to the layout plan to indicate clearly the area covered.
- 12 The use of lanterns utilising light emitting diode (LED) sources are not precluded.

- 13 Variable step ballasts are to be used to maintain lumen output within design levels for duration of lamp life.

ELECTRICAL DESIGN

Changes made are,

- 1 3 Core 16 mm sq. armoured XLPE or MDPE cable (for columns) EU Harmonised colours.
- 2 3 Core 6 mm sq. armoured XLPE or MDPE cable (for signs and bollards) EU Harmonised colours.
- 3 Termination Units (Cut – Outs) to be Double Pole, and fuse ratings to be 6 Amps for 8 – 100 Watt lamps, 10 Amps for 150 – 250 Watt lamps and 16 Amps for 400Watt Lamps.
- 4 HDU Panels to have BS88 fused outgoing circuits.
- 5 Photo-cell control column wiring and Lighting Control Panel altered, to provide fuse protection of photo-cell, when light units which require fuse rating in excess of 6 Amps are used in photo-cell control column. Drawing Refs, **LNR/GE/17B** Highway Distribution Panel Three Phase Switched Schematic and **LNR/GE/3C** Photocell Control Column/Lantern Circuit pages 5 & 6 refers.

MATERIALS

A list of [Approved Lighting Materials](#) is available which are known to satisfy the GCC lighting specification and can be used by developers on prospectively adoptable roads.

Note that Lighting Installation Contractor must check compatibility between Pillars and Panels as they vary individually in size. Allowance must also be made to accommodate the Power Company service Cut-Out (200mm wide x 320mm tall), at the bottom right hand side of the pillar

COLUMNS

Mid hinged columns are to be utilised where vehicular access is unavailable for future maintenance. It should be ensured that when folded down no obstructions can interfere with this operation (particularly from future fencing/hedges, etc) and the lowered lantern should be directly accessible from an adopted area.

ALTERNATIVE EQUIPMENT

The following has been agreed with the Council's Development and Regeneration Services with regards to use of alternative equipment.

The proposed column and lantern design must be historically accurate and seek to replicate that design. All proposals for the use of alternative equipment must be supported by documentary evidence such as photographs and drawings.

CONSTRUCTION CONSENT CHECKLIST**CC9**

		Project - Dwg.No.-	Lighting		Designer Check		GCC Check	
			N/a	Yes	No	Pass	Fail	
<u>Presentation</u>								
P1	Drawings to 1:500 Scale, black on white background including lighting layout							
P2	Drawing legend only to have existing/proposed items shown							
P3	North orientation indicated							
P4	Existing Street Names, and retained street lights (with column refs) indicated							
P5	Lighting layout Drawing indicating features eg, traffic calming, ped crossings, bridges, culverts, rail lines, steps, building overhangs, trees (existing and proposed), soft/hard landscape etc							
P6	Lanterns - Lamp type and wattage, Manufacturer, catalogue reference no and optical setting all indicated on drawing.							
P7	Standard Drawing notes all indicated.							
P8	Supporting lighting design calculations supplied and referenced to lighting drg.							
P9	CDM Design Risk Assessment supplied							
<u>Lighting Design</u>								
L1	GCC (Glasgow City Council) Adoptable areas lit							
L2	Non GCC adoptable areas to be lit has Private lighting shown							
L3	All adoptable equipment contained within GCC adoptable area							
L4	Min. distance between columns acceptable >15metres.							
L5	Equipment selection suitable for Road Type							
L6	Column spacings meeting limits of design calculations							
L7	Lanterns at right angles to heel of footways/paths							
L8	Lighting levels and design geometry acceptable							
L9	Equipment positions sympathetic with drives, windows, etc							
L10	Non vehicle maintenance considered, eg hinged columns and direction of fall indicated							
L11	All equipment generally at heel of footways							
L12	Contiguous lighting system shown, to include 3 units in all directions							
<u>Electrical Design</u>								
E1	Electrical separation of Adoptable and Private lighting							
E2	Schematic diagram provided for each Power Supply positions							
E3	EFL Impedance values, at pillar and end of circuits shown (on schematics)							
E4	Volt Drop values given for each circuit (on schematics)							
E5	Fuse ratings for Load (inc lamp starting) and EFL impedance acceptable							
E6	Unit reference numbers to be indicated on layout drawing and schematic							
E7	Earth Electrodes at both supply and ends of circuits with more than 3 units							
E8	Cabling 3c 16 sq mm PVCSWAPVC, or 3c 6 sq mm if to sign or bollard							
E9	Max.number of cables terminated at any column - three							
E10	Switching - Group Control							
E11	Illuminated traffic signs and bollards indicated.							
E12	Electrical supply to new lighting pillars generally 3 PH							
E13	Circuit maintainability designed in, cable runs, recabling, restricting outages etc							



