

Design Parameters



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Project Number:	100214	Revision:	A
Project Name:	S278 Gresford Road	Date:	31/03/21

B5102 - Straight Mile

Straight Mile has recently been lit as part of a recent large housing development. The calculation attached to this submission assumes a lighting class of M4 in order to establish the most likely Urbis Axia 2.2 configuration in lieu of the inventory data from WBCC.

The calculation confirms that the lighting should maintain P4 classification on the new footway being proposed along Straight Mile as part of the supermarket development.

Gresford Road - M4/P2 Comparable

Gresford Road currently has Parish-style lighting which does not meet any recommended standard. This design proposes that the lighting is brought up to standard to aid safe access to and from the new supermarket.

Gresford Road footpath - P4

The new footpath along Gresford Road is located 11m from the carriageway. This design therefore has introduced a separate system of lighting for pedestrian usage.

Gresford Road - Zebra Crossing

It is recommended that the new crossing has dedicated lighting to positively illuminate persons crossing the road. This is due to the absence of sufficient surface luminance which limits the effectiveness of the preferable negative contrast.

The table below demonstrates the required illuminance values to be achieved on the horizontal and vertical planes of the crossing. The initial designed average illuminance value is taken from the area calculation attached to this submission.

ILP TR12 - Lighting of Pedestrian Crossings

Designed Average Illuminance	Grid	Multiplier	Required Minimum Illuminance
12.79	Centre of Crossing (vert.)	2.00	25.58
	Kerb Edge (vert.)	2.00	25.58
	Rear of Waiting Area (vert.)	1.50	19.19
	Crossing Carpet (horiz.)	3.50	44.77

Selection of Lighting Class - M4/P2 Comparable - Gresford Road					
EN 13201-1:2014 - Table 1					
Parameter	Options	Descriptions		Weighting	Score
Travel Speed	Very High	v ≥ 100 km/h		2	-1
	High	70 < v < 100 km/h		1	
	Moderate	40 < v ≤ 70 km/h		-1	
	Low	v ≤ 40 km/h		-2	
Traffic Volume	High	>40,000		1	0
	Moderate	7,000 - 40,000		0	
	Low	<7,000		-1	
Separation of Carriageway	No			2	2
	Yes			1	
Junction Density	High	Intersection	Interchanges		1
		>3 km	<3 km	1	
	Moderate	≤ 3 km	≥3 km	0	
Parked Vehicles	Present			1	0
	Not Present			0	
Ambient luminosity	High	Shopping windows, Sports		1	0
	Moderate	Normal Situation		0	
	Low			-1	
Navigational task	Very Difficult			2	1
	Difficult			1	
	Easy			0	
				Total Score	3

M Class (CIE 115:2010)							
Score	M Class	Road Surface				Threshold Increment	Rei
		Dry		Wet (*1*)			
		Lav in cd.m²	Uo	UI	Uo	%	
6	M1	2.0	0.4	0.7	15.0	10.0	0.35
5	M2	1.5	0.4	0.7	15.0	10.0	0.35
4	M3	1.0	0.4	0.6	15.0	15.0	0.30
3	M4	0.8	0.4	0.6	15.0	15.0	0.30
2	M5	0.5	0.4	0.4	15.0	15.0	0.30
1	M6	0.3	0.4	0.4	15.0	20.0	0.30

Lighting Classes of Comparable Level - Table A.1 of BS5489 -1		
M-Class	C-Class	S or P Class
-	C0	-
M1	C1	-
M2	C2	-
M3	C3	P1
M4	C4	P2
M5	C5	P3
M6	-	P4
-	-	P5
-	-	P6

Maintenance Factors - Urbis Axia 3

Environmental Zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO starlight reserves, IDA dark sky parks
E1	Natural	Intrinsically dark	National parks, Areas of Outstanding Natural Beauty etc.
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres of suburban locations
E4	Urban	High district brightness	Town / City centres with high levels of night-time activity

Maintenance Factor - 8m Mounting Height

Luminaire Maintenance Factor - Table B.1 from BS5489-1

Environmental Zone	Mounting Height	Cleaning Frequency					
		12 Months	24 Months	36 Months	48 Months	60 Months	72 Months
E1/E2	≤6m	0.96	0.96	0.95	0.94	0.93	0.92
E1/E2	>6m	0.96	0.96	0.95	0.94	0.93	0.92
E3/E4	≤6m	0.94	0.92	0.90	0.88	0.86	0.84
E3/E4	>6m	0.96	0.96	0.95	0.94	0.93	0.92

Maintenance Factors for LED Luminaires - Annex C from BS5489-1

Lx @100,00hrs	0.97
Lamp survival factor (LSF)	0.98
Luminaire Maintenance Factor (LMF)	0.92
Overall Maintenance Factor	0.87

Maintenance Factor - 6m Mounting Height

Luminaire Maintenance Factor - Table B.1 from BS5489-1

Environmental Zone	Mounting Height	Cleaning Frequency					
		12 Months	24 Months	36 Months	48 Months	60 Months	72 Months
E1/E2	≤6m	0.96	0.96	0.95	0.94	0.93	0.92
E1/E2	>6m	0.96	0.96	0.95	0.94	0.93	0.92
E3/E4	≤6m	0.94	0.92	0.90	0.88	0.86	0.84
E3/E4	>6m	0.96	0.96	0.95	0.94	0.93	0.92

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