

Client: PARSIS LTD

Project: SANTA SABINA, SUTTON, DUBLIN 13

Title: SITE LIGHTING REPORT

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1 INTRODUCTION

We, Parsis Ltd, intend to apply to An Bord Pleanála for permission for a strategic housing development at this site that formerly formed part of Santa Sabina Dominican College and Convent Complex, Greenfield Road, Sutton, Dublin 13. St. Dominic's Convent Santa Sabina, located to the east of the application site, is a protected structure (RPS No. 0794).

The development comprises alterations to the development permitted under Reg. Ref.: R17A/0615 (currently under construction) and comprise of the following:

- Provision of 2 additional storeys to Block A-B1 and alterations/redesign to the 3 permitted storeys below to provide a five storey building containing 42 no. apartments (consisting of 9 no. 1 beds, 29 no. 2 beds and 4 no. 3 beds), and including associated alterations to the courtyard communal amenity space.
- Provision of 2 additional storeys to Block C1 and alterations to the 3 permitted floors below to provide a five storey building containing 28 no. apartments (consisting of 28 no. 2 beds).
- Replacement of Block D, comprising 10 no. two and three storey semi-detached houses, with 3 no. three storey apartment buildings (Block D1, D2 and D3) containing 32 no. apartments (consisting of 6 no. 1 beds, 21 no. 2 beds and 5 no. 3 beds).
- The alterations to Block A-B1 and C1 include associated alterations to the basement under these blocks, primarily relating to the omission of core and associated alterations to plant, waste storage, car and cycle parking provision.
- The proposed alterations include the provision of balconies / terraces to external elevations of Block A-B1, C1, D1, D2 and D3
- An ESB substation and Switchroom building and bin collection point are proposed in place of three permitted car parking spaces adjoining the western boundary of the site
- The Proposal includes alterations to the permitted car and cycle parking at basement and ground level, resulting in the provision of a total of 168 no. car parking and 270 no. bicycle spaces.
- The proposed development includes associated ancillary site development works.



Figure 1- Site Location Map

The surrounding area consists of residential dwellings, school & church with local amenities. The lighting has been designed to provide a safe environment for pedestrians, cyclists and moving vehicles. The lighting design also takes into consideration the environmental impact of artificial lighting on existing flora and fauna in the area and is adequately placed to deter anti-social behaviour.

2 DESIGN CONSIDERATIONS

2.1 Road Usage

When designing the proposed lighting scheme for the development the following traffic classifications have been considered;

- Vehicular Traffic
- Pedestrian Traffic
- Cyclist Traffic
- Car parking

2.2 Existing Bat Population

The lighting scheme should adhere to the following lighting design characteristics:

- The minimum level of appropriate/required lighting level will be provided within the developed/residential areas;

- Light standards will be fitted with low intensity, horizontal cut-off LED light fittings employing a narrow directional light or cowled light. This will avoid the effect of light spill arising;
- No light spill into biodiversity areas;
- The lighting includes dimming by 30% post curfew hours;
- Light standards and associated lighting will be directed away from areas of open space;
- No floodlighting will be used in the development;

Useful to refer to the following:

- Bats and Lighting – Guidance Notes for Planners, Engineers, Architects and Developers (Bat Conservation Ireland, 2010);
- Bats and Lighting in the UK – Bats and the Built Environment Series (Institute of Lighting Professionals, September 2018).

2.3 Landscape Trees

Co-ordination with the landscape designer is necessary to ensure the following:

- Luminaire and tree positions do not overlay.
- Luminaires should be located outside the branch width of the trees to avoid damage to the light fitting from falling branches and to avoid the need to regularly trim them back.
- Avoid obstructions to lighting by reducing the height of lighting columns

3 SITE LIGHTING

3.1 Introduction

The lighting design is based on current Fingal County Council, CIBSE lighting guide 6 2016, British Standards BS 5489 and EN 13201 1&2 2013. Based on the guidelines set out in these documents the parameters applicable to the site are set out in Table 1 below:

Table 1

Location	Lighting Class	Maintained (Eave) Lux Level	Maintained (Emin) Lux Level
Site Entrance/T-Junction	Conflict Area *	20 Lux	8 Lux
Along main road	P1	15 Lux	3 Lux
Main Roads-Traffic areas for slow moving vehicles	P2	10 Lux	2 Lux
Along roadways and footpaths	P3	7.5 Lux	1.5 Lux
Subsidiary Roads-Traffic areas for slow moving vehicles	P4	5 Lux	1 Lux
Pedestrian & Cyclist areas	P5	3 lux	0.6 lux

3.2 Lighting Class

As the main entrance to the development is considered a conflict area, it will be illuminated to 20 lux and achieve a uniformity of 0.4U_o.

**Conflict areas are typically junctions, intersections, roundabouts and pedestrian crossings, where significant streams of motorized traffic intersect with each other or with other road users such as pedestrians and cyclists. At conflict areas, the visual task is generally more difficult than on straight roads, and a higher luminance or illuminance class may be selected at the conflict area. Ref BS 5489-1:2003 +A2:2008 Code of practice for the design of road lighting — Part 1: Lighting of roads and public amenity areas*

Along the main road into the development lighting class P2 is selected, achieving a maintained average illuminance of 10lux and minimum illuminance of 2lux.

Along the subsidiary roads within the development lighting class P4 is selected, achieving a maintained average illuminance of 5lux and minimum illuminance of 1lux.

Along the pedestrian and cycle routes within the development, a lighting class P5 is selected, achieving a maintained average illuminance of 3lux and minimum illuminance of 0.6lux.

3.3 Luminaire Selection

The proposed lighting scheme within the development consists of 6m pole mounted fittings as indicated on the drawings. The luminaire selected for site lighting is the Thorn CiviTeq fitting for the following reasons:

- Provides low level lighting;
- Minimises upward light spill;
- Use of low voltage LED lamps;

- Pre-approved by Fingal County Council.



Type 1. THORN CIVIL TEQ – X2, X3



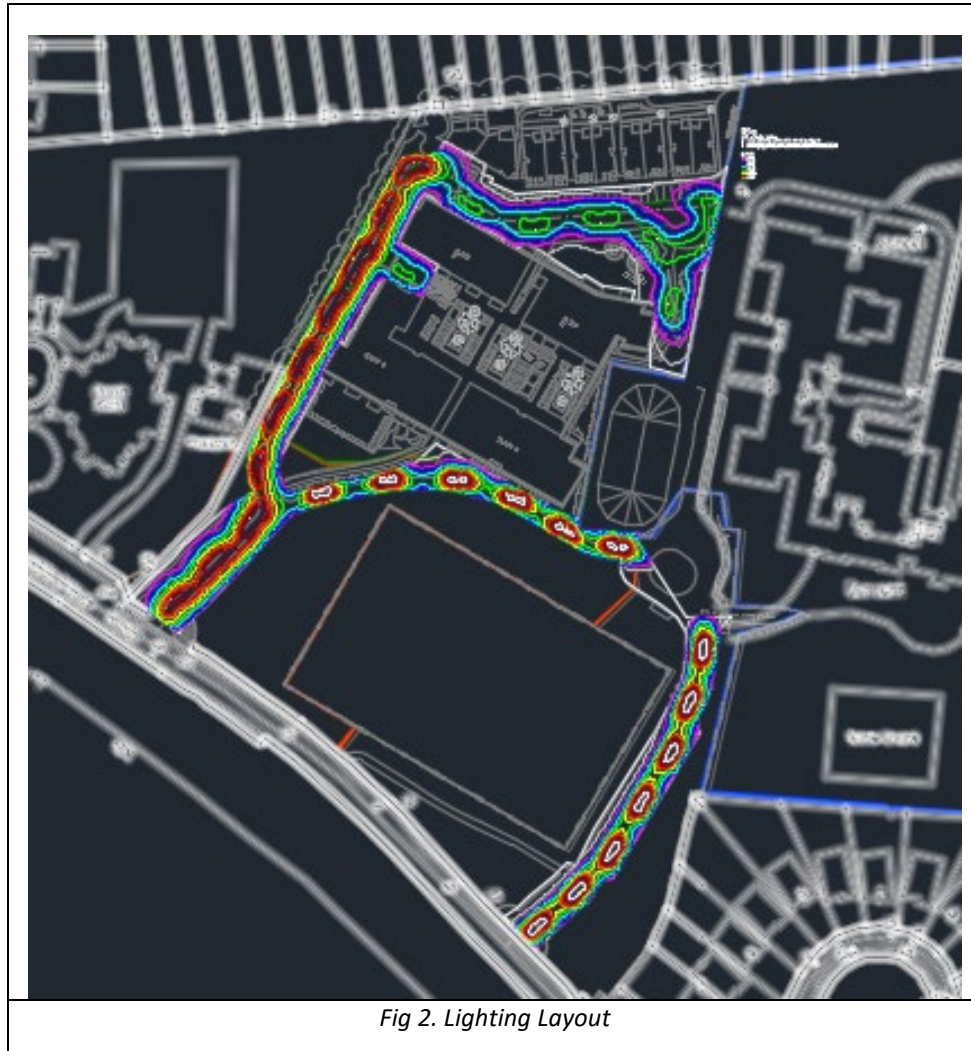
Type 2. THORN FLOW – X1

The output or wattage of the fitting varies depending on the area in which it is being installed. Some areas require a higher output fitting to achieve the required lux level as outlined in Table 1:

- Main road consists of 1x38w LED CIVIL TEQ
- Subsidiary road consists of a combination of 1x28w and 1x20w LED CiviTeq

4 LIGHTING LAYOUT

Fig. 2 indicates the proposed lighting layout (refer to dwg P030-PMEP-00-00-DR-E-01 & P030-PMEP-00-00-DR-E-02).



4.1 Lighting simulation results

The lighting class for the development is determined using the Code of practice for the design of road lighting - Part 1: Lighting of roads and public amenity areas - *Table 3 BS5489-1-2013*.

- Class P1 along main road, achieving a maintained average illuminance of 15 lux and minimum illuminance of 3 lux.
- Class P3 along roadways and footpaths, achieving a maintained average illuminance of 7.5 lux and minimum illuminance of 1.5 lux.
- Class P4 along pedestrian walkways and cycle paths, achieving a maintained average illuminance of 5 lux and minimum illuminance of 1.0 lux.

5 ADDITIONAL DESIGN CONSIDERATION

To ensure the development is not over lit and to reduce light pollution each development is categorised into an environmental zone (ref; Table 2.1 CIBSE Lighting Guide 6 The exterior environment & ILE Guidance notes for the reduction of light pollution). This site location would be considered a class E3 medium brightness district.

5.1 Lighting Control

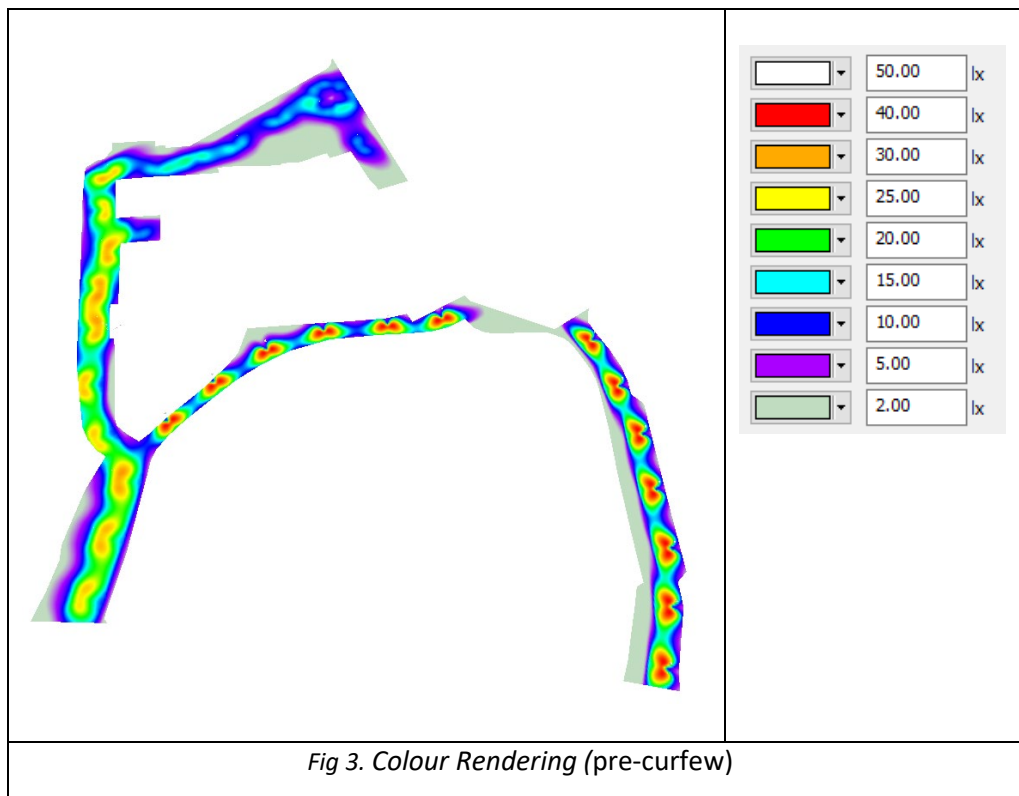
Each light fitting will be controlled via an individual Photoelectric Control Unit (PECU). The operation of the lighting will be on a dusk-dawn profile, 35 lux on/18 lux off.

Additional to this, all lighting will be dimmed by 30% post curfew, this will limit the amount of upward sky glow at night. For this development post curfew is considered to be 11pm (Curfew – The time after which stricter requirements will apply – if not otherwise given, 23:00hrs is suggested ILP GN01:2011).

All lamps selected have a DALI ballast and, as a result are dimmable. Dimming of the lamp is controlled via an astronomical clock which is built into the circuit board of the luminaire. This clock is standard in all external light fittings and it determines when the lamp should be switched on/off based on time and date.

Preferred light output settings can be pre-programmed within the clock. It is proposed to pre-programme the fittings to ensure all lights are dimmed post curfew between 11pm-6am.

Fig 3 below illustrates the maintained lux level pre-curfew:



Pre-curfew lux level results are within the parameters set out in table 1 above.

Post curfew lux level results are within the parameters set out in table 2 below;

Table 2

Location	Maintained (E_{ave}) Lux Level	Maintained (E_{min}) Lux Level
Site Entrance/T-Junction	10 Lux	2 Lux
Main Road-Traffic areas for slow moving vehicles	7.5 Lux	1.5 Lux
Subsidiary Roads-Traffic areas for slow moving vehicles	3 Lux	0.6 Lux
Pedestrian & Cyclist areas	2 Lux	0.4 Lux

6 CONCLUSION

The proposed lighting installation for the Santa Sabina Residential Development achieves the following;

- Luminaire selection limits upward light spill.
- Dimming lights by 30% post-curfew will reduce running and maintenance cost.
- As bat feeding periods are from dusk to dawn, dimming lights by 30% post-curfew will reduce the impact of artificial lighting on the existing fauna and flora in the area.
- The lighting scheme achieves the recommended lux levels in accordance with current regulations and standards.
- The lighting scheme achieves good uniformity throughout the development to ensure good visibility at night.
- The inclusion of baffles/shields to luminaires on completion of site lighting installation to address light spillage into residential areas to be addressed on build completion.
- Co-ordination with the landscape developers will ensure light positions do not clash with tree positions, limiting light obstruction and future maintenance costs.

7 REFERENCE INFORMATION

Codes and Standards;

Calculations performed and results produced in this document are in accordance with the following relevant codes and standards:

- *Fingal County Council Public Lighting Guidance Document*
- *BS 5489 – 1 2013- Code of practice for the design of road lighting Part 1: Lighting of roads and public amenity areas*
- *PD CEN TR 13201 – 1 2004*
- *EN 13201 – 2 2003 – Road Lighting Part 2: Performance Requirements*
- *CIBSE Lighting Guide 6 2016 – Outdoor Environment*