FALLON DESIGN
M&E ENGINEERING

SUSTAINABILITY & ENERGY REPORT
RESIDENTIAL DEVELOPMENT
LANDS AT 23-28 PRUSSIA STREET, DUBLIN 7.

Randalswood Construction Ltd.
Lands at 23-28 Prussia Street,
Dublin 7.

Project: 1981
Issue: Planning
Rev: I

ADDRESS Avocet House, Riverwalk, Arklow, Co. Wicklow. Y14 XD68. CONTACT +353 402 20612 WEBSITE www.fallondesign.ie
EMAIL info@fallondesign.ie DIRECTOR **MARK FALLON** CEng BEng MIEI MCIBSE
VAT No. IE 3452860GH

Table of Contents:

1. Introduction 4

2. Project Description 4

3. Apartments – Mechanical Solution 4
   3.1 Exhaust Air Heat Pump (EAHP) & Mechanical Extract Ventilation (MEV) 4
   3.2 Element 51 – Heating Centre 4
   3.2.1 Element 56 – Space Heating 5
   3.2.2 Element 57 – Ventilation 5

4. Electrical Services 6
   Element 61- Mains Distribution 6
   Element 63 – Lighting Services 6

5. Electric Vehicle (EV): 6
   Element 62- General Services 6

6. Proposed Building Fabric Summary: 7
   6.1 Construction Method: 7
   6.2 Air Tightness: 7
   6.3 Thermal Bridging: 7

Project Details

Project:	Prussia Street Development, Prussia Street, Dublin 7.
Client:	Randalswood Construction Ltd.
Architect:	Downey Planning & Architecture 29 Merrion Square North, Dublin 2
Engineer:	Lohan & Donnelly Consulting Engineers, 13 Gardiner Pl, Rotunda, Dublin 1.
Planning Consultant:	Downey Planning & Architecture 29 Merrion Square North, Dublin 2
M&E Consultant:	Fallon Design Ltd. Avocet House, Riverwalk, Arklow, Co. Wicklow. Y14 XD68

Document Details:

Version	Title	Author
Rev I	Sustainability & Energy Report	Fallon Design Ltd

Distribution Details:

Name	Method	Issue Date	Revision
Prussia Street	Email Copy	26.07.20	A
Prussia Street	Email Copy	12.05.21	B
Prussia Street	Email Copy	15.11.21	C
Prussia Street	Email Copy	15.12.21	D
Prussia Street	Email Copy	12.03.24	E
Prussia Street	Email Copy	22.08.24	F
Prussia Street	Email Copy	05.09.24	G
Prussia Street	Email Copy	20.09.24	H
Prussia Street	Email Copy	11.08.26	I

1. Introduction

The following report will set out the mechanical and electrical strategy including Part L compliance for the proposed the proposed development at Prussia Street. The compliance will be in accordance with the latest 2019 Part L: Conservation of Fuel & Energy – Dwellings.

2. Project Description

We, Randalswood Construction Ltd., intend to apply for permission for:

Development on lands at 23-28 Prussia Street, Dublin 7 (D07 X9X6, D07 FW30 & D07 PAF1), (located at the junction of Prussia Street and St. Joseph's Road, and bounded by No. 29 Prussia Street (Protected Structure) to the north, No. 22 Prussia Street to the south, and TU Dublin, Grangegorman Campus and boundary wall (Protected Structure) to the east). The development will consist of proposed modifications to the previously permitted Large-scale Residential Development (LRD) (permitted under planning permissions Reg. Ref. LRD6057/24-S3A and Reg. Ref. WEBLRD6103/26-S3), including modifications to the previously permitted total number of apartment units (110 No. Permitted units to now provide a total of 120 No. Apartment units i.e. 74 No. 1 beds, 43 No. 2 beds, 2 No. 3 beds, and 1 No. 4 bed) as follows: Modifications to Block C from a total of 53 No. Permitted apartments comprising of 34 No. 1 beds and 19 No. 2 beds, in a permitted building ranging from 7-8 storeys in height, to now provide two additional storeys to this block, to provide for a total of 63 No. Apartments comprising of 40 No. 1-beds and 23 No. 2-beds, with modifications to the unit mix of the permitted seventh floor, in a building now ranging from 7-10 storeys in height, and all apartments provided with private balconies/terraces to south, east and west elevations; 16 No. Additional cycle parking spaces to now provide a total of 240 No. Cycle parking spaces on site, and all associated site 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 heating 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 – 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.

4. Electrical Services

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 pedestrian walkway.

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):

Element 62- General Services

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

Apartments:

Electric vehicle car park spaces shall be provided within the development in accordance with current guidelines and project drawings. Ten percent shall be installed for pre-occupation and all car park spaces shall be enabled for 3rd party operated EV charging points.

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^{2}K
- Wall 0.18 W/m^{2}K
- Roof:
  - Type No. 1 0.14 W/m^{2}K
  - Type No. 2 0.16 W/m^{2}K
- Main Door 1.2 W/m^{2}K
- Windows 1.3 W/m^{2}K

6.2 Air Tightness:

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

Air tightness Method: Airtight membrane with internal plaster

6.3 Thermal Bridging:

Thermal Bridging Factor: 0.08 W/m^{2}K

Key junction details will meet ACD standards. The relevant construction drawings will 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