Varming
Consulting Engineers Ltd.

M&E NARRATIVE

SPORTS PAVILION, MUGA AT KILBOGGET PARK, CABINTEELY

Rev: 2

Date: 20/04/2026

LINKED PRACTICES

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DOCUMENT CONTROL

Rev	Purpose	Issued to	Issued by	Date	Notes
0	Draft	Dun Laoghaire-Rathdown County Council	D.W.	30/09/2025	
1	Draft	Dun Laoghaire-Rathdown County Council	D.W.	07/11/2025	
2	Part 8 Compliance	Dun Laoghaire-Rathdown County Council	D.W.	20/04/2026	

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1. Sustainable Design Approach

The overall proposed energy efficiency objective is to deliver an A3 / A2 rated building by implementing the following:

1.1. Minimise Demand through Passive Measures.

Factors to be considered include - efficient fabric and shading design to reduce heating and cooling demand, natural daylighting to reduce artificial lighting demand, natural ventilation to reduce HVAC demand, appropriate use of thermal mass to mitigate internal gains and reduce cooling demand, minimising thermal bridging through careful detailing.

The following lists the proposed building fabric U-values, glazing spec and air permeability:

Building Element	U-Values (W/m²K)
External Wall	0.18
Ground/Exposed Floor	0.15
Roof	0.15

Glazing Description	U-Value (W/m²K)	g-value	LT-value
Windows & Doors	1.20	0.35	0.70

Building air permeability – 3.00 m³/h/m² @50Pa.

1.2. Reduce Consumption.

This includes efficient HVAC, lighting, vertical transport etc. along with efficient distribution of services to minimise losses and implementing building management systems.

1.3. Use low-carbon fuel sources.

To meet the remaining energy demand of the building, the proposed space heating and hot water generation plant to serve the building will consist of Air Source Heat Pumps. The renewable energy contribution will be supplemented by the PV array if required.

2. Mechanical Services Design Approach

The following is a general overview of the proposed Mechanical Services Installation and systems for the new Sports Pavilion at Kilbogget Park.

2.1. LTHW Heating

The proposed heating system for the building will be via a high temperature ASHP, which will serve radiant panels and radiators. The heating to the changing areas will be served by radiant panels and the small changing, offices, circulation areas, training room & gym will be served by radiators all linked to space temperature stats.

The ASHP system will comprise of an outdoor unit, located on the roof, and indoor unit located within the plantroom. The distribution of the heating pipework will be at high level on the ground floor to serve the radiant panels and dropping down locally to serve the radiators and popping up locally to serve the first-floor radiators.

2.2. Domestic Water Services

The proposed domestic hot water requirements will be from the high temperature ASHP via a DHW indirect cylinder to serve the showers and WHB's. The DHW will be distributed at high level and connecting to TMV's at each of the showers and WHB's.

The proposed cold water service requirements will be served from an incoming Mains Water Service (MWS) which will connect to a potable CWS tank with a booster pump set located within the plantroom. The CWS will be distributed at high level on the ground floor and popping up to the first floor toilet areas.

2.3. Ventilation & Air Conditioning

The proposed ventilation strategy to serve the changing areas will be demand control ventilation system and the toilet areas will be with mechanical extract and passive 'make-up' air. The ventilation to these spaces will comprise of inline extract fans, ductwork, grilles and controls.

The proposed ventilation strategy for the gym & training room will be a mechanical heat recovery unit along with local cooling via an DX Air Conditioning. The ventilation system will comprise of HR unit, ductwork, grilles & controls. The AC system will comprise of outdoor unit mounted on the roof and indoor unit, either wall or ceiling mounted units.

2.4. Above Ground Soils & Waste

The proposed above ground soils & waste will be a gravity system with builder's upstand to serve each of the toilets, showers & WHB's on the ground floor and SVP's to serve the first-floor toilet area.

2.5. Fire Protection

The proposed fire protection will be portable fire extinguishers throughout for firefighting purposes with coverage in accordance with IS 290 and IS 291.

3. Electrical Services Design Approach

The following is a general overview of the proposed Electrical Services Installation and systems for the new Sports Pavilion at Kilbogget Park.

3.1. Electrical Supply and Distribution

ESB meter will be located within an external meter enclosure, the supply shall be taken from ESB Networks infrastructure. The main switchboard shall incorporate a digital power meter linked to the energy monitoring system. All metering will be installed in accordance with the IS 10101 regulations & ESB Networks specifications.

Sub Distribution board shall be located on the 1st to serve that level.

LV and ELV cable tray containment and cable trunking shall be provided within the building to accommodate the new lighting services, general services, power services, data services and protective services.

3.2. General Services

General services and small power services shall be provided within the building. The products of the accessories must meet the tender specification. All wiring will be provided in accordance with IS 10101. LSF cables must be used throughout the project located in steel conduit.

All socket surface plates will be Part M compliant and installed to fit flush with the back box.

3.3. Lighting and Emergency Lighting

In all areas lighting and emergency lighting shall be provided. Robust type light fittings shall be provided for the nature of this building. LED light sources shall be used on all lighting points. Emergency lighting shall be provided as per IS3217:2023 and shall utilise standalone emergency fittings and exit signs.

In general, high-frequency, high-efficiency, LED luminaires will be employed with appropriate control systems to ensure efficient usage consistent with both occupancy and daylight availability.

The lighting system shall be in accordance with the latest CIBSE guidelines

3.4. ICT Services

The building will be fitted with twin telephone & data points (RJ45) which will be interchangeable. These will be wired in Cat 6 standard cable.It is envisaged to apply to Eir for utility services to the site for Telephone & broadband use.

The building shall be provided with full Wi-Fi access.

The communications cabinets shall be located within the Comms Room.

3.5. Fire Alarm System

An L1 Type fire detection and alarm system will be provided within the area in accordance with Irish Standard IS 3218: 2013, “Code of Practice for Fire Detection and Alarm Systems for Buildings” as published by the NSAI. Also any amended requirements of the Fire Consultant and the Fire Officer through out the project must be taken on board. The fire alarm system will be so interconnected that doors locked for security will be automatically unlocked and doors will be released. The wiring system used will be BASEC and LPCB approved in accordance with the requirements of BS 5839 – 1: 2002 for enhanced fire resisting cables.

3.6. Security Services

An intruder alarm, access control and CCTV system will be provided internally and externally of the building. The CCTV system shall be a digital IP based system which shall include internal/external cameras, digital recorders and control equipment. The control equipment and monitor within the dedicated storage room in corridor adjacent to the changing room area.

Provision for an access control system shall be provided

An intruder alarm system shall be provided with central monitoring capabilities. The system will consist of door contacts, inertia/magnetic window contacts and passive infra red detectors to monitor the entire building. The system shall be monitored by an external monitoring company and a Digi dialler shall be installed for this service.

3.7. Lift Services

A new passenger lift shall be provided as per lift specifications.

Appendix 1

(BER & BRIRL Report)

Building Energy Rating (BER)

BER for the building detailed below is: A3

Kilbogget Sports Pavilion
Kilbogget Park
Cabinteely
Co. Dublin
D10W123

The Building Energy Rating (BER) is an indicator of the energy performance of this building. It covers energy use for space heating and cooling, water heating, ventilation and lighting, calculated on the basis of standard operating patterns. It is accompanied by a CO_2 emissions indicator. These indicators are expressed as respective ratios of primary energy use and CO_2 emissions, relative to what would apply for a similar building generally satisfying the Building Regulations 2005. 'A' rated properties are the most energy efficient and will tend to have the lowest energy bills.

BER Number:	**voidvoidvoid**	**Date of Issue:**	**07 Nov 2025**
Useful Floor Area (m^2):	**555.3**	**Valid Until:**	**06 Nov 2035**
Main Heating Fuel:	**Grid Supplied Electricity**	**BER Assessor No.:**	**101502**
Building Environment:	**Heating and Natural Ventilation**	**Assessor Company No.:**	**101502**
		Assessor Scheme:	**SEAI**
Building Type:	**General Assembly and Leisure, Night Clubs, and Theatres**		

Building Energy Rating (Indicator)

MOST EFFICIENT

< 0.17	A1
≥ 0.17	A2
≥ 0.34	A3
≥ 0.50	B1
≥ 0.67	B2
≥ 0.84	B3
≥ 1.00	C1
≥ 1.17	C2
≥ 1.34	C3
≥ 1.50	D1
≥ 1.75	D2
≥ 2.00	E1
≥ 2.25	E2
≥ 2.50	F
≥ 3.00	G

A3
527 kWh/m^2/yr
0.41

LEAST EFFICIENT

Carbon Dioxide (CO_2) Emissions Indicator

BEST
0
1.0
2.0
WORST
>3.0

Calculated annual CO_2 emissions
68 kgCO_2/m^2/yr
0.30

The less CO_2 produced, the less the building contributes to global warming.

IMPORTANT: This BER is calculated on the basis of data provided to and by the BER Assessor, and using the version of the assessment software quoted above. A future BER assigned to this building may be different as a result of changes to the building, its use or the assessment software.

BRIRL Output Document

Compliance Assessment with the Building Regulations (Ireland) TGD-Part L 2017

This report demonstrates compliance with specific aspects of Part L of the Building Regulations. Compliance with all aspects of Part L is a legal requirement. Demonstration of how compliance with every aspect is achieved may be sought from the Building Control Authority.

Kilbogget Sports Pavilion

Date: Fri Nov 07 11:12:24 2025

Administrative information

Building Details

Address: Kilbogget Sports Pavilion, Kilbogget Park, Cabinteely, -, Co. Dublin, D10W123

NEAP

Calculation engine: SBEMIE

Calculation engine version: v5.6.a.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: 7.0.28

BRIRL compliance check version: v5.6.a.0

Client Details

Name: Comhairle Contae County Council

Telephone number: 012300391

Address: County Hall, Marine Road, Co. Dublin, A96K6C9

Energy Assessor Details

Name: Varming Consulting Engineers

Telephone number: 014872300

Email: info@varming.ie

Address: Classon House, Dundrum Business Park, Dublin 14, D14V9F5

Primary Energy Consumption, CO2 Emissions, and Renewable Energy Ratio

The compliance criteria in the TGD-L have been met.

Calculated CO2 emission rate from Reference building	102.2 kgCO2/m2.annum
Calculated CO2 emission rate from Actual building	67.5 kgCO2/m2.annum
Carbon Performance Coefficient (CPC)	**0.66**
Maximum Permitted Carbon Performance Coefficient (MPCPC)	**1.15**
Calculated primary energy consumption rate from Reference building	530.5 kWh/m2.annum
Calculated primary energy consumption rate from Actual building	527.4 kWh/m2.annum
Energy Performance Coefficient (EPC)	**0.99**
Maximum Permitted Energy Performance Coefficient (MPEPC)	**1**
Renewable Energy Ratio (RER)	**0.3**
Minimum Renewable Energy Ratio	**0.2**

Heat Transmission through Building Fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Limit}$	$U_{i\text{-}Calc}$	Surface with maximum U-value*
Walls**	0.21	0.18	0.6	0.2	00000015_W3_A0
Floors (ground and exposed)	0.21	0.15	0.6	0.15	0000000A_F
Pitched roofs	0.16	-	0.3	-	"No heat loss pitched roofs"
Flat roofs	0.2	0.15	0.3	0.15	00000011_C
Windows, roof windows, and rooflights	1.6	1.2	3	1.2	00000000_W1_O0
Personnel doors	1.6	1.2	3	1.2	0000000A_W2_O0
Vehicle access & similar large doors	1.5	-	3	-	"No ext. vehicle access doors"
High usage entrance doors	3	-	3	-	"No ext. high usage entrance doors"

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m2K)]
$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m2K)]
$U_{i\text{-}Limit}$ = Limiting individual element U-values [W/(m2K)]
$U_{i\text{-}Calc}$ = Calculated individual element U-values [W/(m2K)]

* There might be more than one surface with the maximum U-value. ** Automatic U-value check by the tool does not apply to curtain walls whose area-weighted average and individual limiting standards are 1.8 and 3 W/m2K, respectively.

Air Permeability	Upper Limit	This Building's Value
m3/(h.m2) at 50 Pa	5	3

Building Services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Building Regulations documents for details.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- Space Heating

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	2.75	-	-	-	-
Standard value	2.75	N/A**	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

** No automatic check on chiller efficiency has been performed by the tool in this case. Refer to Building Regulations documents for limiting efficiency.

2- Split System

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	3	4.2	-	-	-
Standard value	2.75	4.14**	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

** Standard shown is for split and multi-split air conditioners <6 kW. For systems 6-12 kW, limiting efficiency is 3.87.

1- SYST0001-DHW

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	1.6	0
Standard value	0.8*	N/A

* Standard shown is for all types except absorption and gas engine heat pumps.

Local mechanical ventilation, exhaust, and terminal units

ID	**System type in Building Regulations documents**
A	Local supply or extract ventilation units serving a single area
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery
E	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
H	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

Zone name	**SFP [W/(l/s)]**									**HR efficiency**	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	**Zone**	**Standard**
00-Changing 01	-	-	0.5	-	-	-	-	-	-	-	N/A
00-Changing 02	-	-	0.5	-	-	-	-	-	-	-	N/A
00-Changing 03	-	-	0.5	-	-	-	-	-	-	-	N/A
00-Changing 04	-	-	0.5	-	-	-	-	-	-	-	N/A
00-Changing Places	-	-	0.5	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
00-Ref Changing 01	-	-	0.5	-	-	-	-	-	-	-	N/A
00-Ref Changing 02	-	-	0.5	-	-	-	-	-	-	-	N/A
00-Shower 01	-	-	0.5	-	-	-	-	-	-	-	N/A
00-Shower 04	-	-	0.5	-	-	-	-	-	-	-	N/A
00-WC	-	-	0.5	-	-	-	-	-	-	-	N/A
00-WC	-	-	0.5	-	-	-	-	-	-	-	N/A
00-WC	-	-	0.5	-	-	-	-	-	-	-	N/A
00-WC/Baby Changing	-	-	0.5	-	-	-	-	-	-	-	N/A
01-Acc WC	-	-	0.5	-	-	-	-	-	-	-	N/A
01-GYM	-	-	-	1.9	-	-	-	-	-	0.8	N/A

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
00-Bins	100	-	-	11
00-Changing 01	-	100	-	116
00-Changing 02	-	100	-	86
00-Changing 03	-	100	-	86
00-Changing 04	-	100	-	116
00-Changing Places	-	100	-	30
00-Hallway	-	100	-	38
00-Office 01	100	-	-	97
00-Office 02	100	-	-	98
00-Office 03	100	-	-	97
00-Plant Room	100	-	-	37
00-Ref Changing 01	-	100	-	27
00-Ref Changing 02	-	100	-	27
00-Shower 01	-	100	-	21
00-Shower 04	-	100	-	21
00-Stairwell	-	100	-	55
00-WC	-	100	-	25
00-WC	-	100	-	25
00-WC	-	100	-	25
00-WC Lobby	-	100	-	21
00-WC/Baby Changing	-	100	-	45
01-Acc WC	-	100	-	40
01-Cleaner Store	100	-	-	9
01-GYM	-	100	-	871
01-GYM Store	100	-	-	10
01-Stairwell	-	100	-	98
01-Comms Room	100	-	-	81

Solar Gain in Summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
00-Bins	N/A	N/A
00-Changing 01	N/A	N/A
00-Changing 02	N/A	N/A
00-Changing 03	N/A	N/A
00-Changing 04	N/A	N/A
00-Changing Places	N/A	N/A
00-Hallway	N/A	N/A
00-Office 01	N/A	N/A
00-Office 02	N/A	N/A
00-Office 03	NO (-88.4%)	NO
00-Plant Room	N/A	N/A
00-Ref Changing 01	N/A	N/A
00-Ref Changing 02	N/A	N/A
00-Shower 01	N/A	N/A
00-Shower 04	N/A	N/A
00-Stairwell	N/A	N/A
00-WC	N/A	N/A
00-WC	N/A	N/A
00-WC	N/A	N/A
00-WC Lobby	N/A	N/A
00-WC/Baby Changing	N/A	N/A
01-Acc WC	N/A	N/A
01-Cleaner Store	N/A	N/A
01-GYM	NO (-47.8%)	NO
01-GYM Store	N/A	N/A
01-Stairwell	N/A	N/A
01-Comms Room	N/A	N/A

Overheating

Zone	Risk of overheating
00-Bins	Low risk
00-Changing 01	High risk
00-Changing 02	High risk
00-Changing 03	High risk
00-Changing 04	High risk
00-Changing Places	High risk
00-Hallway	Significant risk
00-Office 01	High risk
00-Office 02	High risk
00-Office 03	High risk
00-Plant Room	Low risk
00-Ref Changing 01	High risk
00-Ref Changing 02	High risk

Zone	Risk of overheating
00-Shower 01	High risk
00-Shower 04	High risk
00-Stairwell	High risk
00-WC	High risk
00-WC	High risk
00-WC	High risk
00-WC Lobby	Significant risk
00-WC/Baby Changing	High risk
01-Acc WC	High risk
01-Cleaner Store	Low risk
01-GYM	High risk
01-GYM Store	Low risk
01-Stairwell	Significant risk
01-Comms Room	N/A

Primary Energy Contributions to RER

Technology	kWh/annum
Photovoltaic systems	19068.5
Wind turbines	0
Solar thermal for water heating	0
Biomass for space and/or water heating	0
Biogas for space and/or water heating	0
Heat pumps for space and/or water heating	104511
CHP generators for space and/or water heating	0
District heating for space and/or water heating	0
Process energy	0
Total for renewables	**123579.5**
Total for renewables & non-renewables	**414686.0**

Technical Data Sheet (Actual vs. Reference Building)

Building Global Parameters

	Actual	Reference
Area (m2)	555	555
External area (m2)	1148	1148
Weather	DUB	DUB
Infiltration (m3/hm2 @ 50Pa)	3	3
Average conductance (W/K)	275.44	374.4
Average U-value (W/m2K)	0.24	0.33
Alpha value* (%)	23.7	25.06

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% area	Building Type
	Retail/Financial and Professional services
	Restaurants and Cafes/Drinking Est./Takeaways
	Offices and Workshop businesses
	General Industrial and Special Industrial Groups
	Storage or Distribution
	Hotels
	Residential Inst.: Hospitals and Care Homes
	Residential Inst.: Residential Primary schools
	Residential Inst.: Universities and colleges
	Secure Residential Inst.
	Residential spaces
	Non-residential Inst.: Community/Day Centre
	Non-residential Inst.: Libraries, Museums, and Galleries
	Non-residential Inst.: Primary Education
	Non-residential Inst.: Primary Health Care Building
	Non-residential Inst.: Law Courts
100	**General Assembly and Leisure, Night Clubs and Theatres**
	Others: Passenger terminals
	Others: Emergency services
	Others: Miscellaneous 24hr activities
	Others: Car Parks 24 hrs
	Others - Stand alone utility block
	Non-residential Inst.: Post-primary Education
	Residential Inst.: Residential Post-primary schools

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Central heating using water: radiators, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	125.5	58.3	13.5	0	10.5	2.58	0	2.75	0
	Reference	152.1	81.4	51.6	0	9.2	0.82	0	----	----
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	62.1	213.7	6.2	19.9	0	2.8	2.98	3	4.2
	Reference	187.1	284	63.4	21.9	4.3	0.82	3.6	----	----

Key to terms

Alpha value (%)	= percentage of the building's average heat transfer coefficient which is due to thermal bridging
Heat dem (MJ/m2)	= Heating energy demand
Cool dem (MJ/m2)	= Cooling energy demand
Heat con (kWh/m2)	= Heating energy consumption
Cool con (kWh/m2)	= Cooling energy consumption
Aux con (kWh/m2)	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type