



Tack Residential

Former TACK Packaging Site
Carmanhall Road
Sandyford Industrial Estate
Dublin 18



Site Lighting Report
IN2 Project No. D2005
06th April 2022
Rev02



Revision History

| Date | Revision | Description |
|------------|----------|----------------|
| 15/12/2021 | 00 | Planning Issue |
| 21/03/2022 | 01 | Planning Issue |
| 06/04/2022 | 02 | Planning Issue |

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1.0 Introduction

IN2 Engineering Design Partnership has been commissioned to complete a Planning Stage Site Lighting Study for the proposed residential scheme at the former 'Tack Packaging' site, 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.

This report will provide an overview of the relevant codes and standards applicable to site lighting, in particular the requirements for accessible routes.

The site lighting design is for information only and provides an indication of the intent for the developments site lighting only and the quantities and types of fittings may differ during the design stage.

2.0 Executive Summary

The following report contains the design layout and accompanying calculations of the site lighting scheme to the proposed development at the former 'Tack Packaging' site.

The external lighting for this proposed 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
- DLRCC - Public Lighting Installations in Residential and Industrial Areas
- BS 5489-1:2013 Code of Practice for the Design of Road Lighting
- BS EN 13201-2:2015 – Road Lighting Part 2: Performance Requirements
- Institution of Lighting Professionals – Guidance Notes for the Reduction of Obtrusive Light GN01:2011
- CIBSE – Lighting Guide 6: The Exterior Environment
- ETCI National Rules for Electrical Installations I.S 10101:2020
- 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).

The design criteria set out for this proposed development is based on the lighting requirements of the BS EN 13201-2:2015, BS 5489-1:2013 and BS 8300:2018, as specified in the table below.

| Area | Lighting Levels (Lux) | Uniformity (Uo) |
|--|-----------------------|-----------------|
| Pedestrian Access Routes in the open Environment. Level and gently sloped. | 5 | 0.2 |
| Entrances/exits of buildings. | 100 | 0.4 |
| Stairways and ramps in the open Environment | 30 | 0.2 |
| Stairways and ramps adjacent to the entrances / exits of buildings | 100 | 0.4 |
| Car Parks (light traffic) | 5 | |
| Car Park (Medium traffic) | 10 | |
| Entrance Road (Main Traffic Routes) | 10 | 0.2 |

Fig 2.1 – Minimum Lighting Requirements

3.0 Development Overview

The proposed residential development is located at the former 'Tack Packaging' site, on Carmanhall road and Ravens Road in Sandyford, Dublin 18, As illustrated below in figure 3.1.



Fig 3.1 – Development Site

The Tack site measures approximately 0.57 hectares and is located at Carmanhall Road and Ravens Rock Road in Sandyford, Dublin. The proposed residential development comprises three blocks ranging in height from seven to eight storeys. The apartments include 48 studios, 103 one beds and 55 two beds and 1 three bed with 415m² of shared amenity located at ground level of block C. The wider development includes a separate proposed residential development of 336 units on the former Avid Technology International site which is subject to a separate planning application.

4.0 Design analysis and Methodology

The site lighting for the proposed development is 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 is provided.

There is a possibility that small numbers of bats could avail of even very minor cracks or crevices for temporary roosting within the site therefore the design has been assessed to establish minimal environmental and ecological impact through glare, sky glow and obtrusive light (light spill) and will adhere to the following 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.
- 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.

4.1 Design Strategy

It is proposed to illuminate the access roads of the development 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 Wide Street optics to ensure a uniform lighting across the development. 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, 4 meters height. The luminaires on shall have a mechanical impact rating of IK08 to provide added protection against vandalism.

To complete the design, the wall recessed led Type 'X5' shall be installed on the footbridge and steps located around the site. The recessed lights shall be used to ensure that the minimum lux levels required on steps are achieved in accordance with BS 8300:2018 while minimising the obtrusive light spill onto the ground floor apartments.

Lighting shall be provided to the entrances & exits of the development with 'Type X6' surface mounted decorative amenity LED lighting to meet the required lighting levels.

5.0 Design Analysis & Calculation Results.

5.1 Main Traffic Routes

The lighting performance of the Main traffic routes and adjacent footpaths around the development have been assessed with fitting Type 'X3' 6-metre (H) lighting columns as per luminaire schedule, Appendix A.

5.1.1 Main Traffic Routes

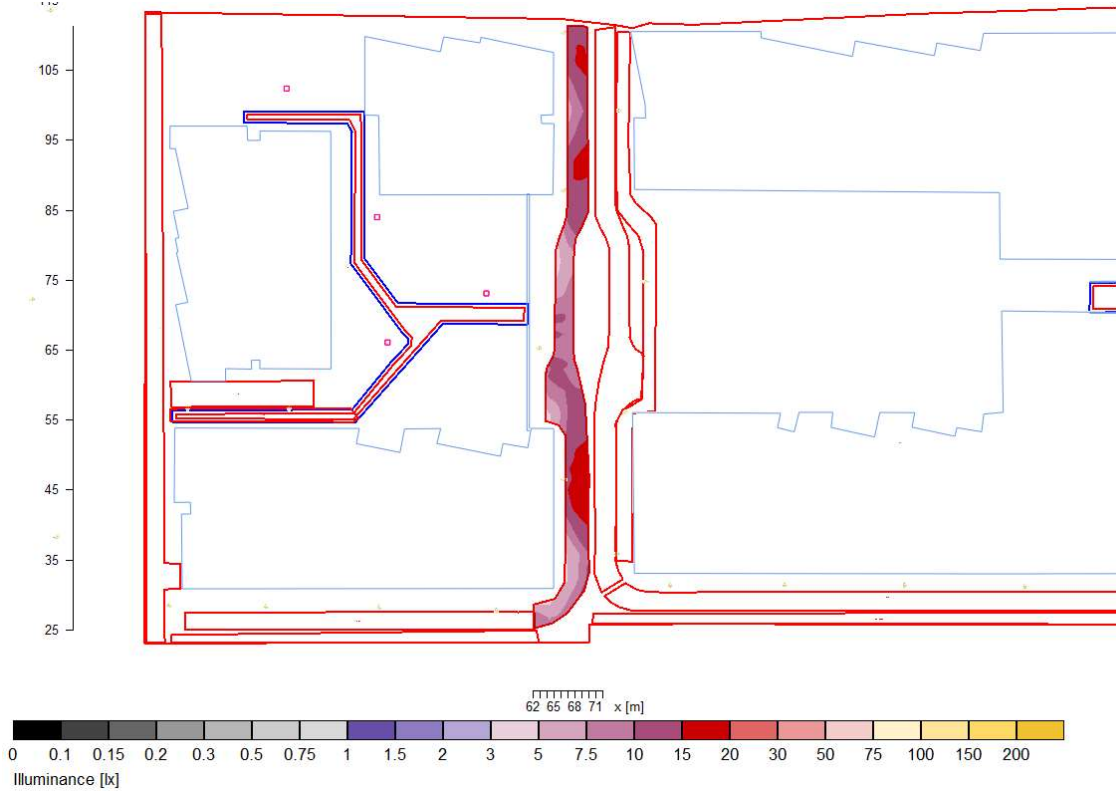


Fig 5.1.1 – Illumination Levels of Traffic Routes

| Evaluation | Target | Result | |
|----------------------------|--------|----------|------|
| $E_{AVERAGE}$ (maintained) | 10 lux | 10.2 lux | PASS |
| U_0 (Uniformity) | 0.20 | 0.40 | PASS |

Fig 5.1.2 – Analysis Results

5.1.2 Side Traffic Route

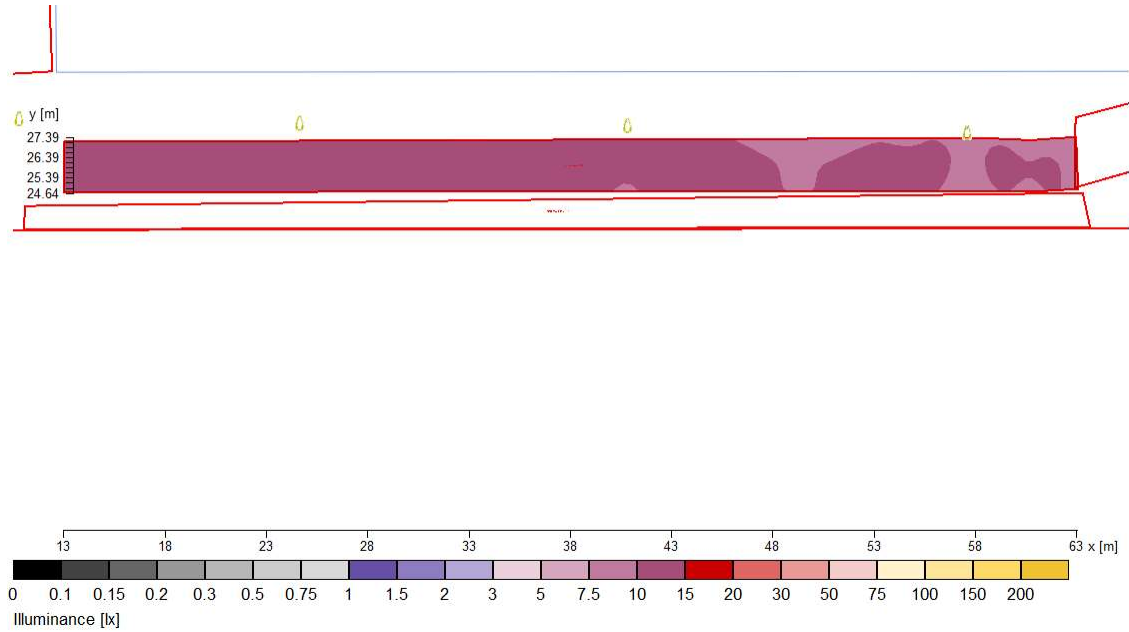


Fig 5.1.3 – Illumination Levels of Traffic Routes

| Evaluation | Target | Result | |
|----------------------------|--------|----------|------|
| $E_{AVERAGE}$ (maintained) | 10 lux | 10.7 lux | PASS |
| U_0 (Uniformity) | 0.20 | 0.71 | PASS |

Fig 5.1.4 – Analysis Results

5.1.3 Central Footpath

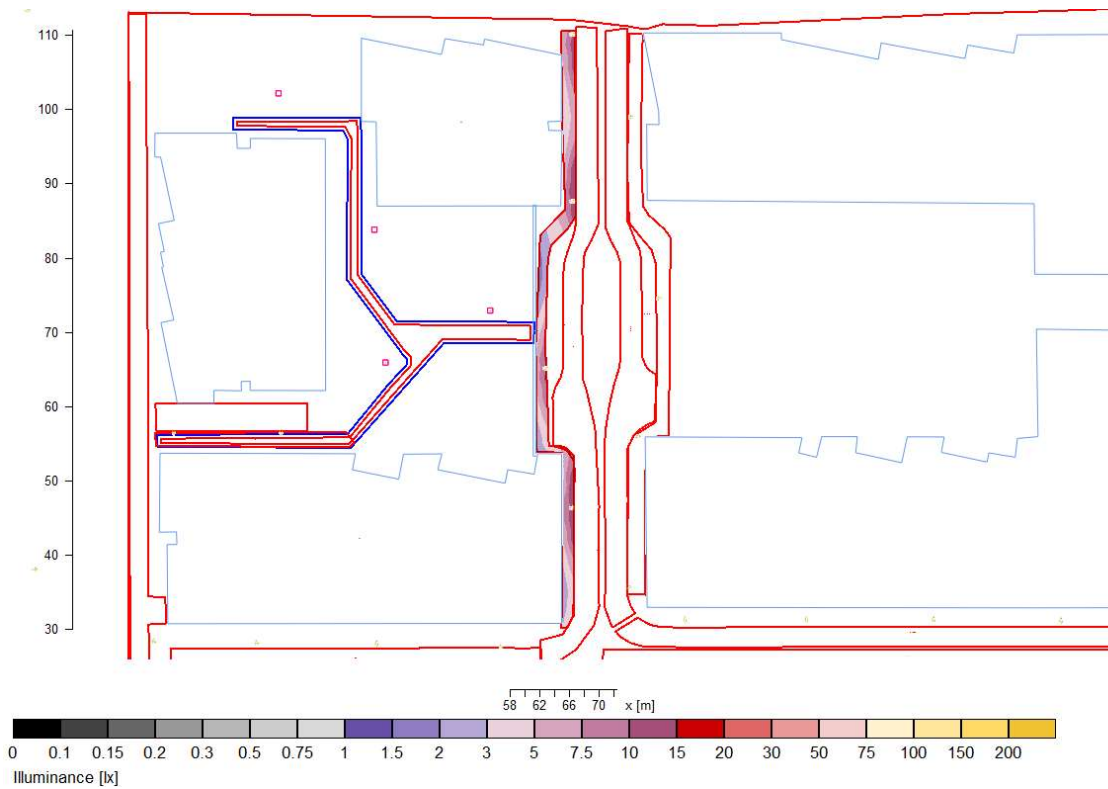


Fig 5.1.5 – Illumination Levels of Footpath

| Evaluation | Target | Result | |
|----------------------------|--------|---------|------|
| $E_{AVERAGE}$ (maintained) | 5 lux | 5.8 lux | PASS |
| U_0 (Uniformity) | 0.20 | 0.27 | PASS |

Fig 5.1.6 – Analysis Results

5.1.4 Side Walkway

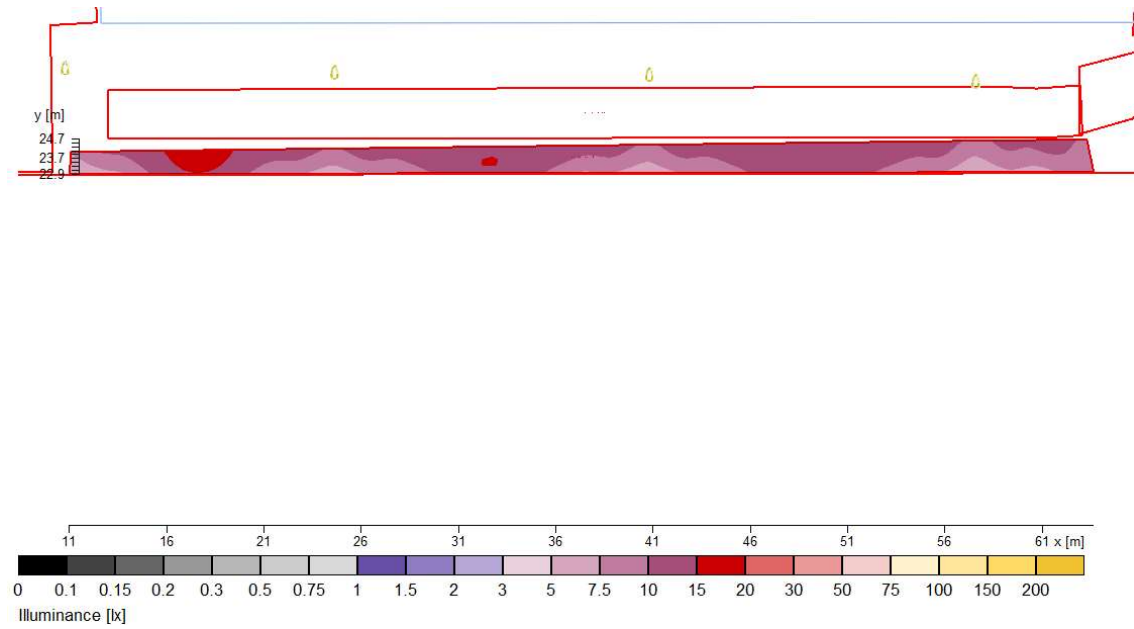


Fig 5.1.5 – Illumination Levels of Footpath

| Evaluation | Target | Result | |
|----------------------------|--------|----------|------|
| $E_{AVERAGE}$ (maintained) | 5 lux | 10.3 lux | PASS |
| U_0 (Uniformity) | 0.20 | 0.51 | PASS |

Fig 5.1.6 – Analysis Results

5.2 Pedestrian Circulation Area

The lighting performance at the Pedestrian Circulation Areas has been assessed with fitting Type 'X4' 4-metre (H) lighting columns as per luminaire schedule, Appendix A.

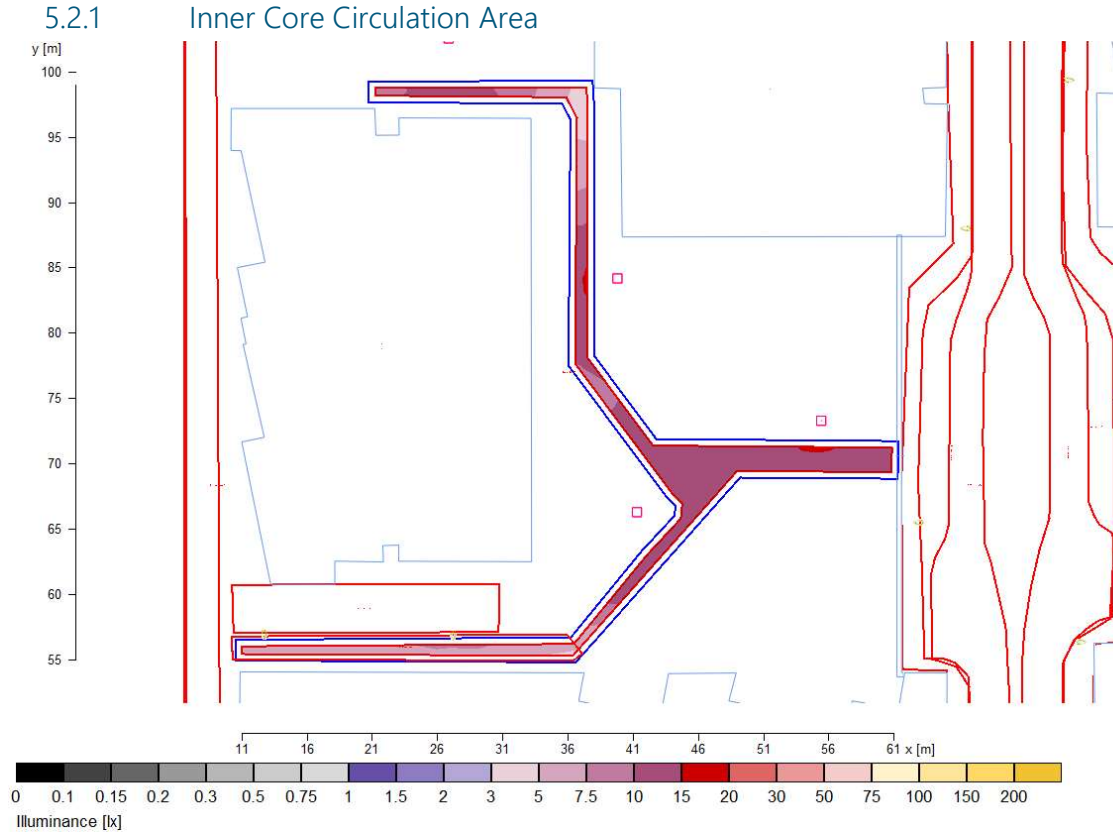


Fig 5.2.1 – Illumination Levels at Pedestrian Walkway

| Evaluation | Target | Result | |
|----------------------------|--------|---------|------|
| $E_{AVERAGE}$ (maintained) | 5 lux | 9.9 lux | PASS |
| U_o (Uniformity) | 0.20 | 0.42 | PASS |

Fig 5.2.2 – Analysis Results

5.3 Footbridge

The lighting performance of the footbridge in the development have been assessed with fitting Type 'X5' wall recessed luminaires as per luminaire schedule, Appendix A.

5.3.1 Footbridge

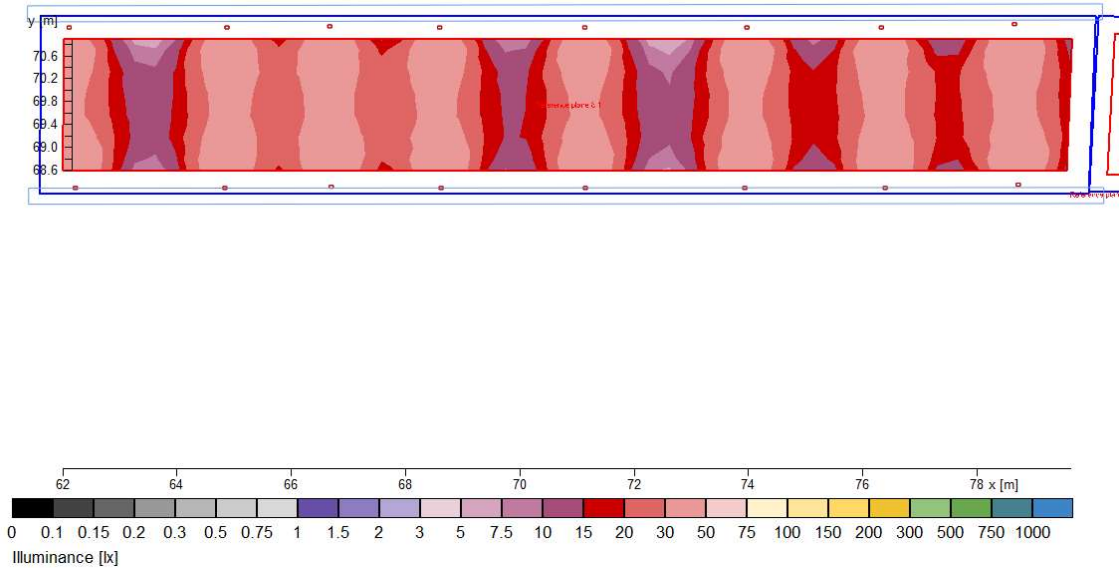


Fig 5.3.1 – Illumination Levels at Steps

| Evaluation | Target | Result | |
|----------------------------|--------|----------|------|
| $E_{AVERAGE}$ (maintained) | 5 lux | 25.3 lux | PASS |
| U_0 (Uniformity) | 0.20 | 0.26 | PASS |

Fig 5.3.2 – Analysis Results

6.0 Site Lighting 3D Render

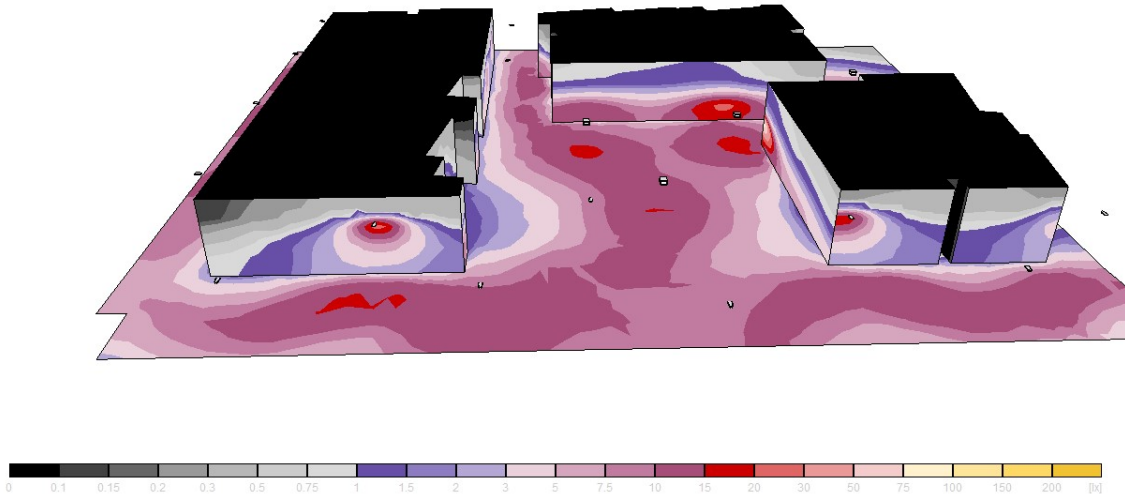


Fig 6.1 – 3D Model indicating Site Illumination Levels

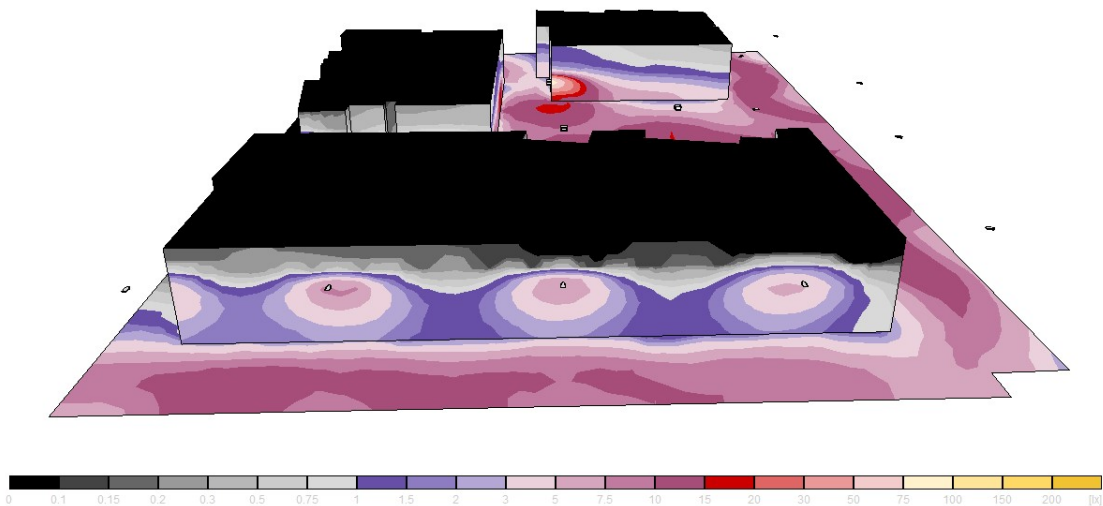


Fig 6.2 – 3D Model indicating Site Illumination Levels

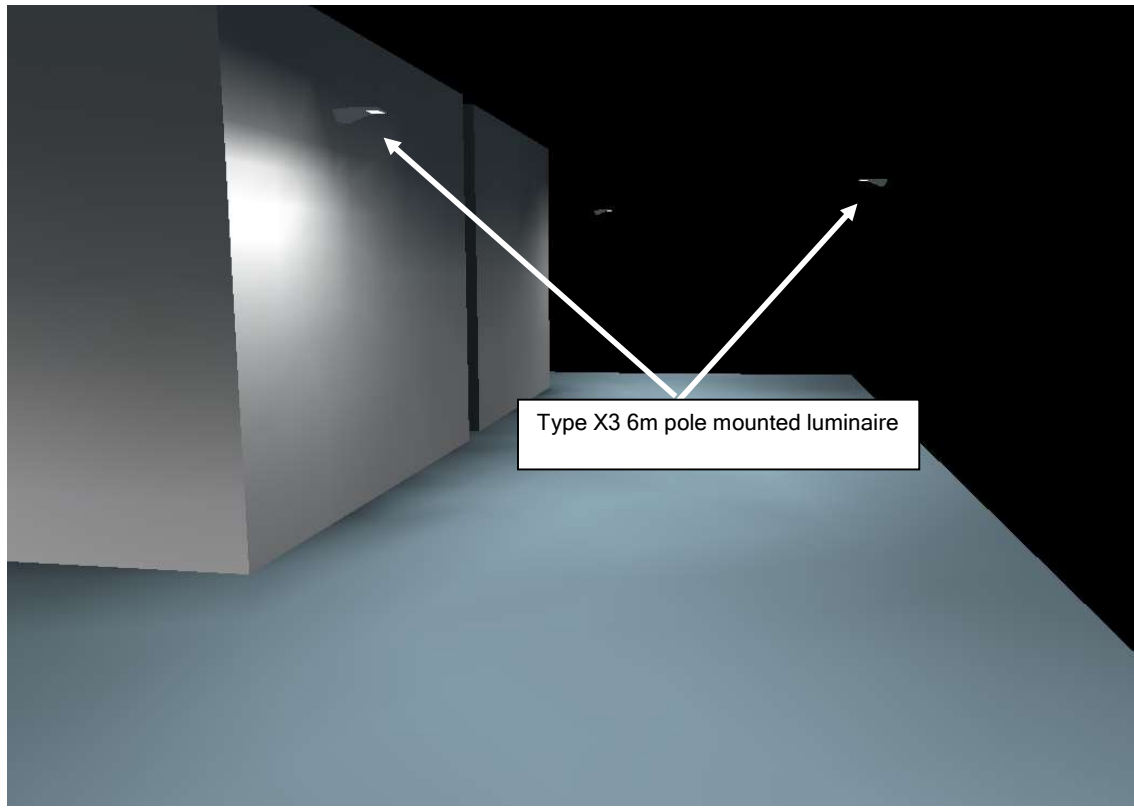


Fig 6.3 – 3D Model indicating Site Illumination Levels

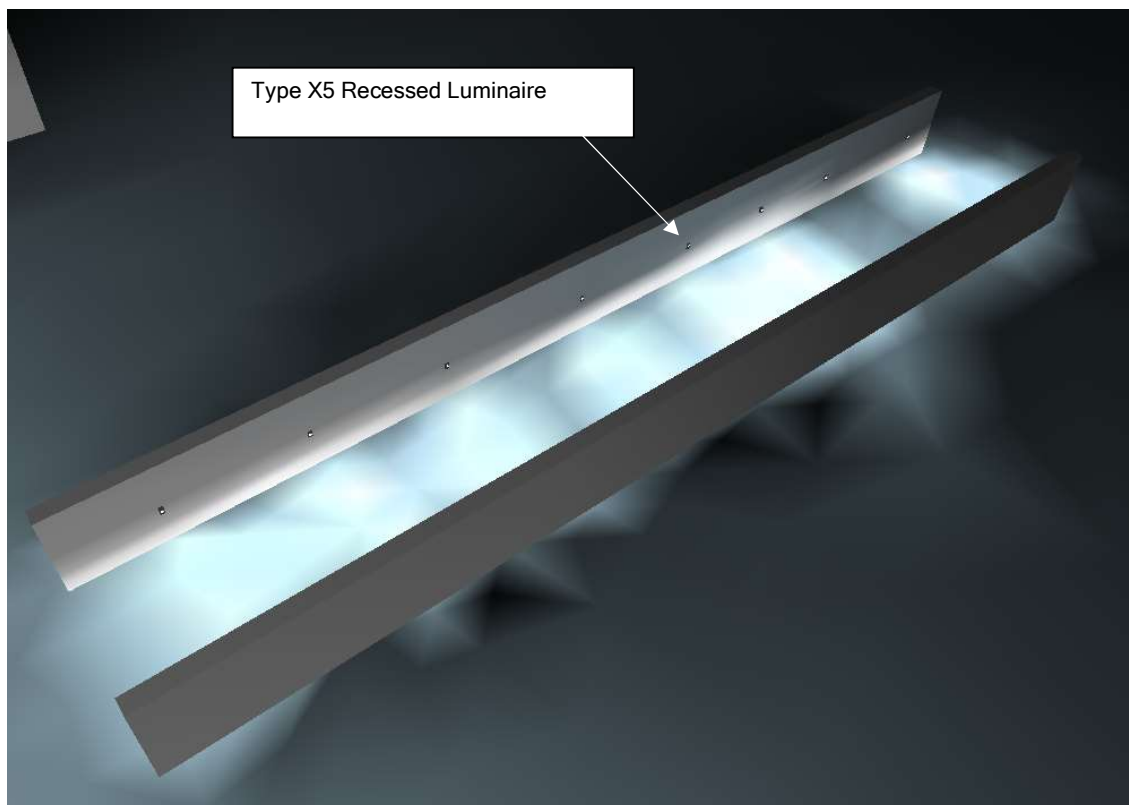


Fig 6.4 – 3D Model indicating Site Illumination Levels

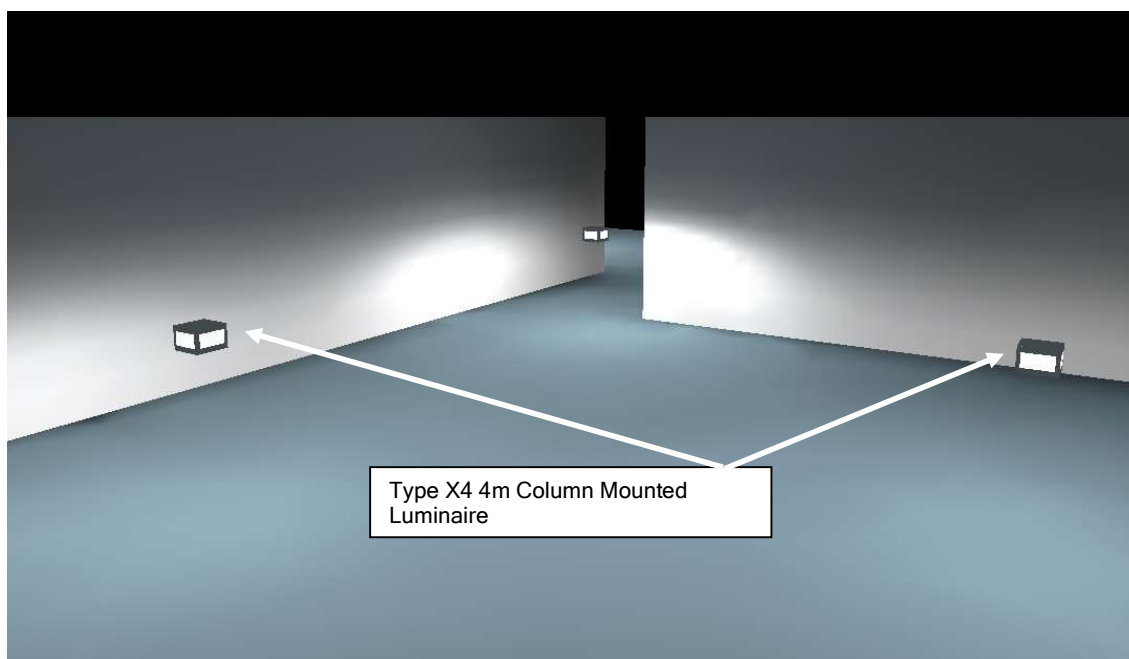
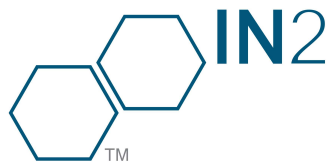


Fig 6.5 – 3D Model indicating Site Illumination Levels

7.0 APPENDIX A – LUMINAIRE SCHEDULE



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Tack Residential
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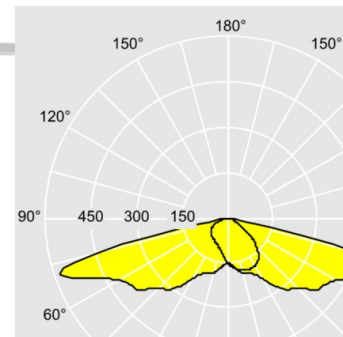


Luminaire Schedule
IN2 Project No. D2005
21st March 2022
Rev01

| | | | |
|----------------------------|-------------------------------------|----------------------------------|-------------------------------------|
| Luminaire Reference | X3 | Manufacturer | Thorn / Equal & Approved |
| Body Description | Die-Cast LM-6 aluminium, IP66, IK08 | Recessed/Surface or Wall Mounted | 6 metre Pole Mounted |
| Diffuser Type | Tempered Glass | Lamps | 15W LED Lamp |
| Reflector | Wide Street Optic | Lumen Output | 1829 Lumens |
| Control Gear | 230 V, 50 Hz. | Colour of Lamps | 3000K |
| Area of Application | Traffic Routes | Lamp Life | 100,000hours |
| Dimensions (mm) | 655mm x 362mm x 155mm | IEC Photometric Code | 840/339 |
| Initial Colour Variation | - | IESNA LM 80-80 tested | Yes |

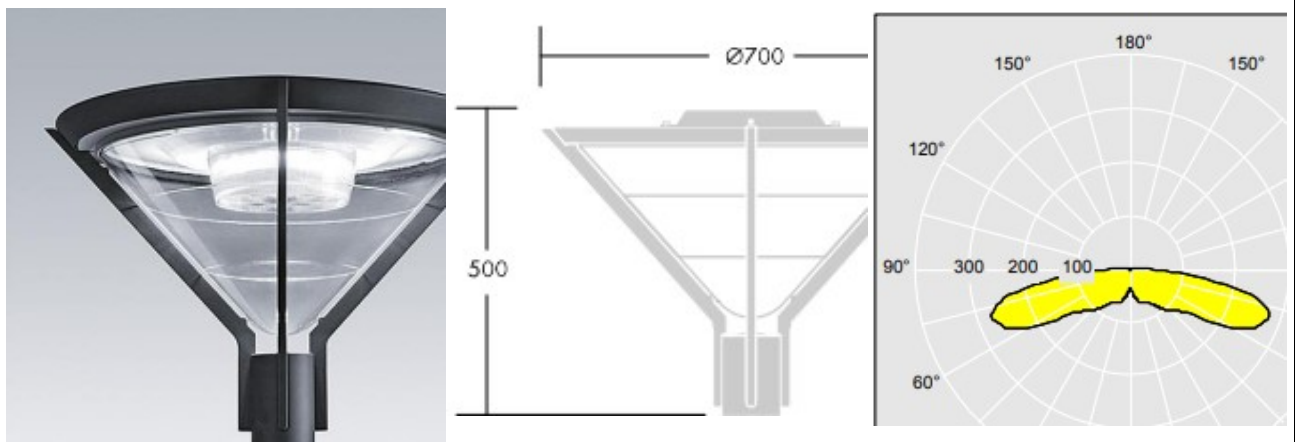
A small size LED road lighting lantern with 12 LEDs driven at 350mA with Wide Street & Comfort optic.

| | | | |
|------------------------|--|----------------------|--|
| 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. | | |



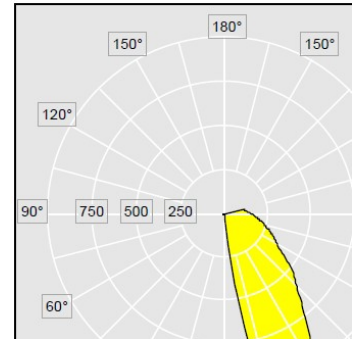
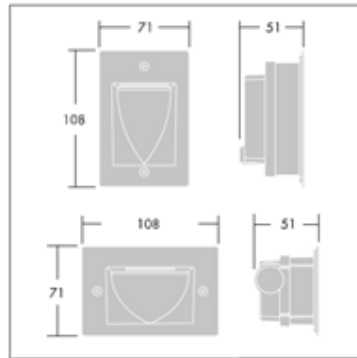
Contractor to ensure catalogue numbers are the latest and are correct prior to ordering.

| | | | |
|--|--|----------------------------------|--|
| Luminaire Reference | X4 | Manufacturer | Thorn / Equal & Approved |
| Body Description | Die-Cast LM-6 aluminium, IP66, IK08 | Recessed/Surface or Wall Mounted | 4 metre Pole Mounted |
| Diffuser Type | Clear Polycarbonate | Lamps | 21W LED Lamp |
| Reflector | Type III Medium Optical Setting | Lumen Output | 2876 Lumens |
| Control Gear | 230 V, 50 Hz. | Colour of Lamps | 4000K |
| 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. | | |



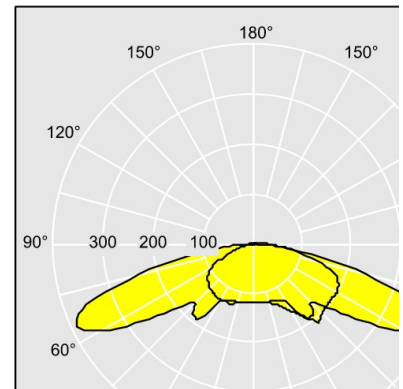
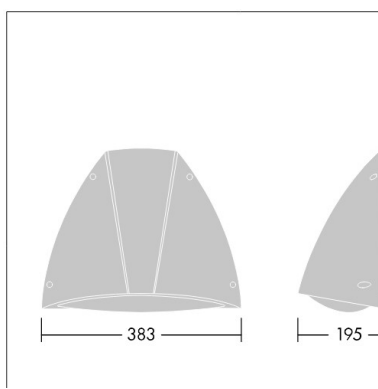
Contractor to ensure catalogue numbers are the latest and are correct prior to ordering.

| Luminaire Reference | X5 | Manufacturer | Thorn or Equal and Approved |
|--------------------------|---|----------------------------------|--|
| Body Description | IP65, die-cast aluminium, painted dark grey. IK05 | Recessed/Surface or Wall Mounted | Wall Recessed |
| Diffuser Type | Polycarbonate | Lamps | 4W LED Lamp |
| Reflector | N/A | Lumen Output | 96 lumens |
| Control Gear | 230V, 50-60Hz AC | Colour of Lamps | 4000K |
| Area of Application | Pathways | Lamp Life | 50,000 Hrs |
| Dimensions (mm) | 71mm (L) x 108mm (W)x 51mm (H) | IEC Photometric Code | 840/339 |
| Initial Colour Variation | N/A | IESNA LM 80-80 tested | Yes |
| Lumen Depreciation | L70 | 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 | Three-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.

| Luminaire Reference | X6 | Manufacturer | Thorn / Equal & Approved |
|---|--|----------------------------------|--|
| Body Description | IP66, IK10 rated, back plate: Die-cast aluminium painted anthracite, Body: anthracite Polycarbonate, | Recessed/Surface or Wall Mounted | Wall Mounted |
| Diffuser Type | N/A | Lamps | 15.1 W LED |
| Reflector | N/A | Lumen Output | 1815 lumens |
| Control Gear | 230V, 50-60Hz | Colour of Lamps | 3000K |
| Area of Application | Entrance / Exits | Lamp Life | 60,000hours |
| Dimensions (mm) | 381mm x 196mm x 305mm | IEC Photometric Code | 840/339 |
| Initial Colour Variation | N/A | IESNA LM 80-80 tested | Yes |
| Robust and decorative wall mounted luminaire suitable for lighting entrance, exits and amenity areas. | | | |
| Lumen Depreciation | L70 | Power Factor | > 0.9 |
| Colour rendering Index | <80 | 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.