Part L Planning Compliance

For the

Mechanical and Electrical Services Installations

At

No.146 & No.148-148A Richmond Road,
Dublin 3

For

Birkey Limited

Date of Issue: 03/12/2021 Revision: 01

Document History

Revision No.	Description	Prepared By	Reviewed By	Date
Rev 0	Planning Issue	EN	RMCK	15/06/2021
Rev 1	Final Planning Issue	EN	RMK	03/12/2021

Contents

1. Planning Overview

Birkey Limited intend to apply to An Bord Pleanála for permission for a strategic housing development at this c. 0.61 hectare (c. 6,067 sq m) site at No. 146A and Nos. 148-148A Richmond Road, Dublin 3 (Eircodes D03 W2H1, D03 T6P0, D03 Y8R9, D03 PX27, D03 K6F7, D03 E447 and D03 HR27). The site is bounded to the north-east by Richmond Road and the Leyden's Wholesalers & Distributor Site, to the north-west by an apartment development (Deakin Court), to the south-west by the Tolka River and to the south-east by a residential and commercial development (Distillery Lofts). Improvement works to Richmond Road are also proposed including carriageway widening and a new signal controlled pedestrian crossing facility on an area of c. 0.08 hectares (c. 762 sq m). The development site area and road works area will provide a total application site area of c. 0.69 hectares (c. 6,829 sq m).

The proposed development will principally consist of: the demolition of all existing structures on site (c. 2,346 sq m) including warehouses and 2 No. dwellings; and the construction of a part 6 No. to part 10 No. storey over basement development (with roof level telecommunications infrastructure over), comprising 1 No. café/retail unit (157 sq m) at ground floor level and 183 No. Build-to-Rent apartments (104 No. one bedroom units and 79 No. two bedroom units). The proposed development has a gross floor area of c. 16,366 sq m over a basement of c. 2,729 sq m. The proposed development has a gross floor space of c. 15,689 sq m.

The development also includes the construction of a new c. 126 No. metre long section of flood wall to the River Tolka along the site's southern boundary. The new flood wall is positioned at the top of the existing river bank and will connect to existing constructed sections of flood wall upstream and downstream of the site. The top of the wall will be set at the required flood defence level resulting in typical wall heights of c. 1.2 to 2 metres above existing ground levels. The development will also include the repair and maintenance of the existing river wall on site adjacent to the River Tolka.

The development also provides ancillary residential amenities and facilities; 71 No. car parking spaces including 8 No. electric vehicle spaces, 4 No. mobility impaired spaces and 1 No. car share space; 5 No. motorcycle parking spaces; bicycle parking; electric scooter storage; a drop off space; the decommissioning of the existing telecommunications mast at ground level and provision of new telecommunications infrastructure at roof level including shrouds, antennas and microwave link dishes; balconies facing all directions; public and communal open space; a pedestrian/bicycle connection along the north-western boundary of the site from Richmond Road to the proposed pedestrian/bicycle route to the south-west of the site adjoining the River Tolka; roof gardens; hard and soft landscaping; boundary treatments; green roofs; ESB Substation; switchroom; comms rooms; generator; lift overruns; stores; plant; 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 TGD L.

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 Birkey Limited to carry out Part L assessment on the proposed development at No.146 & No. 148-148A 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. 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

- 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.

5. Design Inputs and Analysis

The sustainable design of the Apartment Block 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.

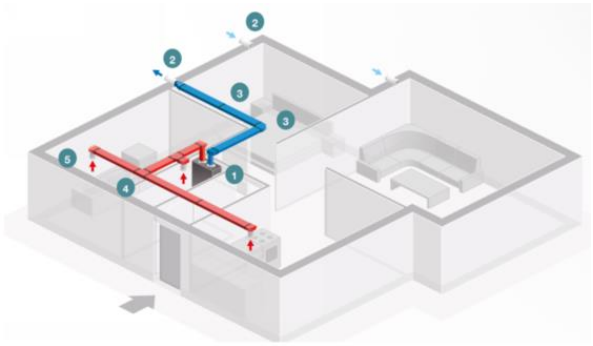
Different apartment units within the development have been chosen as a representative sample of the dwellings. For the purpose of this exercise, more than 30 apartment units have been identified and used in the Part L assessment.

<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 ground, 1st floor, 4th floor and 8th floor.</td><td>A representative sample of dwelling unit selected on poor-performing basis compared to other units.</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.

<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>
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.

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.

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 compliant 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>
</table>

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. 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. This will result in a healthier environment through the use of natural daylight. This will also provide free heating from solar load, reducing heating load.
HVAC system	Ventilation System 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 bedroom and living room. 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 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.  An example of Joule Victorium A4 system built-in 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. Within the scheme there will be a requirement to access each apartment to carry out periodic routine maintenance.
	Hot Water System & Appliances 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. 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 Carbon Performance Coefficient (CPC) = 0.21 – 0.265 Renewable Energy Ratio (RER) = 0.28 – 0.40 (28% - 40%) Building Energy Rating = A2	Part L/NZEB compliant

5.1 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.

6. 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.

7. 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**	2019
Address line 2	1B2P 1B2P	**Date of Assessment**	18/05/2021
Address line 3	Hollybrook Richmond	**Date of Plans**	
County	Co. Dublin	**Planning Reference**	
Eircode		**Building Regulations**	2019 TGD L
BER Number	21001	**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 [m²]	Height [m]	Volume [m³]
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 [m²]	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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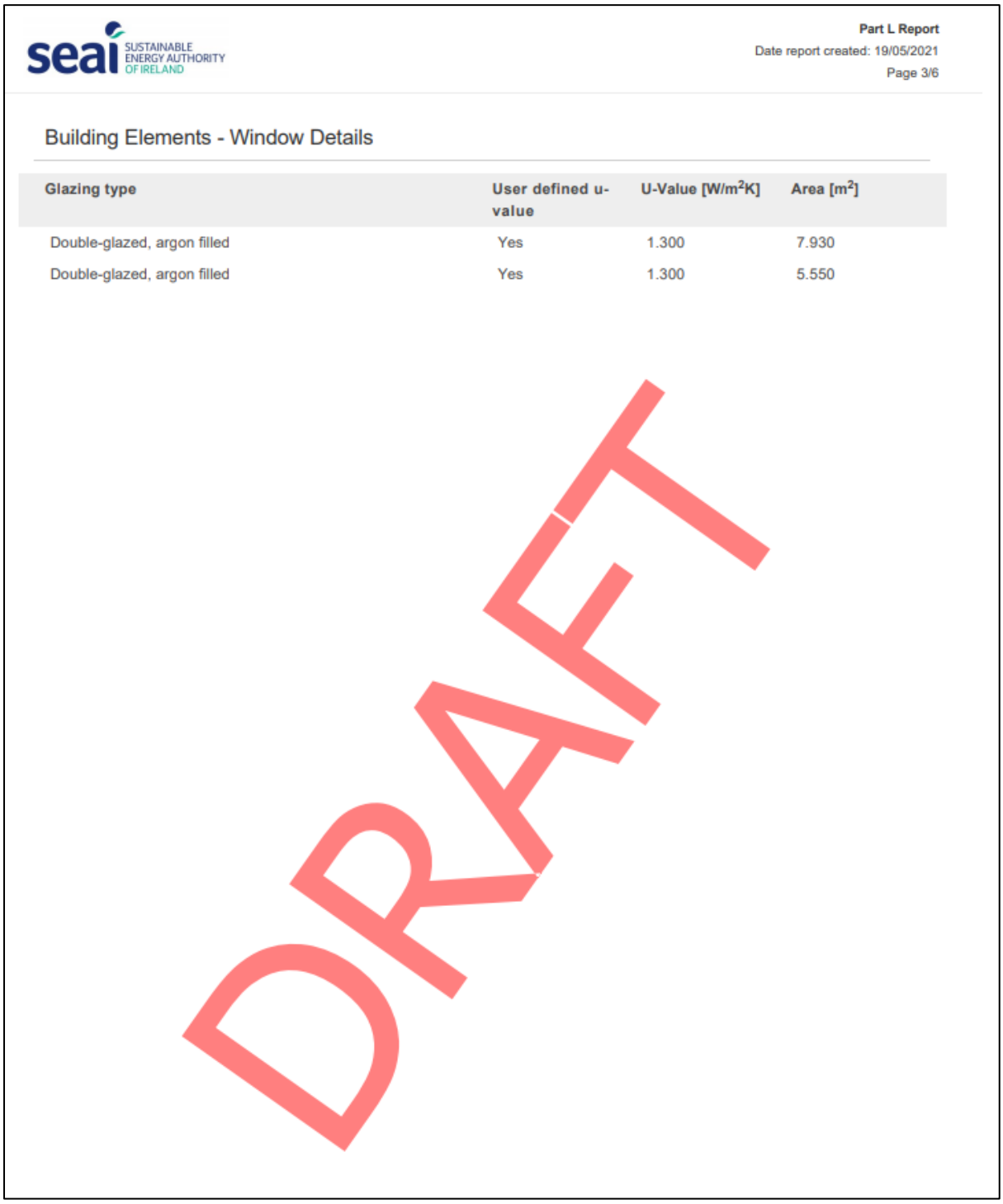

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Building Elements - Window Details

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**	None
Insulation thickness [mm]	0		

Heating System - Dist. system losses and gains

Temperature adjustment [°C]	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	21001	**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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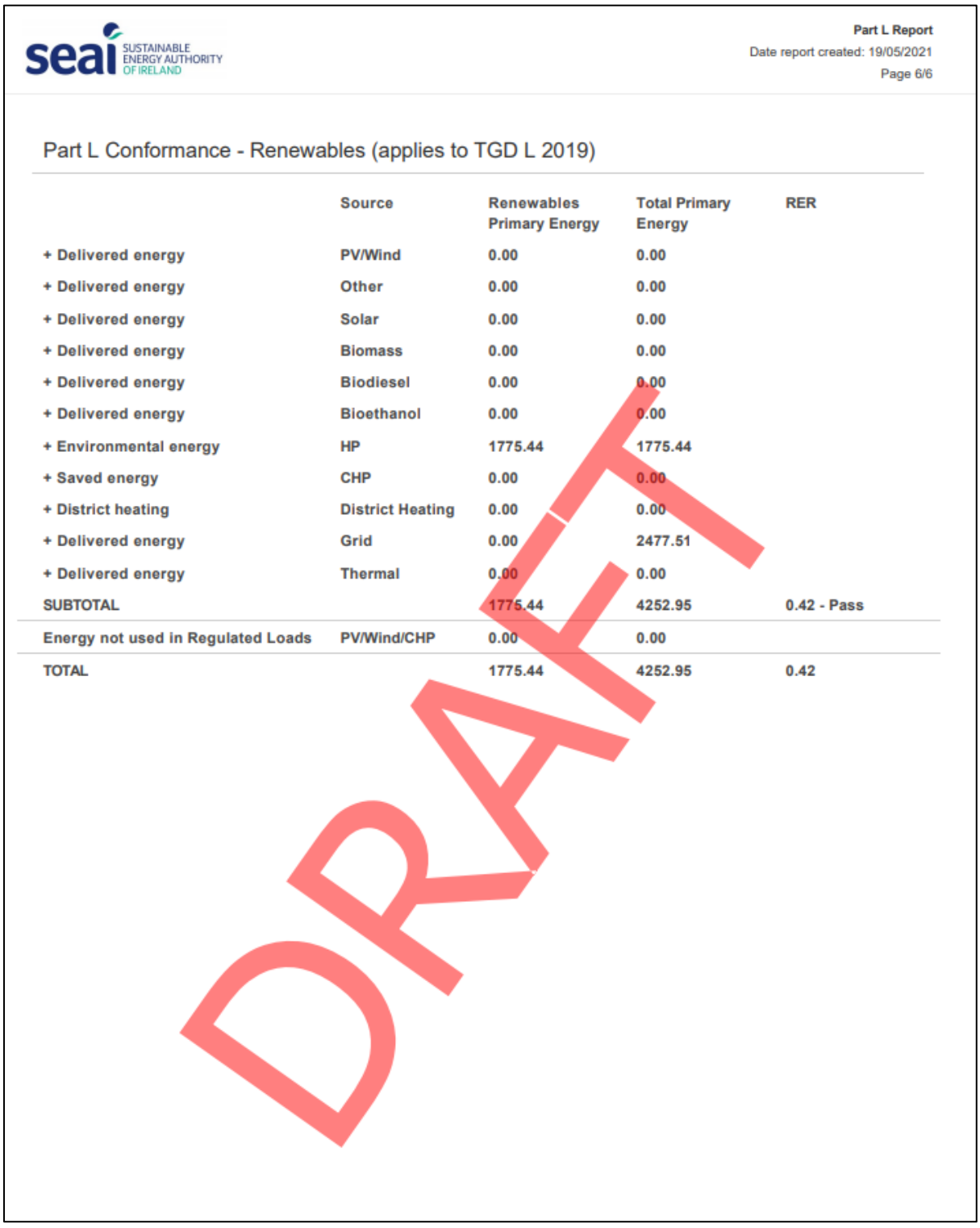

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Part L Conformance - Renewables (applies to TGD L 2019)

	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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