

Project name

Market Place

As designed

Date: Tue Jun 16 15:44:24 2020

Administrative information**Building Details**

Address: 6-8 Market Place, Reading,

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.6.a.1

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v6.1.0

BRUKL compliance check version: v5.6.a.1

Owner Details

Name:

Telephone number:

Address: , ,

Certifier details

Name: Neil Ingham

Telephone number:

Address: Holborn Tower, 137-144 Holborn, WC1V 6PL

Criterion 1: The calculated CO₂ emission rate for the building must not exceed the target

The building does not comply with England Building Regulations Part L 2013

CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	18.1
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	18.1
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	35.8
Are emissions from the building less than or equal to the target?	BER > TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	U _a -Limit	U _a -Calc	U _i -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.3	0.3	existing Level 0 - Lobby 1_W_7
Floor	0.25	0.58	0.58	existing Level 0 - Lobby 1_S_3
Roof	0.25	0.18	0.18	existing Level 1 - Seating Area 1_R_5
Windows***, roof windows, and rooflights	2.2	1.62	2.17	existing Level 1 - Seating Area 1_G_6
Personnel doors	2.2	1.8	1.8	existing Level 1 - Office 1_D_15
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	3.5	-	-	"No external high usage entrance doors"

U_a-Limit = Limiting area-weighted average U-values [W/(m²K)]U_a-Calc = Calculated area-weighted average U-values [W/(m²K)]U_i-Calc = Calculated maximum individual element U-values [W/(m²K)]

* There might be more than one surface where the maximum U-value occurs.

** 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.

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

Air Permeability	Worst acceptable standard	This building
m ³ /(h.m ²) at 50 Pa	10	25

Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the [Non-Domestic Building Services Compliance Guide](#) 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- SPLIT GAS AND AC

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.86	2.5	-	-	-
Standard value	0.91*	N/A	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 gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.					

1- Gas secondary loop DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	Hot water provided by HVAC system	0.001
Standard value	N/A	N/A

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
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		Zone	Standard
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1			
existing Level 0 - Lobby mvhr	-	-	-	1.5	-	-	-	-	-	0.65	0.5	
existing Level 1 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
existing Level 1 - Seating Area mvhr	-	-	-	1.5	-	-	-	-	-	0.65	0.5	
existing Level 1 - Office mvhr	-	-	-	1.5	-	-	-	-	-	0.65	0.5	
existing Level 1 - Lobby mvhr	-	-	-	1.5	-	-	-	-	-	0.65	0.5	
existing Level 2 - WC 1	-	-	0.5	-	-	-	-	-	-	-	N/A	
existing Level 2 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
existing Level 2 - Office mvhr 1	-	-	-	1.5	-	-	-	-	-	0.65	0.5	
existing Level 2 - Office mvhr 2	-	-	-	1.5	-	-	-	-	-	0.65	0.5	
existing Level 2 - Office mvhr 3	-	-	-	1.5	-	-	-	-	-	0.65	0.5	
existing Level 3 - Office mvhr 1	-	-	-	1.5	-	-	-	-	-	0.65	0.5	
existing Level 3 - Office mvhr 2	-	-	-	1.5	-	-	-	-	-	0.65	0.5	
existing Level 3 - Office mvhr 4	-	-	-	1.5	-	-	-	-	-	0.65	0.5	
existing Level 4 - Office mvhr 2	-	-	-	1.5	-	-	-	-	-	0.65	0.5	
existing Level 5 - WC 1	-	-	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
existing Level 5 - WC	-	-	0.5	-	-	-	-	-	-	-	-	N/A
existing Level 5 - Office mvhr 3	-	-	-	1.5	-	-	-	-	-	-	0.65	0.5
existing Level 5 - Office mvhr	-	-	-	1.5	-	-	-	-	-	-	0.65	0.5

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
Standard value		60	60	22	
existing Level 0 - Lobby 1		-	60	22	802
existing Level 0 - Lifts		-	60	-	53
existing Level 0 - Lobby mvhr		-	60	22	108
existing Level 1 - Circulation 1		-	60	-	148
existing Level 1 - Office 1		60	-	-	4501
existing Level 1 - Store		60	-	-	10
existing Level 1 - Seating Area 1		60	-	-	2773
existing Level 1 - WC		-	60	-	130
existing Level 1 - ?		60	-	-	264
existing Level 1 - Lobby 1		-	60	22	823
existing Level 1 - Seating Area mvhr		60	-	-	815
existing Level 1 - Lifts		-	60	-	56
existing Level 1 - Circulation 2		-	60	-	98
existing Level 1 - Circulation		-	60	-	48
existing Level 1 - Office mvhr		60	-	-	1105
existing Level 1 - Lobby mvhr		-	60	22	105
existing Level 2 - Circulation 1		-	60	-	109
existing Level 2 - Office 7		60	-	-	10726
existing Level 2 - WC 1		-	60	-	135
existing Level 2 - WC		-	60	-	140
existing Level 2 - Office mvhr 1		60	-	-	1188
existing Level 2 - Circulation 2		-	60	-	141
existing Level 2 - Store 1		60	-	-	11
existing Level 2 - Circulation		-	60	-	69
existing Level 2 - Store		60	-	-	7
existing Level 2 - Office mvhr 2		60	-	-	1446
existing Level 2 - Office mvhr 3		60	-	-	1027
existing Level 2 - Lifts		-	60	-	66
existing Level 3 - Office 6		60	-	-	9330
existing Level 3 - Office mvhr 1		60	-	-	1188
existing Level 3 - Circulation 2		-	60	-	141
existing Level 3 - Office mvhr 2		60	-	-	1027
existing Level 3 - Office mvhr 4		60	-	-	1160
existing Level 4 - Office 7		60	-	-	7112
existing Level 4 - Office mvhr 2		60	-	-	1027
existing Level 5 - Circulation 2		-	60	-	143

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
existing Level 5 - Store 1		60	-	-	11
existing Level 5 - Office 7		60	-	-	6378
existing Level 5 - WC 1		-	60	-	138
existing Level 5 - WC		-	60	-	142
existing Level 5 - Circulation 1		-	60	-	110
existing Level 5 - Office mvhr 3		60	-	-	433
existing Level 5 - Office mvhr		60	-	-	333
existing Level 5 - Lifts		-	60	-	68

Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
existing Level 0 - Lobby 1	NO (-28.8%)	NO
existing Level 0 - Lifts	N/A	N/A
existing Level 0 - Lobby mvhr	N/A	N/A
existing Level 1 - Circulation 1	YES (+214.8%)	NO
existing Level 1 - Office 1	YES (+54.1%)	NO
existing Level 1 - Store	N/A	N/A
existing Level 1 - Seating Area 1	YES (+218.5%)	NO
existing Level 1 - WC	N/A	N/A
existing Level 1 - ?	N/A	N/A
existing Level 1 - Lobby 1	YES (+80.9%)	NO
existing Level 1 - Seating Area mvhr	NO (-3.9%)	NO
existing Level 1 - Lifts	N/A	N/A
existing Level 1 - Circulation 2	YES (+103.5%)	NO
existing Level 1 - Circulation	N/A	N/A
existing Level 1 - Office mvhr	N/A	N/A
existing Level 1 - Lobby mvhr	N/A	N/A
existing Level 2 - Circulation 1	N/A	N/A
existing Level 2 - Office 7	YES (+14.6%)	NO
existing Level 2 - WC 1	N/A	N/A
existing Level 2 - WC	N/A	N/A
existing Level 2 - Office mvhr 1	N/A	N/A
existing Level 2 - Circulation 2	N/A	N/A
existing Level 2 - Store 1	N/A	N/A
existing Level 2 - Circulation	NO (-80.7%)	NO
existing Level 2 - Store	NO (-22.6%)	NO
existing Level 2 - Office mvhr 2	N/A	N/A
existing Level 2 - Office mvhr 3	N/A	N/A
existing Level 2 - Lifts	N/A	N/A
existing Level 3 - Office 6	YES (+5.5%)	NO
existing Level 3 - Office mvhr 1	N/A	N/A
existing Level 3 - Circulation 2	N/A	N/A
existing Level 3 - Office mvhr 2	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
existing Level 3 - Office mvhr 4	N/A	N/A
existing Level 4 - Office 7	NO (-4.3%)	NO
existing Level 4 - Office mvhr 2	N/A	N/A
existing Level 5 - Circulation 2	N/A	N/A
existing Level 5 - Store 1	N/A	N/A
existing Level 5 - Office 7	NO (-6.1%)	NO
existing Level 5 - WC 1	N/A	N/A
existing Level 5 - WC	N/A	N/A
existing Level 5 - Circulation 1	N/A	N/A
existing Level 5 - Office mvhr 3	N/A	N/A
existing Level 5 - Office mvhr	N/A	N/A
existing Level 5 - Lifts	N/A	N/A

Criterion 4: The performance of the building, as built, should be consistent with the calculated BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

EPBD (Recast): Consideration of alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	6618.8	6618.8
External area [m ²]	4408.4	4408.4
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	25	3
Average conductance [W/K]	3142.28	2501.91
Average U-value [W/m ² K]	0.71	0.57
Alpha value* [%]	10.17	16.04

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

Building Use

% Area	Building Type
	A1/A2 Retail/Financial and Professional services
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
100	B1 Offices and Workshop businesses
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Institutions: Hospitals and Care Homes
	C2 Residential Institutions: Residential schools
	C2 Residential Institutions: Universities and colleges
	C2A Secure Residential Institutions
	Residential spaces
	D1 Non-residential Institutions: Community/Day Centre
	D1 Non-residential Institutions: Libraries, Museums, and Galleries
	D1 Non-residential Institutions: Education
	D1 Non-residential Institutions: Primary Health Care Building
	D1 Non-residential Institutions: Crown and County Courts
	D2 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	22.01	12.38
Cooling	28.2	8.99
Auxiliary	1.65	0.9
Lighting	28.09	19.41
Hot water	4.33	2.78
Equipment*	36.65	36.65
TOTAL**	84.28	44.46

* 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	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	207.6	123.85
Primary energy* [kWh/m ²]	210.02	106.18
Total emissions [kg/m ²]	35.8	18.1

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

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] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
Actual	63.5	144.1	22	28.2	1.5	0.8	1.42	0.86	2
Notional	36.5	87.4	12.4	9	0.9	0.82	2.7	----	----

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

Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

Building fabric

Element	U _{i-Typ}	U _{i-Min}	Surface where the minimum value occurs*
Wall	0.23	0.3	existing Level 0 - Lobby 1_W_7
Floor	0.2	0.58	existing Level 0 - Lobby 1_S_3
Roof	0.15	0.18	existing Level 1 - Seating Area 1_R_5
Windows, roof windows, and rooflights	1.5	1.6	existing Level 0 - Lobby 1_G_8
Personnel doors	1.5	1.8	existing Level 1 - Office 1_D_15
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"
U _{i-Typ} = Typical individual element U-values [W/(m²K)]			U _{i-Min} = Minimum individual element U-values [W/(m²K)]
* There might be more than one surface where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	25

Project name

Market Place

As designed

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Interface to calculation engine version: v6.1.0

BRUKL compliance check version: v5.6.a.1

Owner Details

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Telephone number:

Address: , ,

Certifier details

Name: Neil Ingham

Telephone number:

Address: Holborn Tower, 137-144 Holborn, WC1V 6PL

Criterion 1: The calculated CO₂ emission rate for the building must not exceed the target

CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	19.1
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	19.1
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	16.9
Are emissions from the building less than or equal to the target?	BER ≤ TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	U _a -Limit	U _a -Calc	U _i -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.24	0.24	existing Level 2 - New Office 6_W_6
Floor	0.25	0.25	0.25	existing Level 2 - New Office 6_F_4
Roof	0.25	0.18	0.18	existing Level 4 - New Office 6_R_5
Windows***, roof windows, and rooflights	2.2	1.4	1.4	existing Level 2 - New Office 6_G_8
Personnel doors	2.2	1.4	1.4	existing Level 2 - New Office 6_D_7
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	3.5	-	-	"No external high usage entrance doors"

U_a-Limit = Limiting area-weighted average U-values [W/(m²K)]U_a-Calc = Calculated area-weighted average U-values [W/(m²K)]U_i-Calc = Calculated maximum individual element U-values [W/(m²K)]

* There might be more than one surface where the maximum U-value occurs.

** 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.

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

Air Permeability	Worst acceptable standard	This building
m ³ /(h.m ²) at 50 Pa	10	8.4

Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the [Non-Domestic Building Services Compliance Guide](#) 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- SPLIT GAS AND AC

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.94	2.5	-	-	-
Standard value	0.91*	N/A	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 gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.					

1- Gas secondary loop DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	Hot water provided by HVAC system	0.005
Standard value	N/A	N/A

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
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	
existing Level 2 - New Office mvhr	-	-	-	1.2	-	-	-	-	-	0.75	0.5	
existing Level 3 - New Office mvhr 3	-	-	-	1.2	-	-	-	-	-	0.75	0.5	
existing Level 4 - New Office mvhr	-	-	-	1.2	-	-	-	-	-	0.75	0.5	
existing Level 5 - New Office mvhr 4	-	-	-	1.2	-	-	-	-	-	0.75	0.5	
New Level 6 - Office mvhr	-	-	-	1.2	-	-	-	-	-	0.75	0.5	
New Level 6 - WC 1	-	-	0.4	-	-	-	-	-	-	-	N/A	
New Level 6 - WC	-	-	0.4	-	-	-	-	-	-	-	N/A	
New Level 6 - Office mvhr	-	-	-	1.2	-	-	-	-	-	0.75	0.5	
New Level 6 - Office mvhr	-	-	-	1.2	-	-	-	-	-	0.75	0.5	
New Level 6 - Office mvhr	-	-	-	1.2	-	-	-	-	-	0.75	0.5	
New Level 6 - Office mvhr	-	-	-	1.2	-	-	-	-	-	0.75	0.5	
New Level 7 - Office mvhr	-	-	-	1.2	-	-	-	-	-	0.75	0.5	
New Level 7 - WC	-	-	0.4	-	-	-	-	-	-	-	N/A	

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
existing Level 2 - New Office mvhr		110	-	-	99
existing Level 2 - New Office 6		110	-	-	433
existing Level 3 - New Office 5		110	-	-	789
existing Level 3 - New Circulation 3		-	90	-	40
existing Level 3 - New Office 4		110	-	-	433
existing Level 3 - New Office mvhr 3		110	-	-	156
existing Level 4 - New Office 6		110	-	-	1999
existing Level 4 - New Circulation 3		-	90	-	40
existing Level 4 - New Office 4		110	-	-	433
existing Level 4 - New Office mvhr		110	-	-	789
existing Level 5 - New Office 6		110	-	-	435
existing Level 5 - New Office mvhr 4		110	-	-	478
existing Level 5 - New Office		110	-	-	1374
New Level 6 - Circulation 3		-	90	-	93
New Level 6 - Store 1		90	-	-	7
New Level 6 - Office mvhr		110	-	-	724
New Level 6 - Office		110	-	-	4354
New Level 6 - WC 1		-	90	-	95
New Level 6 - WC		-	90	-	99
New Level 6 - Circulation 1		-	90	-	76
New Level 6 - Office mvhr		110	-	-	76
New Level 6 - Office mvhr		110	-	-	127
New Level 6 - Office mvhr		110	-	-	99
New Level 6 - Office mvhr		110	-	-	478
New Level 6 - Lifts		-	90	-	47
New Level 7 - Circulation 1		-	90	-	59
New Level 7 - Office mvhr		110	-	-	724
New Level 7 - Office 1		110	-	-	1742
New Level 7 - WC		-	90	-	93
New Level 7 - Circulation		-	90	-	65
New Level 7 - Store 1		90	-	-	7
New Level 7 - Store		90	-	-	5
New Level 7 - Lifts		-	90	-	42

Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
existing Level 2 - New Office mvhr	N/A	N/A
existing Level 2 - New Office 6	NO (-39.5%)	NO
existing Level 3 - New Office 5	NO (-17.4%)	NO
existing Level 3 - New Circulation 3	NO (-86%)	NO
existing Level 3 - New Office 4	NO (-55.2%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
existing Level 3 - New Office mvhr 3	N/A	N/A
existing Level 4 - New Office 6	NO (-26.2%)	NO
existing Level 4 - New Circulation 3	NO (-86%)	NO
existing Level 4 - New Office 4	NO (-55.4%)	NO
existing Level 4 - New Office mvhr	N/A	N/A
existing Level 5 - New Office 6	NO (-55.4%)	NO
existing Level 5 - New Office mvhr 4	N/A	N/A
existing Level 5 - New Office	NO (-28.8%)	NO
New Level 6 - Circulation 3	NO (-35%)	NO
New Level 6 - Store 1	N/A	N/A
New Level 6 - Office mvhr	N/A	N/A
New Level 6 - Office	YES (+1.5%)	NO
New Level 6 - WC 1	N/A	N/A
New Level 6 - WC	N/A	N/A
New Level 6 - Circulation 1	N/A	N/A
New Level 6 - Office mvhr	N/A	N/A
New Level 6 - Office mvhr	N/A	N/A
New Level 6 - Office mvhr	N/A	N/A
New Level 6 - Office mvhr	N/A	N/A
New Level 6 - Lifts	N/A	N/A
New Level 7 - Circulation 1	YES (+34.9%)	NO
New Level 7 - Office mvhr	N/A	N/A
New Level 7 - Office 1	YES (+7.1%)	NO
New Level 7 - WC	N/A	N/A
New Level 7 - Circulation	YES (+23.1%)	NO
New Level 7 - Store 1	N/A	N/A
New Level 7 - Store	N/A	N/A
New Level 7 - Lifts	N/A	N/A

Criterion 4: The performance of the building, as built, should be consistent with the calculated BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

EPBD (Recast): Consideration of alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	3249.8	3249.8
External area [m ²]	3558.1	3558.1
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	8	3
Average conductance [W/K]	2083.48	2030.97
Average U-value [W/m ² K]	0.59	0.57
Alpha value* [%]	12.35	15.03

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

Building Use

% Area	Building Type
	A1/A2 Retail/Financial and Professional services
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
100	B1 Offices and Workshop businesses
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Institutions: Hospitals and Care Homes
	C2 Residential Institutions: Residential schools
	C2 Residential Institutions: Universities and colleges
	C2A Secure Residential Institutions
	Residential spaces
	D1 Non-residential Institutions: Community/Day Centre
	D1 Non-residential Institutions: Libraries, Museums, and Galleries
	D1 Non-residential Institutions: Education
	D1 Non-residential Institutions: Primary Health Care Building
	D1 Non-residential Institutions: Crown and County Courts
	D2 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	22.95	20.3
Cooling	10.62	9.62
Auxiliary	1.29	0.87
Lighting	9.17	17.24
Hot water	4.73	3.03
Equipment*	39.03	39.03
TOTAL**	48.75	51.05

* 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	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	170.07	153.37
Primary energy* [kWh/m ²]	98.46	111.45
Total emissions [kg/m ²]	16.9	19.1

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

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] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
Actual	72.4	97.7	22.9	10.6	1.3	0.88	2.56	0.94	3.6
Notional	59.9	93.5	20.3	9.6	0.9	0.82	2.7	----	----

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

Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

Building fabric

Element	U _{i-Typ}	U _{i-Min}	Surface where the minimum value occurs*
Wall	0.23	0.24	existing Level 2 - New Office 6_W_6
Floor	0.2	0.25	existing Level 2 - New Office 6_F_4
Roof	0.15	0.18	existing Level 4 - New Office 6_R_5
Windows, roof windows, and rooflights	1.5	1.4	existing Level 2 - New Office 6_G_8
Personnel doors	1.5	1.4	existing Level 2 - New Office 6_D_7
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"
U _{i-Typ} = Typical individual element U-values [W/(m²K)]			U _{i-Min} = Minimum individual element U-values [W/(m²K)]
* There might be more than one surface where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	8.4