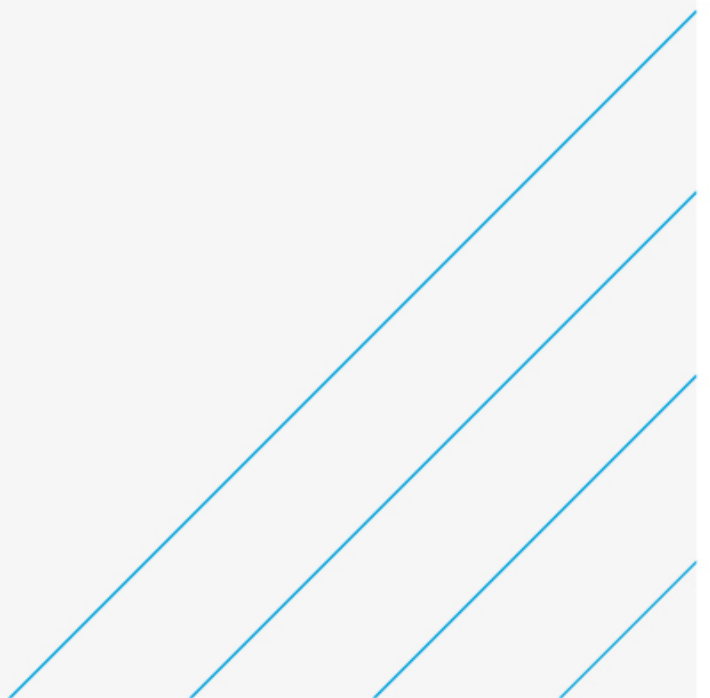


Spring Lane and Ellis Yard Redevelopment

MEP Engineering Report & Energy Statement (Part L
Requirement)

Cork City Council

July 2023



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Outline

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1. Public Lighting Design

This section outlines the proposed public lighting schemes for the proposed residential housing development for the Ellis yard and Spring Lane development.

The public lighting system will be a very high quality, energy efficiency and future proofed road lighting for housing development in compliance with Cork City Council (CCC) requirements.

1.1. Public Lighting Design Standards

Each category of roads, footpath, cycle track of the site development will be designed to its own specific requirements, illuminance level and uniformity to meet the lighting class for each area.

All works will comply with the latest editions of the relevant standards, in particular the works shall be designed to take full account of: -

- BS EN 13201 part 2 – Road Lighting Performance requirements.
- BS EN 13201 Part 3 – Road Lighting Details calculation of performance.
- BS EN 13201 Part 4 – Details methods of measuring light performance.
- The Current British Standards for Road Lighting are BS 5489 and BS EN 13201.
- Cork City Council Exterior Lighting Design Requirement
- BS EN 60529 - Specification for Degrees of Protection for enclosures.
- BS EN 60598-2-3 - Luminaires for Road and Street Lighting.
- BS 5489 -1 - Code of Practice for the design of road lighting.
- BS EN ISO 1461 Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods.
- IS EN 40-1 – Lighting Columns (Definitions and terms).
- IS EN 40-2- Lighting Columns (General requirements and dimensions).
- IS EN 40-3 - Lighting Columns (Design and verification and Verification by testing).
- IS EN 40-5 - Lighting Columns (Requirements for steel lighting columns).
- Roads Act, 1993. Road Traffic Act, 1994.
- Safety, Health and Welfare at Work Act 2005.
- Safety, Health and Welfare at Work Construction Regulations 2013.
- Building Control Act 2007.
- Road Traffic (Control of Traffic) Regulations 2006.
- ET 101 - National Rules for Electrical Installations published by ETCI.
- ET 211 - Code of Practice for Public Lighting Installations in Residential Areas published by ETCI.
- BS 7671 - Requirements for Electrical Installations. 7

1.2. Health & Safety

The attention of the Designer / Developer will be drawn to the obligations arising under the Safety, Health and Welfare at Work Act 2005 or latest approved version such as: -

- Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2012 or latest approved version.
- Safety, Health and Welfare at Work (Construction) regulations 2013 or latest approved version. Account will be taken of any traffic management measures that may be required during the installation of public lighting schemes including compliance with Chapter 8 of the Traffic Signals Manual published by the Department of Transport.

1.3. General Public Lighting Design Requirement

The site development public lighting installations will be designed by a competent public lighting engineer who has successfully completed the Institution of Lighting Professionals (ILP) Diploma in Exterior Lighting and is an active member of the Institution of Lighting Professionals, and as accepted by CCC public lighting department, to ensure that best practice is applied in the external lighting design of this residential development. This will include the requirement that public lighting schemes considers from junctions and traffic (both Pedestrian and Vehicular) conflict areas back i.e. T-junctions, pedestrian crossings, public and private car parking, as appropriate.

All new systems of public lighting of a new development will be designed and installed in accordance with the requirements and as accepted by CCC public lighting department.

The overall lighting requirements for a specific area will be identified within the European design code. This will then be expanded and refined to take account of an area's unique character and needs in terms of vehicular/pedestrian activity, location of local amenities, etc by the design brief. However, generally the requirements of the specific design code as stated above in Public Lighting Standards will be met.

All luminaires will be manufactured to a minimum of IP66 to BS EN 60590 for the lamp containment area and should be manufactured from vandal-resistant material. Lanterns will be designed and tested to provide a minimum normal operating life of 25years.

Construction of lighting columns and luminaire specifications shall comply with the CCC Public Lighting Manual and Product Specification 2021, the installation of schemes in residential areas guideline document.

Lighting control and installation details shall also comply with the above document.

In determining levels of illumination, lighting positions and styles, the design brief will consider pedestrian and vehicular uses/needs in relation to the following: -

- Areas of activity - Shops, School entrances, Creche entrance, Gym, bus stops (as appropriate), paths, etc and areas of conflict (junctions, etc).
- Building heights.
- Street features - crossing points, sitting areas, tree planting, pinch-points, materials / colours, etc.
- Ground form levels (important to people with disabilities), hazards, etc. Local knowledge, incidence of vandalism, accident black spots, etc.

1.3.1. Obtrusive Lighting

Considerations will be given to the restriction of obtrusive light by: -

- The control of the type of light source Restricting the level of light emitted by the luminaire at high angles usually between 70 and 90 degrees.
- The use of full horizontal cut off luminaires for mounting heights above 6m will have a substantial effect on restricting obtrusive light. Similarly, the use of shallow bowl luminaires for mounting heights of 6m or less will help to reduce the overall level of obtrusive light produced by road lighting installations, but may add to the numbers of lighting units required
- Careful consideration will be given to the design, installation, and maintenance of any lighting systems adjacent to the site to reduce the risk of damaging the night sight of the transport operators or reducing the visibility of signaling equipment.

1.3.2. The Residential Areas

Residential areas will be designed using an 'P4' illuminance class derived from BS EN 13201. General street lighting will be installed on 6m columns and 8m where required.

1.3.3. Pedestrian Crossings

Pedestrian crossings will be lit in accordance with BS5489-1:2013 and ILP Technical Report 12.

The maintained illuminance level for the pedestrian crossing is proposed as follows: -

- Average vertical illuminance on this axis of pedestrian crossing at a height of 1m: $E_v \geq 40$ lux
- Uniformity of vertical illuminance on lane in front of the driver ($E_{v \min}/E_{v \text{ av}}$): 0.20
- Average horizontal illuminance on pedestrian crossing at ground level: $E_h \geq 80$ lux
- Uniformity of horizontal illuminance ($E_{h \min}/E_{h \text{ av}}$): 0.30

Traffic route lighting and lighting of residential estates will be powered by local minipillars.

1.4. Trees & Arboriculture

Trees and other vegetation will not impede the functions of public lighting units. A separation of 5 metres between the lighting column and the outside of the crown will be allowed for the lighting to work as designed. Trees or vegetation will not be planted within 7 metres of a public light column.

The design will take into consideration the layout of the proposed public lighting column locations and the proposed landscape design. Both layouts will be coordinated to achieve the 7 metres separation between all trees and public lighting columns.

1.5. Access Chambers

Where appropriate, the access chambers for the site will be selected as per the table below standards and as appropriate.

Table – Chamber Type Description

Item	Chamber Type	Chamber Description
01	Large Inspection Chambers	All access chamber covers on the footpath to cater for a change of direction are proposed to be ductile

		iron with galvanized steel frame with frame opening 615mm x 615 mm to EN 124 D400 marked "Public Lighting" or "Traffic" with M16 stainless steel locking bolt
02	Medium Inspection Chambers	Access chamber covers on the footpath for straight through services are proposed to be ductile iron with galvanized steel frame with frame opening 720mm x 260 mm to EN 124 D400 marked "Public Lighting" or "Traffic" with M16 stainless steel locking bolt.
03	Small Inspection Chambers	Access chamber covers on the footpath for column connections shall be ductile iron with galvanized steel frame with frame opening 385mm x 260 mm to EN 124 B125 marked "Public Lighting" or "Traffic" with M16 stainless steel locking bolt or similar approved

2. Existing Utility Infrastructure

2.1. Identification of Utilities

A desk study of records from various utility companies was undertaken and the following utility holders were contacted, and records obtained / converted into digital format: -

- Irish Water (Foul and Watermain)
- Storm Water
- ESB Networks
- Eir

During the construction phases of the project, realignment, upgrade and replacement of services and utilities will be required in conjunction with and to accommodate the proposed works. These works will include: -

- Provision of new services to provide connections to the proposed development as per the overall designs

3. Proposed Utilities

This section outlines the proposed MEP utilities schemes for the proposed residential development on lands at Ellis Yard and Spring Lane

The Electricity and IT communications system will be designed and installed to the current guidelines.

3.1. Standards

All works will comply with the latest editions of the relevant standards, in particular the works shall be designed to take full account of: -

- Safety, Health and Welfare at Work Act 2005.
- Safety, Health and Welfare at Work Construction Regulations 2013.
- National Rules for Electrical Installations 4th Edition ET 101: 2008, including amendments, published by the Electro-Technical Council of Ireland (ETCI).
- Code of Practice for the Design, Selection and Erection of LV Switchboards for Residential Applications: ET 208: 2000 published by the ETCI.
- Code of Practice for Customer Interface, current edition published by ESB Networks (ESBN).
- ELECTRICAL SERVICES GUIDEBOOK – Housing Schemes, current edition published by ESB Networks.
- The Building Regulations published by the Department of Environment, Heritage and Local Government (DOEHLG).
- Code of Practice for Avoiding Danger from Underground Services published by the Health and Safety Authority (H.S.A.).
- Criteria document Cer/08/071 and any other requirements specified by the Commission for Energy Regulation (CER).
- BS 7671 - Requirements for Electrical Installations.

3.2. Electrical Infrastructure Preliminary Information

The total site electrical load is to be supplied by ESB Networks with a maximum estimated demand load of in the range of 300kVA (approximately).

The main ESB power cable will be buried in ducts or direct buried and specified as multicore XLPE/SWA/PVC. The electricity supply to each dwelling via standard ESB Networks standard LV minipillars scattered around the site.

Clarification:

The total estimated power electrical load for the development have been based on BSRIA / Rules of Thumb Guidelines for building services (5th Edition) - CIBSE / Energy Benchmarks.

- Predicting Electrical Future Load Growth - 10% power load growth factor is considered regarding future power expansion for the building associated with Building expansion and function of the building or facilities and Equipment technology within the building.
- Renewable Energy - Based on the Heat pumps systems.
- Every house which has a parking space on curtilage to be allow for a possible charging point.
- Houses heating and domestic hot water production will be achieved with individual heat pumps.

3.3. Energy Statement

The proposed design strategy will ensure sustainable energy efficiency to ensure low running cost of use and consideration of green energy.

Some of considerations are listed below: -

- Highly insulated external building façade
- Materials with long time life expectancy and low embodied energy.
- Consideration of water saving measures including water saving devices and controls and limiting the heat loss from pipes, ducts and vessels used for the transport or storage of heated water or air.
- Providing energy efficient space heating and cooling systems, heating and cooling equipment, water heating systems, and ventilation systems, with effective controls.
- Providing energy efficient artificial lighting systems (LED) and adequate control of public and internal lighting systems.
- The guidance of the MEP design in compliance with Building Regulations Part L recommendations for conservation of fuel and energy setting of minimum energy performance requirements for building to achieve the Nearly Zero Energy Building, providing that the energy performance of the building is such as to limit the calculated primary energy consumption and related Carbon Dioxide (CO₂) emissions as is reasonably practicable.
- Limitation of Carbon Dioxide (CO₂) emissions to a Nearly Zero Energy Building level insofar as is reasonably practicable of for Landlord areas/ and Non-domestic buildings using the Non-domestic Energy Assessment Procedure (NEAP) published by Sustainable Energy Authority of Ireland.
- Ensuring that when a building element that forms part of the building envelope and has a significant impact on the energy performance of the building envelope, and the energy performance of the building element meets minimum energy performance requirements, functionally and economically feasible.
- The energy performance of each house will comply with the requirement of Part L building regulations
- System design that provides to the building owner or occupants sufficient information about the building, the fixed building services, controls and their maintenance requirements so that the building can be operated in such a manner as to use no more fuel and energy than is reasonable.

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