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1. INTRODUCTION

Lawler Consulting has been commissioned by Bluemont Developments (Firhouse) Ltd to provide transport engineering advice and to prepare an updated M&E Services Report for a proposed amendment (the provision of 5 no. additional units) to a previously granted 78 no. unit Large-Scale Residential Development (LRD) at No. 2 Firhouse Road and the former 'Morton's The Firhouse Inn', Firhouse Road, Dublin 24 (SDCC Planning Ref: LRD24A/0001). The additional 5 no. units result in a new total provision of 83 no. units.

This report outlines the nature, suitability, and overall design approach to the design of the Mechanical and Electrical services installations throughout the proposed prestigious development.

2. DESIGN PHILOSOPHY

The design philosophy for the residential development is to deliver highly effective building services and environmental design solutions in harmony with the Client's requirements and the Architect's vision.

The objectives are to provide Building Services Installation designs based on robust systems in order to ensure reliable performance throughout. Systems and components will be selected on a low-maintenance/low-energy approach to ensure ongoing operational costs are minimised throughout the building and associated systems' life cycles.

Residential development concerns many aspects across a wide spectrum of issues, which include economic, environmental, quality of life, as well as energy and resource consumption. Lawler Consulting have considered these aspects most applicable to the built environment such as reducing energy usage through quality design solutions as well as the selection of materials and equipment which are obtained from sustainable sources or have the lowest possible in--use environmental impact.

The Mechanical and Electrical systems will be designed to be user friendly with simple intuitive controls appropriate for the technical abilities of the staff.

Service Co-ordination: Our approach is to ensure co-ordination of mechanical and electrical services design solutions and to work closely with the architect, and remaining design team such that the mechanical and electrical services are coordinated in respect of the integration of services with other specialists and main contract works.

It is proposed to meet the developments NZEB requirements through the utilisation of a centralised air to water heat pump located in a plant room with a network of pipework providing hot water for both heating and plumbing services to each housing unit. A local Heat Interface unit will be located in each apartment which will give instantaneous demand usage when required by each householder.

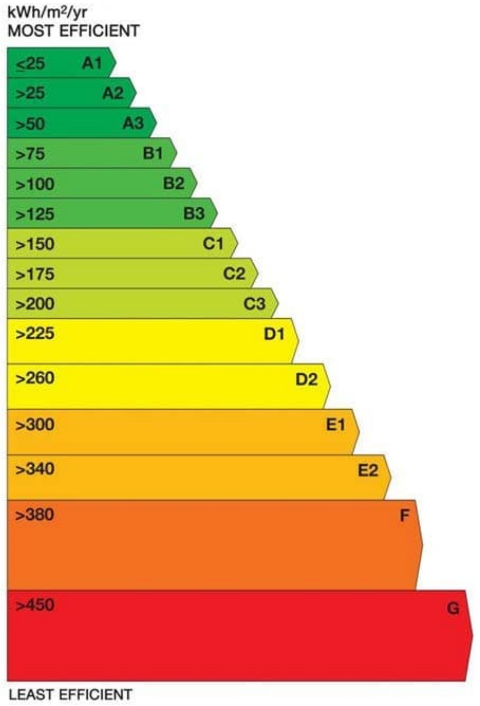
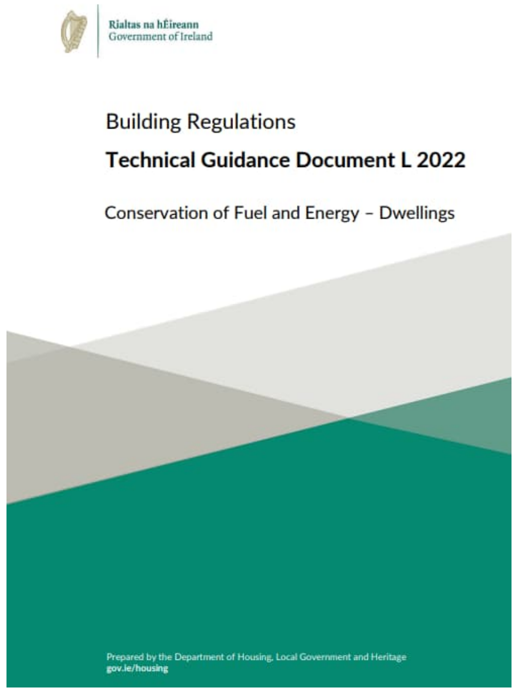


Figure 01: Building Energy Rating Categories


Rialtas na hÉireann
Government of Ireland

Building Regulations

Technical Guidance Document L 2022

Conservation of Fuel and Energy – Dwellings

Prepared by the Department of Housing, Local Government and Heritage
gov.ie/housing

Figure 02: Part L of Building Regulations

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3. SITE INFRASTRUCTURE SERVICES

3.1. ESB Services Infrastructure

The electrical supply infrastructure to the existing site will be managed by the ESB. There is currently overhead ESB power lines and poles adjacent to the site which supply the existing buildings. Lawler Consulting will apply for a new ESB connection to the site. The ESB will review the increased usage in the area and determine if the existing sub-unit will have enough capacity to allow for the new housing units. The new development will allow for diversion and undergrounding of the existing overhead power lines.

3.2. TV, Telecom, & Broadband Services Infrastructure

A new application for the site will be made by Lawler Consulting for TV, Telecom, and Broadband services. We will design for a flexible infrastructure which will allow service providers use the internal network of cabling infrastructure. Each apartment unit will be supplied with high speed broadband and TV service via central riser location. Currently OpenEIR have existing ducting close to the new site. A local OpenEIR manhole (1281) is provide new route to housing development,

In Multi Dwelling Units (MDU's) an individual Optical Network Terminal (ONT) is located in each apartment. A fibre connection will be provided between each apartment at the Access Terminating box (ATB) and the Optical Distribution Frame (ONF) in a designated communications equipment area close to the foot of the riser.

Figure E03: Existing OpenEIR network

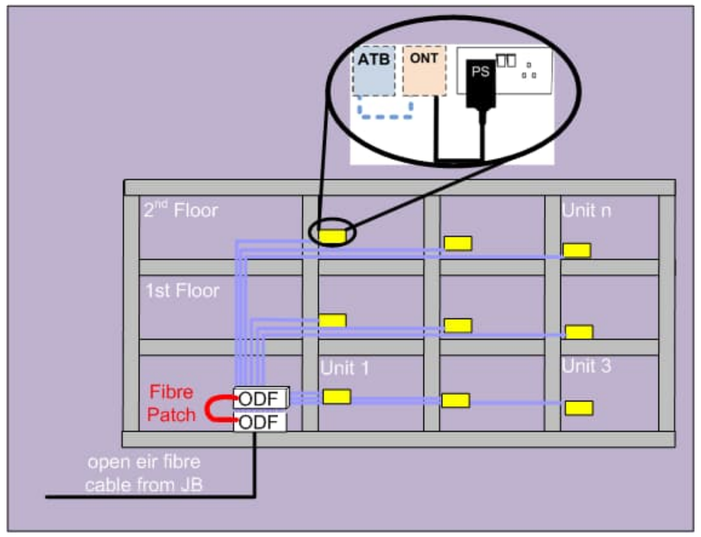

Figure E04: Internal OpenEIR network Schematic

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4. MECHANICAL SERVICES INSTALLATIONS

4.1. Thermal Analysis

A detailed thermal analysis will be completed for the duplex units using approved level 5 dynamic simulation software by our in-house accredited Irish Part L and BER assessor.

The results of this analysis will confirm the proposed services design will comply with Part L compliance and any local authority requirement which may be over and ensure all apartments achieve a minimum BER ‘A2’ Rating.

The results of the Thermal Analysis will be contained within Lawler Consulting Engineering Energy and Part L Strategy Report, which will be issued during Stage 2.

4.1.1. Heat pump

The air source heat pump (ASHP) system provides low carbon energy to heat the buffer vessels. The external condensers linked to the heat pump are placed on the roof of the apartment block and fed internally through the service riser.

The ASHP system has the following features.

- The unit is suitable for the generation of LPHW heating water at a temperature of 65°C. Flow, 35°C return. We intend running at 60°C flow / 30°C for improved efficiency.
- The system working refrigerant fluid is R290
- The system can operate as standard down to -10°C while maintaining its heating output.
- Each external evaporator unit achieves a sound pressure level of 38 dBA @ 10m
- Each unit is provided with spring type anti vibration mounts with 99% isolation efficiency.
- The heat pump system has Modbus interface to facilitate full control & system diagnostic monitoring.

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4.2. Residential Heating Services

The dwellings are with individual Exhaust Air Heatpumps (EAHP) within each residential unit.

Each unit will be served with an EAHP unit. The indoor unit will be located internally in each dwelling, typically a utility room or cupboard, with the outdoor unit located either on the balcony or on the roof of the development.

Figure M11: Typical indoor heatpump unit)

Radiator heating will be provided to all dwellings served from the individual heatpump unit associated with each unit. The dwelling will be zoned to allow for separate time control of living and sleeping spaces. Each each radiator heating zone will be controlled via wall mounted digital temperature control stat to give local control over temperature in each room. In order to enable a time-depending temperature control program, a zone valve with actuator and a room thermostat can be included as an option.

A simple intuitive local wall controller will be provided interlocked with the heatpump to allow the user the following adjustable parameters:

- On/Off
- Quick Start
- Temperature Adjustment
- 7-day programming
- Standby with Frost Protection

Hot water to the apartment will be generated by the heatpump and stored internally in the indoor heatpump unit. The indoor heatpump unit will also be provided with an immersion heater.

4.3. Water Services Installations

The incoming mains water will be filtered and metered as it enters the building.

An approx. 4,600 Litre potable cold water storage tank will be located in the plant room to provide minimum 210 litres of water storage per bedroom. The water storage tank will be insulated to “Format 30” standard, meaning that all cold water distributed through the buildings shall be potable. The tank will be split to permit the tank to be cleaned without affecting water supply to the Apartments.

A variable speed, duty/assist/standby booster pumpset will be located in the Plant Room to pressurise the water services throughout the Apartment complex to a minimum of 3bar at the top floor.

Figure M09: Typical cold water storage tank

The water services will be distributed from the plant room and will rise vertically in each of the landlord risers to serve the apartments. Local isolation valves and Pressure Reducing Valves (PRV) for the water services will be strategically located within each riser should it be necessary to isolate any apartment.

The water supply to each apartment will connect to the EAHP to generate domestic hot water locally. A spool piece will be fitted on the potable cold water supply instead of a cold water meter. If cold water meter is required at later stage, the spool piece can simply be removed and replaced with Irish Water approved cold water meter.

4.4. Fire Protection

The complete firefighting installations throughout the Complex will be designed in accordance with the Fire Cert application provided by the Fire Consultant.

Local hand held Fire Extinguishers shall be provided, in accordance with IS 291

4.5. Soils & Wastes Installations

The soils and wastes throughout the Complex shall be uPVC pipework at all stacks primary and secondary distribution. Where soils and waste pipework runs through other apartments, the pipework shall be acoustically rated to avoid nuisance.

Final connections to all sanitary ware will be welded uPVC.

Soils pipework to each residential unit will be accessible for rodding within each riser. The complete above ground soils installation shall be fully accessible for rodding.

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5. ELECTRICAL SERVICES INSTALLATIONS

5.1. Power Distribution

There are existing ESB overhead lines adjacent the site, which will need to be diverted away put underground as part of the new development works. Power load studies are being carried out by the ESB to determine if the existing local supply has capacity for the new residential units. From the ESB Sub-unit, power is distributed from here to the ESB meter boards. Power is then distributed from the meters to sub-distribution boards located in the entrance lobbies of each residential unit.These sub-distribution boards will provide power to each of the dweillings. Landlord's sub- distribution boards will be located in the electrical risers to provide power to the landlord services.

Sub-main cables (and all other cabling) will be supported and contained within a cable containment system consisting of galvanised steel cable tray, cable ladder and cable trunking. The Cable containment systems generally traverse horizontally and are contained within the corridor ceiling void & electrical risers of each building block. The Cable containment installation will be coordinated with other services along agreed service.

5.2. Lighting Installations

The lighting design throughout the apartment development shall be designed in accordance with CIBSE Code for Lighting.

It is envisaged to use low energy LED light fittings throughout the development so as to significantly lower the electrical loading. There shall be collaboration with the architect to ensure the final lighting design is harmonious with the client's vision of the interior design including colours, finishes, etc.

LED recessed downlights will be allowed for in all apartment bedrooms and living / kitchen areas. Bedroom lighting will be 2-way switched from the door to one side of the bed. Bathrooms will be supplied with IP65 rated LED downlights. Utility / storerooms will be supplied with LED surface mounted luminaires. Lighting control to the apartment will consist of manual rocker switches.

5.3. General Power

The design for the General Services throughout the apartment buildings shall be in accordance with IS 10101:2020. National Rules for Electrical Installations.

General power outlets shall consist of twin 13A switched socket outlets and fused connection units etc. strategically located throughout the apartments building block. The exact quantity of general power outlets is in accordance with the agreed layout drawings.

Wiring accessories located in the apartments will be brushed stainless steel finish with black inserts and outboard rocker switches in order to comply with Part M of the Building Regulations. Wiring accessories located in the landlords areas will be white PVC finish. Wiring accessories located in the plant rooms will be surface mounted metalclad type.

5.4. Protective Services; Fire Detection and Alarm System

The Automatic Fire Detection & Alarm System (AFDS) throughout the apartment building blocks will be designed in accordance with IS3218 Standards for Fire Detection and Alarm Systems for Buildings

The automatic fire Detection & alarm System (AFDS) will generally consist of combination smoke detector / sounder units in entrance lobby areas, smoke & heat detection in public areas (where appropriate).

The fire alarm system will incorporate open protocol analogue addressable control panels located at ground floor level entrances.

The AFDS will be also interfaced with the passenger lifts, the Public address, the Access Control system and the BMS.

The fire detection system will be interfaced with the intruder alarm system in order to enable 24hr monitoring from a central security control monitoring station if required.

Each residential unit will be provided with mains powered heat and smoke detection, heat detector where required under regulations.

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I.T. Structured Cabling Installations

Incoming Telecoms and Broadband connectivity to the residential units brought from the local wide infrastructure. The duplex block will be linked to utility services infrastructure by new incoming multi-core copper & fibre cables; terminated within a comms area. The new main comms area will consist of a central main distribution frame (MDF) with floor standing cabinets that will contain cable termination equipment (passive installation) and active equipment consisting of servers, POS switches, routers, etc. CCTV central equipment central (active) control equipment will also be contained within the main comms room

5.5. Intruder Alarm Installations

There is provision for Intruder Alarm Systems (wiring only) to all ground floor apartments. The system will be designed in accordance with I.S. EN 50131- Alarm systems, intrusion and hold up systems.

5.6. Television

All the residential should be wired for Openeir and SIRO distribution systems

- 1 Bed unit 2No. TV point to the bedroom and living area.
- 2 Bed unit 3No. TV point to the bedrooms and living area.

Comments

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