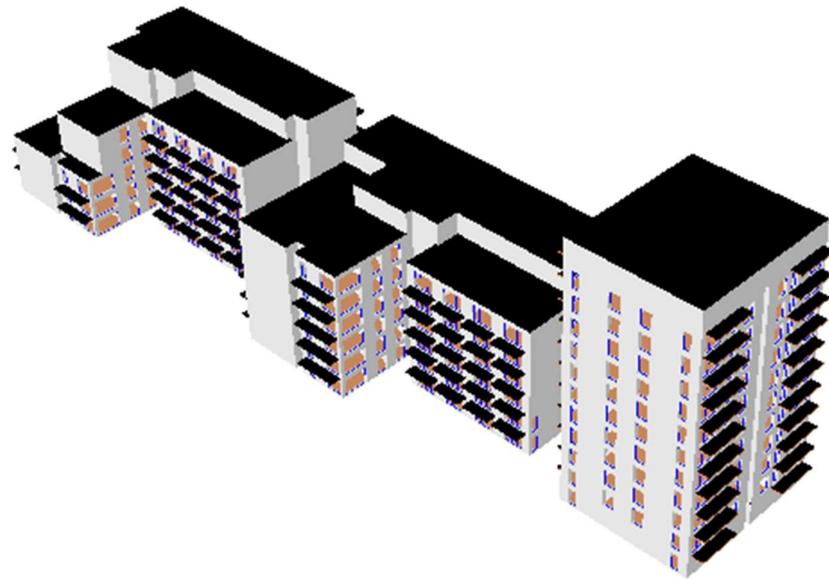


## Cross Guns Bridge Residential



o'mahony pike

## Site Lighting Report

IN2 Project. No. D2012  
25<sup>th</sup> January 2021  
Rev04

#### ISSUE REGISTER

Revision	Stage	Date	Issued By
Rev 02	Planning Issue	09 <sup>th</sup> June 2020	DS
Rev 03	Planning Issue	24 <sup>th</sup> November 2020	SG
Rev 04	Planning Issue	25 <sup>th</sup> January 2021	SG

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- 2.0 Executive Summary
- 3.0 Development Overview
- 4.0 Proposed Installation
- 5.0 Design Analysis and Calculation Results
- 6.0 Appendix A - Luminaire Schedule

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## 1.0 INTRODUCTION

IN2 Engineering Design Partnership have been retained by Bindford Limited to complete a Planning Stage Site Lighting Study for the proposed Cross Guns Bridge Residential, to demonstrate that the proposed site lighting design will both enhance the development and maintain safe levels of illumination to circulation areas while minimising light overspill on the neighbouring properties and mitigating the residual impacts that the proposed lighting scheme may have on existing habitats within the site.

## 2.0 EXECUTIVE SUMMARY

The following report contains the design layout and accompanying calculations for the proposed site lighting scheme for the new proposed development.

The external lighting for this development has been designed to achieve the performance requirements as set out in the following standards:

- BS 8300:2018 Design of an accessible and inclusive built environment
- Institution of Lighting Professionals - Guidance Notes for the Reduction of Obtrusive Light GN01:2011
- BS EN 13201-2:2015 - Road Lighting Part 2: Performance Requirements
- BS 5489-1:2013 Code of Practice for the Design of Road Lighting
- Chartered Institution of Building Services Engineers - Lighting Guide 6: The Exterior Environment
- ETCI National Rules for Electrical Installations ET 101
- 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).

For the purposes of this report, the development has been classed as an Environmental Zone E3 - Suburban with Medium District Brightness, in Accordance with ILP GN01:2011. The design criteria set out for this development, based on the lighting requirements for the stated environmental zone of E3, are as specified in the table below.

Area	Lighting Levels (Lux)	Uniformity ( $U_o$ )
Walkways/Footpaths	5	0.2
Access Routes	5	0.2
Pedestrian Access routes adjacent to the entrances / exits of buildings. Level and gently sloped.	100	0.4
Stairways and ramps in the open Environment	30	0.2
Light Spill (Obtrusive Light)	10 (Maximum)	N/A
Entrance Road (Main Traffic Routes)	10	0.2

Figure 2.1 - Minimum Lighting Requirements

### 3.0 DEVELOPMENT OVERVIEW

The proposed development is to be situated in Phibsborough Road bordered by the Royal Canal the site context as illustrated below in Figure 3.1.



*Figure 3.1 - Development Site*

The proposal is for a Strategic Housing Development for Build -To-Rent apartments and will comprise the demolition of all derelict buildings on site and the construction of a new residential development comprising 3 no. blocks ranging in height up to 12 storeys consisting of 205 no. dwellings and associated residential amenities, basement and surface carparking with vehicular and pedestrian access from the eastern end of the site off Phibsborough Road. Additional pedestrian only accesses to the north of the site off the Royal Canal Way. A new café/ retail area will be located at ground floor level of block C along with a new public open space to the east of the site. All associated site development works, landscaping and boundary treatment, children's play area, cycle parking, bin stores, substation, and services provision.

A full description is set out in the statutory notices.

## 4.0 PROPOSED INSTALLATION

The proposed site lighting for the Cross Guns Bridge Residential has been designed to ensure that the lighting criteria set out in each of the relevant standards listed previously are met or exceeded and that sufficient illumination is provided to ensure that key requirements such as access/egress, enhanced site security and the safe use of paths, amenity spaces, pedestrian crossings is provided. The design has been assessed to establish minimal environmental impact through glare, sky glow and obtrusive light (light spill).

It is proposed to illuminate the entrance for the basement carpark using 6m galvanised steel lighting columns with 'Type X3' post-top mounted LED luminaires as per the luminaire schedule in Appendix A of this report. The luminaires shall be complete with narrow beam optics to ensure minimal light spill to adjacent buildings and no upward light spill. Each luminaire shall have individual photocell switching to reduce the energy consumption of the proposed lighting scheme.

Lighting shall be provided on the pedestrian pathways and the landscaped space surrounding the development with 'Type X4' decorative column LEDs, 3 meters height. The luminaires on the 3-meter columns shall have a mechanical impact rating of IK10 to provide added protection against vandalism and shall be Extra-Low Voltage LED luminaires to ensure protection against electric shock in the event that damage may occur.

The floodlight 3-meter height Type 'X5' shall be provided around the stepped areas and ramps, it shall achieve the required lux levels. The fittings will also have IK06 protection and shall be Extra-Low Voltage LED.

## 5.0 DESIGN ANALYSIS AND CALCULATION RESULTS

### Road Access

The lighting performance in the access to the site road has been assessed with fitting Type 'X3' 6000mm (H) lighting columns as per luminaire schedule, Appendix A.

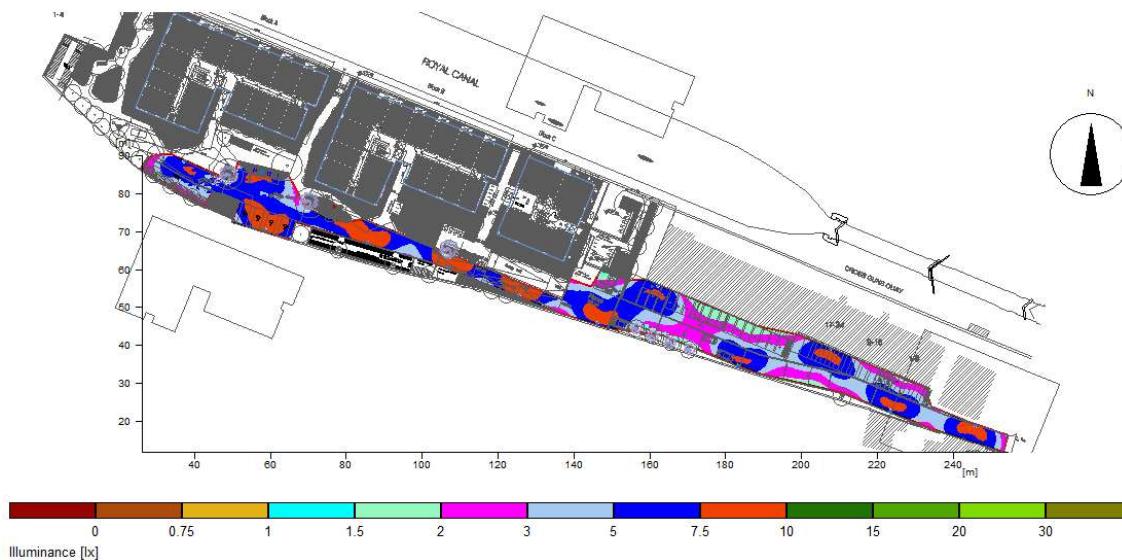


Figure 5.1.1 - Illumination Levels in Road Access

Evaluation	Target	Result	
$E_{AVERAGE}$ (maintained)	7.5 - 10 lux	9.8 lux	PASS
$E_{MIN}$	2 lux	2.1 lux	PASS
$U_o$ (Uniformity)	0.20	0.20	PASS

Figure 5.1.2 - Analysis Results

### Pedestrian Circulation Routes

The lighting performance on the Pedestrian circulation routes has been assessed with fitting Type 'X4' 3000mm (H) lighting columns and Type 'X5' 3000mm (H) floodlights as per luminaire schedule, Appendix A.

- **Block A**

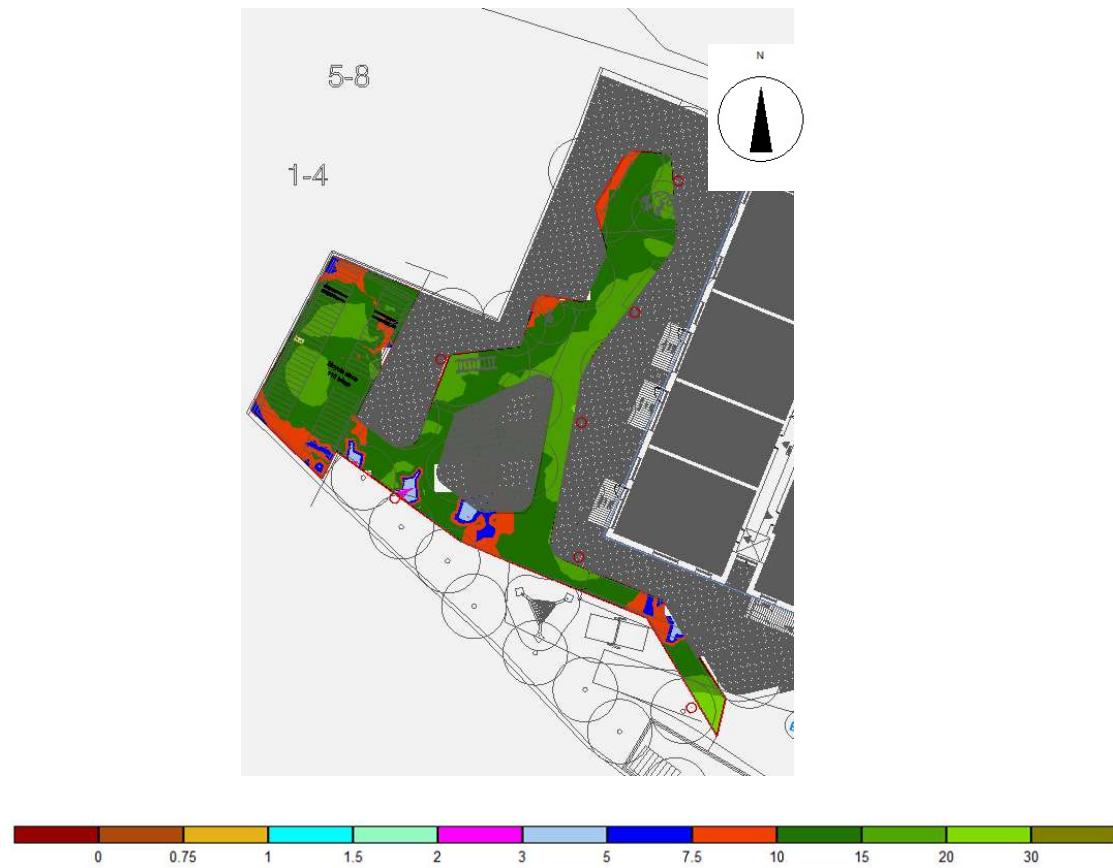


Figure 5.2.1 - Illumination Levels on Pedestrian Circulation Routes

Evaluation	Target	Result	
$E_{AVERAGE}$ (maintained)	5-7.5 lux	12.4 lux	PASS
$E_{MIN}$	2 lux	2.7 lux	PASS
$U_o$ (Uniformity)	0.20	0.22	PASS

Figure 5.2.2 - Analysis Results

- **Block A - B**

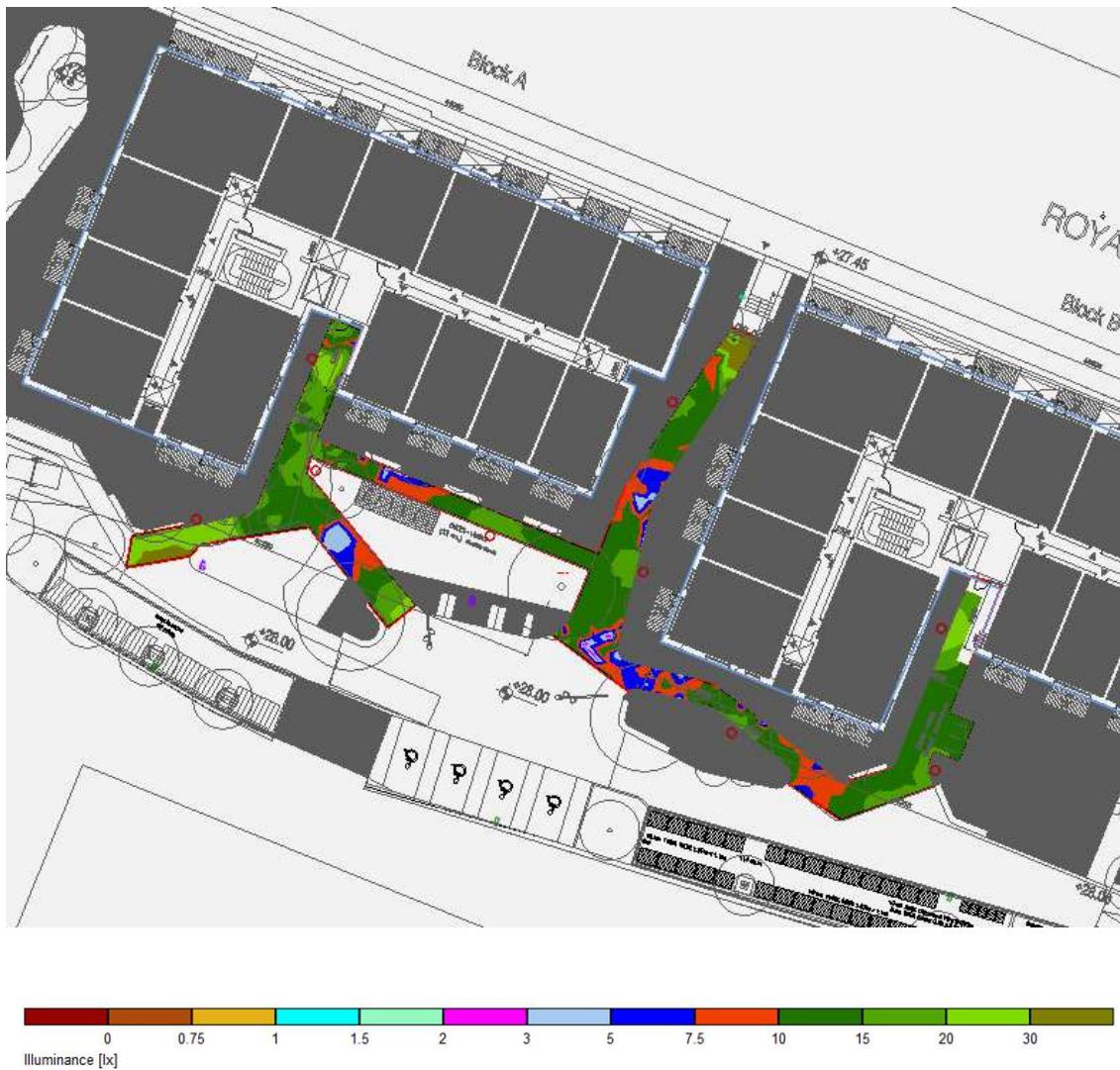


Figure 5.2.3 - Illumination Levels on Pedestrian Circulation Routes

Evaluation	Target	Result	
$E_{\text{AVERAGE}}$ (maintained)	5-7.5 lux	13.2 lux	PASS
$E_{\text{MIN}}$	2 lux	3.6 lux	PASS
$U_o$ (Uniformity)	0.20	0.27	PASS

Figure 5.2.4 - Analysis Results

- **Block B - C**

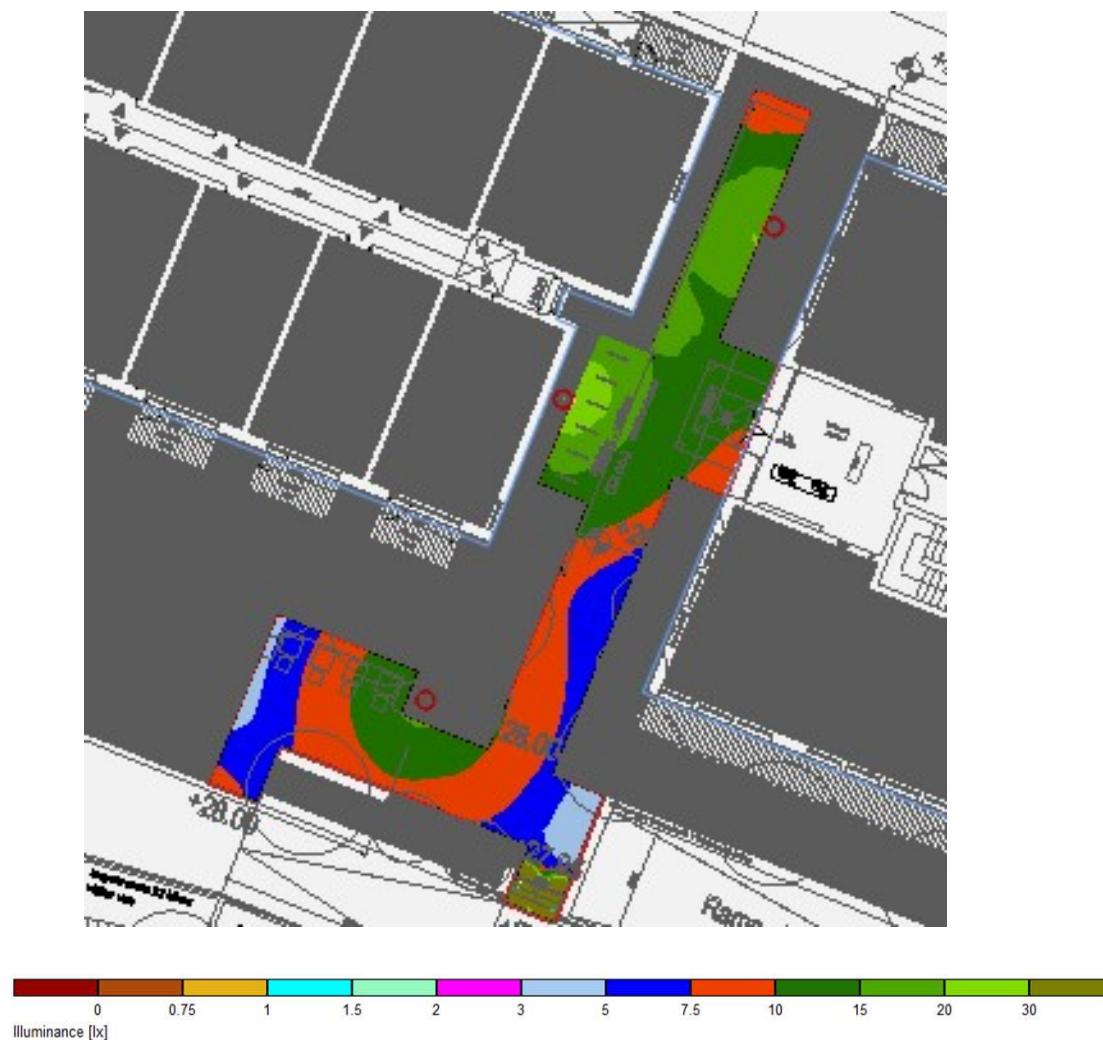


Figure 5.2.5 - Illumination Levels on Pedestrian Circulation Routes

Evaluation	Target	Result	
$E_{\text{AVERAGE}}$ (maintained)	5-7.5 lux	12.2 lux	PASS
$E_{\text{MIN}}$	2 lux	3.2 lux	PASS
$U_o$ (Uniformity)	0.20	0.26	PASS

Figure 5.2.6 - Analysis Results

- *Café*

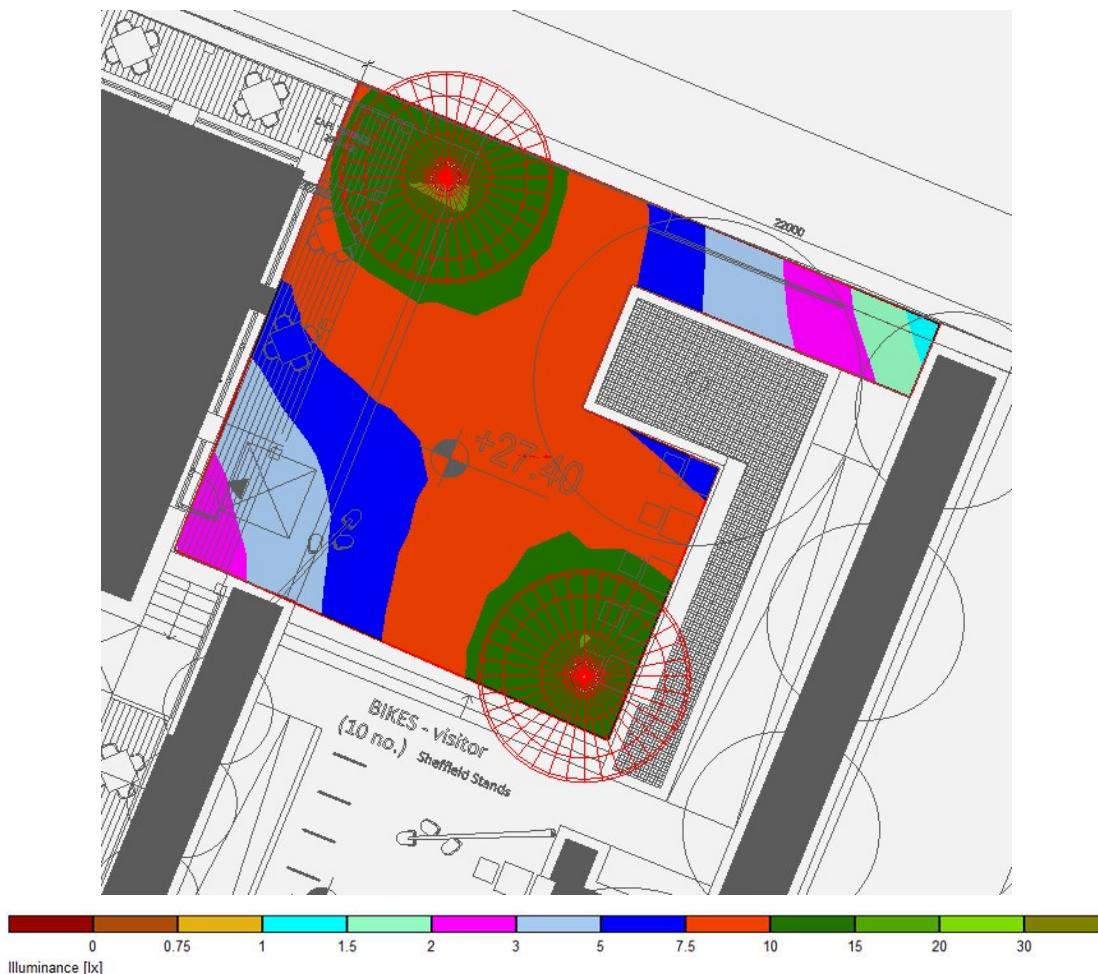


Figure 5.2.7 - Illumination Levels on Pedestrian Circulation Routes

Evaluation	Target	Result	
$E_{\text{AVERAGE}}$ (maintained)	5-7.5 lux	10.2 lux	PASS
$E_{\text{MIN}}$	2 lux	2.27 lux	PASS
$U_o$ (Uniformity)	0.20	0.26	PASS

Figure 5.2.8 - Analysis Results

- Stepped Areas & Ramps***

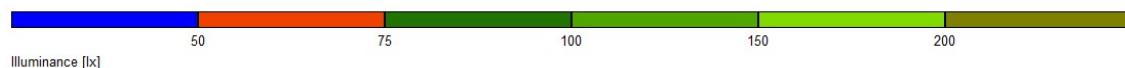
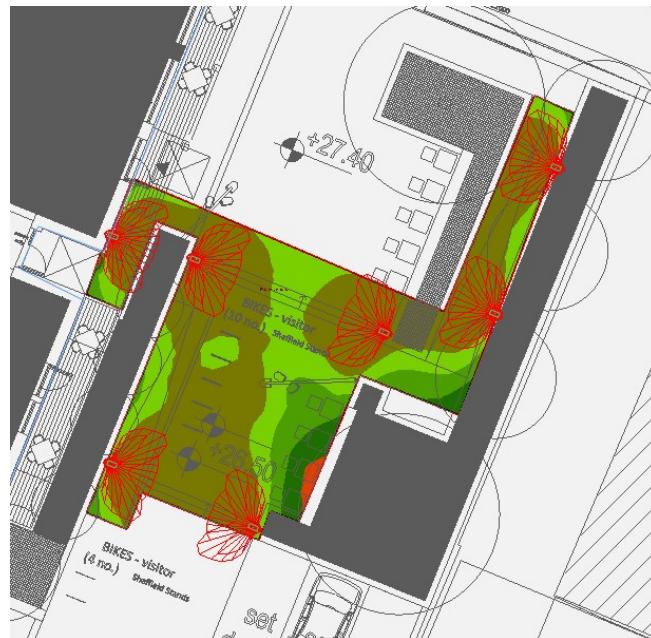


Figure 5.2.9 - Illumination Levels Around the Building

Evaluation	Target	Result	
$E_{AVERAGE}$ (maintained)	30 lux	30 lux	PASS
$U_o$ (Uniformity)	0.20	0.25	PASS

Figure 5.2.10 - Analysis Results

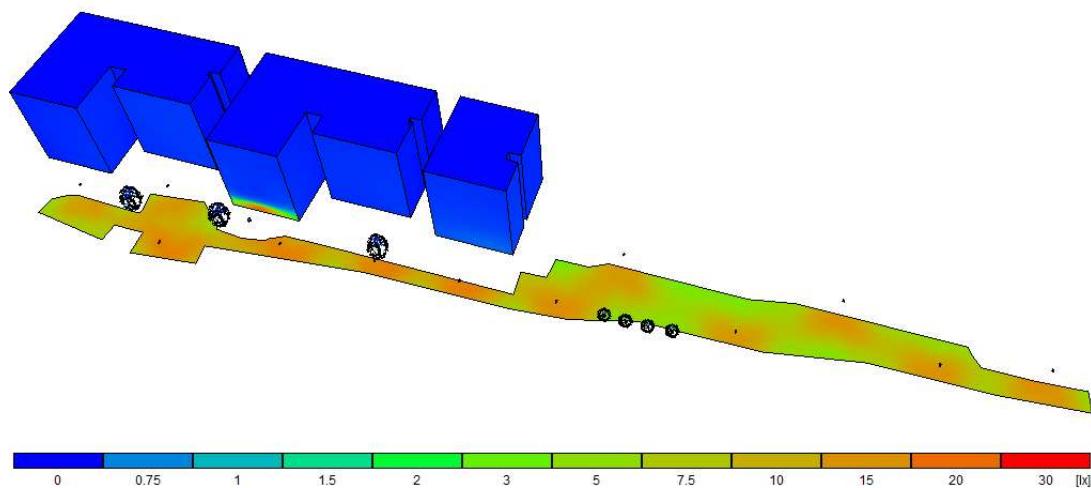


Figure 5.2.11 - 3D Model indicating Road Access Illumination Levels

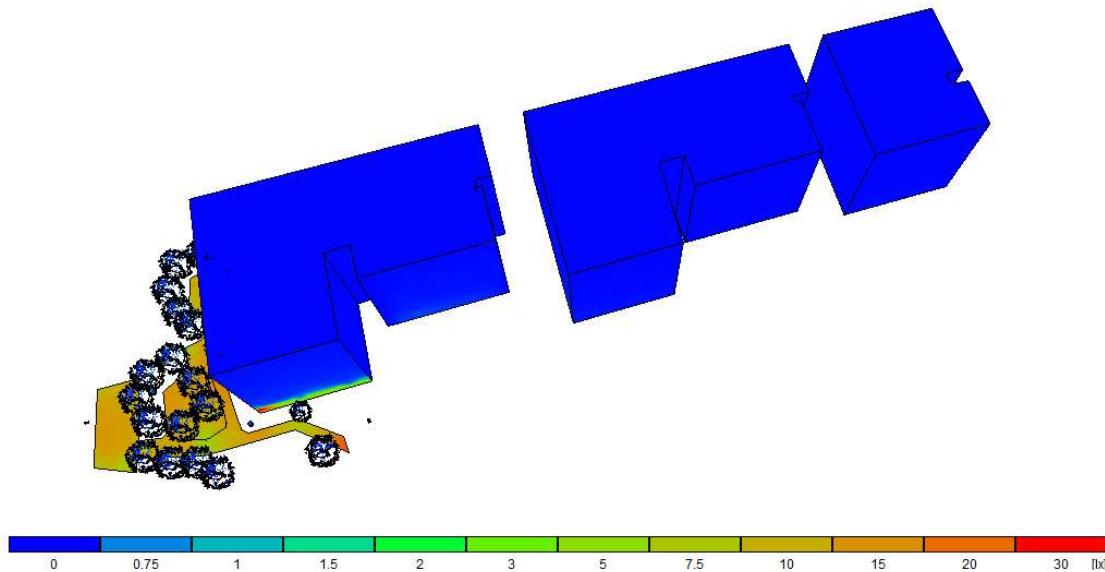


Figure 5.2.12 - 3D Model indicating Site Illumination Levels

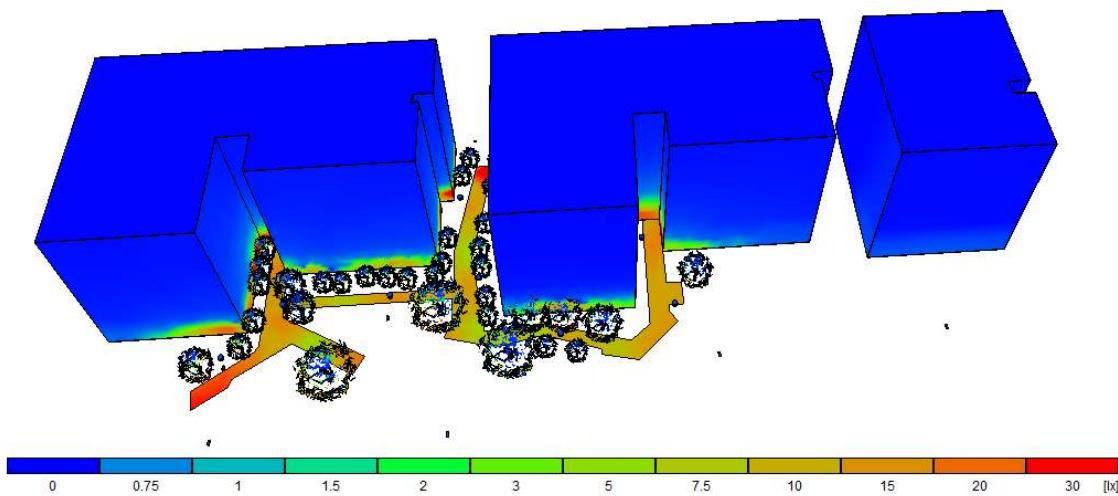


Figure 5.2.13 - 3D Model indicating Site Illumination Levels

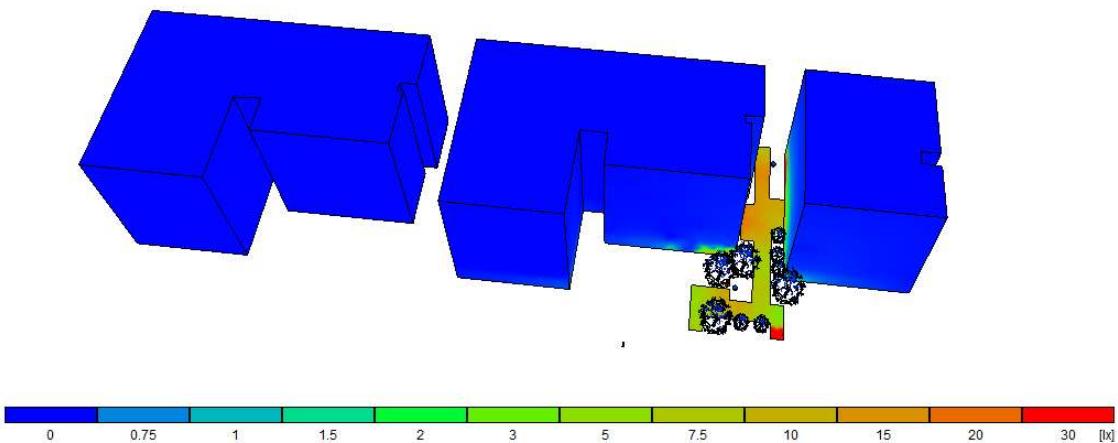


Figure 5.2.14 - 3D Model indicating Site Illumination Levels

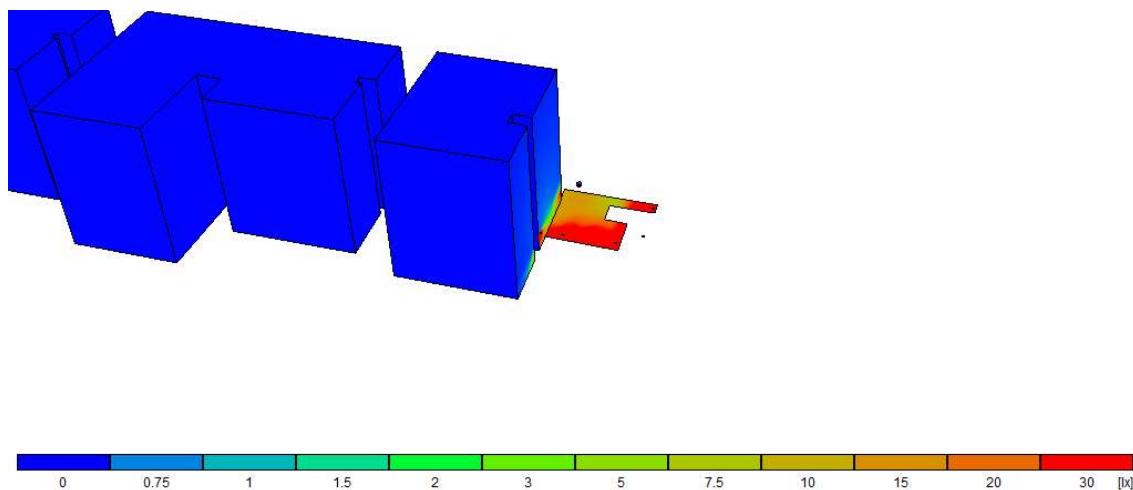


Figure 5.2.15 - 3D Model indicating Café-External Area Illumination Levels

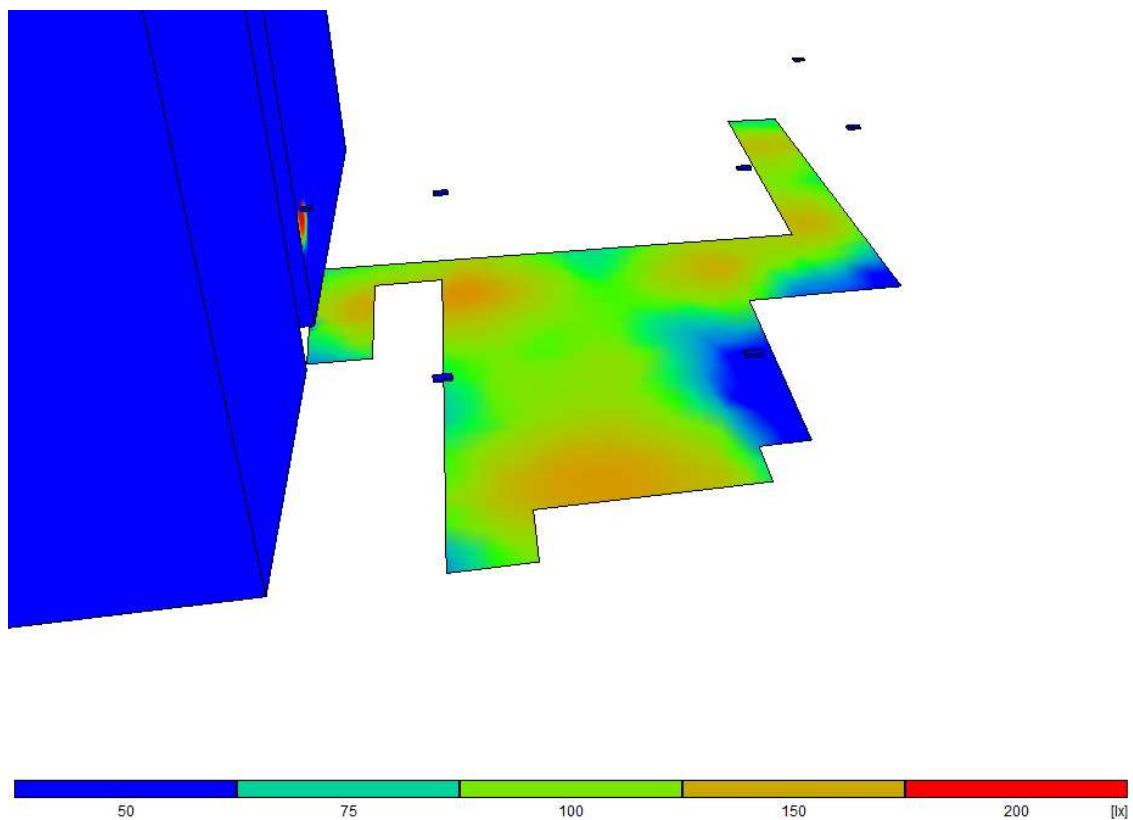


Figure 5.2.16 - 3D Model indicating Stepped Area & Ramps Illumination Levels

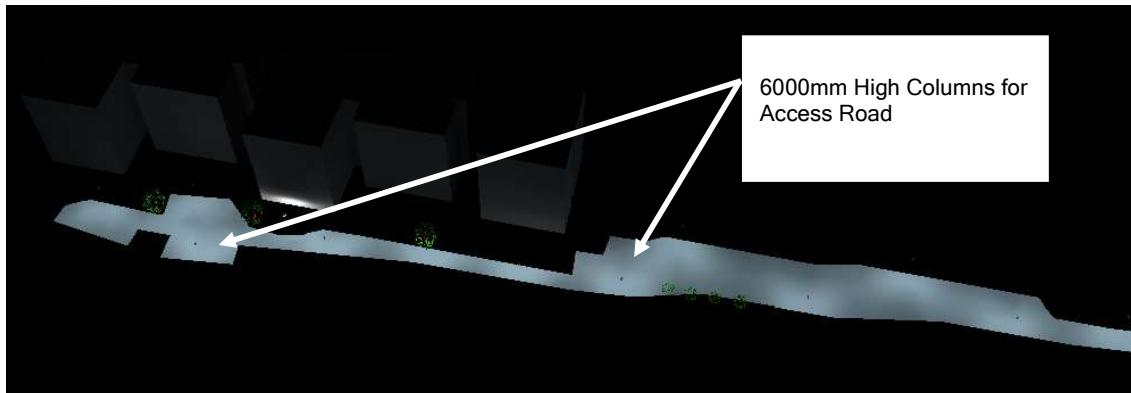


Figure 5.2.17 - 3D Model Lux Levels

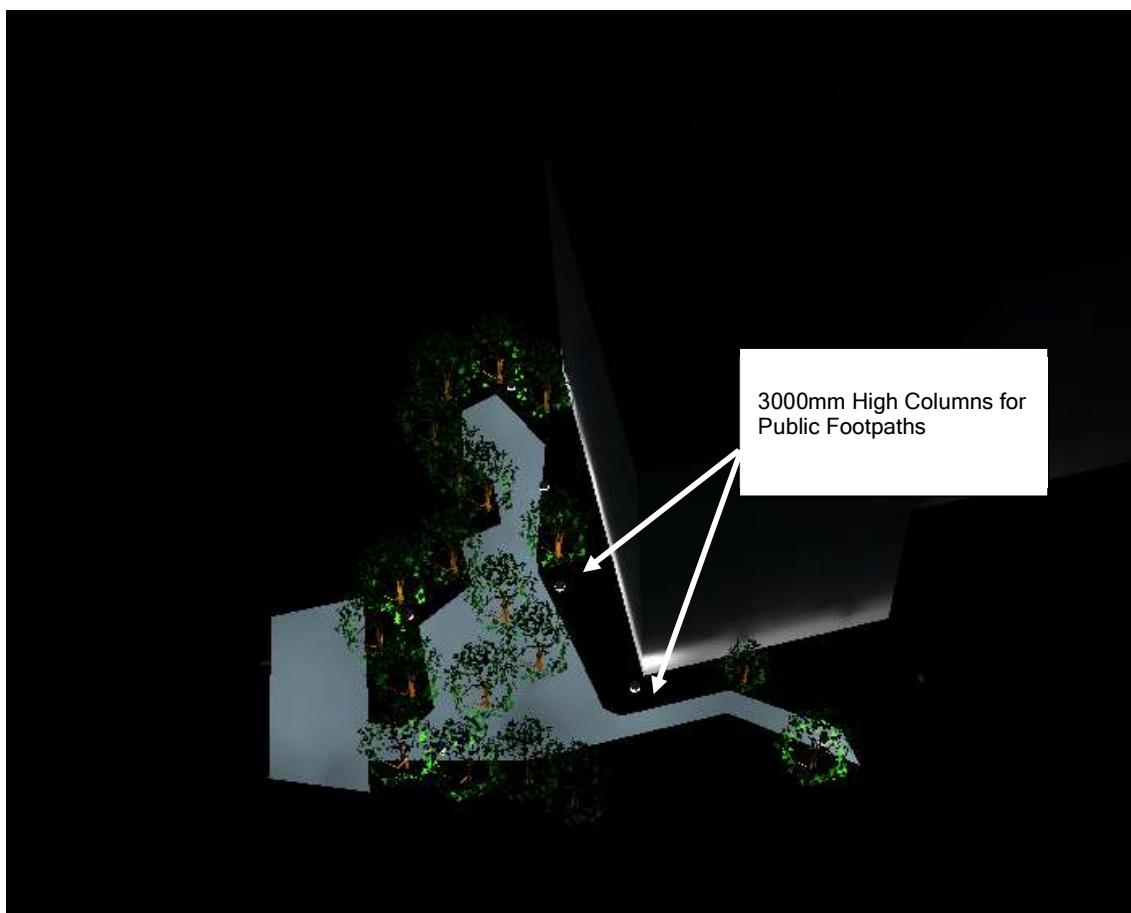


Figure 5.2.18 - 3D Model Lux Levels



Figure 5.2.19 - 3D Model Lux Levels

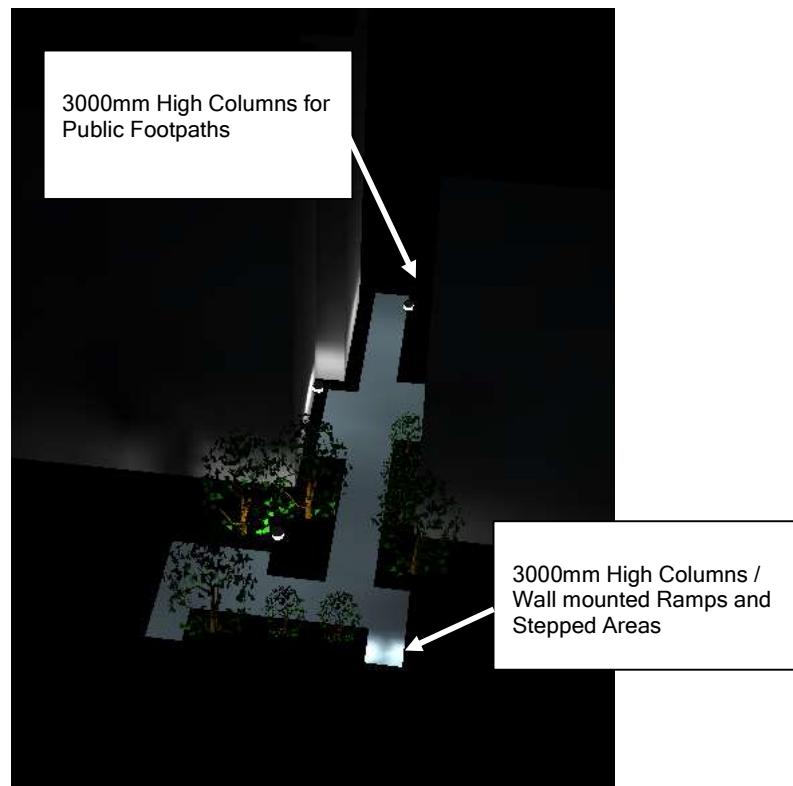


Figure 5.2.20 - 3D Model Lux Levels

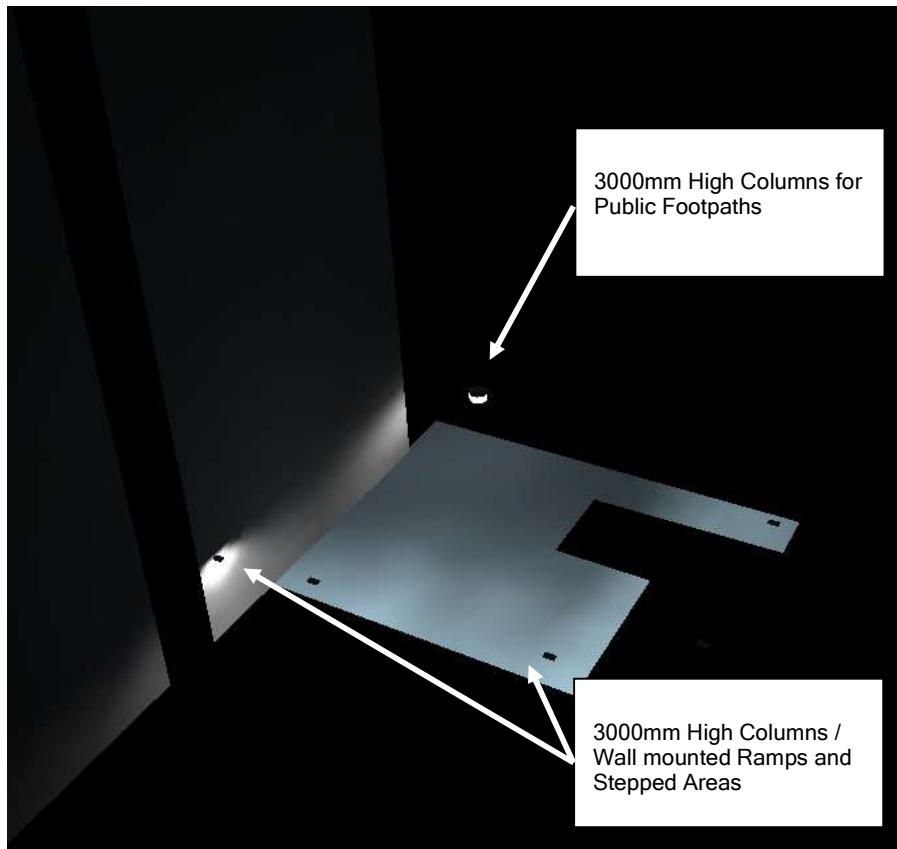


Figure 5.2.21 - 3D Model Lux Levels

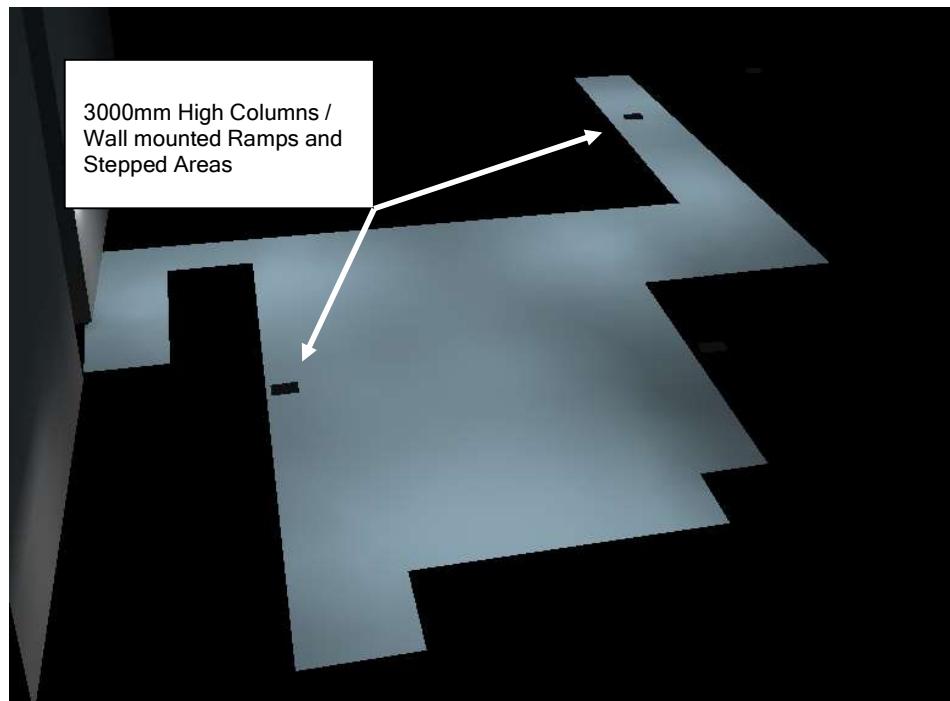


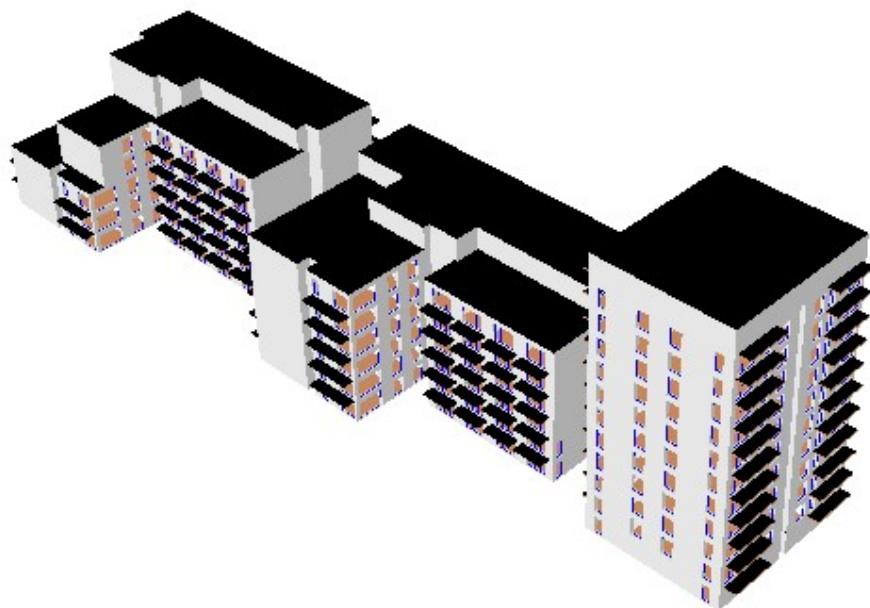
Figure 5.2.22 - 3D Model Lux Levels

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## 6.0 APPENDIX A - LUMINAIRE SCHEDULE



## LUMINAIRE SCHEDULE

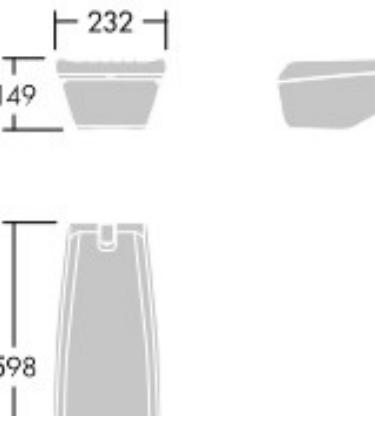
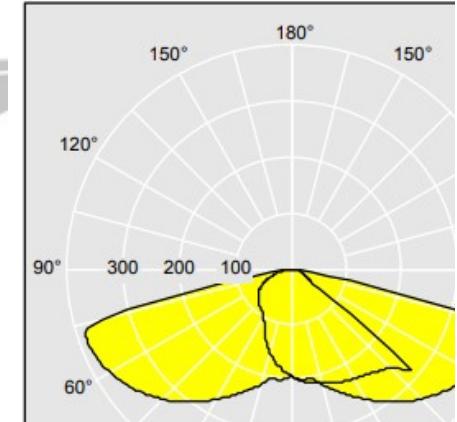


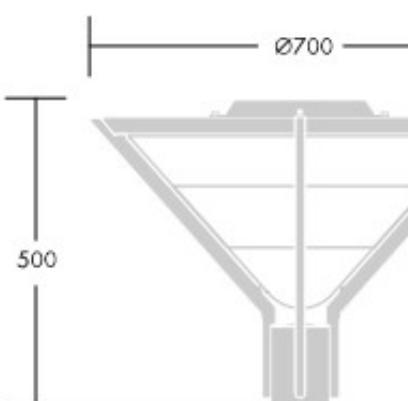
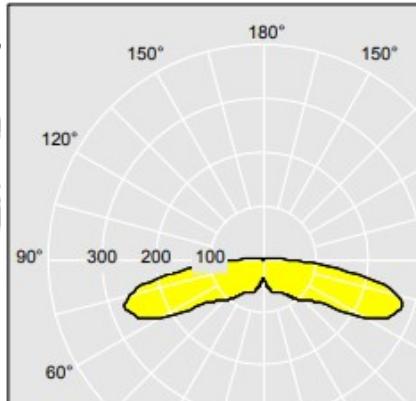
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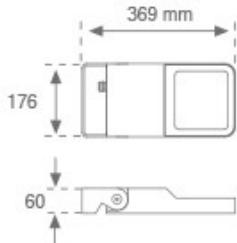
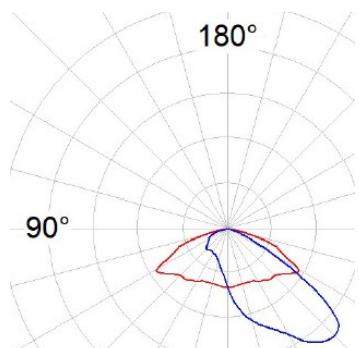
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Luminaire Reference	X3	Manufacturer	Thorn / R2L2			
Body Description	Die-Cast aluminium, powder coated textured light grey, IP66, IK09	Recessed/Surface or Wall Mounted	Pole Mounted			
Diffuser Type	Tempered Glass	Lamps	38W LED Lamp			
Reflector	Narrow Road Optic	Lumen Output	1983 Lumens			
Control Gear	230 V, 50 Hz. Individual Photocell Control	Colour of Lamps	4000K			
Area of Application	Pathways and landscape	Lamp Life	100,000hours			
Dimensions (mm)	568mm (L) x 232mm (W) x 149mm (H)	IEC Photometric Code	840/339			
Initial Colour Variation	-	IESNA LM 80-80 tested	Yes			
An extra small size LED road lighting lantern with 12 LEDs driven at 350mA with Narrow Road optic.						
Lumen Depreciation	L95 B10	Power Factor	> 0.9			
Colour rendering Index	<70	LED luminaire tested	To be in accordance with IESNA LM-79-08.			
Manufacturing Standard	EN 60 598-1:2015, EN 60598-2-2:2012, IEC/TR 62778:2014	LED module tested	To be in accordance with IEC 61347-2-13 & IEC 62384.			
Warranty Length	Five-year manufacturer's warranty to include failure of all luminaire components, inclusive of driver, electronics & LED modules. Contractor to include for all fixtures and fixings necessary for correct mounting and operation.					
  						
Contractor to ensure catalogue numbers are the latest and are correct prior to ordering.						

Luminaire Reference	X4	Manufacturer	Thorn / Avenue F2			
Body Description	Die-Cast LM-6 aluminium, IP66, IK08	Recessed/Surface or Wall Mounted	Pole Mounted			
Diffuser Type	Clear Polycarbonate	Lamps	21W LED Lamp			
Reflector	Type III Medium Optical Setting	Lumen Output	2330 Lumens			
Control Gear	230 V, 50 Hz.	Colour of Lamps	4100K			
Area of Application	Pedestrian Routes	Lamp Life	100,000hours			
Dimensions (mm)	Ø700mm x 500mm (H)	IEC Photometric Code	840/339			
Initial Colour Variation	-	IESNA LM 80-80 tested	Yes			
Decorative post-top lantern with symmetric distribution. Equipped with 50% power reduction circuit, effective 3 hours before and 5 hours after a calculated midnight. It can be deactivated at installation with an easily accessible internal switch.						
Lumen Depreciation	L90 B10	Power Factor	> 0.9			
Colour rendering Index	<70	LED luminaire tested	To be in accordance with IESNA LM-79-08.			
Manufacturing Standard	EN 60 598-1:2015, EN 60598-2-2:2012, IEC/TR 62778:2014	LED module tested	To be in accordance with IEC 61347-2-13 & IEC 62384.			
Warranty Length	Ten-year manufacturer's warranty to include failure of all luminaire components, inclusive of driver, electronics & LED modules. Contractor to include for all fixtures and fixings necessary for correct mounting and operation.					
  						
Contractor to ensure catalogue numbers are the latest and are correct prior to ordering.						

Luminaire Reference	X5	Manufacturer	Lamp / Mini Flut			
Body Description	IP66 rated, Die-cast aluminium body – Texturized Grey, IK06	Recessed/Surface or Wall Mounted	Column Mounted			
Diffuser Type	Tempered Glass	Lamps	49W LED			
Reflector	N/A	Lumen Output	4990 lumens			
Control Gear	230V, 50-60Hz	Colour of Lamps	3000K			
Area of Application	Stepped Areas & Ramps	Lamp Life	60,000hours			
Dimensions (mm)	369mm (L) x 176mm (W) x 60mm (H)	IEC Photometric Code	840/339			
Initial Colour Variation	N/A	IESNA LM 80-80 tested	Yes			
Surface mounting outdoor luminaire model MINI FLUT G2 6500 WW ASYM GR. ,LAMP brand. Manufactured in aluminium injection body lacquered in texturized grey colour and serigraphed tempered glass.						
Lumen Depreciation	N/A	Power Factor	> 0.9			
Colour rendering Index	>70	LED luminaire tested	To be in accordance with IESNA LM-79-08.			
Manufacturing Standard	EN 60 598-1:2015, EN 60598-2-2:2012, IEC/TR 62778:2014	LED drivers shall conform to	To be in accordance with IEC 61347-2-13 & IEC 62384.			
Warranty Length	Five-year on-site warranty to include failure of all luminaire components, inclusive of driver, electronics & LED modules. Contractor to include for all fixtures and fixings necessary for correct mounting and operation.					
  						
Contractor to ensure catalogue numbers are the latest and are correct prior to ordering.						