Castleforbes Residential

Site Lighting Report

20_D003 Castleforbes Residential

10th November 2020

ethos
ENGINEERING

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CURRENT ISSUE			
Issue No:	P2	Issue Date:	10th of November
Sign Off	Originator:	Checker:	Reason For Issue:
Print Name:	Raul Turcu	Peter Farrell	Issue for planning

PREVIOUS ISSUES (Type Names)				
Issue No:	Date:	Originator:	Checker:	Reason For Issue:
P1	11th of August	Raul Turcu	Peter Farrell	Draft for planning

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1. Executive Summary

The development will consist of the demolition of all structures on the site and the construction of a mixed use residential development set out in 9 no. blocks, ranging in height from 1 to 18 storeys, above part basement/upper ground level, to accommodate 702 no. build to rent residential units, retail/café/restaurant units, cultural building, creche and residential tenant amenity.

The site will accommodate car parking spaces, bicycle parking, storage, services and plant areas. The residential buildings are arranged around a central open space (at ground level) and raised residential courtyards at upper ground level over part basement level. Ground floor level uses located onto Sheriff Street and into the central open space include a cultural building, retail/restaurant/cafe units, and tenant amenity space. Two vehicular access points are proposed along Sheriff Street, and the part basement car parking is split into two areas accordingly, accommodating bicycle parking spaces, car parking spaces, plant, storage areas and other associated facilities. The main pedestrian access is located centrally along Sheriff Street with additional access points from East Rd and from the eastern end of Sheriff Street. The application also includes for a pocket park on the corner of Sheriff Street Upper and East Rd to be provided as a temporary development prior to additional future development on this part of the site. A detailed development description is set out in the Statutory Notices.

This external lighting report is based upon the following requirements;

- Provide adequate illumination to contribute towards the safe use of the site by both vehicles and pedestrians.
- Enhance site security.
- Provide a visually interesting environment.
- Contain the lighting within the site to lighting levels which will not impact on the neighbouring surroundings.
- Safe access to fire assembly points.
- Minimise light pollution, sky glow and visual glare for pedestrians and surrounding areas.

The external lighting is designed using the lighting simulation software DIALux and is in accordance with the following:

- CIBSE Lighting Guide LG – 6
- IS EN 12464-2
- CIE Guide regarding Illumination levels and "Obtrusive Light" to neighbouring properties
- HSA Regulations for Electricity
- ETCI National Rules for Electrical Installations I.S. 10101

2. Design Criteria

The design criteria is based upon the following:

Area	Lighting Levels (Lux)
Car Park	20
Walkways	5
Public Roadways	20
Stairs	100
Courtyard	20
Overspill Areas	5

3. Proposed Site Lighting Installation

The proposed site lighting installation comprises of 4.6 metre high post top column lighting to main access route and 1000mm bollard lighting to pedestrian walkways.

The proposed 4.6meter column with post top luminaires will illuminate the areas described above to achieve an average illumination level of 20 lux. The photometric curve enclosed within Appendix 1 figure 1 for the proposed LED luminaire to the area, indicates how the light output is directed downwards with no risk of "sky glow".

It is proposed to provide 4.5meter square column with fitting installed within to the open space area. This allows us to achieve a better uniform light distribution while make sure all the important features of the development are highlighted.

It is proposed to provide 1000mm bollard type light fittings to pedestrian walkways to achieve an average illumination level of 20 lux at ground level.

It is proposed to provide wall mounted LED luminaires to the entrances at ground level.

It is proposed to provide step recessed and handrail luminaires for the stairs to achieve the 100 lux requirement to comply with Part M requirements.

Additional inground recessed fittings were proposed to give a more welcoming aspect to the open space walkways and to light up the trees.

4. Bat Considerations

4.1. Lighting Considerations

A major consideration in the design and development of the facility design of lighting to ensure there is no impacts on the local bat population which has been identified. There are certain key requirements that have to be addressed in the overall lighting design to ensure the scheme is sympathetic to its environment. It is accepted that bats will generally tend to keep away from illuminated areas so lighting can impede their flight to natural feeding areas and this is the main consideration.

There are two type of bat sensitive areas that need to be considered when evaluating a site and determining the most appropriate lighting scheme.

1. Bat Roosts
2. Bat Foraging and Commuting Routes

Bat Conservation Ireland (www.batconservationireland.org) has produced a set of guidance notes for consideration in the design of bat sensitive lighting schemes. The main items to consider for both types of bat habitat are listed below

Bat Roosts	**Foraging & Commuting**
No direct illumination at exist points	Avoid lighting along river, lakes and canals
Position lights to avoid sensitive areas	Avoid lighting along important commuting routes
Use low pressure or high-pressure sodium lights	Avoid the use of mercury or metal halide lamps
Avoid the use of mercury or metal halide lamps	Minimise light spills using shields masking and louvres
Restrict lights and the timing of such to avoid bat activity	Keep lighting columns as low as possible
Restrict lighting to ensure there are dark areas	Restrict lighting to ensure there are dark areas

Whilst the guidelines are particular to bats sensitive areas the principles are compatible with good lighting design which the overriding design principle should be to ensure adequate illumination is provided only where it is required with no overspill.

4.2. Design Principle

The current site proposal identifies a defined bat commuting route which is the key area of interest. To address the concerns the following are the main elements of the proposed lighting scheme.

- Lighting will be restricted to the building perimeter, plant areas, roadways and car parking.
- Lighting controls will be provided to ensure loading
- All lighting columns will be a maximum of 5m high with sharp cut off luminaires. These will be positioned 1m from kerb edges to protect the lower column height from high vehicles.
- All pathways etc will be illuminated using bollards etc.
- LED technology will be utilised to ensure no UV component as recommended by Bat Conservation Ireland.

The design as proposed and shown on drawing CFR-ETH-ZZ-XX-DR-E-SS100 has been modelled to ensure the solution achieves the twin aims of having safe circulation routes external to the proposed facility but while not creating an issue for the bat population.

4.3. Construction Phase

Similar principles as outlined in the site scheme above will apply during the construction phase of the project.

The following is a summary of the key considerations to be taken into account during the construction phase.

- Lighting shall be controlled, and external lighting will be switched outside or working hours apart from necessary security lighting which will be sensor controlled
- No metal halide sources will be used
- All luminaires used will have shielded sources to ensure light is directed only where it is required.

All fittings installed adjacent to the bat commuting route will have baffle plates / shielding fitted to ensure that no light spill occurs.

5. External Site Light Overspill

Figures bellow indicates the illumination levels on the neighbouring properties from the proposed luminaires. From the analysis the maximum average illumination achieved is 5 lux which is within the design guidelines, CIE Guide regarding Illumination levels and "Obtrusive Light" to neighbouring properties.

From the figures below we can see that the light overspill is present mostly at the locations where the fittings are mounted close to the building. This indicates a higher light spill surrounding the fitting as the light is directed downwards, from our calculations we found that the average overspill on each of the buildings is below the 5 lux requirement.

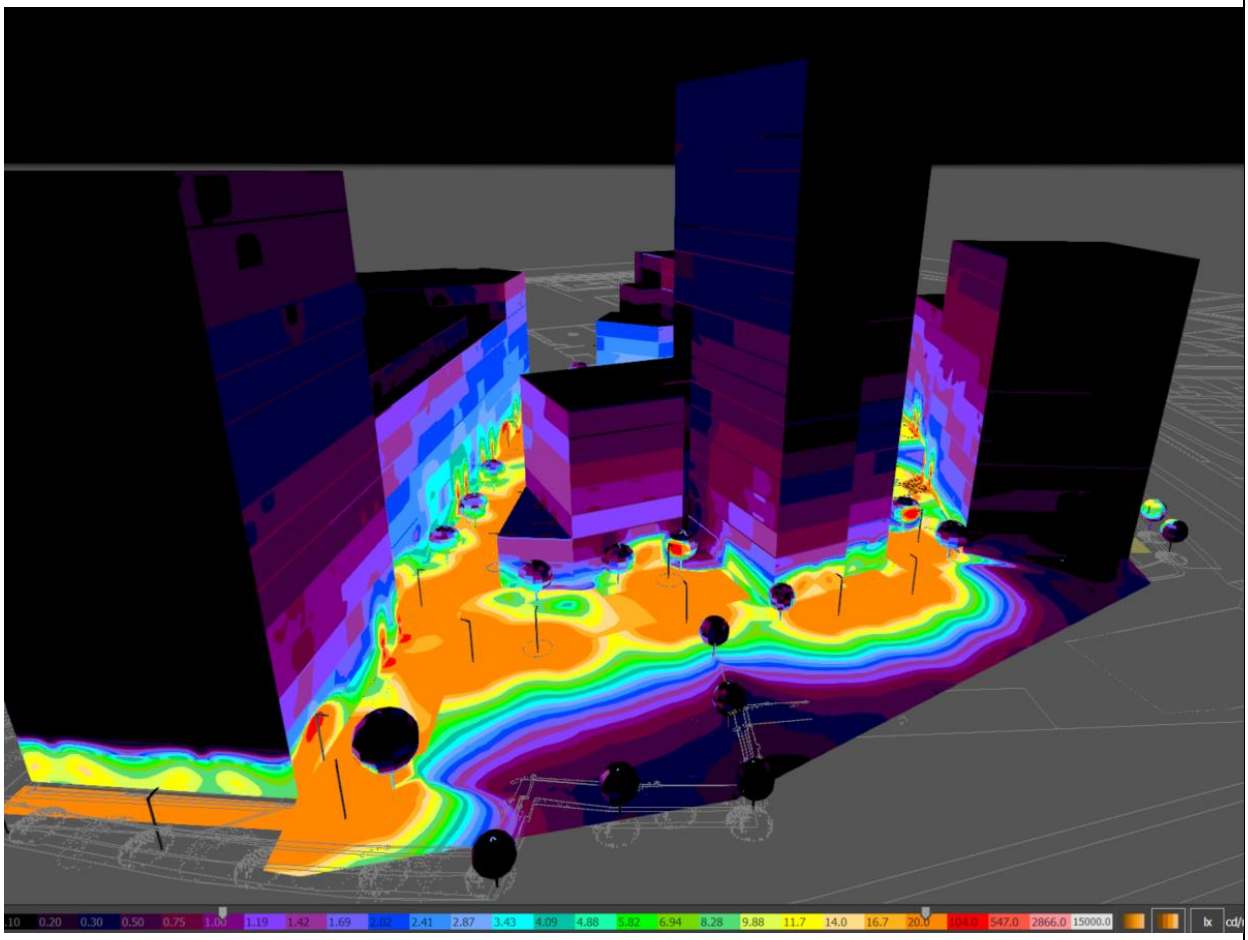


Figure 1 – North View of Site

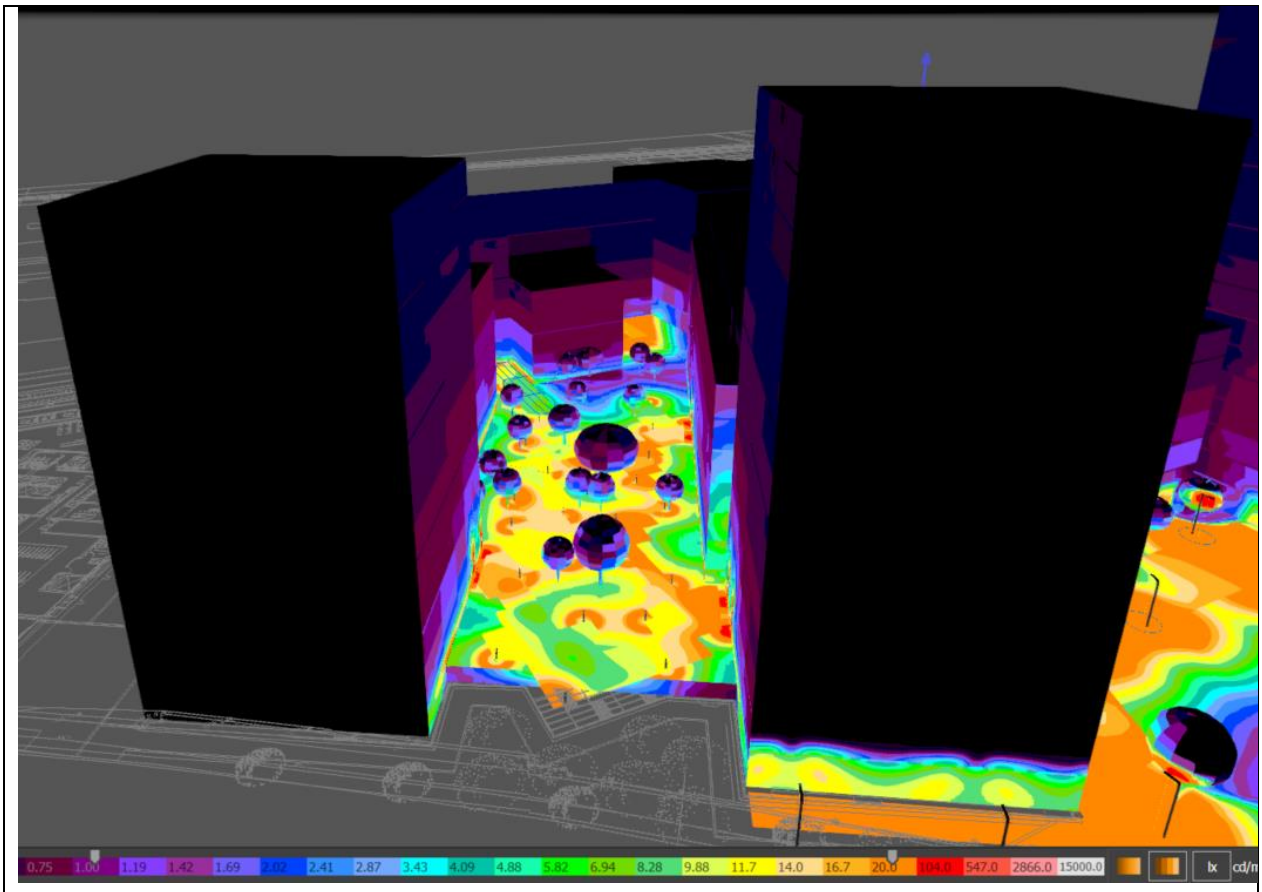


Figure 2 - North View of Site

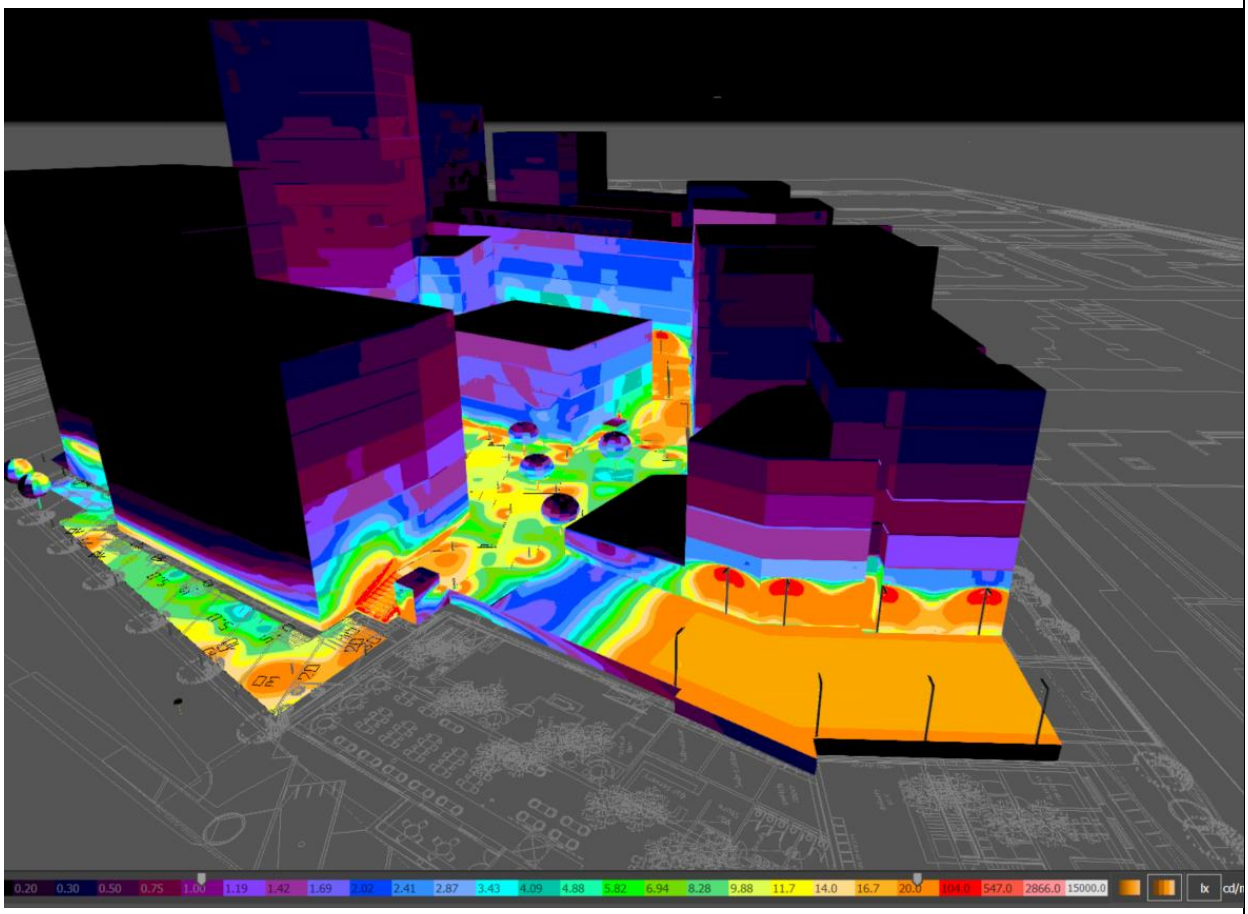


Figure 3 – West View of Site

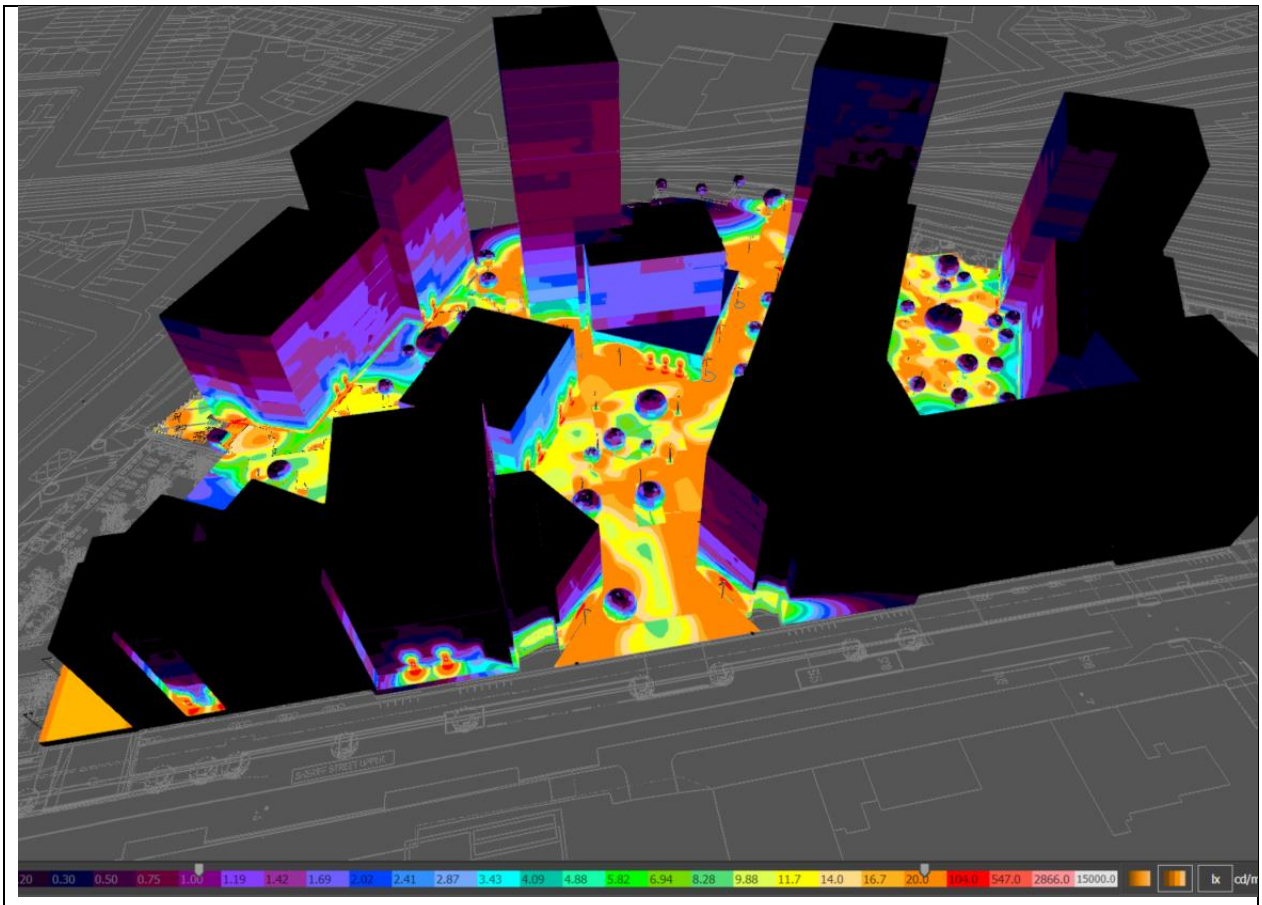


Figure 4 – South View of Site

Multiple Site Views – Highlighting Overspill and Light Levels on the Ground Level

APPENDIX 1: External Luminaire Schedule

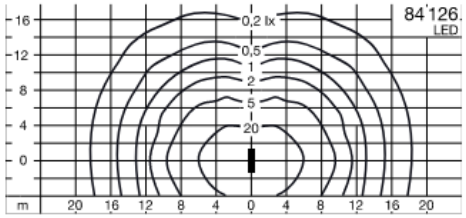
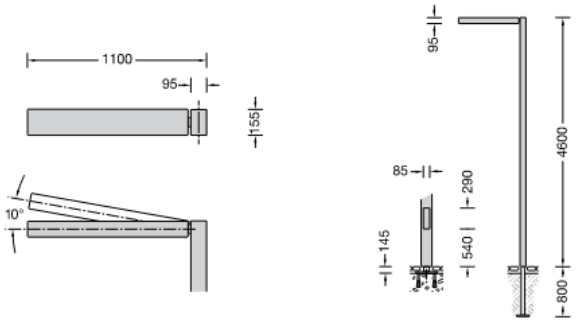
	Image	**Photometric Curve**	**Description**
Type A			4.6meter Wall/Pole mounted fittings installed along fire tender route/courtyard The indicative luminaire selected would be provided with 43.1 Watt LED lamp module, with a lamp output of 4,919 lumens. The photometric curve displayed indicates how all light output is directed downwards; i.e. no risk of sky glow
	Dimensions of Luminaire		
			

Fig 1 – Proposed 8 Meters Column for Roadways

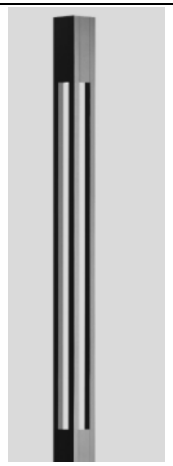
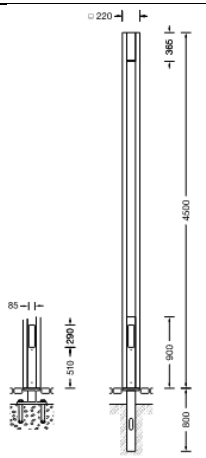
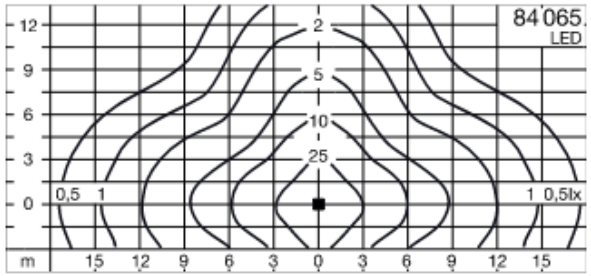
	Image	**Photometric Curve**	**Description**
Type A1			4.5 meter fittings installed along fire tender route/courtyard The indicative luminaire selected would be provided with 43.5 Watt LED lamp module, with a lamp output of 2,640 lumens. The photometric curve displayed indicates how all light output is directed downwards; i.e. no risk of sky glow
	Dimensions of Luminaire		
			

Fig 2 – Proposed Column Luminaire

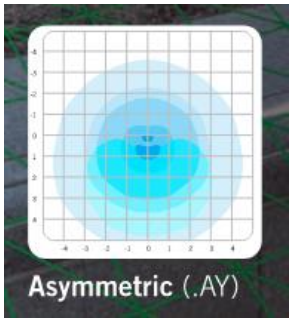
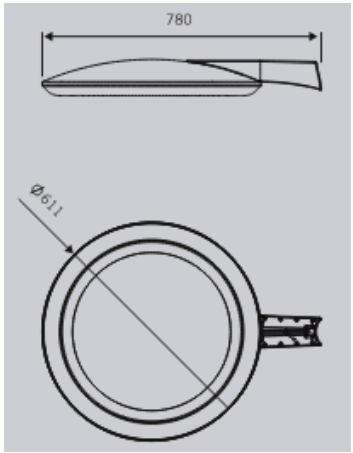
	Image	Photometric Curve	Description
Type A2			8 Meter column light fittings to be used along the roadway. Light fitting to be approved by Dublin City Council The indicative luminaire selected would be provided with 23W – 95W LED lamp module, with a lamp output of 3,000 – 14,000 lumens. The photometric curve displayed indicates how all light output is directed downwards; i.e. no risk of sky glow
	Dimensions of Luminaire		
			

Fig 3 – Proposed 8 Meters Column for Roadways

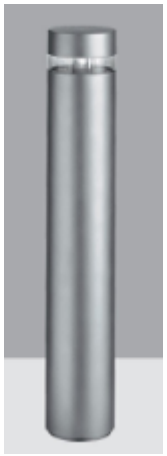
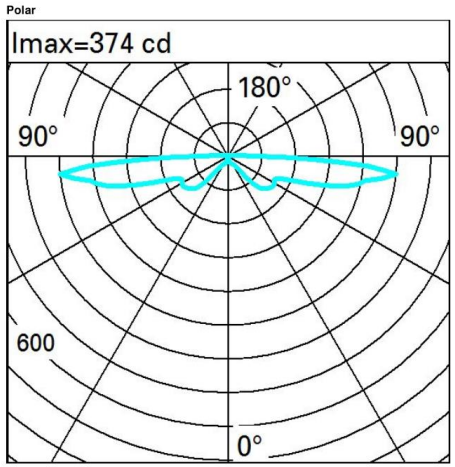
	Image	Photometric Curve	Description
Type B			Bollard light fittings to be used in the access walkways. The indicative luminaire selected would be provided with 21 Watt LED lamp module, with a lamp output of 2,010 lumens. 1000mm high bollard light fittings installed in the amenity areas of the site to light up the walkways.
	Dimensions of Luminaire		
			

Fig 4 – Proposed Bollard Luminaire

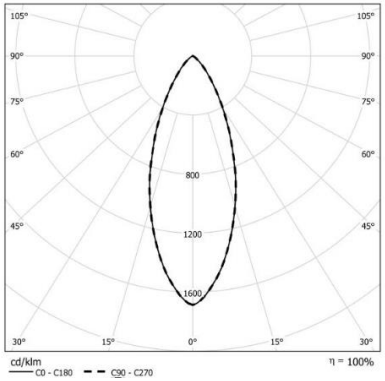
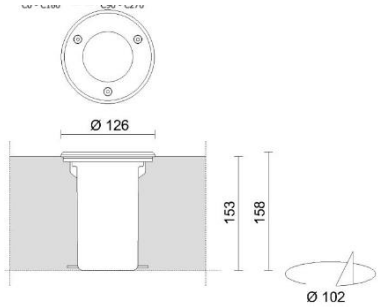
	Image	Photometric Curve	Description
Type C			Uplighter luminaire installed into the planters to upplight the trees/landscape present in the planter. The indicative luminaire selected would be provided with 4 Watt LED lamp module, with a lamp output of 330 lumens.
	Dimensions of Luminaire		
			

Fig 5 – Proposed Uplighter Luminaire

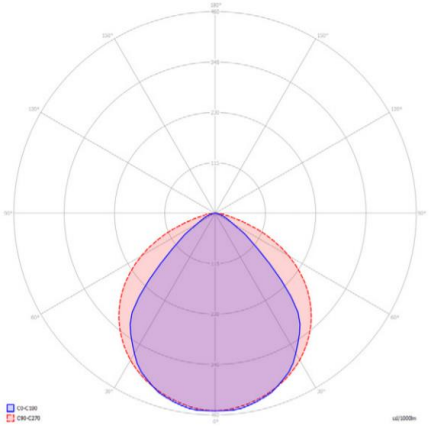
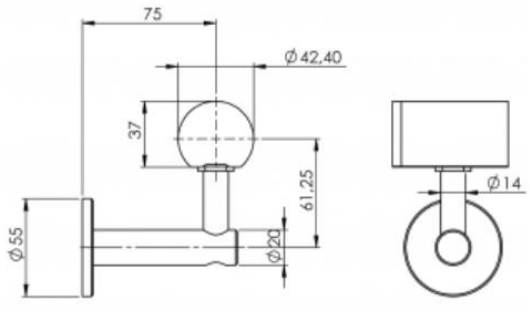
	Image		**Description**
Type D			Recessed handrail fittings installed in the handrails The indicative luminaire selected would be provided with 9.4 Watt LED lamp module, with a lamp output of 594 lumens/m.
	Dimensions of Luminaire		
			

Fig 7 – Proposed Handrail Luminaire

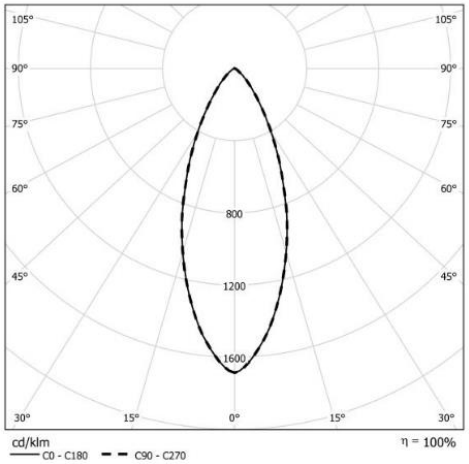
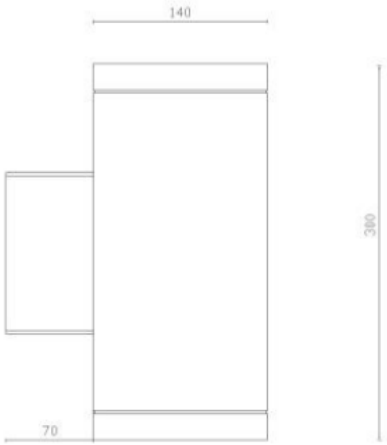
	Image		**Description**
Type F			Wall mounted fitting to be used at the entrance of in the apartment block/retail. The indicative luminaire selected would be provided with 10 Watt LED lamp module, with a lamp output of 850 lumens.
	Dimensions of Luminaire		
			

Fig 8 – Proposed Wall Mounted Luminaire at Entrances

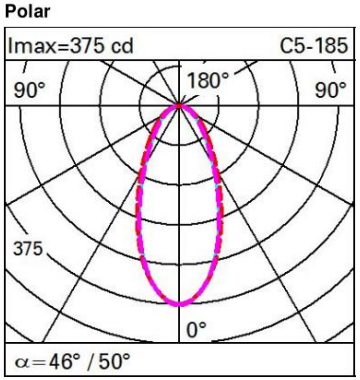
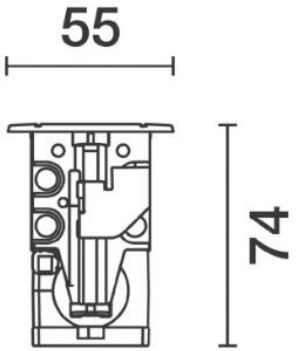
	Image		Description
Type G			Uplighter luminaire installed into the roadway for a glow effect.
	Dimensions of Luminaire		
			

Fig 9 – Proposed Uplighter Luminaire

	Image		**Description**
Type H			Recessed fittings installed in the sitting arrangements/planters The indicative luminaire selected would be provided with 15 Watt LED lamp module, with a lamp output of 420 lumens.
	Dimensions of Luminaire		
	Up to 10 meters per line		

Fig 10 – Proposed Luminaire Recessed into Planters/Seating

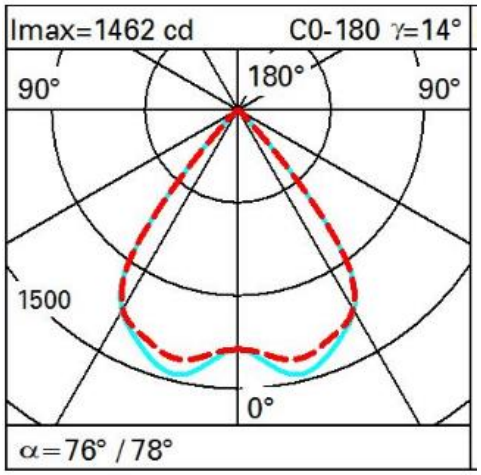
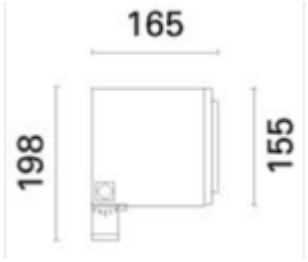
	Image		Description
Type I			Wall mounted fitting to be used at the entrance of the platform lifts. The indicative luminaire selected would be provided with 17 Watt LED lamp module, with a lamp output of 1,875 lumens.
	Dimensions of Luminaire		
			

Fig 11 – Proposed Wall Mounted Luminaire at External Platform Lifts

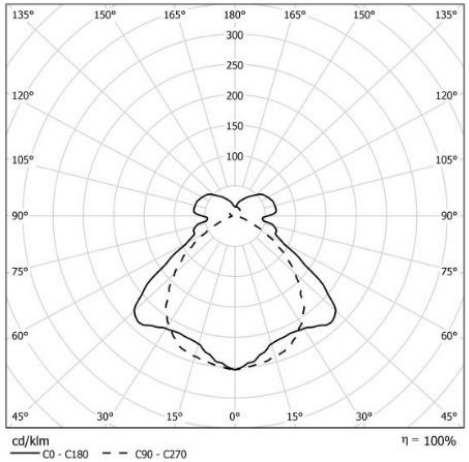
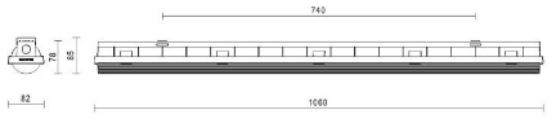
	Image		Description
Type J			Ceiling recessed fitting to be used in the canopy at the car park entrance. The indicative luminaire selected would be provided with 38 Watt LED lamp module, with a lamp output of 3,823 lumens.
	Dimensions of Luminaire		
			

Fig 12 – Proposed Surface Mounted Car Park Ramp Luminaire

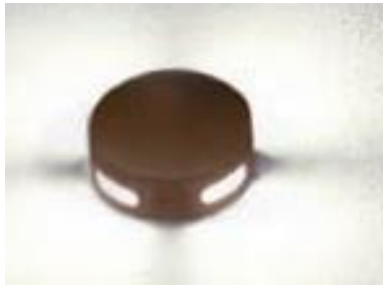
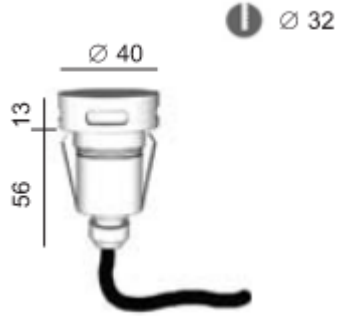
	Image		**Description**
Type L			Floor mounted fittings installed in the courtyard The indicative luminaire selected would be provided with 3.2 Watt LED lamp module, with a lamp output of 331 lumens.
	Dimensions of Luminaire		
			

Fig 13 – Proposed Floor Mounted Luminaire

APPENDIX 2: Site Lighting Drawing (A1)

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ISO 14001:2004 EQA ENVIRONMENTAL APPROVED SYSTEM

OHSAS 18001:2007 EQA OCCUPATIONAL, HEALTH & SAFETY APPROVED SYSTEM