BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2013

Project name

Hertfordshire Constabulary Headquarters As designed

Date: Tue Jul 06 13:24:26 2021

Administrative information

Building Details

Address: Stanborough Road, Welwyn Garden City, AL8 6XF

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.13

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.13

BRUKL compliance check version: v5.6.b.0

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Criterion 1: The calculated CO_2 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), $kgCO_2/m^2.annum$	14.2
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	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.12	0.12	0000000F:Surf[0]
Floor	0.25	0.12	0.12	LG00002D:Surf[0]
Roof	0.25	0.12	0.12	0000003D:Surf[0]
Windows***, roof windows, and rooflights	2.2	1.4	1.4	00000001:Surf[0]
Personnel doors	2.2	2.2	2.2	00000078:Surf[12]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [$W/(m^2K)$]
$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [$W/(m^2K)$]
$U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [$W/(m^2K)$]

* 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	3.5

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	YES
Whole building electric power factor achieved by power factor correction	>0.95

1- _heating only - nvhr

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.74	-	0	0	-
Standard value	2.5*	N/A	N/A	N/A	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. For types <=12 kW output, refer to EN 14825 for limiting standards.

2- _fcu

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.74	4.14	0	1.5	-
Standard value	2.5*	2.55	N/A	1.6^	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. For types <=12 kW output, refer to EN 14825 for limiting standards.

^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.

3- _heating only - hr 76%

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.74	-	0	0	0.76
Standard value	2.5*	N/A	N/A	N/A	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. For types <=12 kW output, refer to EN 14825 for limiting standards.

4- _fcu - hr 76%

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.74	4.14	0	1.5	0.76
Standard value	2.5*	2.55	N/A	1.6^	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. For types <=12 kW output, refer to EN 14825 for limiting standards.

^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.

5- _constant volume - hr 74%

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.74	4.14	0	1.86	0.74
Standard value	2.5*	2.55	N/A	1.6^	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. For types <=12 kW output, refer to EN 14825 for limiting standards.

^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.

6- _heating - mech vent kitchen

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.74	-	0	0	-
Standard value	2.5*	N/A	N/A	N/A	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. For types <=12 kW output, refer to EN 14825 for limiting standards.					

"No HWS in project, or hot water is provided by HVAC system"

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
0.01_FF_Server	-	-	-	-	-	-	-	0.3	-	-	N/A
0.01_FF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.01_FF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.01_FF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.01_FF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.02_SF_Server	-	-	-	-	-	-	-	0.3	-	-	N/A
0.02_SF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.02_SF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.02_SF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.02_SF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.02_SF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.03_TF_Server	-	-	-	-	-	-	-	0.3	-	-	N/A
0.03_TF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.03_TF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.03_TF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.03_TF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.03_TF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.0_GF_Cold Water Storage	-	-	-	-	-	-	-	0.5	-	-	N/A
0.0_GF_I.T. Comms	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Mechanical pumps and Thermal stores		-	-	-	-	-	-	0.5	-	-	N/A
0.0_GF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Server	-	-	-	-	-	-	-	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	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
0.0_GF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.0_GF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.0_GF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.0_GF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
LG_LGF_Electrical Plant	-	-	-	-	-	-	-	0.5	-	-	N/A
LG_LGF_Kitchen	-	-	-	0.7	-	-	-	-	-	-	N/A
LG_LGF_Kitchen AHU Plant	-	-	-	-	-	-	-	0.5	-	-	N/A
LG_LGF_Server	-	-	-	-	-	-	-	0.3	-	-	N/A
LG_LGF_Staff welfare	-	-	-	-	-	-	-	0.3	-	-	N/A
LG_LGF_WCs	-	0.8	0.9	-	-	-	-	-	-	-	N/A
0.0_GF_Meeting room (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Meeting room (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Meeting room (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Agile working	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Agile working (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Meeting room (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Meeting room (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Meeting room (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Conference / Meeting	-	-	-	-	-	-	-	0.3	-	-	N/A
0.0_GF_Conference / Meeting (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
0.01_FF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.01_FF_Meeting room (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
0.01_FF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.01_FF_Meeting room (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
0.02_SF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.02_SF_Meeting room (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
0.02_SF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.02_SF_Meeting room (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
0.03_TF_Meeting room (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
0.03_TF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.03_TF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.03_TF_Meeting room (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
0.03_TF_Meeting room (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	N/A
0.03_TF_Meeting room	-	-	-	-	-	-	-	0.3	-	-	N/A
0.03_TF_Meeting room	-	-	-	-	-	-	-	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	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
0.03_TF_Meeting room (Perimeter)	-	-	-	-	-	-	-	0.3	-	-	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	
0.01_FF_Circulation	-	100	-	30
0.01_FF_Circulation	-	100	-	30
0.01_FF_Server	90	-	-	47
0.01_FF_Stair	-	100	-	78
0.01_FF_Stair	-	100	-	81
0.01_FF_Stair	-	100	-	78
0.01_FF_Stair	-	100	-	81
0.01_FF_WCs	-	100	-	101
0.01_FF_WCs	-	100	-	101
0.01_FF_WCs	-	100	-	113
0.01_FF_WCs	-	100	-	93
0.02_SF_Circulation	-	100	-	30
0.02_SF_Circulation	-	100	-	30
0.02_SF_Server	90	-	-	47
0.02_SF_Stair	-	100	-	78
0.02_SF_Stair	-	100	-	78
0.02_SF_Stair	-	100	-	81
0.02_SF_Stair	-	100	-	81
0.02_SF_WCs	-	100	-	101
0.02_SF_WCs	-	100	-	101
0.02_SF_WCs	-	100	-	113
0.02_SF_WCs	-	100	-	71
0.02_SF_WCs	-	100	-	88
0.03_TF_Circulation	-	100	-	30
0.03_TF_Circulation	-	100	-	30
0.03_TF_Circulation	-	100	-	112
0.03_TF_Circulation	-	100	-	234
0.03_TF_Server	90	-	-	47
0.03_TF_Stair	-	100	-	81
0.03_TF_Stair	-	100	-	81
0.03_TF_Stair	-	100	-	78
0.03_TF_Stair	-	100	-	78
0.03_TF_WCs	-	100	-	101
0.03_TF_WCs	-	100	-	101
0.03_TF_WCs	-	100	-	113
0.03_TF_WCs	-	100	-	71
0.03_TF_WCs	-	100	-	88
0.0_GF_Circulation	-	100	-	30

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
0.0_GF_Circulation	-	100	-	69
0.0_GF_Circulation	-	100	-	69
0.0_GF_Circulation	-	100	-	156
0.0_GF_Circulation	-	100	-	159
0.0_GF_Cold Water Storage	90	-	-	261
0.0_GF_Entrance Hall	-	100	25	3198
0.0_GF_I.T. Comms	90	-	-	133
0.0_GF_Mechanical pumps and Thermal stores	90	-	-	303
0.0_GF_Meeting room	90	-	-	185
0.0_GF_Meeting room	90	-	-	249
0.0_GF_Reception office	90	-	-	329
0.0_GF_Restaurant and Agile working	-	100	-	1223
0.0_GF_Server	90	-	-	47
0.0_GF_Showers	-	100	-	236
0.0_GF_Stair	-	100	-	78
0.0_GF_Stair	-	100	-	81
0.0_GF_Stair	-	100	-	81
0.0_GF_Stair	-	100	-	78
0.0_GF_WCs	-	100	-	101
0.0_GF_WCs	-	100	-	101
0.0_GF_WCs	-	100	-	113
0.0_GF_WCs	-	100	-	93
LG_LGF_Electrical Plant	90	-	-	236
LG_LGF_Kitchen	-	100	-	1041
LG_LGF_Kitchen AHU Plant	90	-	-	377
LG_LGF_Restaurant	-	100	-	1722
LG_LGF_Server	90	-	-	41
LG_LGF_Staff welfare	90	-	-	219
LG_LGF_Stair	-	100	-	76
LG_LGF_Stair	-	100	-	73
LG_LGF_WCs	-	100	-	93
0.0_GF_Meeting room (Perimeter)	90	-	-	144
0.0_GF_Meeting room	90	-	-	90
0.0_GF_Meeting room (Perimeter)	90	-	-	262
0.0_GF_Meeting room	90	-	-	159
0.0_GF_Meeting room (Perimeter)	90	-	-	346
0.0_GF_Meeting room	90	-	-	164
0.0_GF_Meeting room	90	-	-	146
0.0_GF_Meeting room	90	-	-	121
0.0_GF_Agile working	90	-	-	464
0.0_GF_Agile working (Perimeter)	90	-	-	228
0.0_GF_Meeting room	90	-	-	62
0.0_GF_Meeting room (Perimeter)	90	-	-	144

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
0.0_GF_Meeting room	90	-	-	63
0.0_GF_Meeting room (Perimeter)	90	-	-	145
0.0_GF_Meeting room	90	-	-	78
0.0_GF_Meeting room (Perimeter)	90	-	-	172
0.0_GF_Conference / Meeting	90	-	-	762
0.0_GF_Conference / Meeting (Perimeter)	90	-	-	504
0.01_FF_Office_East (Perimeter)	90	-	-	757
0.01_FF_Office_East	90	-	-	1070
0.01_FF_Office_East (Perimeter)	90	-	-	912
0.01_FF_Meeting room	90	-	-	261
0.01_FF_Meeting room (Perimeter)	90	-	-	228
0.01_FF_Office_West (Perimeter)	90	-	-	668
0.01_FF_Office_West	90	-	-	1560
0.01_FF_Office_West (Perimeter)	90	-	-	140
0.01_FF_Office_West (Perimeter)	90	-	-	911
0.01_FF_Office_West	90	-	-	1071
0.01_FF_Office_West (Perimeter)	90	-	-	757
0.01_FF_Office_East (Perimeter)	90	-	-	667
0.01_FF_Office_East	90	-	-	1707
0.01_FF_Meeting room	90	-	-	261
0.01_FF_Meeting room (Perimeter)	90	-	-	228
0.02_SF_Office_West (Perimeter)	90	-	-	911
0.02_SF_Office_West	90	-	-	1071
0.02_SF_Office_West (Perimeter)	90	-	-	757
0.02_SF_Office_East (Perimeter)	90	-	-	544
0.02_SF_Office_East	90	-	-	1810
0.02_SF_Meeting room	90	-	-	98
0.02_SF_Meeting room (Perimeter)	90	-	-	228
0.02_SF_Green room (Perimeter)	90	-	-	147
0.02_SF_Green room	90	-	-	86
0.02_SF_Office_East (Perimeter)	90	-	-	757
0.02_SF_Office_East	90	-	-	1070
0.02_SF_Office_East (Perimeter)	90	-	-	912
0.02_SF_Office_West (Perimeter)	90	-	-	668
0.02_SF_Meeting room	90	-	-	97
0.02_SF_Meeting room (Perimeter)	90	-	-	228
0.02_SF_Office_West	90	-	-	1582
0.02_SF_Office_West (Perimeter)	90	-	-	282
0.03_SF_Safeguarding_West (Perimeter)	90	-	-	911
0.03_SF_Safeguarding_West	90	-	-	1071
0.03_SF_Safeguarding_West (Perimeter)	90	-	-	757
0.03_SF_Safeguarding_East (Perimeter)	90	-	-	667
0.03_SF_Safeguarding_East	90	-	-	1862

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
0.03_TF_Meeting room (Perimeter)	90	-	-	228
0.03_TF_Meeting room	90	-	-	98
0.03_TF_Executive open plan office (Perimeter)	90	-	-	276
0.03_TF_HFRS (3P) (Perimeter)	90	-	-	158
0.03_TF_HFRS (3P)	90	-	-	78
0.03_TF_Meeting room	90	-	-	261
0.03_TF_Meeting room (Perimeter)	90	-	-	228
0.03_TF_OPCC (2P) (Perimeter)	90	-	-	145
0.03_TF_OPCC (2P)	90	-	-	70
0.03_TF_OPCC (2P) (Perimeter)	90	-	-	145
0.03_TF_OPCC (2P)	90	-	-	70
0.03_TF_PES (3P) (Perimeter)	90	-	-	145
0.03_TF_PES (3P)	90	-	-	70
0.03_TF_Meeting room (Perimeter)	90	-	-	145
0.03_TF_Meeting room	90	-	-	70
0.03_TF_PES (3P) (Perimeter)	90	-	-	145
0.03_TF_PES (3P)	90	-	-	70
0.03_TF_Executive open plan office	90	-	-	530
0.03_TF_Executive open plan office (Perimeter)	90	-	-	345
0.03_TF_HFRS (6P)	90	-	-	127
0.03_TF_HFRS (6P) (Perimeter)	90	-	-	262
0.03_TF_HFRS Exec	90	-	-	73
0.03_TF_HFRS Exec (Perimeter)	90	-	-	145
0.03_TF_HFRS Exec	90	-	-	73
0.03_TF_HFRS Exec (Perimeter)	90	-	-	145
0.03_TF_OPCC Exec	90	-	-	81
0.03_TF_OPCC Exec (Perimeter)	90	-	-	145
0.03_TF_Meeting room	90	-	-	81
0.03_TF_Meeting room (Perimeter)	90	-	-	145
0.03_TF_PES Exec	90	-	-	81
0.03_TF_PES Exec (Perimeter)	90	-	-	145
0.03_TF_PES Exec	90	-	-	81
0.03_TF_PES Exec (Perimeter)	90	-	-	145
0.03_TF_OPCC Exec	90	-	-	81
0.03_TF_OPCC Exec (Perimeter)	90	-	-	145
0.03_TF_OPCC Exec	90	-	-	81
0.03_TF_OPCC Exec (Perimeter)	90	-	-	145

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?
0.01_FF_Server	N/A	N/A
0.02_SF_Server	N/A	N/A
0.03_TF_Server	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
0.0_GF_Cold Water Storage	N/A	N/A
0.0_GF_Entrance Hall	YES (+363.6%)	NO
0.0_GF_I.T. Comms	N/A	N/A
0.0_GF_Mechanical pumps and Thermal stores	N/A	N/A
0.0_GF_Meeting room	NO (-99.5%)	NO
0.0_GF_Meeting room	N/A	N/A
0.0_GF_Reception office	N/A	N/A
0.0_GF_Restaurant and Agile working	NO (-32%)	NO
0.0_GF_Server	N/A	N/A
LG_LGF_Electrical Plant	N/A	N/A
LG_LGF_Kitchen AHU Plant	N/A	N/A
LG_LGF_Restaurant	YES (+180%)	NO
LG_LGF_Server	YES (+232.5%)	NO
LG_LGF_Staff welfare	N/A	N/A
0.0_GF_Meeting room (Perimeter)	NO (-84.9%)	NO
0.0_GF_Meeting room	NO (-87.9%)	NO
0.0_GF_Meeting room (Perimeter)	NO (-58.6%)	NO
0.0_GF_Meeting room	NO (-56.8%)	NO
0.0_GF_Meeting room (Perimeter)	NO (-52.2%)	NO
0.0_GF_Meeting room	NO (-51.7%)	NO
0.0_GF_Meeting room	NO (-59.8%)	NO
0.0_GF_Meeting room	NO (-75%)	NO
0.0_GF_Agile working	NO (-93.5%)	NO
0.0_GF_Agile working (Perimeter)	NO (-79%)	NO
0.0_GF_Meeting room	NO (-67.8%)	NO
0.0_GF_Meeting room (Perimeter)	NO (-71%)	NO
0.0_GF_Meeting room	NO (-70.4%)	NO
0.0_GF_Meeting room (Perimeter)	NO (-74%)	NO
0.0_GF_Meeting room	NO (-77.3%)	NO
0.0_GF_Meeting room (Perimeter)	NO (-73.5%)	NO
0.0_GF_Conference / Meeting	NO (-70.7%)	NO
0.0_GF_Conference / Meeting (Perimeter)	NO (-19.6%)	NO
0.01_FF_Office_East (Perimeter)	NO (-77.7%)	NO
0.01_FF_Office_East	NO (-70.5%)	NO
0.01_FF_Office_East (Perimeter)	NO (-43.1%)	NO
0.01_FF_Meeting room	NO (-84.8%)	NO
0.01_FF_Meeting room (Perimeter)	NO (-67%)	NO
0.01_FF_Office_West (Perimeter)	NO (-47.6%)	NO
0.01_FF_Office_West	NO (-5.9%)	NO
0.01_FF_Office_West (Perimeter)	NO (-75.5%)	NO
0.01_FF_Office_West (Perimeter)	NO (-63.9%)	NO
0.01_FF_Office_West	NO (-75.2%)	NO
0.01_FF_Office_West (Perimeter)	NO (-60.2%)	NO
0.01_FF_Office_East (Perimeter)	NO (-57.5%)	NO
0.01_FF_Office_East	YES (+3.2%)	NO
0.01_FF_Meeting room	NO (-82.7%)	NO
0.01_FF_Meeting room (Perimeter)	NO (-52%)	NO
0.02_SF_Office_West (Perimeter)	NO (-60.6%)	NO
0.02_SF_Office_West	NO (-73.2%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
0.02_SF_Office_West (Perimeter)	NO (-57.7%)	NO
0.02_SF_Office_East (Perimeter)	NO (-47.3%)	NO
0.02_SF_Office_East	NO (-66.9%)	NO
0.02_SF_Meeting room	NO (-28.1%)	NO
0.02_SF_Meeting room (Perimeter)	NO (-57.5%)	NO
0.02_SF_Green room (Perimeter)	NO (-39.9%)	NO
0.02_SF_Green room	NO (-31.6%)	NO
0.02_SF_Office_East (Perimeter)	NO (-68.9%)	NO
0.02_SF_Office_East	NO (-73.9%)	NO
0.02_SF_Office_East (Perimeter)	NO (-47.7%)	NO
0.02_SF_Office_West (Perimeter)	NO (-48.4%)	NO
0.02_SF_Meeting room	NO (-30.5%)	NO
0.02_SF_Meeting room (Perimeter)	NO (-53.7%)	NO
0.02_SF_Office_West	NO (-58.6%)	NO
0.02_SF_Office_West (Perimeter)	NO (-67.8%)	NO
0.03_SF_Safeguarding_West (Perimeter)	NO (-59.9%)	NO
0.03_SF_Safeguarding_West	NO (-71.6%)	NO
0.03_SF_Safeguarding_West (Perimeter)	NO (-51%)	NO
0.03_SF_Safeguarding_East (Perimeter)	NO (-50.1%)	NO
0.03_SF_Safeguarding_East	NO (-61.3%)	NO
0.03_TF_Meeting room (Perimeter)	NO (-64.4%)	NO
0.03_TF_Meeting room	NO (-39.6%)	NO
0.03_TF_Executive open plan office (Perimeter)	NO (-68.7%)	NO
0.03_TF_HFRS (3P) (Perimeter)	NO (-41.5%)	NO
0.03_TF_HFRS (3P)	NO (-62.8%)	NO
0.03_TF_Meeting room	NO (-89.2%)	NO
0.03_TF_Meeting room (Perimeter)	NO (-61.6%)	NO
0.03_TF_OPCC (2P) (Perimeter)	NO (-62.7%)	NO
0.03_TF_OPCC (2P)	NO (-54.4%)	NO
0.03_TF_OPCC (2P) (Perimeter)	NO (-75.5%)	NO
0.03_TF_OPCC (2P)	NO (-70.3%)	NO
0.03_TF_PES (3P) (Perimeter)	NO (-65.3%)	NO
0.03_TF_PES (3P)	NO (-57.5%)	NO
0.03_TF_Meeting room (Perimeter)	NO (-70.2%)	NO
0.03_TF_Meeting room	NO (-63.9%)	NO
0.03_TF_PES (3P) (Perimeter)	NO (-78%)	NO
0.03_TF_PES (3P)	NO (-73.5%)	NO
0.03_TF_Executive open plan office	NO (-78.3%)	NO
0.03_TF_Executive open plan office (Perimeter)	NO (-38.2%)	NO
0.03_TF_HFRS (6P)	NO (-28.6%)	NO
0.03_TF_HFRS (6P) (Perimeter)	NO (-45.5%)	NO
0.03_TF_HFRS Exec	NO (-54.1%)	NO
0.03_TF_HFRS Exec (Perimeter)	NO (-54.2%)	NO
0.03_TF_HFRS Exec	NO (-53.4%)	NO
0.03_TF_HFRS Exec (Perimeter)	NO (-53.8%)	NO
0.03_TF_OPCC Exec	NO (-51.1%)	NO
0.03_TF_OPCC Exec (Perimeter)	NO (-35.5%)	NO
0.03_TF_Meeting room	NO (-66.5%)	NO
0.03_TF_Meeting room (Perimeter)	NO (-56.8%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
0.03_TF_PES Exec	NO (-66.9%)	NO
0.03_TF_PES Exec (Perimeter)	NO (-56.7%)	NO
0.03_TF_PES Exec	NO (-67%)	NO
0.03_TF_PES Exec (Perimeter)	NO (-56.7%)	NO
0.03_TF_OPCC Exec	NO (-50.6%)	NO
0.03_TF_OPCC Exec (Perimeter)	NO (-35.7%)	NO
0.03_TF_OPCC Exec	NO (-51.1%)	NO
0.03_TF_OPCC Exec (Perimeter)	NO (-35.3%)	NO

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]	8617.8	8617.8
External area [m^2]	11812.7	11812.7
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	4	3
Average conductance [W/K]	5200.79	5292.36
Average U-value [W/m^2K]	0.44	0.45
Alpha value* [%]	9.56	10

* 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
99	**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
1	**Others: Miscellaneous 24hr activities**
	Others: Car Parks 24 hrs
	Others: Stand alone utility block

Energy Consumption by End Use [kWh/m^2]

	Actual	Notional
Heating	4.3	5.53
Cooling	2.92	2.27
Auxiliary	8.62	4.82
Lighting	12.81	19.1
Hot water	5.61	6.09
Equipment*	48.27	48.27
TOTAL**	**34.25**	**37.83**

* 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^2]

	Actual	Notional
Photovoltaic systems	6.03	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	91.32	81.96
Primary energy* [kWh/m^2]	102.52	113.22
Total emissions [kg/m^2]	14.2	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 SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Constant volume system (fixed fresh air rate), [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	14	76.1	1.2	5.7	28.6	3.37	3.73	3.74	4.14
	Notional	6.2	46.6	0.7	3.4	8	2.56	3.79	----	----
[ST] Fan coil systems, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	19.4	123.3	1.6	9.2	14.1	3.37	3.73	3.74	4.14
	Notional	35.2	105	3.8	7.7	12	2.56	3.79	----	----
[ST] Central heating using water: radiators, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	18	0	1.5	0	31.6	3.37	0	3.74	0
	Notional	58	0	6.3	0	20.8	2.56	0	----	----
[ST] Central heating using water: radiators, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	3.1	0	0.3	0	7.4	3.37	0	3.74	0
	Notional	0	0	0	0	5.6	2.56	0	----	----
[ST] Central heating using water: radiators, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	70	0	5.8	0	2	3.37	0	3.74	0
	Notional	62.6	0	6.8	0	1	2.56	0	----	----
[ST] Fan coil systems, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	0	1542.8	0	114.9	47.7	3.37	3.73	3.74	4.14
	Notional	0	1254.5	0	92	37.9	2.56	3.79	----	----
[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

Key Features

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

Building fabric

Element	$U_{i\text{-}Typ}$	$U_{i\text{-}Min}$	Surface where the minimum value occurs*
Wall	0.23	0.12	0000000F:Surf[0]
Floor	0.2	0.12	LG00002D:Surf[0]
Roof	0.15	0.12	0000003D:Surf[0]
Windows, roof windows, and rooflights	1.5	1.19	00000078:Surf[1]
Personnel doors	1.5	2.2	00000078:Surf[12]
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building

$U_{i\text{-}Typ}$ = Typical individual element U-values [W/(m²K)] $U_{i\text{-}Min}$ = 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	3.5