



**SUSTAINABILITY & ENERGY REPORT  
MECHANICAL & ELECTRICAL  
MONASTERY ROAD APARTMENTS**

**Propiteer Ibis Red Cow Ltd**

**Monastery Rd  
Clondalkin  
Dublin 22**

**Project: 2022  
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**Project Details:**

Project: Monastery Rd, Clondalkin, Dublin 22.

Client: Propiteer Ibis Red Cow Limited,  
9 Exchange Place,  
IFSC  
Dublin 1.

Architect: Shane Birney Architects,  
Building 80/81,  
Ebrington  
Derry-Londonderry,  
Northern Ireland.

Planner: Downey Planning,  
29 Merrion Square,  
D02RW64.

Engineer: Taylor & Boyd LLP  
12 Windsor Terrace,  
Infirmary Road  
Derry/Londonderry  
BT48 7HQ

M&E Consultant: Fallon Design Ltd.  
Suite 4,  
No. 4 Riverwalk,  
Arklow,  
Co. Wicklow.

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## 1. Introduction

The following report will set out the mechanical and electrical strategy including Part L compliance for the proposed residential development at Monastery Rd., Clondalkin, Dublin 22. The compliance will be in accordance with latest Part L: Conservation of Fuel & Energy – Dwellings.

## 2. Project Description

The proposed development provides for a total of 115 no. build-to-rent apartments (10 no. studio 1-bed units, 62 no. 1-bed, 38 no. 2-bed units and 5 no. 3-bed units), with ancillary residential services & amenities including conference room (75m<sup>2</sup>), gym (61m<sup>2</sup>), studio (21m<sup>2</sup>), meeting room (23m<sup>2</sup>), 2 no. lounges (71m<sup>2</sup> & 54m<sup>2</sup>), games room (44m<sup>2</sup>), concierge (27m<sup>2</sup>) and managers office (27m<sup>2</sup>) and associated underground car parking, car share & bicycle parking, 1 no. ESB substation, landscaping including semi-private open space courtyard & communal roof top terrace, pathway & boundary treatments, and all associated engineering and site development works necessary to facilitate the development.

## 3. Apartments – Mechanical Solution

### 3.1 Exhaust Air Heat Pump (EAHP) & Mechanical Extract Ventilation (MEV)

The heating and hot water strategy shall be used for the apartments in the development in accordance with current Part L of the building regulations and compliance demonstrated with the latest edition of the DEAP software.

### 3.2 Element 51 – Heating Centre

The proposed heating and hot solution for the apartments shall be designed as an exhaust air heat pump. An Exhaust Air Heat Pump (EAHP), is an energy recycling system. It extracts energy from the warm air as it leaves the home via the ventilation system and uses it to heat the radiators and Domestic Hot Water (DHW).

The installation of an EAHP is self-contained within each apartment and only requires an ESB connection and standard mains water connection.

An exhaust air heat pump can satisfy the heating requirements of a well-insulated apartment in some of the coldest conditions. When working efficiently, it can reduce energy consumption of heating by up to 50% when compared to conventional heating systems.

If there is an extended period of cold weather the heat pump will call on a suitably sized back up heater to assist in meeting the apartments requirement.

The extracted air from the wet rooms is passed through the ducting into the heat pump. At this point, if there is a heat or hot water demand, the air passes through the heat pumps evaporator, which transfers the heat into the heat pump's refrigerant circuit.

The cooled air is then discharged from the unit and exhausted outside. Meanwhile, the vapour compression cycle of the heat pump raises the temperature of the refrigerant and transfers the extracted heat into a water-based system that can either heat the domestic hot water via a coil in an indirect cylinder or heat the building via radiators.

The EAHP is controlled with a touchscreen wall controller in each apartment with a phone app function as standard.

A local 200 litre hot water storage cylinder shall be located in a hot press of each apartment and meets the demands of the resident's hot water. An electric immersion shall be installed for boost and fast recovery of the cylinder if required.

### **3.2.1 Element 56 – Space Heating**

The units will be heated with steel, horizontal panel radiators in each room of the units and designed for the operating temperature of the heat pump.

Each unit shall have two heating zones, the first zone will be the main open plan kitchen /living room and the second zone will be the bedrooms.

Heating control in the kitchen / living room will be with a 2-port valve and the room thermostat. Heating control in the master bedroom will be with a 2-port valve and thermostat. TRV's will control the space temperature in all other bedrooms.

### **3.2.2 Element 57 – Apartment Ventilation**

The ventilation for the apartments shall be provided by the EAHP and be classed as mechanically ventilated. The central extract shall operate on the principle of mechanical extract ventilation (MEV).

MEV will be commissioned with two dedicated extract flow rates for the unit, one for background ventilation and one for boost ventilation.

- The background ventilation rate will be maintained 24/7 in order to ventilate the unit and maintain the heat pump operation volume flow rate.
- The boost ventilation will be activated by a drop-in air or water temperature and raise the volume flow rate to a maximum pre-set value.
- Passive wall inlet vents are required in all habitual rooms.

### **3.2.3 Basement Ventilation**

Basement level -1 and -2 requires between 3 and 10ACH rate mechanical extract which will be controlled by CO2 sensor to comply with Part F and will be linked to fire alarm system.

#### **4. Electrical Services**

##### **4.1 Element 61- Mains Distribution**

A new ESB electrical supply will be brought to each apartment in accordance with ETCI and ESB standards. A centrally located meter enclosure shall be provided with direct access from the public road.

##### **4.2 Element 63 – Lighting Services**

Low energy LED lighting shall be designed and specified in accordance the BER requirements in each unit and in the landlord areas in accordance with Part L.

Low energy LED public lighting shall be designed in accordance with CIBSE lighting guide and local County Council public lighting standards.

## **5. Electric Vehicle (EV):**

### **5.1 Element 62- General Services**

With introduction of new guidelines from the Irish government and the growing demand for alternative sources of fuel, the public's need for EV charging options is ever increasing in popularity. The following allowance will be included in the development for EV charging.

#### **5.1.1 Apartments:**

Fifty Five (55) car park spaces shall be provided with EV charging points for the development. The remainder of the apartment car park spaces shall be enabled for 3<sup>rd</sup> party management company operated EV charging points. This will be managed with pre-paid open access for all residents and the number and points can be added as demand from the residents increases.

## 6. Proposed Building Fabric Summary:

### 6.1 Construction Method:

The proposed construction method for the building shall be in accordance with the engineer's drawings and façade finishes as per the Architectural specification. The following shall outline the back-stop thermal performance achieved as part of the detailed design stage in accordance with the current Part L 2019 requirements achieving nearly energy zero standards;

○ Floor	0.15 W/m <sup>2</sup> K
○ Wall	0.18 W/m <sup>2</sup> K
○ Roof:	
▪ Type No. 1	0.14 W/m <sup>2</sup> K
▪ Type No. 2	0.16 W/m <sup>2</sup> K
○ Main Door	1.2 W/m <sup>2</sup> K
○ Windows	1.3 W/m <sup>2</sup> K

### 6.2 Air Tightness:

Air tightness Target: < 3m<sup>3</sup>/hr/m<sup>2</sup> at 50 Pascals

Air tightness Method: Air tight membrane with internal plaster

### 6.3 Thermal Bridging:

Thermal Bridging Factor: 0.08 W/m<sup>2</sup>K

Key junction details will meet ACD standards. The relevant construction drawings to be signed off by the developer, builder, site engineer & project Architect in compliance with the requirements of SEAI and B(C)AR.

### Glossary of Terms:

- HP	Heat Pump
- CH & DHW	Central Heating & Domestic Hot Water
- kWh's	Kilowatt Hours
- EAHP	Exhaust Air Heat Pump
- MEV	Mechanical Extract Ventilation
- TRV	Thermostatic Radiator Valve
- DCV	Demand Control Ventilation