

Chester Road

Proposed External Lighting

South Elevation Lighting

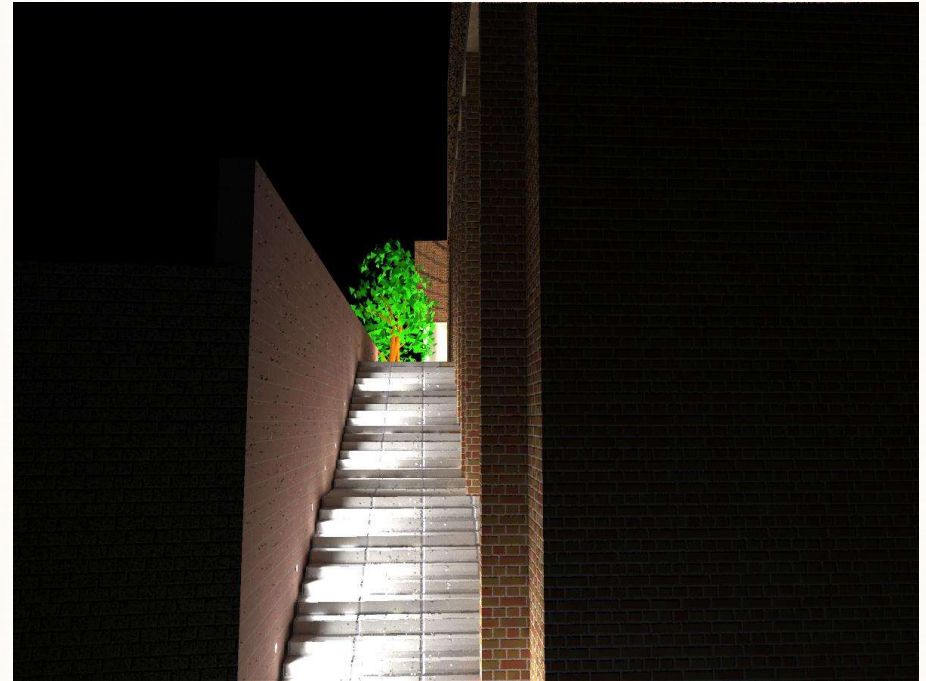
Main entrance approach.

Ambient lighting provided by soffit recessed down lights.
Feature lighting to structural pillars and planters.



Stairways

Wall recessed miniature spot lights, providing light directly on changes of level.



North Elevation Lighting

Rear exit and landscaping to east building

Ambient lighting provided by soffit recessed down lights.
Feature lighting to planters and building columns.



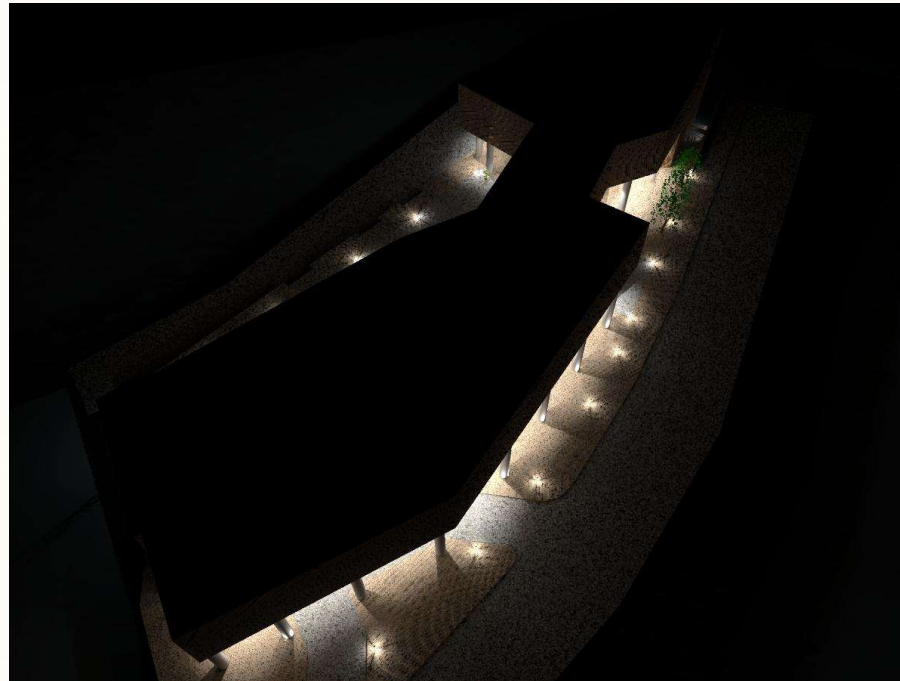
Rear of west building

Ambient lighting provided by soffit recessed down lights.
Feature lighting to planters and building columns.



Aerial View

Periphery marked by bollard lights, to give a feeling of security. It is essential that the perimeter of an outdoor lit area has a defined boundary. Without a physical structure, this can be simulated by lighting. Without this, the surrounding areas can appear dark and foreboding.



Ambient Soffit Recessed Lights



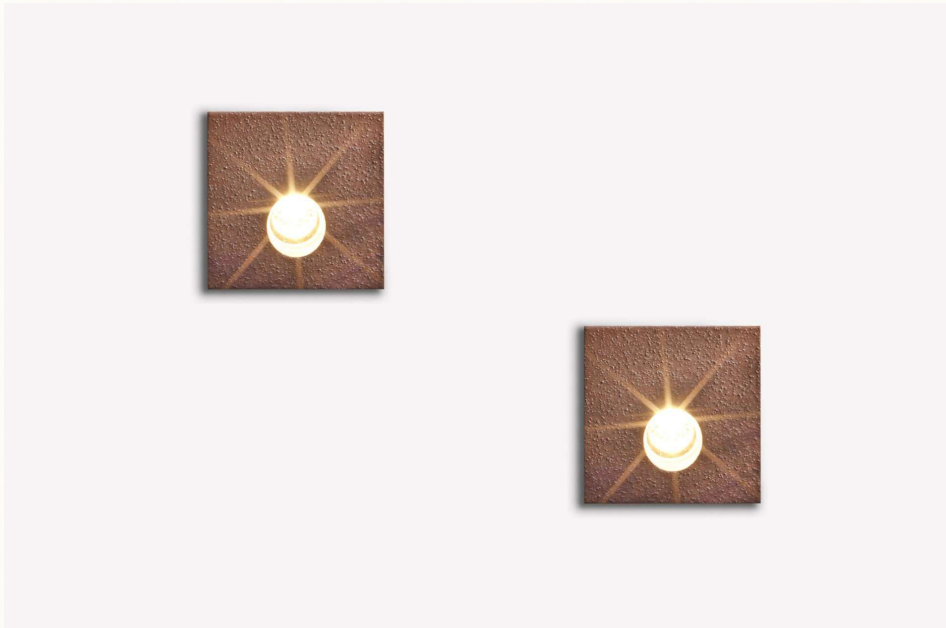
- The CIMBRI recessed down light is 150mm diameter with a recessing depth of 132mm.
- The luminaire is sealed to IP65 from the optical side.
- It utilises a 18.5w 2150 lm light engine.
- The CIMBRI has a medium wide beam optic to maximise the distribution for the given mounting height.

Perimeter Bollard Lights



- The Tripo bollard stands at 800mm high.
- It has a 360 degree distribution.
- It utilises a 8.5w 750 lm light engine.
- The Tripo produces zero upward light.

Feature Wall Marker Lights



- The Mark Square stands at 800mm high.
- It has a downward asymmetric distribution.
- It utilises a 1.2w 120 lm light engine.
- The Mark is 40mm² and 28mm deep
- Remote driver can power up to 10 luminaires.

Ground Recessed Feature Light



- The Trim CC for walk over 1000kg max
- It has a narrow flood optic.
- It utilises a 4w 410 lm light engine.
- The Trim CC is 65mm² wide and 86mm deep
- Remote driver can power up to 2 luminaires.

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Exterior Lighting Environmental Impact

ILP Guidance Notes For The Reduction of Obtrusive Light

The Institute of Lighting Professionals (ILP) provide guidance on the environmental impact of artificial lighting. The parameters for measurement are also set out in EN BS 12464-2 2014 Lighting of Outdoor Work Places

These parameters are as follows:

- 1) Sky Glow or upward light ratio of installation
- 2) Light intrusion (into windows) This is aimed at light spill into domestic spaces
- 3) Luminaire intensity. This applies to each luminaire in the potentially obtrusive direction. This could be the brightness as viewed from a major road junction or domestic dwelling

With the exception of sky glow, there are limits set for pre and post-curfew

ILP Guidance Notes For The Reduction of Obtrusive Light

Table 1 showing the definitions of each environmental zone

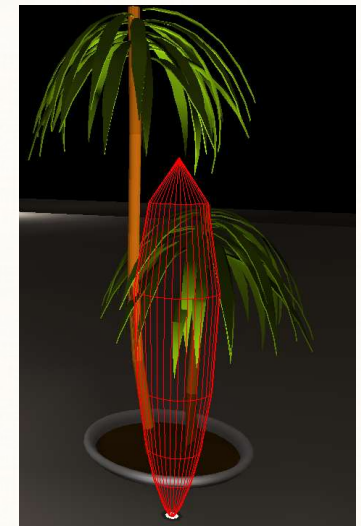
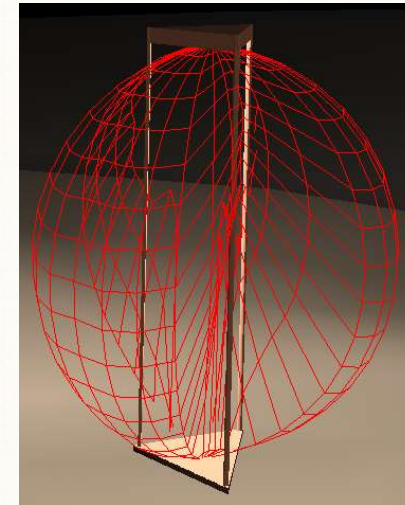
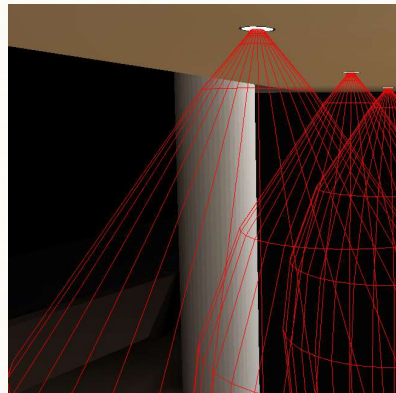
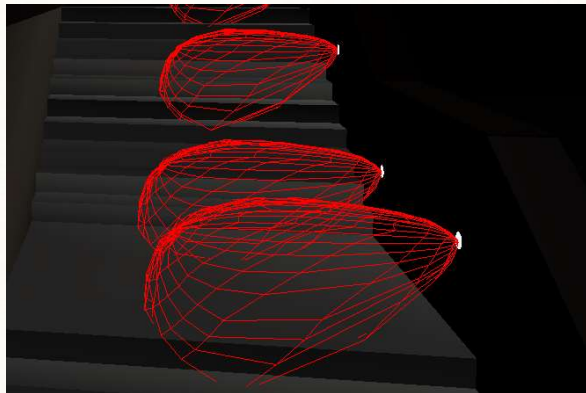
Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty etc
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium 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 setting out the limiting parameters

Environment al Zone	Sky Glow ULR [Max %] ⁽¹⁾	Light Intrusion (into Windows) E _v [lux] ⁽²⁾		Luminaire Intensity I [candelas] ⁽³⁾		Building Luminance Pre-curfew ⁽⁴⁾
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Average, L [cd/m ²]
E0	0	0	0	0	0	0
E1	0	2	0 (1*)	2,500	0	0
E2	2.5	5	1	7,500	500	5
E3	5.0	10	2	10,000	1,000	10
E4	15	25	5	25,000	2,500	25

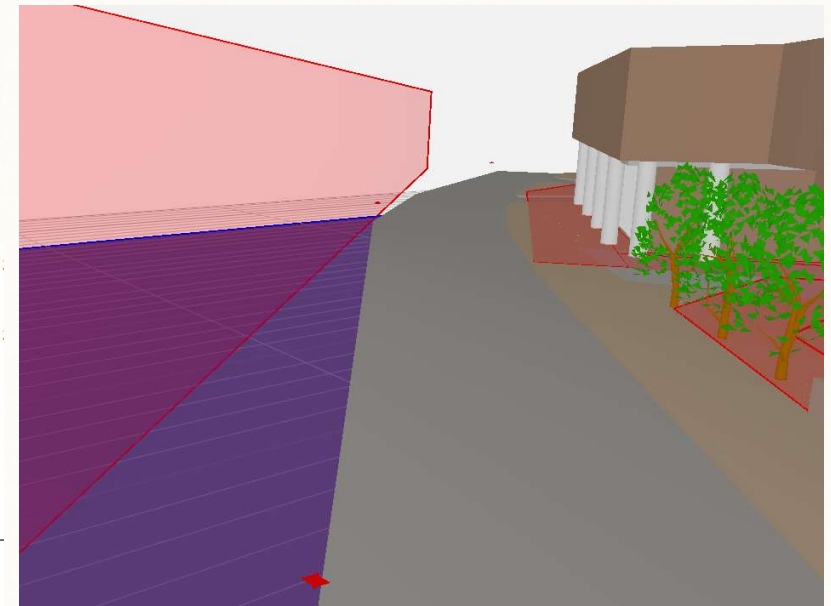
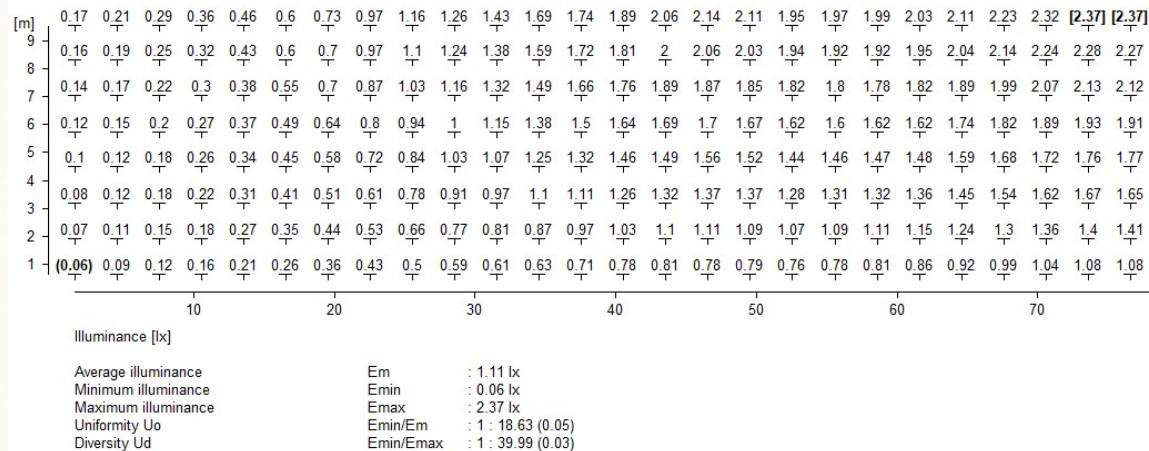
Sky Glow – Environmental Zone 4

The ILP document recommends limits to upward light based upon the site as a whole. This means the average of all luminaires. In this case, the 2 highest output luminaires have no upward light with the remaining 2 decorative lights making up just below 15%. The criteria for maximum upward light for Environmental Zone 4, is 15%



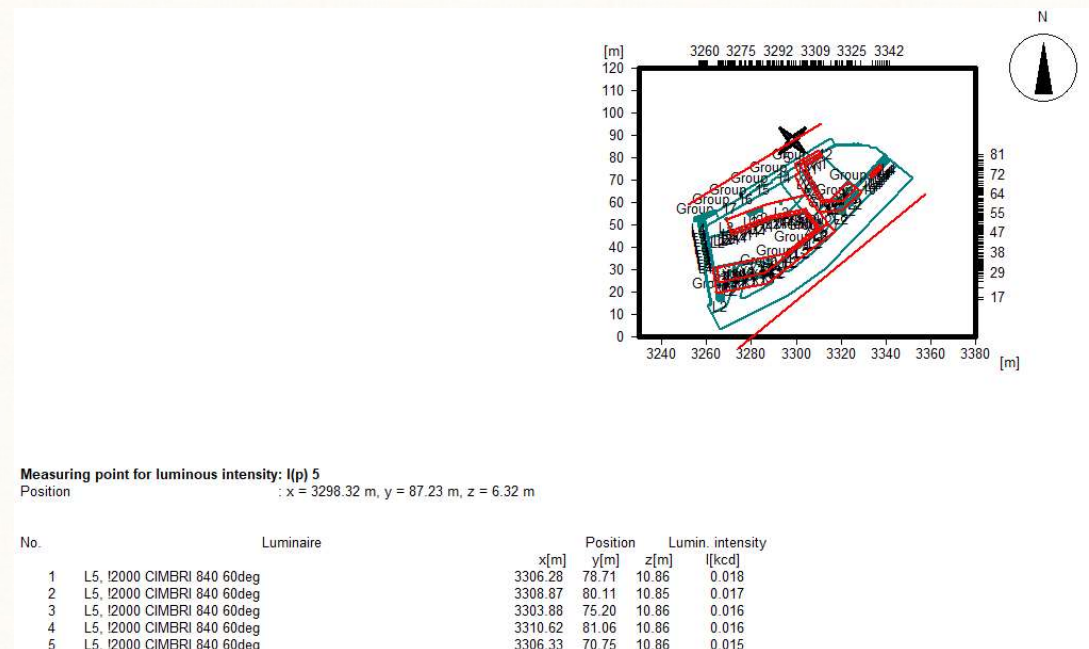
Light Into Windows – Environmental Zone 4

Several vertical illuminance calculations were plotted around the building, to demonstrate possible spill light into windows. The maximum measures at 2.37 lux, as shown below. This is below the 5 lux post-curfew maximum set out for Environmental Zone 4



Luminaire Intensity – Environmental Zone 4

The post-curfew intensity limit set out for Environmental Zone 4 is 2.5 kcd (1,000 candelas). Local Planning Authorities set a curfew typically around 11:00pm. In the case of this project, as viewed from a boarder approximately 10m from the site boundary, the maximum luminaire intensity measured is 0.018 kcd. This comfortably complies with the 2.5 kcd limit set out for Environmental Zone 4



Obtrusive Light Summary

Although there are 2 luminaire types utilised on this project which emit a large proportion of their light above 90 degrees (upward), they are very low power decorative and wayfinding luminaires. The main functional lighting, consists of full cut-off types, with zero upward light. This is born out in the vertical spill data and source intensity measurements, which are well within limits.

In summary, the proposed new lighting complies with the post-curfew limits set out in The ILP Guidance Notes & EN BS 12464-2, for an Environmental Zone 4.

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