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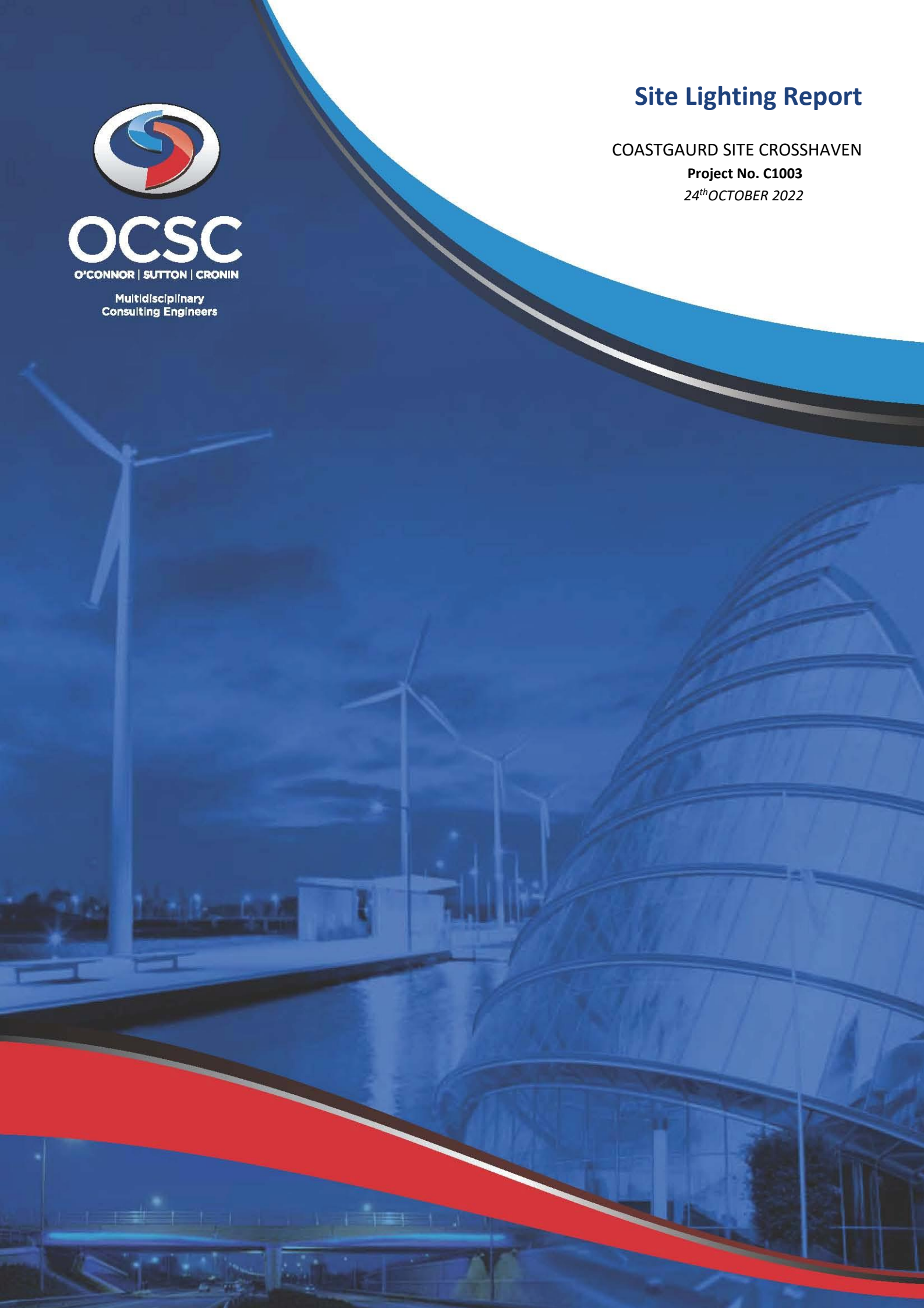
Multidisciplinary
Consulting Engineers

Site Lighting Report

COASTGAURD SITE CROSSHAVEN

Project No. C1003

24th OCTOBER 2022



Site Lighting Report



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DOCUMENT CONTROL & HISTORY

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24th OCTOBER 2022

SITE LIGHTING REPORT

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EXECUTIVE SUMMARY

We have been appointed as the Consultants to design the lighting coastguard site Crosshaven, co. Cork.

The report considers the lighting design as developed by O'Connor Sutton Cronin (OCSC). The report has been developed with the following principal considerations:

- a) Lighting design criteria as set out in the CIBSE Lighting guide about obtrusive light.
- b) Lux levels in the landscape around the site properties.
- c) Provide a visually interesting environment
- d) Enhance Security
- e) Minimize light pollution and visual glare to residential neighbours, pedestrians, and neighbouring areas.
- f) Provide adequate illumination to contribute towards the safe use of all walkways and footpaths by pedestrians within the residential development.
- g) Take account of ecological factors such as local bat populations.

The complete external lighting installation will be designed in accordance with the regulations for electrical services as ETCI National Rules for Electrical Installations ET101:2020 as well as BS5489-1:2013 Code of practice for the design of road lighting, IS EN 13201:2003 & Cork County Council: Public Lighting Installations in Residential and Industrial Areas: Guidance Document – January 2022.

The predicted performance of the external lighting installations has been assessed in detail using Lighting Simulation software. The Lighting Simulation software used was Lighting Reality.

1. INTRODUCTION

The development will consist of 24 new residential units across 3 blocks of up to 3 stories in height and all associated site works. An additional 7 existing terrace houses at the north boundary of the site are to be redeveloped as part of the works. The subject site is approximately 0.9 hectares in area and is located on the east side of the town of Crosshaven, approximately 800m from the town centre. The site is bounded by Lower Road to the north and private property to the south, east and west. Existing site levels vary from approximately +23.00m OD on the south boundary to + 3.00m OD to the north.

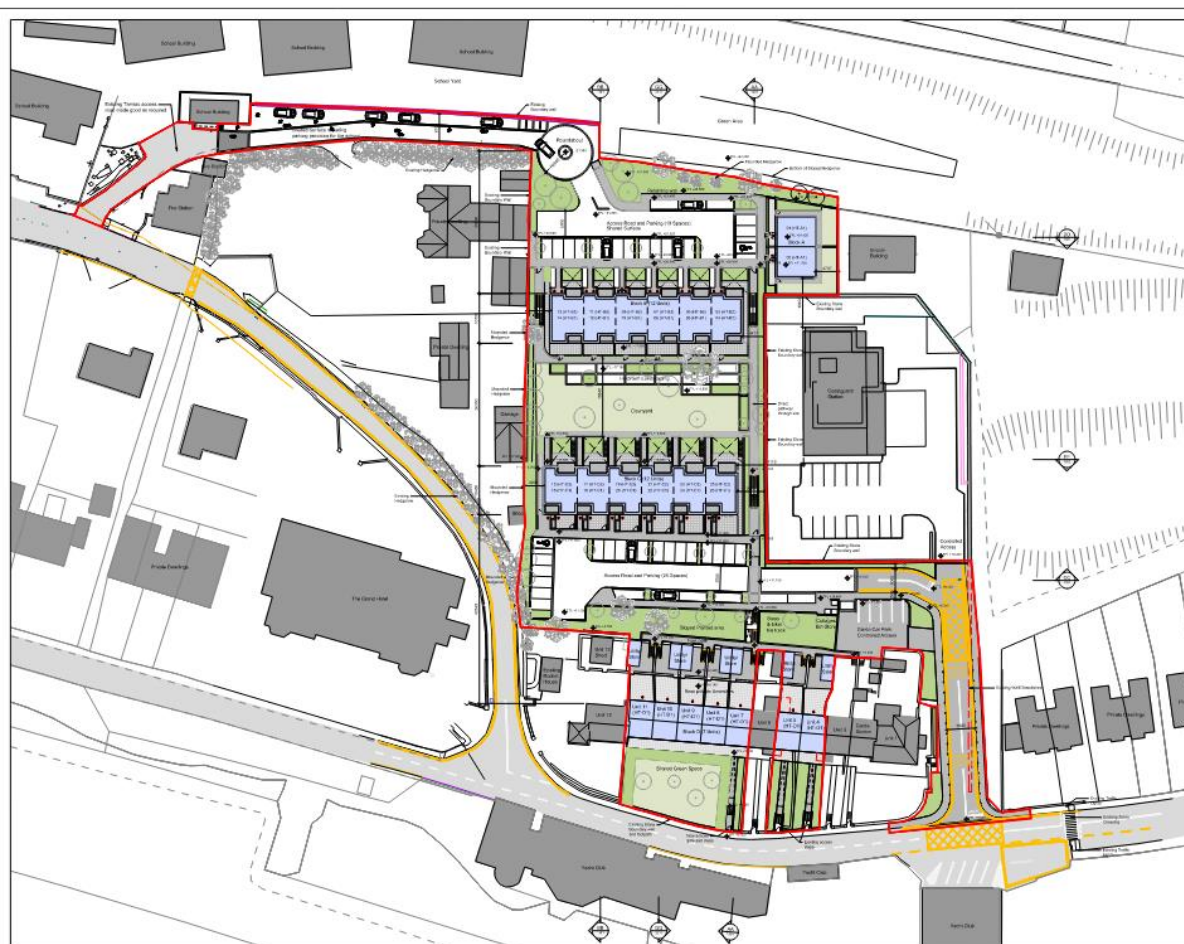


Figure 1: Proposed Site Plan

Figure 1.1 –Proposed Site Plan
(Source: Architects Department Housing Directorate Cork
County Council (S_2020_02-1200))

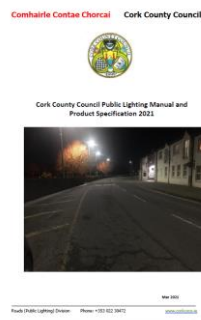
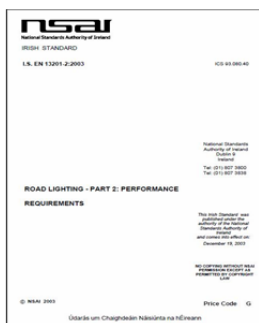
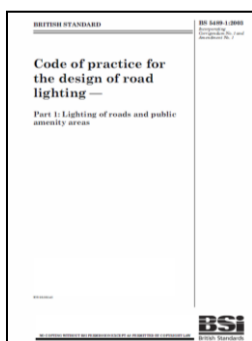
2. LIGHTING DESIGN CRITERIA

The landscape lighting installation is designed in accordance with CIBSE Lighting Design Guide. Special consideration was given regarding Obtrusive light and to overspill (intrusive light and light into windows) as set out in table 3 of the CIBSE lighting guide.

Recommended limits – Table 3

Environmental Zone	Skyglow ULR inst (Max %)	Light trespass (into windows) Max LUX	Source intensity / (kcd) max
E1 Dark Landscapes	0	2	2.5
E2 Rural, Village, Dark Urban Locations	2.5	5	7.5
E3 Urban locations, small town centres	5	10	10
E4 Town and city centres	15	25	25

The design criteria applied to the proposed external lighting installations shall be in accordance with BS 5489-1:2013¹, NSAI EN I.S. 13201-2 Road Lighting Performance Requirements², and Cork County Council: Public Lighting Installations in Residential and Industrial Areas: Guidance Document – January 2022³. The guidelines in “Bats & Lighting, Guidance Notes for Planners, engineers, architects and developers”⁴, issued by Bat Conservation Ireland were also taken into account in the design of lighting.



¹ British Standards Institution 5489-1:2013

² IS EN 13201:2015-2

³ Cork County Council Public lighting Manual and Product Specification 2021.

⁴ The guidelines in “Bats & Lighting, Guidance Notes for Planners, engineers, architects and developers”, issued by Bat Conservation Ireland

3. GUIDELINES TO STREET LIGHTING DESIGN

The points below were used as guidelines in the design of the external lighting. The different lighting classifications used for the proposed development can be seen below.

3.1 Proposed Development

1. Light spillage from doorways and windows should be kept to a minimum.
2. Cork County Council public lighting guidance document states that, pedestrian areas where there are no parked vehicles are to be designed to conform to required lux levels of P4 lighting classes: 5 lux and for residential roadways and carpark to required lux levels of P3 lighting classes: 7.5 lux.
3. No white light or other lighting with a UV component will be permitted in the throughout the development to reduce the impact on Bat habitat;
 - Lighting with little or no UV will be utilised.
 - Lighting with a narrow spectrum will be permitted to reduce impact.
 - It is recommended that the actual overall uniformity of illuminance (U_o) be as high as reasonably practicable.
 - Warm light (3000K) has been utilised in this design in the areas considered as Bat path and other wildlife rooster area.
 - LED lighting with a broad spectrum will not be used.
4. Minimum lux level to be used or as required by Health & Safety especially along the perimeters.
5. An Amber LED has been shown to have a reduced impact on Bats due to its narrow spectrum properties.
6. Lighting Classification
 - P3 – Roadways and Carpark
 - P4 – Pathways 6m columns
7. The lighting will be directional on to the development roads only with no significant spillage of light to adjoining habitats. To reduce light spillage from luminaires, lights that are designed not to emit light at angles greater than 70deg from the vertical plane will be used.
 - Consequently, a flat glass protector is often used to reduce light spillage. Other methods to control light spillage are:
 - a. Cowls/Shields: these can be mounted on lamps to control direction of the light.

b.Masking: part of the luminaires is painted to block light to control the direction of the light.

c.Louvres: either as internal or external slates organized in rows or at angles depending on the direction of light control.

4. PROPOSED INSTALLATIONS

The proposed development's pedestrian access routes, roadway and carpark will require illumination and shall for the purpose of this report comprise of lighting installations to Crosshaven as identified on the drawing 'C1003-OCSC-XX-XX-DR-E-0002-S4-P01' which illustrates the design intent.

The lighting design proposed is to use high efficiency LED luminaires. A lighting design for the proposed development incorporates 6-metre-high lamppost with outreach to provide directional light output direct to the roadways, carparking area and Pedestrian pathways .

4.1 Selected Luminaires for Cross haven

It is proposed to provide 6m high column-type light fittings roadways and pedestrian pathways routes to achieve and 5lux average illumination levels respectively. This height of column was selected to comply public specifications. The luminaire will be installed with a DALI ballast for future use. Fully compliant with EN 60598: CE.



Figure 4.2.3
Luminaire Fitting

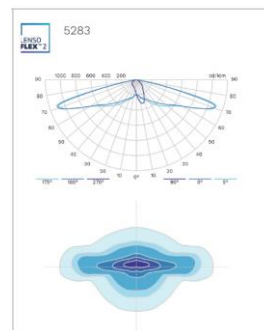


Figure 4. 2.4
Luminaire Photometric Curve

5. RESULTS

5.1 Lighting Calculation for Crosshaven Canal Extension

Figure 5.1.1 indicates the predicted illumination levels on ground for the proposed installations in the entire development respectively.

Results for the Crosshaven indicates indicate the following:

- The average 5 lux level maintained at all pedestrian pathways throughout the site according to P4 class.
- The average 7.5 lux level maintained at carpark and roadways throughout the site according to P3 class



Figure 5.1.1 –Illumination Levels (Lux) (Lighting Reality)

5.2 Effects on environmental factors

The results shown in Figure 5.1.1 is design intent only. Whilst keeping the light spill to a minimum the required lux levels throughout the site will be maintained. Reduced light spill is adhered to, while ensuring lux level requirements are maintained throughout. The final layout will also consider the following factors to reduce the negative impact of lighting on neighbourhood habitat:

- The minimisation of night-time lighting emitted during both the Construction and Operational Phases of the Proposed Development (once health and safety requirements are met).
- The avoidance of direct lighting of existing or proposed treelines and hedgerows at the Site, as well as areas of planting.
- LED luminaires will be used as they have low UV output, sharp cut-off, lower intensity, good colour rendition and dimming capability.
- Greenway lighting shall dim at night by way of motion sensor lighting. This shall keep lighting within the proposed wildlife corridor, culvert & river to an absolute minimum while these areas are unoccupied during the hours of darkness, thus maintaining the natural ecology of the site wherever possible.
- Lighting within the proposed wildlife corridor shall be triggered by interruption of a receptor fixed at a height of 1 metre. This shall prevent almost all bat activation, while maintaining activation for safe movement of pedestrians and cyclists.
- Glare shields can be utilized if required in order to minimise any unnecessary light spill onto bat routes along the stream and woodland areas.
- A lux level of 0 will be provided within 5m of the proposed site boundary to ensure that there is no spillage onto surrounding landscape.
- Metal halide lighting is not Bat friendly and it is not used in the design. LED fittings with no UV output were used throughout.

6. CONCLUSION

As shown in Figure 5.1.1 the illumination throughout the development meets the lighting design requirements; with an average of 7.5 lux and 5 lux for roadways and Carpark and pedestrian pathways respectively.

The illumination throughout the development roadways meets the lighting design requirements of P3 and P4 lighting classes. The proposed luminaires and lighting design ensures that there is no negative impact of lighting on neighbourhood habitat.

The details of the proposed lighting layout are shown on the accompanying drawing no. C1003-OCSC-XX-XX-DR-E-0002-S4-P01.

APPENDIX A

Reference

C1003-OCSC-XX-XX-DR-E-0002-S4-P01

Drawing Title

Proposed Site Lighting Layout



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