



### Project name

**Paddington Packet Boat - Lean**

**As designed**

**Date:** Wed Jun 19 08:28:18 2024

### Administrative information

#### Building Details

Address:

#### Certifier details

Name: George Farr

Telephone number:

Address: , ,

#### Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.1

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.26

BRUKL compliance module version: v6.1.e.1

Foundation area [m<sup>2</sup>]: 328.94

### The CO<sub>2</sub> emission and primary energy rates of the building must not exceed the targets

Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> :annum	5.17
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> :annum	4.66
Target primary energy rate (TPER), kWh <sub>PE</sub> /m <sup>2</sup> :annum	54.3
Building primary energy rate (BPER), kWh <sub>PE</sub> /m <sup>2</sup> :annum	49.2
Do the building's emission and primary energy rates exceed the targets?	BER <= TER   BPER <= TPER

### The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	U <sub>a</sub> -Limit	U <sub>a</sub> -Calc	U <sub>i</sub> -Calc	First surface with maximum value
Walls*	0.26	0.18	0.3	00000055_W4_A0
Floors	0.18	0.12	0.12	00000005_F
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.13	0.45	00000084_C_A0
Windows** and roof windows	1.6	1.2	1.2	00000058_W-1_O0
Rooflights***	2.2	-	-	No external rooflights
Personnel doors <sup>^</sup>	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

U<sub>a</sub>-Limit = Limiting area-weighted average U-values [W/(m<sup>2</sup>K)]

U<sub>i</sub>-Calc = Calculated maximum individual element U-values [W/(m<sup>2</sup>K)]

U<sub>a</sub>-Calc = Calculated area-weighted average U-values [W/(m<sup>2</sup>K)]

\* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

\*\* Display windows and similar glazing are excluded from the U-value check. \*\*\* Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m<sup>2</sup>K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa	8	4

## Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

<b>Whole building lighting automatic monitoring &amp; targeting with alarms for out-of-range values</b>	YES
<b>Whole building electric power factor achieved by power factor correction</b>	<0.9

### 1- LTHW HEAT PUMP

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	2.82	-	-	-	-
<b>Standard value</b>	2.5*	N/A	N/A	N/A	N/A
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					YES

\* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

### 1- SYST0000-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
<b>This building</b>	Hot water provided by HVAC system	0.002
<b>Standard value</b>	N/A	N/A

### Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
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 balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	ID of system type	SFP [W/(l/s)]									HR efficiency	
		A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A	

Zone name	SFP [W/(l/s)]									HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
BATHROOM	-	-	0.3	-	-	-	-	-	-	-	N/A
LAUNDRY	-	-	0.3	-	-	-	-	-	-	-	N/A
WC	-	-	0.3	-	-	-	-	-	-	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name	Standard value	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
BATHROOM	95	80	0.3	
120	-	-	-	



General lighting and display lighting		General luminaire	Display light source	
Zone name	Standard value	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
BATHROOM	120	-	-	-
BATHROOM	120	-	-	-
BATHROOM	120	-	-	-
BATHROOM	120	-	-	-
BATHROOM	120	-	-	-
BATHROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
BEDROOM	120	-	-	-
CIRCULATION	120	-	-	-
CIRCULATION LOBBY	120	-	-	-
CIRCULATION LOBBY	120	-	-	-
CIRCULATION LOBBY	120	-	-	-
CIRCULATION LOBBY	120	-	-	-
CIRCULATION LOBBY	120	-	-	-
CORRIDOR 00	120	-	-	-
CORRIDOR 01	120	-	-	-
CORRIDOR 02	120	-	-	-
CORRIDOR 03	120	-	-	-
CORRIDOR 04	120	-	-	-
LAUNDRY	120	-	-	-
RECEPTION	120	80	1.688	
RESIDENTS LOUNGE	120	-	-	-
STAIRWELL	120	-	-	-
STAIRWELL	120	-	-	-
STAIRWELL	120	-	-	-
STAIRWELL	120	-	-	-
STAIRWELL	120	-	-	-
STORE	120	-	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m <sup>2</sup> ]
Standard value	95	80	0.3
WC	120	-	-
PLANT	120	-	-

**The spaces in the building should have appropriate passive control measures to limit solar gains in summer**

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
BEDROOM	NO (-18%)	NO
BEDROOM	NO (-24.9%)	NO
BEDROOM	NO (-17.1%)	NO
BEDROOM	YES (+0.6%)	NO
BEDROOM	NO (-34%)	NO
BEDROOM	NO (-38.7%)	NO
BEDROOM	NO (-28%)	NO
BEDROOM	NO (-47.6%)	NO
BEDROOM	NO (-12.6%)	NO
BEDROOM	NO (-38.7%)	NO
BEDROOM	NO (-11%)	NO
BEDROOM	NO (-23%)	NO
BEDROOM	NO (-44.4%)	NO
BEDROOM	NO (-41.5%)	NO
BEDROOM	NO (-12.8%)	NO
BEDROOM	NO (-32.2%)	NO
BEDROOM	NO (-30.7%)	NO
RECEPTION	NO (-40.2%)	NO

**Regulation 25A: Consideration of high efficiency alternative energy systems**

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

# Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters		Building Use	
	Actual	Notional	% Area
Floor area [m <sup>2</sup> ]	1662.1	1662.1	Retail/Financial and Professional Services
External area [m <sup>2</sup> ]	2292.9	2292.9	Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	LON	LON	Offices and Workshop Businesses
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	4	3	General Industrial and Special Industrial Groups
Average conductance [W/K]	623.95	975.12	Storage or Distribution
Average U-value [W/m <sup>2</sup> K]	0.27	0.43	Hotels
Alpha value* [%]	17.49	26.81	Residential Institutions: Hospitals and Care Homes
		Residential Institutions: Residential Schools	
		<b>100</b> <b>Residential Institutions: Universities and Colleges</b>	
		Secure Residential Institutions	
		Residential Spaces	
		Non-residential Institutions: Community/Day Centre	
		Non-residential Institutions: Libraries, Museums, and Galleries	
		Non-residential Institutions: Education	
		Non-residential Institutions: Primary Health Care Building	
		Non-residential Institutions: Crown and County Courts	
		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	

## Energy Consumption by End Use [kWh/m<sup>2</sup>]

	Actual	Notional
Heating	14.89	19.63
Cooling	0	0
Auxiliary	2.6	2.83
Lighting	5.79	6.03
Hot water	8.67	7.58
Equipment*	13.71	13.71
<b>TOTAL**</b>	<b>31.95</b>	<b>36.07</b>

\* Energy used by equipment does not count towards the total for consumption or calculating emissions.

\*\* Total is net of any electrical energy displaced by CHP generators, if applicable.

## Energy Production by Technology [kWh/m<sup>2</sup>]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>0</i>	<i>0</i>

## Energy & CO<sub>2</sub> Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m <sup>2</sup> ]	245.96	262.73
Primary energy [kWh <sub>PE</sub> /m <sup>2</sup> ]	49.2	54.3
Total emissions [kg/m <sup>2</sup> ]	4.66	5.17

## HVAC Systems Performance

System Type	Heat dem MJ/m <sup>2</sup>	Cool dem MJ/m <sup>2</sup>	Heat con kWh/m <sup>2</sup>	Cool con kWh/m <sup>2</sup>	Aux con kWh/m <sup>2</sup>	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
<b>[ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity</b>									
Actual	143.2	90	15	0	2.4	2.64	0	2.82	0
	Notional	188.5	62.4	19.8	0	2.1	2.64	0	----
<b>[ST] No Heating or Cooling</b>									
Actual	0	1454.8	0	0	0	0	0	0	0
	Notional	0	1382.1	0	0	0	0	0	----

### Key to terms

Heat dem [MJ/m <sup>2</sup> ]	= Heating energy demand
Cool dem [MJ/m <sup>2</sup> ]	= Cooling energy demand
Heat con [kWh/m <sup>2</sup> ]	= Heating energy consumption
Cool con [kWh/m <sup>2</sup> ]	= Cooling energy consumption
Aux con [kWh/m <sup>2</sup> ]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
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