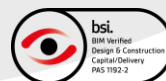


Mechanical and Electrical Services Installations
For the
Public Realm Improvements for a
pedestrianised New Street
At
New Street, Malahide
For
Fingal County Council

Date of Issue: 05/04/2023

Version: 0



professional projects. professional engineering.

Document History

Version No.	Description	Prepared By	Reviewed By	Date
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1.0 Executive Summary

Axiseng were engaged as part of the Design Team commissioned by Fingal County Council (FCC) to develop the design for the Proposed Public Realm Improvements to a Pedestrianised New Street. This report outlines the Mechanical & Electrical (M&E) design for this proposed development.

The design intent includes for a P1 class of public lighting to the proposed development, feature in-ground lighting, in-ground water/power requirements, Wi-Fi & power to public spaces and EV bike chargers for public use. A separate sustainability report is available as part of the M&E submission.

Part of the design intent for the lighting, as per FCC concerns, is to light current areas which are subject to anti-social behaviour whilst maintaining minimal spill into existing residences, i.e., 2lux "post curfew".

2.0 Introduction

As AxisEng have been commissioned to engage in the design intent for both street lighting and Mechanical & Electrical Services, this report will outline the precursive requirements as set out by FCC and other lighting guidelines - including ILP Guidance Notes for the Reduction of Obtrusive Light (GN01:2011) in relation to the impact on residences with regards to the lighting design and any light spill elements.

Lighting Reality Software was used to confirm the proposed lighting is compliant with both Fingal County Council and the ILP Guidance Notes. Lighting Reality was used as this was requested by FCC to confirm the P1 Class of lighting is met with the proposed design. The software gives a detailed output in terms of the lux levels and lighting types used. The software provides a detailed summary of all proposed fittings with their locations, heights, and quantities – refer to Appendix A attached.

3.0 Lighting Design

3.1 Design Parameters

In order to meet the requirements, set-out by Fingal County Council the following parameters were considered:

- According to ILP Guidance Notes
 - Environmental zone of E4 – urban i.e., Town/City centre with high levels of night-time activity
 - The permitted light spill allowance within this zone is:
 - Pre-curfew – 25lux
 - Post-curfew (between 21:00/23:00 to approx. 05:00/07:00) – 5lux
- The Fingal County Council Street Lighting Specification does not outline the parameters for curfew times; therefore, this report includes for a curfew time of 23:00 to 05:00.
- Proposed public lighting shall be controlled via Photo Electric Cell Units (PECUs) via a 7-pin NEMA socket and pre-set to an on/off level of 35/18lux – as per Fingal County Council Public Lighting Specification.
- Lighting levels to disabled access parking space of 30lux average.

3.1.1 Proposed New Street Re-development

The luminaire type proposed for the New Street replacement lighting scheme, the fittings shall be mounted on or at building facades at varying heights to align with the building facades available – refer to Appendix A page 2 for referenced heights.

The proposed public lighting luminaire has been selected to maintain a P1 Class throughout the development. The design is modern and simple, in keeping with the concept of decluttering of the streetscape. Fittings have been positioned on or at commercial businesses to ensure private residences are kept clear of any items and reduce any spill to these buildings.

The existing lighting has been included at both the north and south of the street to accurately confirm lux levels.

3.1.2 Conclusions

Page 3 of the attached Appendix A outlines in tabular form the max, min and average lux levels on the selected grid area. This also denotes the lux contours in graphical form.

The following results can be noted from the Lighting Reality Report (Appendix A):

- The overall average lux level is compliant with the P1 Class for public lighting – 15.08lux (Eav) with the required being 15lux
- The minimum lux level is compliant with the P1 Class for public lighting – 2.24lux (Emin) with the required being 2lux
- The area currently with the lowest lux level is a private residence and avoiding spill into these private residences is part of the overall lighting design strategy

Refer to drawing NSM-X-X-DR-AXE-EE-60101 to view lux level contours and lighting locations in detail.

4.0 Mechanical & Electrical Services

There shall be an element of site services design during the detailed design period. This shall include coordination with the Civil Engineer with regards to in ground services. A developed detail design shall be presented which includes new services, relocating of existing and removal of redundant services.

There are existing site services as follows:

- Eir – existing includes ducting/chambers within footpaths on either side of the street
- Gas Networks – existing includes a low pressure routed down the righthand side of the street
- ESB - existing includes ducting/chambers/mini pillars within footpaths on either side of the street
- There is currently no Virgin Media presence noted on this street
- A provision for additional ducting for future telecoms has been included – 2No 110mm ducts for future and 2No 110mm ducts for telecoms services to the street development

The following sections outline the specific Mechanical & Electrical requirements for the design intent and detailed design.

4.1 Mechanical Services

An allowance has been made in the current design intent for the inclusion of 2No. in-ground potable water units. These are envisioned to be used by street market vendors and/or during special events on the street.

4.2 Electrical Services

Further to the public lighting element of the proposed development, the current design intent includes for the following electrical elements, refer to drawing NSM-X-X-DR-AXE-EE-60101 unless otherwise stated:

- EV Bike charging stations – for public usage
- In-ground power - envisioned to be used by street market vendors and/or during special events on the street
- Feature lighting to landscape planters – LED lighting beneath planters, these shall include access chamber within benches to allow for maintenance
- Automated traffic barriers – these shall include “timeclock” elements for loading and unloading to businesses with an access control element for the residences/businesses on the street
- USB’s within benches – to be coordinated with feature furniture
- Feature lighting – up-lighting of specimen trees
- The existing public Wi-Fi shall be retained in place

5.0 Energy Report

With consideration to the EU Energy Performance of Buildings Directive (EPBD), the Building Regulations Technical Guidance Document, for sustainable design and reductions in energy and carbon emissions, the services design strategy for the development is to utilise sustainable design options and energy efficient systems that are technically, environmentally, and economically feasible for a project of this kind.

The strategy targets a low energy and environmentally friendly development. This report will demonstrate that the design philosophy for the proposed development will employ a holistic approach to the construction and integration of the services, and its users. This philosophy is supported using sustainable solutions and energy efficient systems throughout.

This design team recognises the need for the development to be designed and operated in a manner that reduces the environmental impact of the development as a neighbourhood. This objective will be achieved in an economical manner whilst maintaining an environment that is comfortable for occupants and visitors.

While undertaking the analysis on the proposed development, it presented us with an opportunity to develop a design to ensure the development performs with a high energy efficiency and satisfies regulation challenges.

This report schedules a list of different elements considered and the use of active measures designed to reduce energy and costs for the duration of the development's lifecycle.

6.0 Sustainability Overview

The sustainability design of the proposed development presents an opportunity to ensure the development performs efficiently and meets any energy challenges. The following design elements will be incorporated to reduce energy and carbon emissions through the proposed development lifecycle.

6.1 Active Measures

Active measures have been considered to ensure minimal energy consumption, robust design, optimal operation, and minimal life cycle costs are achieved. The active energy measures considered include the following technologies:

- Automatic daylight control including timeclocks and photocells. Intelligent lighting controls allow for electrical energy savings.
- The majority of luminaires selected will be based LED type (A+ Rated) providing a reduction in electrical energy usage.
- Metering to monitor & optimise substantive energy use, reducing clients' overall energy consumption and carbon footprint, and reducing energy costs.
- Electric bike charging points will be provided with easy-to-use metered supplies, in line with the sustainable design strategy.
- Low flow water demand outlets with inbuilt leak detection and metering. This will provide users with potable or cold-water outlets for use, while ensuring no unnecessary water loss.

7.0 Reference Information – Appendices

- NSM-X-X-DR-AXE-EE-60101 – Mechanical & Electrical Services
- NSM-X-X-DR-AXE-EE-60102 – Existing Site Services
- NSM-X-X-DR-AXE-EE-60103 – Proposed Site Services
- Appendix A – Lighting Reality Report

DATE: 21 February 2023
DESIGNER: JC
PROJECT No: P22074
PROJECT NAME: New Street Malahide

**LIGHTING
REALITY**

Outdoor Lighting Report

PREPARED BY: JC - Electrical Engineer
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Layout Report

General Data

Dimensions in Metres Angles in Degrees

Calculation Grids

ID	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	Grid 1	722623.35	746121.12	20.27	129.19	1.45	1.48

Luminaires

Luminaire A Data

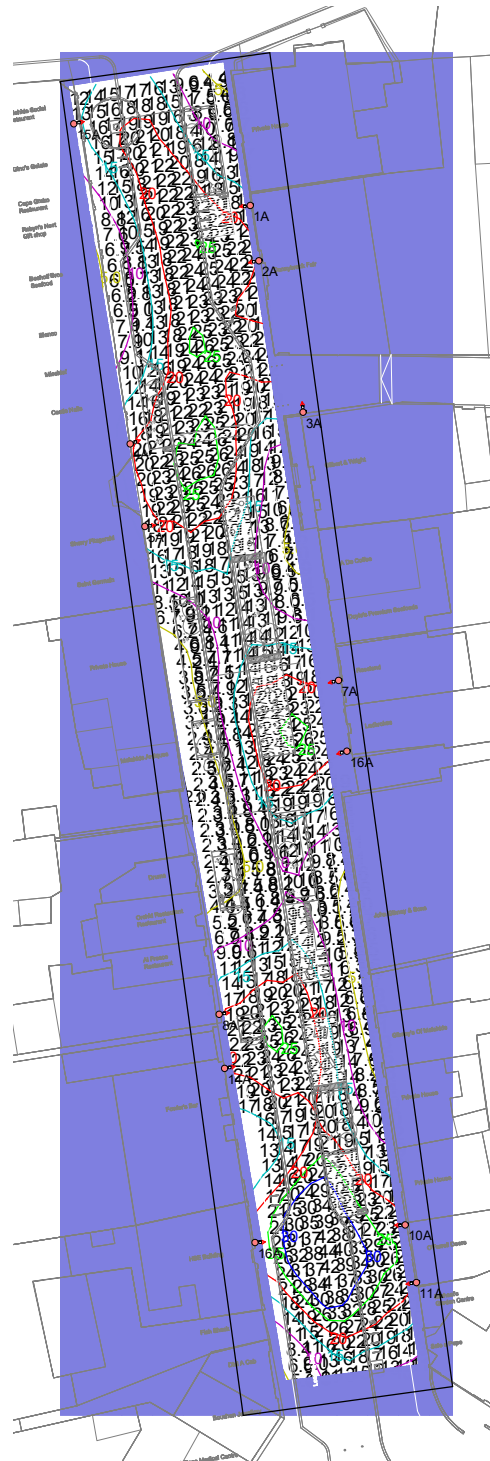
Supplier	
Type	P875_A09J
Lamp(s)	LED Warm White
Lamp Flux (klm)	3.65
File Name	P875_A09J.IES
Maintenance Factor	0.96
Imax70,80,90(cd/klm)	230.0, 53.2, 0.0
No. in Project	16

Layout

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	722624.02	746237.17	7.50	184.00	15.00	0.00	0.50			
2	A	722624.85	746231.90	6.00	191.00	15.00	0.00	0.50			
3	A	722629.11	746217.38	6.00	97.00	10.00	0.00	0.50			
4	A	722612.52	746214.35	5.80	20.00	15.00	0.00	0.50			
5	A	722613.91	746206.42	5.80	7.00	15.00	0.00	0.50			
7	A	722632.50	746191.63	6.00	194.00	15.00	0.00	0.50			
8	A	722621.04	746159.60	6.30	10.00	15.00	0.00	0.50			
10	A	722638.90	746139.38	6.00	181.00	15.00	0.00	0.50			
11	A	722639.97	746133.88	6.00	190.00	15.00	0.00	0.50			
13	A	722626.39	746112.59	6.00	334.00	10.00	0.00	1.00			
14	A	722648.42	746116.70	6.00	216.00	10.00	0.00	1.00			
15	A	722624.10	746266.07	6.00	282.00	10.00	0.00	1.00			
14	A	722621.57	746154.43	6.30	10.00	15.00	0.00	0.50			
15	A	722607.12	746245.05	6.00	13.00	15.00	0.00	0.50			
16	A	722633.30	746184.85	6.00	198.00	15.00	0.00	0.50			
16	A	722624.48	746137.69	4.75	4.00	15.00	0.00	0.50			

Horizontal Illuminance (lux)

Grid 1



Results

Eav	16.49
Emin	2.27
Emax	43.62
Emin/Emax	0.05
Emin/Eav	0.14