

Appendix 10.4

Upper Brook Street Sci-Tech BRUKL Report

Project name

RIBA Stage 2 - Upper Brook Street Office Block

As designed

Date: Thu Apr 20 20:11:16 2023

Administrative information

Building Details

Address: Kadans Science Partner 8 UK Ltd,

Certifier details

Name: Felipe Tibabuzo Castro

Telephone number: 03304605287

Address: Wallace Whittle. The Garment Factory, 10
Montrose Street, Glasgow, G1 1RE

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.19

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.19

BRUKL compliance module version: v6.1.e.0

Foundation area [m²]: 2089.59The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	3.39
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	2.89
Target primary energy rate (TPER), kWh _{PE} /m ² .annum	34.83
Building primary energy rate (BPER), kWh _{PE} /m ² .annum	30.41
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 _{a-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.16	0.26	L0000127:Surf[0]
Floors	0.18	0.1	0.11	L0000005:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.1	0.1	L0000012:Surf[1]
Windows** and roof windows	1.6	1.2	1.2	L0000004:Surf[1]
Rooflights***	2.2	1.25	1.25	5T000036:Surf[2]
Personnel doors [^]	1.6	-	-	No personnel doors in building
Vehicle access & similar large doors	1.3	-	-	No vehicle access doors in building
High usage entrance doors	3	-	-	No high usage entrance doors in building

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

* 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/m²K

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 ³ /(h.m ²) at 50 Pa	8	3

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	>0.95

1- 000 FCU System + Rev Heat Pump

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.12	4.67	0	2.06	0.73
Standard value	2.5*	N/A	N/A	2^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

2- 001 Direct Electric System (Background vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

3- 002 Direct Electric System (Extrat Only)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- 101 DHW (Changing Rooms) ASHP

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	2.9	0.005
Standard value	2*	N/A
* Standard shown is for all types except absorption and gas engine heat pumps.		

2- 100 DHW System - Direct Electric Point Of Use

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.022
Standard value	1	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	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	2.3	2	0.5	0.5	0.4	1	Zone	Standard	
L00_GF_Cafe/Bar	-	-	-	-	-	-	-	0.2	-	-	N/A	
L00_GF_FM Office	-	-	-	-	-	-	-	0.2	-	-	N/A	
L00_GF_FM Office	-	-	-	-	-	-	-	0.2	-	-	N/A	
L00_GF_FM Office	-	-	-	-	-	-	-	0.2	-	-	N/A	
L00_GF_Incubator Space	-	-	-	-	-	-	-	0.2	-	-	N/A	
L00_GF_Kitchen	-	-	-	-	-	-	-	0.2	-	-	N/A	
L00_GF_Locker Room	-	-	0.4	-	-	-	-	-	-	-	N/A	
L00_GF_Meeting Room	-	-	-	-	-	-	-	0.2	-	-	N/A	
L00_GF_Post Room	-	-	-	-	-	-	-	0.2	-	-	N/A	
L00_GF_Reception Entrance	-	-	-	-	-	-	-	0.2	-	-	N/A	
L00_GF_Security Room	-	-	-	-	-	-	-	0.2	-	-	N/A	
L00_GF_Showers	-	-	0.4	-	-	-	-	-	-	-	N/A	
L00_GF_Showers	-	-	0.4	-	-	-	-	-	-	-	N/A	
L00_GF_Toilets	-	-	0.4	-	-	-	-	-	-	-	N/A	
L00_GF_Toilets	-	-	0.4	-	-	-	-	-	-	-	N/A	
L00_GF_WC	-	-	0.4	-	-	-	-	-	-	-	N/A	
L00_GF_WC	-	-	0.4	-	-	-	-	-	-	-	N/A	
L00_GF_WC	-	-	0.4	-	-	-	-	-	-	-	N/A	
L00_GF_WC	-	-	0.4	-	-	-	-	-	-	-	N/A	
L00_GF_WC	-	-	0.4	-	-	-	-	-	-	-	N/A	
L01_FirstFloor_Breakout	-	-	-	-	-	-	-	0.3	-	-	N/A	
L01_FirstFloor_Office/Lab	-	-	-	-	-	-	-	0.2	-	-	N/A	
L01_FirstFloor_Office/Lab	-	-	-	-	-	-	-	0.2	-	-	N/A	
L01_FirstFloor_Office/Lab	-	-	-	-	-	-	-	0.2	-	-	N/A	
L01_FirstFloor_WC 1	-	-	0.4	-	-	-	-	-	-	-	N/A	
L01_FirstFloor_WC 2	-	-	0.4	-	-	-	-	-	-	-	N/A	
L01_FirstFloor_WC 3	-	-	0.4	-	-	-	-	-	-	-	N/A	
L01_FirstFloor_WC 4	-	-	0.4	-	-	-	-	-	-	-	N/A	
L02_2ndFloor_Breakout	-	-	-	-	-	-	-	0.3	-	-	N/A	
L02_2ndFloor_Office/Lab	-	-	-	-	-	-	-	0.2	-	-	N/A	
L02_2ndFloor_WC 1	-	-	0.4	-	-	-	-	-	-	-	N/A	
L02_2ndFloor_WC 2	-	-	0.4	-	-	-	-	-	-	-	N/A	
L02_2ndFloor_WC 3	-	-	0.4	-	-	-	-	-	-	-	N/A	
L02_2ndFloor_WC 4	-	-	0.4	-	-	-	-	-	-	-	N/A	
L03_3rdFloor_Breakout	-	-	-	-	-	-	-	0.3	-	-	N/A	
L03_3rdFloor_Breakout	-	-	-	-	-	-	-	0.3	-	-	N/A	
L03_3rdFloor_Office/Lab	-	-	-	-	-	-	-	0.2	-	-	N/A	
L03_3rdFloor_WC 1	-	-	0.4	-	-	-	-	-	-	-	N/A	
L03_3rdFloor_WC 2	-	-	0.4	-	-	-	-	-	-	-	N/A	
L03_3rdFloor_WC 3	-	-	0.4	-	-	-	-	-	-	-	N/A	
L03_3rdFloor_WC 4	-	-	0.4	-	-	-	-	-	-	-	N/A	
L04_4thFloor_Breakout	-	-	-	-	-	-	-	0.3	-	-	N/A	
L04_4thFloor_Breakout	-	-	-	-	-	-	-	0.3	-	-	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	2.3	2	0.5	0.5	0.4	1	Zone	Standard	
L04_4thFloor_Office/Lab	-	-	-	-	-	-	-	0.2	-	-	N/A	
L04_4thFloor_WC 1	-	-	0.4	-	-	-	-	-	-	-	N/A	
L04_4thFloor_WC 2	-	-	0.4	-	-	-	-	-	-	-	N/A	
L04_4thFloor_WC 3	-	-	0.4	-	-	-	-	-	-	-	N/A	
L04_4thFloor_WC 4	-	-	0.4	-	-	-	-	-	-	-	N/A	
L05_5thFloor_Breakout	-	-	-	-	-	-	-	0.3	-	-	N/A	
L05_5thFloor_Breakout	-	-	-	-	-	-	-	0.3	-	-	N/A	
L05_5thFloor_WC 1	-	-	0.4	-	-	-	-	-	-	-	N/A	
L05_5thFloor_WC 2	-	-	0.4	-	-	-	-	-	-	-	N/A	
L06_6thFloor_Breakout	-	-	-	-	-	-	-	0.3	-	-	N/A	
L06_6thFloor_WC 1	-	-	0.4	-	-	-	-	-	-	-	N/A	
L06_6thFloor_WC 2	-	-	0.4	-	-	-	-	-	-	-	N/A	
L07_7thFloor_WC 1	-	-	0.4	-	-	-	-	-	-	-	N/A	
L07_7thFloor_WC 2	-	-	0.4	-	-	-	-	-	-	-	N/A	
L07_7thFloor_Office/Lab	-	-	-	-	-	-	-	0.2	-	-	N/A	
L06_6thFloor_Office/Lab	-	-	-	-	-	-	-	0.2	-	-	N/A	
L02_2ndFloor_Office/Lab	-	-	-	-	-	-	-	0.2	-	-	N/A	
L05_5thFloor_Office/Lab	-	-	-	-	-	-	-	0.2	-	-	N/A	
L04_4thFloor_Office/Lab	-	-	-	-	-	-	-	0.2	-	-	N/A	
L03_3rdFloor_Office/Lab	-	-	-	-	-	-	-	0.2	-	-	N/A	

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value		95	80	0.3
L00_GF_Cafe/Bar		100	-	-
L00_GF_Chem Waste		100	-	-
L00_GF_Circulation		100	-	-
L00_GF_Circulation Space 1		100	-	-
L00_GF_Circulation Space 2		100	-	-
L00_GF_Circulation Space 3		100	-	-
L00_GF_Circulation Space 4		100	-	-
L00_GF_Circulation Space 5		100	-	-
L00_GF_Circulation Space 6		100	-	-
L00_GF_Circulation Space 7		100	-	-
L00_GF_Circulation Space 8		100	-	-
L00_GF_Circulation Space 9		100	-	-
L00_GF_Circulation Space 10		100	-	-
L00_GF_Circulation Space 11		100	-	-
L00_GF_Circulation Space 12		100	-	-
L00_GF_Circulation Space 13		100	-	-
L00_GF_Clinical Waste		100	-	-
L00_GF_Cycle Store		100	-	-
L00_GF_Expedition Room		100	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
L00_GF_Fire Comms		100	-	-
L00_GF_FM Office		120	-	-
L00_GF_FM Office		120	-	-
L00_GF_FM Office		120	-	-
L00_GF_Gas Bottle Store		100	-	-
L00_GF_General Waste		100	-	-
L00_GF_Generator and LS Switchroom		100	-	-
L00_GF_Hazardous Waste		100	-	-
L00_GF_Incomming Comms		100	-	-
L00_GF_Incomming Comms		100	-	-
L00_GF_Incubator Space		120	-	-
L00_GF_Kitchen		100	-	-
L00_GF_Lobby		100	-	-
L00_GF_Lobby		100	-	-
L00_GF_Lobby		100	-	-
L00_GF_Lobby		100	-	-
L00_GF_Locker Room		100	-	-
L00_GF_LV Switch Room		100	-	-
L00_GF_LV Switch Room		100	-	-
L00_GF_Meeting Room		120	-	-
L00_GF_Plant		100	-	-
L00_GF_Post Room		120	-	-
L00_GF_Reception Entrance		120	100	1.08
L00_GF_Security Room		120	-	-
L00_GF>Showers		100	-	-
L00_GF>Showers		100	-	-
L00_GF_Stair 1		100	-	-
L00_GF_Stair 2		100	-	-
L00_GF_Stair 3		100	-	-
L00_GF_Stair 4		100	-	-
L00_GF_Store		100	-	-
L00_GF_Store		100	-	-
L00_GF_Store		100	-	-
L00_GF_Store		100	-	-
L00_GF_Store		100	-	-
L00_GF_Store		100	-	-
L00_GF_Substation		100	-	-
L00_GF_Substation		100	-	-
L00_GF_Switchroom Lobby		100	-	-
L00_GF_Toilets		100	-	-
L00_GF_Toilets		100	-	-
L00_GF_WC		100	-	-
L00_GF_WC		100	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
L00_GF_WC		100	-	-
L00_GF_WC		100	-	-
L00_GF_WC		100	-	-
L01_FirstFloor_Breakout		100	-	-
L01_FirstFloor_Circulation		100	-	-
L01_FirstFloor_Circulation		100	-	-
L01_FirstFloor_Corridor Stair 1		100	-	-
L01_FirstFloor_Corridor Stair 2		100	-	-
L01_FirstFloor_Corridor Stair 4		100	-	-
L01_FirstFloor_Corridor Stair 4		100	-	-
L01_FirstFloor_Office/Lab		120	-	-
L01_FirstFloor_Office/Lab		120	-	-
L01_FirstFloor_Office/Lab		120	-	-
L01_FirstFloor_Stair		100	-	-
L01_FirstFloor_Stair 1		100	-	-
L01_FirstFloor_Stair 2		100	-	-
L01_FirstFloor_Stair 3		100	-	-
L01_FirstFloor_Stair 4		100	-	-
L01_FirstFloor_WC 1		100	-	-
L01_FirstFloor_WC 2		100	-	-
L01_FirstFloor_WC 3		100	-	-
L01_FirstFloor_WC 4		100	-	-
L02_2ndFloor_Stair 4		100	-	-
L02_2ndFloor_Breakout		100	-	-
L02_2ndFloor_Corridor		100	-	-
L02_2ndFloor_Corridor		100	-	-
L02_2ndFloor_Corridor		100	-	-
L02_2ndFloor_Corridor		100	-	-
L02_2ndFloor_Corridor Stair 2		100	-	-
L02_2ndFloor_Lobby 3		100	-	-
L02_2ndFloor_Lobby 4		100	-	-
L02_2ndFloor_Office/Lab		120	-	-
L02_2ndFloor_Stair 1		100	-	-
L02_2ndFloor_Stair 2		100	-	-
L02_2ndFloor_Stair 3		100	-	-
L02_2ndFloor_Stair Lobby 1		100	-	-
L02_2ndFloor_WC 1		100	-	-
L02_2ndFloor_WC 2		100	-	-
L02_2ndFloor_WC 3		100	-	-
L02_2ndFloor_WC 4		100	-	-
L03_3rdFloor_Stair 4		100	-	-
L03_3rdFloor_Breakout		100	-	-
L03_3rdFloor_Breakout		100	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
	Standard value	95	80	0.3
L03_3rdFloor_Corridor		100	-	-
L03_3rdFloor_Corridor		100	-	-
L03_3rdFloor_Corridor		100	-	-
L03_3rdFloor_Corridor		100	-	-
L03_3rdFloor_Lobby 3		100	-	-
L03_3rdFloor_Lobby 4		100	-	-
L03_3rdFloor_Office/Lab		120	-	-
L03_3rdFloor_Stair 1		100	-	-
L03_3rdFloor_Stair 2		100	-	-
L03_3rdFloor_Stair 3		100	-	-
L03_3rdFloor_Stair Lobby 1		100	-	-
L03_3rdFloor_WC 1		100	-	-
L03_3rdFloor_WC 2		100	-	-
L03_3rdFloor_WC 3		100	-	-
L03_3rdFloor_WC 4		100	-	-
L04_4thFloor_Stair 4		100	-	-
L04_4thFloor_Breakout		100	-	-
L04_4thFloor_Breakout		100	-	-
L04_4thFloor_Corridor		100	-	-
L04_4thFloor_Corridor		100	-	-
L04_4thFloor_Corridor		100	-	-
L04_4thFloor_Corridor		100	-	-
L04_4thFloor_Lobby 3		100	-	-
L04_4thFloor_Lobby 4		100	-	-
L04_4thFloor_Office/Lab		120	-	-
L04_4thFloor_Stair 1		100	-	-
L04_4thFloor_Stair 2		100	-	-
L04_4thFloor_Stair 3		100	-	-
L04_4thFloor_Stair Lobby 1		100	-	-
L04_4thFloor_WC 1		100	-	-
L04_4thFloor_WC 2		100	-	-
L04_4thFloor_WC 3		100	-	-
L04_4thFloor_WC 4		100	-	-
L05_5thFloor_Breakout		100	-	-
L05_5thFloor_Breakout		100	-	-
L05_5thFloor_Corridor		100	-	-
L05_5thFloor_Corridor		100	-	-
L05_5thFloor_Corridor		100	-	-
L05_5thFloor_Corridor		100	-	-
L05_5thFloor_Stair 1		100	-	-
L05_5thFloor_Stair 2		100	-	-
L05_5thFloor_Stair Lobby 1		100	-	-
L05_5thFloor_WC 1		100	-	-

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
L05_5thFloor_WC 2		100	-	-
L06_6thFloor_Breakout		100	-	-
L06_6thFloor_Corridor		100	-	-
L06_6thFloor_Corridor		100	-	-
L06_6thFloor_Corridor		100	-	-
L06_6thFloor_Corridor		100	-	-
L06_6thFloor_Stair 1		100	-	-
L06_6thFloor_Stair 2		100	-	-
L06_6thFloor_Stair Lobby 1		100	-	-
L06_6thFloor_WC 1		100	-	-
L06_6thFloor_WC 2		100	-	-
L07_7thFloor_Corridor		100	-	-
L07_7thFloor_Corridor		100	-	-
L07_7thFloor_Stair 1		100	-	-
L07_7thFloor_Stair 2		100	-	-
L07_7thFloor_Stair Lobby 1		100	-	-
L07_7thFloor_WC 1		100	-	-
L07_7thFloor_WC 2		100	-	-
L00_GF_Circulation		100	-	-
L00_GF_Circulation Space 14		100	-	-
L07_7thFloor_Office/Lab		120	-	-
L06_6thFloor_Office/Lab		120	-	-
L02_2ndFloor_Office/Lab		120	-	-
L05_5thFloor_Office/Lab		120	-	-
L04_4thFloor_Office/Lab		120	-	-
L03_3rdFloor_Office/Lab		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?
L00_GF_Cafe/Bar	NO (-22.1%)	NO
L00_GF_FM Office	N/A	N/A
L00_GF_FM Office	N/A	N/A
L00_GF_FM Office	N/A	N/A
L00_GF_Incubator Space	YES (+59.3%)	NO
L00_GF_Kitchen	N/A	N/A
L00_GF_Meeting Room	N/A	N/A
L00_GF_Post Room	N/A	N/A
L00_GF_Reception Entrance	YES (+13.5%)	NO
L00_GF_Security Room	N/A	N/A
L01_FirstFloor_Breakout	NO (-96%)	NO
L01_FirstFloor_Office/Lab	NO (-11%)	NO
L01_FirstFloor_Office/Lab	NO (-35.3%)	NO
L01_FirstFloor_Office/Lab	NO (-20.1%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
L02_2ndFloor_Breakout	NO (-96%)	NO
L02_2ndFloor_Office/Lab	NO (-36.1%)	NO
L03_3rdFloor_Breakout	NO (-91.7%)	NO
L03_3rdFloor_Breakout	NO (-85.8%)	NO
L03_3rdFloor_Office/Lab	NO (-34.6%)	NO
L04_4thFloor_Breakout	NO (-61.6%)	NO
L04_4thFloor_Breakout	NO (-81%)	NO
L04_4thFloor_Office/Lab	NO (-35.1%)	NO
L05_5thFloor_Breakout	NO (-73.8%)	NO
L05_5thFloor_Breakout	NO (-45.8%)	NO
L06_6thFloor_Breakout	YES (+140.1%)	NO
L07_7thFloor_Office/Lab	NO (-31%)	NO
L06_6thFloor_Office/Lab	NO (-28.9%)	NO
L02_2ndFloor_Office/Lab	NO (-28.1%)	NO
L05_5thFloor_Office/Lab	NO (-26.1%)	NO
L04_4thFloor_Office/Lab	NO (-25.9%)	NO
L03_3rdFloor_Office/Lab	NO (-26.3%)	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?	NO
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m ²]	19170.2	19170.2
External area [m ²]	14321.7	14321.7
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	3	3
Average conductance [W/K]	4779.24	5237.89
Average U-value [W/m ² K]	0.33	0.37
Alpha value* [%]	24.39	10

* 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 Establishments/Takeaways
100	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
	Storage or Distribution
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	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/m²]

	Actual	Notional
Heating	2.42	1.92
Cooling	3.63	2.83
Auxiliary	8.55	8.23
Lighting	5.84	8.14
Hot water	3.1	3.82
Equipment*	37.7	37.7
TOTAL **	23.54	24.92

* 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/m²]

	Actual	Notional
Photovoltaic systems	2.71	0.89
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>2.71</i>	<i>0.89</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	62.34	60.96
Primary energy [kWh _{PE} /m ²]	30.41	34.83
Total emissions [kg/m ²]	2.89	3.39

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 SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER	
[ST] Fan coil systems, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
Actual	14	58.8	1.3	4.5	10	2.96	3.61	3.12	4.67	
Notional	10.4	58.7	1	3.5	9.3	2.78	4.63	----	----	
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
Actual	89.3	0	31	0	0	0.8	0	1	0	
Notional	104	0	20.5	0	0	1.41	0	----	----	
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
Actual	27.3	0	9.5	0	10.1	0.8	0	1	0	
Notional	57	0	11.2	0	14.3	1.41	0	----	----	
[ST] No Heating or Cooling										
Actual	0	0	0	0	0	0	0	0	0	
Notional	0	0	0	0	0	0	0	----	----	

Key to terms

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 (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