

Appendix D - Breeam - Reduction of Night Time Light pollution compliance confirmation

We have included 2 sets of results. The first set is based on all the external light fittings within the development and the second set with all uplighters removed.

This exercise has been carried out to demonstrate that with or without the uplighters the light pollution appraisal of the scheme is still Breeam compliant.

These results refer the "ILP Guidance Notes for the Reduction of Obtrusive Light GN01:2011." Within the guidelines it states that uplighters can be excluded from the overall ULR value meaning that any lighting scheme can still pass the overall Breeam assessment as it recognises that the luminous intensity of uplighters diminish rapidly with distance.

BREEAM and Light Pollution Compliance Summary



Project Reference	C4C13112
Project Name	Mount Pleasant External Lighting
Date	23.09.2020
Report By	CMC
WLL Drawing Numbers	
Comments	Entire project - including all aspects of Upward Light.

BREEAM Pol 4 - Reduction of Night Time Light Pollution Non-Domestic Buildings

One BREEAM credit is available where the lighting design is in compliance with the criteria below

Demonstrate compliance with ILP Guidance Notes for the Reduction of Obtrusive Light (2011)

Select Environmental Zone from table below:

Table 1 - 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 or suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night-time activity

Table 2 - Obtrusive Light Limitations for Exterior Lighting Installations - General Observers						
Environmental Zone	Sky Glow ULR (Max %)	Light Intrusion (into windows) Ev (lux)		Luminaire Intensity I (candelas)		Building Luminance Pre-curfew
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Average, L (cd/m²)
E0	0	0	0	0	0	0
E1	0	2	0	2500	0	0
E2	2.5	5	1	7500	500	5
E3	5.0	10	2	10000	1000	10
E4	15	25	5	25000	2500	25

General notes relating to the ILP Guidance

- 1 - Values for Light Trespass into windows can only be demonstrated with full detailed drawings showing adjacent properties. Please see Lighting Calculation for further details
- 2 - No building is lit directly as a night time feature so Building Luminance requirements are not exceeded
- 3 - This applies to each luminaire in the **potentially obtrusive direction**, outside of the area being lit. The figures given are for general guidance only and for some applications with limited mounting heights, may be difficult to achieve.
- 4 - External lighting (except for safety and security) should be automatically switched off between 11pm and 7am (Post curfew) **to gain the BREEAM credit**
- 5 - Safety and security lighting between 11pm and 7am should meet the 'Post curfew' targets in Table 2
- 6 - Night-time switching control is recommended to achieve compliance post curfew
- 7 - Lumen outputs reduced by 50% where 'Dual Power' feature is used

Upward Light (ULR)	
Target	15.0%
Project	47.8%
PASS/FAIL	FAIL

Source Intensity (kcd)		
	Pre Curfew	Post Curfew
Target	25.0	2.5
Project	2.0	1.2
PASS/FAIL	PASS	PASS

E4	Project Environmental Zone
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Input project equipment details into white boxes below

Reference	Part Number	Product Type	Time of Operation	Lamps	Lumens	Qty	Light Outpt Ratio % (LOR)	Upward Light Ratio % (ULR)	Total upward lumens	Total available lumens	Max. source Intensity cd/1000 lm	Max. source Intensity kcd Pre Curfew	Max. source Intensity kcd Post Curfew	Circuit Watts	Total Watts
ST	CYT14KG	CYGNUS ST	Post Curfew	LED	3361	23	100.00%	0.00%	0.0	77303.0	320		1.076	43.5	1000.5
VE	K6H44KHB	KOLO IP65 HOOD	Post Curfew	LED	1008	59	100.00%	7.00%	4163.0	59472.0	802		0.808	14.0	826.0
V1E	CENPL1Y	CENTURION PP65 LED	Post Curfew	LED	2835	18	100.00%	9.20%	4694.8	51030.0	409		1.160	36.0	648.0
W	MRSD1M	MARINE SD	Pre Curfew	LED	1705	29	100.00%	100.00%	49445.0	49445.0	1163	1.983		20.0	580.0
Y	MRLF33M	MARINE LF	Pre Curfew	LED	358.672	230	100.00%	100.00%	82494.6	82494.6	4223	1.515		3.3	759.0
Z	BQG14K	BROADWALK QUAD GRILLE	Post Curfew	LED	144	10	100.00%	0.02%	0.3	1440.0	585		0.084	4.2	42.0
LL	LLR2H14K	LED Line Recessed	Pre Curfew	LED	1830	12	100.00%	100.00%	21960.0	21960.0	388	0.710		21.0	252.0
X	SF67W14K (per metre)	Starline Flex IP67 (per metre)	Pre Curfew	LED	390	6	100.00%	100.00%	2340.0	2340.0	326	0.127		5.0	30.0
									165098	345485					4137.5

BREEAM Ene 03 External Lighting, BREEAM New Construction (Non-Domestic Buildings)

Select BREEAM version in box below:

2018	If 2014 or 2018, status is shown to the right. If 2011, use separate table
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One BREEAM credit is available where luminaires meet the criteria below and are controlled through time or daylight to prevent operation during daytime hours.

Minimum target indicates the minimum average for external luminaires in all areas and with any colour rendition

Total LL/CW	83.5
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BREEAM 2018	
Luminaire lumens per circuit watt LL/CW	
Target	70.0
Project	83.5
PASS/FAIL	PASS

BREEAM and Light Pollution Compliance Summary



Project Reference	C4C13112
Project Name	Mount Pleasant External Lighting
Date	23.09.2020
Report By	CMC
WLL Drawing Numbers	
Comments	Without the uplight

BREEAM Pol 4 - Reduction of Night Time Light Pollution Non-Domestic Buildings

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Demonstrate compliance with ILP Guidance Notes for the Reduction of Obtrusive Light (2011)

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- 7 - Lumen outputs reduced by 50% where 'Dual Power' feature is used

Upward Light (ULR)	
Target	15.0%
Project	5.8%
PASS/FAIL	PASS

Source Intensity (kcd)		
	Pre Curfew	Post Curfew
Target	25.0	2.5
Project	0.1	1.2
PASS/FAIL	PASS	PASS

E4	Project Environmental Zone
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Input project equipment details into white boxes below

Reference	Part Number	Product Type	Time of Operation	Lamps	Lumens	Qty	Light Outpt Ratio % (LOR)	Upward Light Ratio % (ULR)	Total upward lumens	Total available lumens	Max. source Intensity cd/1000 lm	Max. source Intensity kcd Pre Curfew	Max. source Intensity kcd Post Curfew	Circuit Watts	Total Watts
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X	SF67W14K (per metre)	Starline Flex IP67 (per metre)	Pre Curfew	LED	390	6	100.00%	100.00%	2340.0	2340.0	326	0.127		5.0	30.0
									11198	191585					2546.5

BREEAM Ene 03 External Lighting, BREEAM New Construction (Non-Domestic Buildings)

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Total LL/CW	75.2
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BREEAM 2018	
Luminaire lumens per circuit watt LL/CW	
Target	70.0
Project	75.2
PASS/FAIL	PASS