BCC-HRA-ZZ-RP-A-102-CAES-PO1

Climate Action Energy Statement

For:

A NEW COMMUNITY CENTRE
at: RACECOURSE PARK
BALDOYLE
DUBLIN 13

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Content:

1.0 Introduction

This Climate Action Energy Statement has been prepared by Henchion Reuter Architects as part of the planning documentation for a proposed NEW COMMUNITY CENTRE at: RACECOURSE PARK , BALDOYLE, DUBLIN 13 in response to CAP 12 and DMSO261 in the Fingal County Development Plan 2023-2029.

The subject site, considered a 'brown field site' with an existing redundant building originally build as a marketing suite for adjoining residential development, is located in the southern part (south of Red Arches Road) of the overall Racecourse Park Development Scheme located between Baldoyle and Portmarnock, Baldoyle, Dublin 13.

It comprises a corner location of approximately 0.4644 ha bounded by Red Arches Road to the north, existing carparking to north and east, and the extended existing playing pitches to the east with children's playground to the south. The overall Racecourse Park Development Scheme located between Baldoyle and Portmarnock was the subject to An Bord Pleanála Reg. Ref. No. JP06F.311315, lodged under the provisions of s.177AE of the Planning and Development Act 2000 (as amended).

Following a number of design feasibility studies, the following room programme was agreed as the basis of the design:

Entrance/Draught Lobby 8 m2:
Reception (Public Side) 2 5 m2
Reception Staff Side 3 5m2
Sports Hall - smaller standard 3 court -24.75x17.5 431 2 m2
Community Room #1 6 0.
Dance Yoga Space/ Meeting Room #2 100 m2
Community Room #2 - Youth Room 80 m2:
Multipurpose room #3 40 m2:
Kitchen/Staff Room 27 m2:
Coffee Dock with external counter 16 m2:
WC Provision Male & Female 50m2:
Changing Places WC (Incl First Aid) 12m2: Storage 37m2:
Plant room 30 m2:
Changing Room #1 23 m2:
Changing Room #2 23m2
Changing Room #3 23m2:
Changing Room #4 23 m2:

Total Net Internal Area:	1120 M2
Gross Floor Area:	1220 m2
Gross Building Area:	1320 m2.

The development will also include the provision of car parking, cycle parking, new pedestrian / cycle links, services, drainage and attenuation, and all associated site and infrastructural works. This report identifies the energy standards with which the proposed development will have to comply and also sets out the overall strategy that will be adopted to achieve these energy efficiency targets.

This report also will also address the following Polices of the Fingal County Development Plan 2023-2029 as follows:

CAP 11 Climate Adaptation Actions in the Built Environment (Addressed in section 6)
CAP 12 Climate Action Energy Statements (Addressed in all sections of the report)
CAP 13 Energy from Renewable Sources (Addressed in section 4)

CAP 18 Waste Heat, District Heating and Decentralised Energy (Addressed in section 4)
CAP 19 Supporting the Potential of District Heating in Fingal (Addressed in section 4)
CAP 20 Capture and Utilisation of Waste Heat (Addressed in section 4

1.1 Project Team:

Client:
For Fingal County Council Community Department:
Janet Ivers, Linda Ennis.

For Fingal County Council Architects Department:
Paula Serada-Kapetangiannis, Pat Boyle.

Architects
Henchion Reuter Architects:
Martin Henchion, Elizabeth Wheeler, Kevin Moran.

Civil and Structural Engineers:
ROD Ltd
Andrew Thompson. Kieran O Riordan.

M&E Engineers
MOMA
Paul O'Brien

Planning and Environmental Assessment:
The Planning Partnership
Wessel Vosloo.

Quantity Surveyor
Walsh Associates
Paul Malone.

Fire Safety Consultant
EOBA
Stephen Lee

Disability Access Consultant
EOBA
Stephen Lee

2. Building Regulations Part L 2022:

Compliance with Building Regulations Part L 2022 is broken down into six distinct categories, known as Regulation 8; parts (a) to (f).

A summary of each of these parts as listed in Technical Guidance Document L 2011 is provided below together with a description of what is required to demonstrate compliance and suggested routes to meeting the required standards.

2.1 Regulation 8 Part (a)

The regulation requires that:

Providing that the energy performance of the building is such as to limit the calculated primary energy consumption and related carbon dioxide (CO2) to that of a nearly zero energy building within the meaning of the Directive insofar as is reasonably

Regulation 8 Part (a) is the overarching compliance target which stipulates the required overall reduction in energy consumption and carbon emissions for new dwellings.

2.2 Regulation 8 Part (b)

The regulation requires that:

> *Providing that, the nearly zero or very low amount of energy required is covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby;*

2.3 Regulation 8 Part (c)

The regulation requires that:

> *Limiting heat loss and, where appropriate, availing of heat gain through the fabric of the building;*

This requires that the fabric of the building is designed to minimise heat loss from the building and that the air permeability of the structure limits the unwanted passage of air into the building.

Typical compliant U-Values are as follows.

Pitched roof 0.16 W/m2K

Flat roof 0.20 W/m2K

Walls 0.18 W/m2K

Floor 0.18 W/m2K

Windows 1.4 W/m2K

The u-values of individual elements can be relaxed if required provided that compensatory measures are taken on other elements and that the overall area weighted u-value for the entire dwelling is the same as it would have been if all individual elements had complied.

Every building must also be subjected to an air pressure test to determine the air tightness. All buildings must achieve an air tightness of less than 5m3/m2 /hour when tested at 50 Pascals.

2.4 Regulation 8 Parts (d & e)

The regulation requires that:

> *Providing and commissioning energy efficient space and water heating systems with efficient heat sources and effective controls;*
>
> *Providing that all oil and gas fired boilers shall meet a minimum seasonal efficiency of 90%;*

2.5 Requirements for Common Areas

2.7 S.I No 393 of 2021 - Regulation 5 Part (f)

The regulation requires that:

> *For a new building, where there are more than 10 car parking spaces, ducting infrastructure, consisting of conduits for electric cables, should be provided for every parking space, to enable the subsequent installation of recharging points for electric vehicles where:*
>
> *• the car park is located inside the building, e.g. a basement car park; or*
>
> *• the car park is physically adjacent to the building, i.e. the car park is within the curtilage of the site.*

This requires that ducting provision for the future installation of car charging point be made in all carparks with more than 10 parking spaces.

3. Building Fabric

Before considering efficient building services or renewable energy systems, the form and fabric of a building must be assessed and optimised so as to reduce the energy demand for heating, lighting and ventilation. Target performance levels have been identified by the design team and are presented below.

3.1 Elemental U-Values

The U-Value of a building element is a measure of the amount of heat energy that will pass through the constituent element of the building envelope. Increasing the insulation levels in each element will reduce the heat lost during the heating season and this in turn will reduce the consumption of fuel and the associated carbon emissions and operating costs.

It is the intention of the design team to exceed the requirements of the building regulations.

Target U Values are identified below.

U-Values	Range of Target Values Proposed	Part L 2022 Compliant Values
Floor	0.10 to 0.18 W/m2K	0.18W/m2K
Roof (Flat)	0.12 to 0.20 W/m2K	0.20 W/m2K
Roof (Pitched)	0.10 to 0.16 W/m2K	0.16 W/m2K
Walls	0.10 to 0.18 W/m2K	0.18 W/m2K
Windows	0.9 to 1.4 W/m2K	1.4W/m2

3.2 Air Permeability

A major consideration in reducing the heat losses in a building is the air infiltration. This essentially relates to the ingress of cold outdoor air into the building and the corresponding displacement of the heated internal air. This incoming cold air must be heated if comfort conditions are to be maintained. In a traditionally constructed building, infiltration can account for 30 to 40 percent of the total heat loss, however construction standards continue to improve in this area.

With good design and strict on-site control of building techniques, infiltration losses can be significantly reduced, resulting in equivalent savings in energy consumption, emissions and running costs.

In order to ensure that a sufficient level of air tightness is achieved, air permeability testing will be specified in tender documents, with the responsibility being placed on the main contractor to carry out testing and achieve the targets identified in the tender documents.

A design air permeability target of **3 m3/m2/hr** has therefore been identified for the building.

The air permeability testing will be carried out in accordance with BS EN 13829:2001 ‘Determination of air permeability of buildings, fan pressurisation method’ and CIBSE TM23: 2000 ‘Testing buildings for air leakage”.

3.3 Thermal Bridging

Thermal bridges occur at junctions between planar elements of the building fabric and are typically defined as areas where heat can escape the building fabric due to a lack of continuity of the insulation in the adjoin elements.

Careful design and detailing of the manner in which insulation is installed at these junctions can reduce the rate at which the heat escapes. Standard good practice details are available and are known as Acceptable Construction Details (ACDs). Adherence to these details is known to reduce the rate at which heat is lost.

The rate at which heat is lost is quantified by the Thermal Bridging Factor of the dwelling and measured in W/m2K. The Thermal Bridging Factor is used in the overall dwelling Part L calculation, this value can be entered in three different ways:

0.15W/m2K Used where the ACDs are not adhered to

0.08W/m2K Used where the ACDs are fully adhered to

< 0.08 W/m2K Used where the thermal details are thermally modelled and considered to perform better than the ACDs

It is intended that the ACDs will be adhered where suitable benchmarks exist, and that thermal modelling will be carried out for any non-standard junction details within proposed development and that the resultant Thermal Bridging Factor will be less than 0.08W/m2K.

4. Heat Sources & Renewable Energy Options & Proposals

The following section addresses the policy CAP 13, CAP 18, Cap 19 and CAP 20 of the Fingal Development Plan 2023-2029. Section 4.1 – 4.6 address CAP 13 and section 4.3 addresses CAP 18, CAP 19 and CAP 20 of the Fingal Development Plan 2023-2029.

All new buildings other than dwellings must meet overall energy performance levels (as defined by the Energy Performance Coefficient - EPC) and must have a portion of their annual energy demand provided by renewable energy sources.

The renewable energy source can be thermal energy such as solar thermal collection, biomass boilers or heat pumps or it can be electrical energy as generated by photovoltaic solar panels or wind turbines. The minimum renewable energy contributions defined in Part L 2022 Buildings other than Dwellings Part (b) is 0.20 where the EPC of 1.0 and CPC of 1.15 is achieved. Where an EPC of 0.9 and a CPC of 1.04 is achieved an RER of 0.10 represents a very significant level of energy provision from renewable energy technologies.

The main fuel source generally available for developments of this nature is electricity. Biomass may also be a possibility. Each present distinct options for compliance with the new standards. Solutions involving biomass as the primary fuel source will typically include a solar technology such as PV panels to meet the renewable energy requirements while solutions relying on electricity will include heat pump technology.

The options presented in Sections 4.1 to 4.2 below set out two possible means of complying with Part L 2022 Buildings other than Dwellings for the Community Centre. Each is based on the building fabric performance levels identified in Table 1 in Section 1 of TGD L Buildings Other than Dwellings.

The final selection and combination of technologies will most likely be selected from these options based on a more in-depth technical and financial appraisal of the technologies which will be carried out during detailed design.

4.1 Option 1 –

Electric heat pumps providing heat to a carefully zoned low temperature hot water (LTHW) heating system comprising zones where heat is dissipated via (1) radiant panels; (2) radiators & (3) underfloor heating pipework (all suitably sized to ensure adequate heat delivery to the spaces served – taking account of the 'flow temperature' possible using this technology). Each zone is thermostatically controlled & managed by the proposed building management system (BMS). Ventilation to areas where higher densities of people may be expected & where activity levels are such that high indoor air quality is appropriate are to be provided with mechanical heat recovery ventilation (HRV) systems, again controlled by the building management systems & operating on a principle where CO_2 levels are monitored & maintained below a pre-defined threshold. This will ensure both excellent indoor air quality throughout the centre & also assist in reducing the Primary Energy consumption of the premises.

4.2 Option 2 -

— a biomass boiler system providing heat to a carefully zoned low temperature hot water (LTHW) heating system comprising zones where heat is dissipated via (1) radiant panels; (2) radiators & (3) underfloor heating pipework (all suitably sized to ensure adequate heat delivery to the spaces served – taking account of the 'flow temperature' possible using this technology). Each zone is thermostatically controlled & managed by the proposed building management system (BMS).

Ventilation to areas where higher densities of people may be expected & where activity levels are such that high indoor air quality is appropriate are to be provided with mechanical heat recovery ventilation (HRV) systems, again controlled by the building management systems & operating on a principle where CO_2 levels are monitored & maintained below a pre-defined threshold. This will ensure both excellent indoor air quality throughout the centre & also assist in reducing the Primary Energy consumption of the premises.

5. Electric Vehicle Charging.

All new commercial buildings must make a provision for charging electric vehicles. Legislation provides for minimum standards for certain buildings. The European Union (Energy Performance of Buildings) Regulations 2021 apply to (a) new buildings, (b) existing buildings (other than dwellings), and (c) buildings undergoing major renovation. They require that:

- existing buildings, other than dwellings, with more than 20 parking spaces have one or more charging points by 2025,
- buildings, other than dwellings, (new or undergoing major renovation) with more than 10 parking spaces have at least one charging point for every five parking spaces, and

A building (other than a dwelling) which has more than 10 car parking spaces, that is new, shall have installed at least one recharging point and ducting infrastructure (consisting of conduits for electric cables) for at least one in every 5 car parking spaces to enable the subsequent installation of recharging points for electric vehicles.

The Community Centre proposed here will be a new non-domestic building. It includes a total of 28 parking spaces so ducting infrastructure to facilitate future provision of EV charge points for 20% of spaces will be required, along with provision of at least one EV charging point. Since the development will also include Part M compliant accessible spaces, the location of the charging point will be such that it can serve one accessible parking space and one standard parking space.

6. Climate Change Adaptation Actions in the Built Environment

The following measures have been implemented in the design to address policy CAP 11 of the Fingal Development Plan 2023-2029. This is a summary of the measures with separate reports addressing each measure in more detail.

6.1 On-site Construction

The construction and waste management proposals for the scheme are comprehensively addressed in the Construction and Waste Management Plan submitted with this planning application, the measures below are provided as a summary of the recommendations contained within the plan.

The demolition arising on site will consist of the following expected demolition waste: -

- MADE GROUND (sample taken on a mound of fill on the site) firm grey-brown sandy slightly gravelly CLAY with low cobbles content.
- COHESIVE DEPOSITS either firm grey brown sandy slightly gravelly CLAY or stiff black slightly sandy gravelly CLAY with low cobbles content.
- Only after in-situ reuse and recycling options have been fully considered will the demolition waste will be disposed of off-site by licensed waste contractors.

- During the construction phase of the project, proposals for the minimisation / reuse and recycling of construction arisings will be implemented as set out in the Construction and Waste Management Plan including: ·
- In the case of topsoil, careful planning and on-site storage can ensure that this resource is reused on-site as much as possible ·
- Earthworks for road, drainage and structure foundation forms a major part of the quantity of waste that will be generated by the construction phase of this project. To optimise the impact of the generation of surplus material due to excavation every attempt to optimise cut and fill volumes will be undertaken ·
- The treatment of excavated materials (cement / lime stabilisation) where necessary to allow their reuse as fill materials, further reducing the need to remove these materials to landfill, and import stone and concrete materials ·
- Appropriate material ordering to minimise waste ·
- Reuse of Concrete blocks, engineering bricks and clay bricks that are surplus can be broken up and used for hardstanding areas. ·
- It is envisaged that most of the recyclable waste on site will come from the demolition of the existing building in a form of wood and metal. Any excess wood or metal generated on site will be kept segregated and removed off site to a licenced recycling facility.

6.2 Transport

- Car and Bicycle parking for the proposed development have been designed in accordance with the requirements set out in the current Fingal Development Plan. ·
- The subject site is located within reasonable walking time to to bus stops along Red Arches Road.·
- The design of the site, and it's location within the racecourse park are such that pedestrian and cycling trips are a genuine alternative to private car use.

6.3 Embodied Carbon:

Recent advances in the energy efficiency of buildings have reduced operational energy use to such an extent that the life cycle carbon emissions of a building are actually influenced more by the carbon that is embodied in the materials and processes used during the construction than it is by the carbon emitted as a result of energy used in the buildings operation. As such, the embodied carbon of a building must now be considered if a construction project is to be considered low carbon or "net-zero" carbon.

Addressing the embodied carbon requires that all the key building element categories (substructure, structure, façade, MEP services) are assessed to identify the optimal solutions in terms of embodied carbon and assess them through a multidisciplinary and holistic approach, considering implications in different areas such as efficiency, cost, programme etc.

The process of design and of material and product selection must include an analysis of the final embodied carbon and comparison with benchmarks to identify the areas that need to be optimised. This process allows the building designers and procurement managers to focus on how to eliminate the impact of the key identified hotspots, through comparative assessments and specification of products that demonstrate low embodied carbon and facilitate the production of the final embodied carbon assessment at the end of the detailed design to identify the expected impact of the Development.

6.4 Sustainable Urban Drainage.

The Surface Water drainage proposals for the scheme are comprehensively addressed in the Flood Risk Assessment Report & Engineers Design Report submitted with this planning application, the measures below are provided as a summary of the recommendations contained within the assessment.

It is proposed to discharge the surface water from the proposed development, via a series of SuDS features and downstream defender manholes, into the existing downstream stormwater system. The methodology involved in developing a Storm Water Management Plan for the subject site is based on recommendations in the Greater Dublin Strategic Drainage Study (GDSDS) and in the SuDS Manual. It is proposed to incorporate a Storm Water Management Plan though the use of various SuDS techniques.

Based on three key elements, Water Quantity, Water Quality and Amenity, the targets of SuDS train concept will be implemented in the design. The following SuDS measures are proposed for the site: •

- Source Control the provision of permeable paved driveways, green roofs & infiltration trenches.
- Regional Control A flow restriction device will be used to limit the outflow to a maximum rate of 3.7l/s/ha (13.7x4.54 = 16.8l/s) as permitted by FCC. A Class 1 petrol interceptor will be provided before the surface water outfall.

7. Proposed Solutions and Conclusions

To address Policy CAP 12 and DMSO261 of the Fingal Development Plan 2023-2029 a comprehensive evaluation of the building fabric and the energy systems has been carried out on the Baldoyle Community Centre Development.

The preceding sections of this report set out the regulatory requirements with which the scheme will have to comply while identifying a number of technologies and design approaches that may be utilised to achieve compliance.

The building fabric standards and the technology solutions discussed will all be assessed in greater detail during the detailed design stage of the project. A cost benefit analysis of all these available solutions will be carried out to determine the correct balance between an efficient building envelope and the most appropriate combination of technology and renewable energy systems.

The proposed approach to achieving Part L Compliance will be based on a combination of the solutions below once a detailed analysis has been completed at detailed design stage. A final decision will be made once capital costs, renewable targets and regulation compliance have all been compared to find the most appropriate solution.

The most likely solutions that will be implemented for each building typology are set out below, each of which demonstrates the preferred method of compliance with DMSO261

- Meet or exceed minimum U-Value standards identified in Part L 2022.
- Achieve air tightness standards of 3m3 /m2/hr
- Ensure thermal bridging details are designed to achieve appropriate thermal bridging factors.
- Provide an appropriate combination of technologies to ensure energy consumption is in line with Part L 2022 requirements.
- Install centralised mechanical ventilation systems to ensure adequate ventilation rates are achieved in the overall building , while maximising the benefits of the airtight construction.