# Climate Action and Energy Statement incorporating Part L for Planning Compliance

For the

Mechanical and Electrical Services Installations

At

Leydens Wholesalers & Distributors
No.158A Richmond Road,
Dublin 3

For

Malkey Limited

Date of Issue: 23/02/2023 Revision: 00

## Document History

| Revision No. | Description | Prepared By | Reviewed By | Date |
|---|---|---|---|---|
| Rev 0 | Planning Issue | KT | RMK | 23/02/2023 |
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# Contents

# 1. Planning Overview

Malkey Limited intend to apply for permission for development (Large-scale Residential Development (LRD)) at this c. 0.55 hectare site at the former Leydens Wholesalers & Distributors, No. 158A Richmond Road, Dublin 3, D03 YK12. The site is bounded to the north-east by Richmond Road, to the west/south-west by No. 146A and Nos. 148-148A Richmond Road (pending application ABP Reg. Ref. TA29N.312352), to the south/south-west by a residential and commercial development (Distillery Lofts) and to the east/south-east by the Former Distillery Warehouse (derelict brick and stone building). Improvement works to Richmond Road are also proposed including carriageway widening up to c. 6 metres in width, the addition of a c. 1.5 metre wide one-way cycle track/lane in both directions, the widening of the northern footpath on Richmond Road to a minimum of c. 1.8 metres and the widening of the southern footpath along the site frontage which varies from c. 2.2 metres to c. 7.87 metres, in addition to a new signal controlled pedestrian crossing facility, all on an area of c. 0.28 hectares. The development site area and road works area will provide a total application site area of c. 0.83 hectares.

The proposed development will principally consist of: a Large-scale Residential Development (LRD) comprising the demolition of existing industrial structures on site (c. 3,359 sq m) and the construction of a mixed-use development including artist studios (c. 749 sq m), a creche (c. 156 sq m), a retail unit (c. 335 sq m), and a gym (c. 262 sq m), and 133 No. residential units (65 No. one bed apartments and 68 No. two bed apartments). The development will be provided in 3 No. blocks ranging in height from part 1 No. to part 10 No. storeys as follows: Block A will be part 1 No. storey to part 4 No. storeys in height, Block B will be part 1 No. storeys to part 10 No. storeys in height (including podium) and Block C will be part 1 No. storeys to part 9 No. storeys in height (including podium). The proposed development has a gross floor area of c. 14,590 sq m and a gross floor space of c. 13,715 sq m.

The development also proposes the construction of: a new c. 204 No. metre long flood wall along the western, southern and south-eastern boundaries of the proposed development with a top of wall level of c. 6.4 metres AOD to c. 7.15 metres AOD (typically c. 1.25 metres to c. 2.3 metres in height) if required; and new telecommunications infrastructure at roof level of Block B including shrouds, antennas and microwave link dishes (18 No. antennas enclosed in 9 No. shrouds and 6 No. transmission dishes, together with all associated equipment) if required. A flood wall and telecommunications infrastructure are also proposed in the adjoining Strategic Housing Development (SHD) application (pending decision ABP Reg. Ref. TA29N.312352) under the control of the Applicant. If that SHD application is granted and first implemented, no flood wall or telecommunications infrastructure will be required under this application for LRD permission (with soft landscaping provided instead of the flood wall). If the SHD application is refused permission or not first implemented, the proposed flood wall and telecommunications infrastructure in the LRD application will be constructed.

The proposed development also provides ancillary residential amenities and facilities; 25 No. car parking spaces including 13 No. electric vehicle parking spaces, 2 No. mobility impaired spaces and 3 No. car share spaces; 2 No. loading bays; bicycle parking spaces; motorcycle parking spaces; electric scooter storage; balconies and terraces facing all directions; public and communal open space; hard and soft landscaping; roof gardens; green roofs; boundary treatments; lighting; ESB substation; switchroom; meter room; comms rooms; generator; stores; plant; lift overruns; and all associated works above and below ground.

## 2. Executive Summary

The purpose of this document is to detail in broad terms how the development incorporates sustainability and energy efficiency into the development with the focus being on Technical Guidance Document Part L of the Irish Building Regulations.

The initial design proposals as set out in this document has considered the EU Energy Performance of Buildings Directive (EPBD), the Building Regulations Technical Guidance Document Part L (NZEB) the Local Authorities strategy for sustainable design generally reducing energy usage and carbon emissions.

Nearly Zero Energy Buildings (NZEB) means a building that is designed to achieve nearly zero energy or a very low amount of energy which can be largely sourced from renewable energy produced on-site or nearby.

On this basis the building services design strategy in the proposed 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 report demonstrates the proposed strategy will meet the energy and sustainability targets for this development.

## 3. Introduction

Axiseng was commissioned by Malkey Limited to carry out Part L assessment on the proposed development at No.158A Richmond Road, Dublin 3.

The purpose of this report is to detail the energy efficient elements incorporated onto the design of the new residential units and demonstrate compliance with the 2019 Part L, Conservative of Fuel and Energy – Dwellings & 2019 Part L, Conservative of Fuel and Energy –Buildings other than Dwellings.

The development is compliant with Part L 2019 (NZEB) and the project is targeting an A2 BER (Building Energy Rating).

## 4. Climate Action and Energy Statement

In compliance with Section 3.5.2 of 'The Built Environment' and Section 3.5.3 'Energy' of Chapter 3 of Dublin City Council Development Plan 2022-2028, the development is designed with high efficient heat pumps installed in each of the units. Details of the heat pumps are included in the preliminary energy model and show that renewable contributions are being met. Amenity spaces will be provided with Variable Refrigerant Flow (VRF) systems incorporating refrigerant gases, for heating & cooling, which will meet the requirements of NZEB and Part L compliance.

## 5. Strategy - Part L Conservation of Fuel & Energy - Dwellings

The design approach is to firstly address the passive measures associated with the building fabric, then implement active measures through an efficient services design and finally implementation of renewables to supply the energy. The building includes the following energy conservation measures to achieve the best energy performance possible;

- Passive
    - High-performance construction envelope including low U-Value and G-Value
    - Air tightness in construction
    - Minimise Thermal Bridging
- Active
    - Exhaust Air Heat Pumps for heating and hot water
    - Low Energy LED Lighting
    - Efficient Controls
    - Electric vehicle charging points will be provided inline with planning
- Renewable
    - Exhaust Air Heat Pumps

The design has been developed and the analysis carried out using the current Part L version of the Dwelling Energy Assessment Procedure (DEAP) software v4. The inputs used to perform the analysis are summarised in the following section. This report details the proposed design solution used in the analysis and the calculation of the building performance metrics used to show indicative results whether it is in compliant with the NZEB under the regulation.

## 6. Design Inputs and Analysis

The sustainable design of the Apartment Blocks presents an opportunity for each dwelling to perform in an energy efficient manner and meet the NZEB challenges.

The following table outlines each element which has been designed to reduce energy, carbon emission, and cost through the buildings lifecycle.

Different apartment units within the development have been chosen as a representative sample of the dwellings. For the purpose of this exercise, more than 30 apartment units have been identified and used in the Part L assessment.

<table>
<tr><th>Measures</th><th>Description</th><th>Outcome</th></tr>
<tr><td>Sample Apartment Unit tested</td><td>More than 30 apartment units selected from development including 1st floor, 5th & 8th floor.</td><td>A representative sample of dwelling units selected & tested.</td></tr>
<tr><td>High Performance Construction Fabric</td><td>The construction u-values set out for dwelling building is lower than u-values requirement set out in the building regulation 2019.<br><br><table><tr><th>Element</th><th>U-value (W/m2k)</th></tr><tr><td>Window</td><td>1.3 (g-value 0.6)</td></tr><tr><td>Door</td><td>1.3</td></tr><tr><td>External Wall</td><td>0.18</td></tr><tr><td>Roof</td><td>0.15</td></tr><tr><td>Floor</td><td>0.15</td></tr></table><br>The window design has been considered to maximise daylight and solar heat gains during winter which reduces the artificial lighting and add free solar heating to reduce space heating load.<br><br>The high-performance construction element of wall, roof, and glazing is being considered and selected to minimise heat loss from the space. Aside from the reduction in heating energy consumption and carbon emissions, the reduction in loads results in reduced plant capacity and size. This has a net effect of reducing embodied energy consumption with a reduction plant, as well as the reduced input from the national electricity grid for heating.</td><td>This minimises heat loss and gain which impacts on the heating requirement, thus lowering energy and carbon footprint.</td></tr>
<tr><td>Thermal Bridging</td><td>The limitation of thermal bridging will be achieved in accordance with guidance under section 1.3.3 within technical guidance Part L regulation, where provision for thermal bridging is made in accordance with guidelines. To account for thermal bridging allowances for additional heat loss, it is assumed construction elements between the junction will be designed to achieve allowance less than 0.12 (W/m2k) factor.<br><br>When the detail of construction element between junction are known, the transmission heat loss coefficient shall be calculated using the psi values based on construction details.</td><td>This minimises heat losses at junctions between construction element, thus lowering energy consumption and carbon emission.</td></tr>
<tr><td>Air Tightness Construction</td><td>The building will be designed to ensure it is in compliance with the building regulation and achieving air tightness between 3 m³/(h.m²) or 0.15 ach infiltration.</td><td>This minimises heat losses through the building fabric thus lowering heating load.</td></tr>
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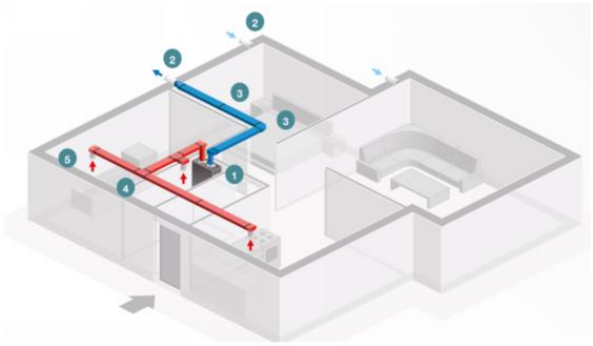
|---|---|---|
| Daylight & Lighting | Provision of natural daylight in buildings creates a positive environment by providing connectivity with the outside world and assisting in the well-being of the building inhabitants. Daylight also represents an energy source - reducing the reliance on artificial lighting.<br><br>All lamps will be LED type. This will deliver a reduction of 30-35% reduction in electrical energy usage when compared to fluorescent lighting. It is assumed each LED type lamp will achieve minimum efficiency value of 66.9 lumen/watt per bulb. | This will reduce the lighting electricity energy consumption, thus reducing carbon emission footprint overall.<br><br>This will result in a healthier environment through the use of natural daylight.<br><br>This will also provide free heating from solar load, reducing heating load. |
| HVAC system | Ventilation System<br>An exhaust ventilation system will operate as part of Exhaust Air Heat Pump system (EAHP) in each dwelling. This will extract air via ventilation ducts in the wet rooms of the dwellings. Extracted air is passed through ducting into the heat pump. Fresh air will be drawn through passive vents into bedrooms and living rooms.<br><br>The specific fan power of mechanical ventilation box is to be selected upon based on rating of less than 0.29 (w/(l/s)). | Heat recovery via warm air from wet rooms and kitchen will allow for heat transfer to incoming air thus reduce the heating load requirement in the apartment. |
| | Heating System<br>Exhaust Air Source Heat Pump (EAHP) will be used for heating and hot water generation for all apartment units. This system also provides the ventilation required within the unit as noted above.<br><br>  <br>An example of Joule Victorium A4 system built-in<br><br>The efficiencies of EAHP system is selected upon based on rating over 500% | The use of a heat pump is a highly efficient system and solution and allows end users control their bills. This promotes energy reduction by the end user.<br><br>Within the scheme there will be a requirement to access each apartment to carry out periodic routine maintenance. |
| | Hot Water System & Appliances<br>All hot water taps including the shower in the proposed development will be fitted with flow regulators to allow for the conservation of water usage as well as energy used to heat hot water.<br><br>All hot water taps including the shower head fitting in the proposed development are to be fitted with intelligent water flow regulators to all for full water flow until the discharge rate reaches eight litres per minute, to allow for the conservation of water usage as well as energy used to heat hot water. | This minimises hot water usage, thus reducing heating energy load and increasing heating plant operating performance and reducing the cost. |

| | | |
|---|---|---|
| | The overall efficiency of the main hot water system in EAHP design should be at least over 290% | |
| Building Energy Management System | No central control will be provided, however local time clocks and temperature stats will regulate temperature and demand within the space. | Continuous energy monitoring allows for further energy savings to be quantified through building lifecycle thus lowering overall cost and carbon footprint. |
| Result | Energy Performance Coefficient (EPC) = - 0.219 – 0.271<br>Carbon Performance Coefficient (CPC) = 0.21– 0.265<br>Renewable Energy Ratio (RER) = 0.28 – 0.40 (28% - 40%)<br>Building Energy Rating = A2 | Part L/NZEB compliant |

## 6.1 Design Forecasting

The current design model is based on an initial envelope performance and using a heat pump system to achieve Part L and NZEB compliance.

While the current design model is based on hot water heat pump system solution to achieve Part L and NZEB compliance and taking into account design progress in energy efficient solutions a number of alternative solutions had been reviewed during the planning stage energy modelling process. When the design moves into further detail stages the latest technologies will be further reviewed to ensure the most effective solution for the project is utilised. Adhering to planning conditions & building regulations, alternate M&E systems may be explored for the scheme.

Should district heating become available within the zone of the development in future, we will liaise with local councils working to incorporate this into the development where possible.

There is no requirement within the current energy model for PV to meet compliance.

# 7. Results and Conclusions

In conclusion the development complies with the Part L and NZEB requirements and is achieving an A2 BER. The following output of sample dwellings from DEAP software can be found under *Appendix A – DEAP Part L report* in this report.

The results show that the apartment units analysed have an Energy Performance Coefficient (EPC) between 0.219 and 0.271 which is less than the maximum permitted energy performance coefficient (MPEPC) of 0.3.

The results also show that the apartment units analysed has a Carbon Performance Coefficient (CPC) between 0.210 and 0.265 which is less than the maximum permitted energy performance coefficient (MPEPC) of 0.35.

The result also shows the renewable energy ratio target is achieved with results ranging between 0.28 to 0.39 (28% - 40%) for the apartments analysed.

The overall results show that the units are performing & exceeding the requirements to meet Part L and NZEB compliance. The combination of efficient plant & high performing envelope details ensures thermal comfort for occupants and minimal energy use.

## 8. Appendix A – DEAP Part L report

Note: Certs are in 'DRAFT' format until final as-built information input. Draft is based on design intent.

# Part L Specification

**BER IS NOT PUBLISHED**

## Property Details

| | | | |
|---|---|---|---|
| **Dwelling Type** | Mid-floor apartment | **Type of BER rating** | New Dwelling - Provisional |
| **Address line 1** | L00 | **Year of Construction** | 2022 |
| **Address line 2** | 1B2P 1B2P | **Date of Assessment** | 29/08/2022 |
| **Address line 3** | Richmond Road - Leydens | **Date of Plans** | |
| **County** | Co. Dublin | **Planning Reference** | |
| **Eircode** | | **Building Regulations** | 2019 TGD L |
| **BER Number** | | **MPRN No.** | 0 |
| **Purpose of Rating** | New dwelling for owner occupation | **Is MPRN shared with another dwelling?** | N/A |
| **Assessor Name** | | | |
| **Comment** | | **BER number assigned to shared dwelling** | N/A |

## Dimension Details

| | Area [$m^2$] | Height [m] | Volume [$m^3$] |
|---|---|---|---|
| Ground Floor | 48.00 | 3.60 | 172.80 |
| First Floor | 0.00 | 0.00 | 0.00 |
| Second Floor | 0.00 | 0.00 | 0.00 |
| Third and other floors | 0.00 | 0.00 | 0.00 |
| Room in roof | 0.00 | 0.00 | 0.00 |
| Total Floor Area | 48.00 | | 172.80 |

| | | | |
|---|---|---|---|
| **Living Area [$m^2$]** | 9.50 | **Living area percentage [%]** | 19.79 |
| **No of Storeys** | 1 | | |

## Ventilation Details

| | Number | | |
|---|---|---|---|
| **Chimneys** | 0 | **Has permeability test been carried out?** | Yes |
| **Open Flues** | 0 | **Structure type** | N/A |
| **Fans & Vents** | 2 | **Is there a suspended wooden ground floor?** | No |
| **Number of flueless combustion room heaters** | 0 | **Percentage windows/doors draught stripped [%]** | N/A |
| **Is there a draught lobby on main entrance?** | No | **Number of sides sheltered** | 3 |
| **Ventilation method** | Exhaust Air Heat Pump | **Mechanical Ventilation Manufacturer** | N/A |
| **Specific fan power [W/(L/s)]** | 0.290 | **Mechanical Ventilation Model Name** | N/A |
| **Heat exchanger efficiency [%]** | N/A | **How many wetrooms (incl. kitchen)?** | N/A |

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## Building Elements - Floor Details

| Type | Description | Underfloor heating | U-Value [W/m²K] | Area [m²] |
|---|---|---|---|---|
| Ground Floor - Solid | | No | 0.15 | 48 |

## Building Elements - Roof Details

| Type | Description | U-Value [W/m²K] | Area [m²] |
|---|---|---|---|

## Building Elements - Wall Details

| Type | Description | U-Value [W/m²K] | Area [m²] |
|---|---|---|---|
| Solid Mass Concrete | | 0.18 | 24.045 |

## Building Elements - Door Details

| Description | Number of Doors | U-Value [W/m²K] | Area [m²] |
|---|---|---|---|

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## Building Elements - Window Details

| Glazing type | User defined u-value | U-Value [W/m$^2$K] | Area [m$^2$] |
|---|---|---|---|
| Double-glazed, argon filled | Yes | 1.300 | 7.930 |
| Double-glazed, argon filled | Yes | 1.300 | 5.550 |

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## Other Details

| | | | |
|---|---|---|---|
| **Thermal bridging factor [W/m²k]** | 0.1200 | **Thermal mass category of dwelling** | Medium |

## Heating System - Solar Water Heating

| | | | |
|---|---|---|---|
| **Solar Water Heating Present?** | No | **Aperture area of solar collector [m²]** | N/A |
| **Type, manufacturer, model** | N/A | | |
| **Zero loss collector efficiency, n0** | N/A | **Collector heat loss coefficient, a1 [W/m²>K]** | N/A |
| **Annual Solar Radiation [kWh/m²] (Refer to Appendix H in DEAP)** | N/A | **Overshading factor** | N/A |
| **Dedicated storage volume [Litres]** | N/A | **Combined Cylinder** | N/A |
| **Solar fraction [%]** | 0.000 | | |

## Heating System - Hot Water System

| | | | |
|---|---|---|---|
| **Distribution Losses** | 220.35 | **Combi boiler present?** | No |
| **Supplementary electric water heating** | No | **Water Storage Volume [L]** | 200 |
| **Hot water storage manufacturer and model name** | JOULE | **Declared loss factor [kWh/d]** | 2.06 |
| **Temperature factor unadjusted** | 0 | **Temperature Factor Multiplier** | 1 |
| **Primary Circuit loss type** | None | | |
| **Is hot water storage indoors or in group heating system?** | Yes | **Insulation type** | N/A |
| **Insulation thickness [mm]** | N/A | | |

## Heating System - Dist. system losses and gains

| | | | | | |
|---|---|---|---|---|---|
| **Temperature adjustment [ºC]** | 0 | **Control Category** | 1 | **Responsiveness category** | 1 |
| **Central heating pumps** | 1 | **Oil Boiler Pump** | 0 | **Oil boiler pump inside dwelling** | No |
| **Gas boiler flue fan** | 0 | **Warm air heating or fan coil radiators present** | No | | |

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## Heating System - Energy Requirements (Individual)

| | | | | | |
|---|---|---|---|---|---|
| **Main space heating system efficiency [%]** | 647.61 | **Space heating efficiency adjustment factor** | 1.0000 | **Main space heating fuel** | Electricity |
| **Main water heating system efficiency [%]** | 296.86 | **Water heating efficiency adjustment factor** | 1.0000 | **Main water heating fuel** | Electricity |
| **Secondary heating system efficiency [%]** | N/A | **Fraction of heating from secondary heating system** | N/A | **Secondary space heating system fuel** | None |
| **Fraction of main space and water heat from CHP** | | **Electrical efficiency of CHP** | | **Heat efficiency of CHP** | |
| **CHP Fuel type** | N/A | | | | |

## Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

| | | | |
|---|---|---|---|
| **BER Number** | | **Building Regulations** | **2019 TGD L** |
| **BER Result** | A3 | **Energy Value kWh/m²/yr** | **51.61** |
| **$CO_2$ emissions [kg/m²/yr]** | 10.15 | | |
| **EPC** | 0.255 | **EPC Pass/Fail** | **Pass** |
| **CPC** | 0.248 | **CPC Pass/Fail** | **Pass** |

## Part L Conformance - Fabric

| **Conformity with Maximum avg U-value requirements** | **U-value [W/m²K]** | **Pass/Fail** | **Conformity with Maximum U-value requirements** | **U-Value [W/m²K]** | **Pass/Fail** |
|---|---|---|---|---|---|
| **Pitched roof insulated on ceiling** | 0.00 | Pass | **Roofs** | 0 | Pass |
| **Pitched roof insulated on slope** | 0 | Pass | **Walls** | 0.18 | Pass |
| **Flat Roof** | 0 | Pass | **Floors** | 0.15 | Pass |
| **Floors with no underfloor heat** | 0.15 | Pass | **External doors / windows / rooflights** | 1.30 | Pass |
| **Floors with underfloor heat** | 0.00 | Pass | | | |
| **Walls** | 0.18 | Pass | | | |
| **Percentage of opening areas [%]** | 28.08 | | | | |
| **Average U value of openings** | 1.30 | Pass | | | |
| **Permeability test carried out and meets guidelines in TGD L** | | | | 0.15 \| Pass | |

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## Part L Conformance - Renewables (applies to TGD L 2019)

| | Source | Renewables Primary Energy | Total Primary Energy | RER |
|---|---|---|---|---|
| + Delivered energy | PV/Wind | 0.00 | 0.00 | |
| + Delivered energy | Other | 0.00 | 0.00 | |
| + Delivered energy | Solar | 0.00 | 0.00 | |
| + Delivered energy | Biomass | 0.00 | 0.00 | |
| + Delivered energy | Biodiesel | 0.00 | 0.00 | |
| + Delivered energy | Bioethanol | 0.00 | 0.00 | |
| + Environmental energy | HP | 1775.44 | 1775.44 | |
| + Saved energy | CHP | 0.00 | 0.00 | |
| + District heating | District Heating | 0.00 | 0.00 | |
| + Delivered energy | Grid | 0.00 | 2477.51 | |
| + Delivered energy | Thermal | 0.00 | 0.00 | |
| SUBTOTAL | | 1775.44 | 4252.95 | 0.42 - Pass |
| Energy not used in Regulated Loads | PV/Wind/CHP | 0.00 | 0.00 | |
| TOTAL | | 1775.44 | 4252.95 | 0.42 |

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