

11 Appendix

11.1 Appendix A: BRUKLs

Project name

CCCG Tottenham - Be Lean

As designed

Date: Wed Jan 24 16:13:49 2024

Administrative information

Building Details

Address: Address 1, London, Postcode

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.23

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.23

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

Foundation area [m²]: 461.44The 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	5.47
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	5.3
Target primary energy rate (TPER), kWh _{PE} /m ² annum	58.67
Building primary energy rate (BPER), kWh _{PE} /m ² annum	57.33
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	0.15	0.15	F0000006:Surf[25]
Floors	0.18	0.12	0.12	F0000006:Surf[26]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.12	0.12	F0000006:Surf[27]
Windows** and roof windows	1.6	1.02	1.6	RM00001A:Surf[11]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	1.16	1.2	F0000006:Surf[0]
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	1

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- AHU + VAV (Heating + Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	4.5	0	1.2	0.8
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					NO
* 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- ASHP Stairs (Heating Only)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	-	0.03	-	-
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.					

3- Extract Only

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	-	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					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

4- Vent + Extract

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	-	0	1.2	0.8
Standard value	2.5*	N/A	N/A	1.9^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* 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.					

5- Cooling + Extract

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	5	0	-	-
Standard value	2.5*	5	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 all types >12 kW output, except absorption and gas engine heat pumps.					

6- AHU + FanCoils (Heating + Cooling + Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	4.5	0	1.2	0.8
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					NO
* 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.					

1- DHW - ASHP

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	2.86	0.005
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
F00-Bricklaying Workshop-R00-09	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F00-Circulation-R00-16	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F00-Circulation-R00-17	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F00-Cleaners Store-R00-19	0.3	-	-	-	-	-	-	-	-	-	-	N/A
F00-Dis Changing Room-R00-04	-	-	0.3	-	-	-	-	-	-	-	-	N/A
F00-Dis WC-R00-05	0.3	-	-	-	-	-	-	-	-	-	-	N/A
F00-Engineering Workshop-R00-11	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F00-Entrance/Reception-R00-01	-	-	0.3	-	-	-	-	-	-	-	-	N/A
F00-LV Switchroom-R00-21	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F00-Workshop Office-R00-14	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F00-Workshop Store-R00-10	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F00-Workshop Store-R00-15	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F01-Changing Area-R01-17	-	-	0.3	-	-	-	-	-	-	-	-	N/A
F01-Circulation-R01-16	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F01-Circulation-R01-07	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F01-Dis WC-R01-24	0.3	-	-	-	-	-	-	-	-	-	-	N/A
F01-Electrical Installation Workshop-R01-08	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F01-General Classroom-R01-06	-	-	-	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
F01-Heating&Plumbing Workshop-R01-11		-	-	0.3	-	-	-	-	-	-	-	N/A
F01-Server-R01-20		0.3	-	-	-	-	-	-	-	-	-	N/A
F01-Store-R01-19		0.3	-	-	-	-	-	-	-	-	-	N/A
F01-WC-R01-25		0.3	-	-	-	-	-	-	-	-	-	N/A
F01-WC-R01-26		0.3	-	-	-	-	-	-	-	-	-	N/A
F01-Workshop Office-R01-09		-	-	-	0.3	-	-	-	-	-	-	N/A
F01-Workshop Office-R01-14		-	-	-	0.3	-	-	-	-	-	-	N/A
F01-Workshop Store-R01-10		-	-	-	0.3	-	-	-	-	-	-	N/A
F01-Workshop Store-R01-15		-	-	-	0.3	-	-	-	-	-	-	N/A
F02-Acc WC-R02-24		0.3	-	-	-	-	-	-	-	-	-	N/A
F02-Circulation-R02-06		-	-	-	0.3	-	-	-	-	-	-	N/A
F02-Cleaners Store-R02-17		0.3	-	-	-	-	-	-	-	-	-	N/A
F02-Dis WC-R02-20		0.3	-	-	-	-	-	-	-	-	-	N/A
F02-General Classroom-R02-13		-	-	-	0.3	-	-	-	-	-	-	N/A
F02-General Classroom-R02-15		-	-	-	0.3	-	-	-	-	-	-	N/A
F02-ICT-R02-09		-	-	-	-	-	-	-	0.2	-	-	N/A
F02-ICT-R02-12		-	-	-	-	-	-	-	0.2	-	-	N/A
F02-ICT-R02-14		-	-	-	-	-	-	-	0.2	-	-	N/A
F02-Plant-R02-25		-	-	-	0.3	-	-	-	-	-	-	N/A
F02-Server-R02-18		0.3	-	-	-	-	-	-	-	-	-	N/A
F02-Staff Office-R02-08		-	-	-	0.3	-	-	-	-	-	-	N/A
F02-Staff Room-R02-07		-	-	-	0.3	-	-	-	-	-	-	N/A
F02-WC-R02-21		0.3	-	-	-	-	-	-	-	-	-	N/A
F02-WC-R02-22		0.3	-	-	-	-	-	-	-	-	-	N/A
F02-WC-R02-23		0.3	-	-	-	-	-	-	-	-	-	N/A
F03-Acc WC-R03-23		0.3	-	-	-	-	-	-	-	-	-	N/A
F03-Circulation-R03-05		-	-	-	0.3	-	-	-	-	-	-	N/A
F03-Cleaners Room-R03-16		0.3	-	-	-	-	-	-	-	-	-	N/A
F03-Dis WC-R03-19		0.3	-	-	-	-	-	-	-	-	-	N/A
F03-Engineering&Technology Labs-R03-08		-	-	-	-	-	-	-	0.2	-	-	N/A
F03-Engineering&Technology Labs-R03-13		-	-	-	-	-	-	-	0.2	-	-	N/A
F03-General Classroom-R03-11		-	-	-	0.3	-	-	-	-	-	-	N/A
F03-ICT-R03-14		-	-	-	-	-	-	-	0.2	-	-	N/A
F03-Plant-R03-24		-	-	-	0.3	-	-	-	-	-	-	N/A
F03-Project Based Learning Space-R03-06		-	-	-	0.3	-	-	-	-	-	-	N/A
F03-Server-R03-17		0.3	-	-	-	-	-	-	-	-	-	N/A
F03-Technician Room-R03-12		-	-	-	0.3	-	-	-	-	-	-	N/A
F03-WC-R03-20		0.3	-	-	-	-	-	-	-	-	-	N/A
F03-WC-R03-21		0.3	-	-	-	-	-	-	-	-	-	N/A
F03-WC-R03-22		0.3	-	-	-	-	-	-	-	-	-	N/A

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
F00-Bricklaying Workshop-R00-09		115	-	-

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
F00-Circulation-R00-03		115	-	-
F00-Circulation-R00-16		115	-	-
F00-Circulation-R00-17		115	-	-
F00-Cleaners Store-R00-19		115	-	-
F00-Dis Changing Room-R00-04		115	-	-
F00-Dis WC-R00-05		115	-	-
F00-Engineering Workshop-R00-11		115	-	-
F00-Entrance/Reception-R00-01		115	115	1.174
F00-LV Switchroom-R00-21		115	-	-
F00-Stairs-R00-02		115	-	-
F00-Stairs-R00-20		115	-	-
F00-Workshop Office-R00-14		115	-	-
F00-Workshop Store-R00-10		115	-	-
F00-Workshop Store-R00-15		115	-	-
F01-Changing Area-R01-17		115	-	-
F01-Circulation-R01-02		115	-	-
F01-Circulation-R01-16		115	-	-
F01-Circulation-R01-18		115	-	-
F01-Circulation-R01-07		115	-	-
F01-Dis WC-R01-24		115	-	-
F01-Electrical Installation Workshop-R01-08		115	-	-
F01-General Classroom-R01-06		115	-	-
F01-Heating&Plumbing Workshop-R01-11		115	-	-
F01-Plant-R01-27		115	-	-
F01-Server-R01-20		115	-	-
F01-Stairs-R01-01		115	-	-
F01-Stairs-R01-28		115	-	-
F01-Store-R01-19		115	-	-
F01-WC-R01-25		115	-	-
F01-WC-R01-26		115	-	-
F01-Workshop Office-R01-09		115	-	-
F01-Workshop Office-R01-14		115	-	-
F01-Workshop Store-R01-10		115	-	-
F01-Workshop Store-R01-15		115	-	-
F02-Acc WC-R02-24		115	-	-
F02-Circulation-R02-02		115	-	-
F02-Circulation-R02-06		115	-	-
F02-Circulation-R02-16		115	-	-
F02-Cleaners Store-R02-17		115	-	-
F02-Dis WC-R02-20		115	-	-
F02-General Classroom-R02-13		115	-	-
F02-General Classroom-R02-15		115	-	-
F02-ICT-R02-09		115	-	-

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
F02-ICT-R02-12		115	-	-
F02-ICT-R02-14		115	-	-
F02-Plant-R02-25		115	-	-
F02-Server-R02-18		115	-	-
F02-Staff Office-R02-08		115	-	-
F02-Staff Room-R02-07		115	-	-
F02-Stairs-R02-01		115	-	-
F02-Stairs-R02-26		115	-	-
F02-WC-R02-21		115	-	-
F02-WC-R02-22		115	-	-
F02-WC-R02-23		115	-	-
F03-Acc WC-R03-23		115	-	-
F03-Circulation-R01-02		115	-	-
F03-Circulation-R03-05		115	-	-
F03-Circulation-R03-15		115	-	-
F03-Cleaners Room-R03-16		115	-	-
F03-Dis WC-R03-19		115	-	-
F03-Engineering&Technology Labs-R03-08		115	-	-
F03-Engineering&Technology Labs-R03-13		115	-	-
F03-Genaral Classroom-R03-11		115	-	-
F03-ICT-R03-14		115	-	-
F03-Plant-R03-24		115	-	-
F03-Project Based Learning Space-R03-06		115	-	-
F03-Server-R03-17		115	-	-
F03-Stairs-R03-01		115	-	-
F03-Stairs-R03-25		115	-	-
F03-Technician Room-R03-12		115	-	-
F03-WC-R03-20		115	-	-
F03-WC-R03-21		115	-	-
F03-WC-R03-22		115	-	-
F04-Circulation-R04-02		115	-	-
F04-Stairs-R04-01		115	-	-
F04-Enclosed Plant-R04-07		115	-	-

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?
F00-Bricklaying Workshop-R00-09	NO (-53.7%)	NO
F00-Circulation-R00-16	N/A	N/A
F00-Circulation-R00-17	NO (-99.9%)	NO
F00-Engineering Workshop-R00-11	NO (-46.2%)	NO
F00-Entrance/Reception-R00-01	NO (-6.7%)	NO
F00-LV Switchroom-R00-21	NO (-71.8%)	NO
F00-Workshop Office-R00-14	NO (-71.6%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
F00-Workshop Store-R00-10	NO (-59.7%)	NO
F00-Workshop Store-R00-15	N/A	N/A
F01-Circulation-R01-16	N/A	N/A
F01-Circulation-R01-07	N/A	N/A
F01-Electrical Installation Workshop-R01-08	NO (-48%)	NO
F01-General Classroom-R01-06	NO (-19.2%)	NO
F01-Heating&Plumbing Workshop-R01-11	NO (-21.9%)	NO
F01-Server-R01-20	NO (-99.9%)	NO
F01-Workshop Office-R01-09	NO (-71.6%)	NO
F01-Workshop Office-R01-14	NO (-26.3%)	NO
F01-Workshop Store-R01-10	N/A	N/A
F01-Workshop Store-R01-15	N/A	N/A
F02-Circulation-R02-06	NO (-28.5%)	NO
F02-General Classroom-R02-13	NO (-61.4%)	NO
F02-General Classroom-R02-15	NO (-72.3%)	NO
F02-ICT-R02-09	NO (-14.1%)	NO
F02-ICT-R02-12	NO (-27.9%)	NO
F02-ICT-R02-14	NO (-34.4%)	NO
F02-Plant-R02-25	N/A	N/A
F02-Server-R02-18	N/A	N/A
F02-Staff Office-R02-08	NO (-12.1%)	NO
F02-Staff Room-R02-07	NO (-22.7%)	NO
F03-Circulation-R03-05	NO (-26.9%)	NO
F03-Engineering&Technology Labs-R03-08	NO (-7.6%)	NO
F03-Engineering&Technology Labs-R03-13	NO (-13.9%)	NO
F03-General Classroom-R03-11	NO (-57.9%)	NO
F03-ICT-R03-14	NO (-70.6%)	NO
F03-Plant-R03-24	N/A	N/A
F03-Project Based Learning Space-R03-06	NO (-18.5%)	NO
F03-Server-R03-17	N/A	N/A
F03-Technician Room-R03-12	NO (-0.1%)	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

	Actual	Notional
Floor area [m ²]	2307.2	2307.2
External area [m ²]	3590.8	3590.8
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	1	3
Average conductance [W/K]	1035	0
Average U-value [W/m ² K]	0.29	0
Alpha value* [%]	12.35	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
 Offices and Workshop Businesses
 General Industrial and Special Industrial Groups
 Storage or Distribution
 Hotels
 Residential Institutions: Hospitals and Care Homes
 Residential Institutions: Residential Schools

99 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

1 Others: Miscellaneous 24hr Activities

Others: Car Parks 24 hrs
 Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	4.76	8.17
Cooling	3.96	2.35
Auxiliary	12.54	9.78
Lighting	10.59	13.28
Hot water	6.88	5.84
Equipment*	36.01	36.01
TOTAL**	38.72	39.41

* 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
Displaced electricity	0	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	110.69	120.97
Primary energy [kWh _{PE} /m ²]	57.33	58.67
Total emissions [kg/m ²]	5.3	5.47

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] Indoor packaged cabinet (VAV), [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
Actual	29.7	60.2	3.1	3.7	16	2.64	4.5	2.64	4.5	
Notional	56.2	28.3	5.6	1.7	11.6	2.78	4.63	----	----	
[ST] Fan coil systems, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
Actual	4.8	105.4	0.5	6.5	11.9	2.64	4.5	2.64	4.5	
Notional	13.3	78.9	1.3	4.7	10.8	2.78	4.63	----	----	
[ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
Actual	135.4	0	14.2	0	2.8	2.64	0	2.64	0	
Notional	249.5	0	24.9	0	1.7	2.78	0	----	----	
[ST] Other local room heater - unfanned, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
Actual	42.2	0	4.4	0	0.8	2.64	0	2.64	0	
Notional	95.2	0	9.5	0	1	2.78	0	----	----	
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
Actual	0	1073.8	0	59.7	2.1	2.64	5	2.64	5	
Notional	0	804	0	48.2	2.7	2.78	4.63	----	----	
[ST] Central heating using air distribution, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
Actual	65.1	0	6.8	0	9.5	2.64	0	2.64	0	
Notional	78.4	0	7.8	0	10.4	2.78	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

Project name

CCCG Tottenham - Be Green

As designed

Date: Wed Jan 24 16:57:37 2024

Administrative information

Building Details

Address: Address 1, London, Postcode

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.23

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.23

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

Foundation area [m²]: 461.44The 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	5.47
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	3.52
Target primary energy rate (TPER), kWh _{PE} /m ² annum	58.67
Building primary energy rate (BPER), kWh _{PE} /m ² annum	37.06
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	0.15	0.15	F0000006:Surf[25]
Floors	0.18	0.12	0.12	F0000006:Surf[26]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.12	0.12	F0000006:Surf[27]
Windows** and roof windows	1.6	1.02	1.6	RM00001A:Surf[11]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	1.16	1.2	F0000006:Surf[0]
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	1

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- AHU + VAV (Heating + Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.3	4.5	0	1.2	0.8
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					NO
* 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- ASHP Stairs (Heating Only)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.3	-	0.03	-	-
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.					

3- Extract Only

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.3	-	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					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

4- Vent + Extract

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.3	-	0	1.2	0.8
Standard value	2.5*	N/A	N/A	1.9^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* 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.					

5- Cooling + Extract

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.3	5	0	-	-
Standard value	2.5*	5	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 all types >12 kW output, except absorption and gas engine heat pumps.					

6- AHU + FanCoils (Heating + Cooling + Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.3	4.5	0	1.2	0.8
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					NO
* 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.					

1- DHW - ASHP

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	3.4	0.005
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
F00-Bricklaying Workshop-R00-09	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F00-Circulation-R00-16	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F00-Circulation-R00-17	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F00-Cleaners Store-R00-19	0.3	-	-	-	-	-	-	-	-	-	-	N/A
F00-Dis Changing Room-R00-04	-	-	0.3	-	-	-	-	-	-	-	-	N/A
F00-Dis WC-R00-05	0.3	-	-	-	-	-	-	-	-	-	-	N/A
F00-Engineering Workshop-R00-11	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F00-Entrance/Reception-R00-01	-	-	0.3	-	-	-	-	-	-	-	-	N/A
F00-LV Switchroom-R00-21	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F00-Workshop Office-R00-14	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F00-Workshop Store-R00-10	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F00-Workshop Store-R00-15	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F01-Changing Area-R01-17	-	-	0.3	-	-	-	-	-	-	-	-	N/A
F01-Circulation-R01-16	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F01-Circulation-R01-07	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F01-Dis WC-R01-24	0.3	-	-	-	-	-	-	-	-	-	-	N/A
F01-Electrical Installation Workshop-R01-08	-	-	-	0.3	-	-	-	-	-	-	-	N/A
F01-General Classroom-R01-06	-	-	-	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
F01-Heating&Plumbing Workshop-R01-11		-	-	0.3	-	-	-	-	-	-	-	N/A
F01-Server-R01-20		0.3	-	-	-	-	-	-	-	-	-	N/A
F01-Store-R01-19		0.3	-	-	-	-	-	-	-	-	-	N/A
F01-WC-R01-25		0.3	-	-	-	-	-	-	-	-	-	N/A
F01-WC-R01-26		0.3	-	-	-	-	-	-	-	-	-	N/A
F01-Workshop Office-R01-09		-	-	-	0.3	-	-	-	-	-	-	N/A
F01-Workshop Office-R01-14		-	-	-	0.3	-	-	-	-	-	-	N/A
F01-Workshop Store-R01-10		-	-	-	0.3	-	-	-	-	-	-	N/A
F01-Workshop Store-R01-15		-	-	-	0.3	-	-	-	-	-	-	N/A
F02-Acc WC-R02-24		0.3	-	-	-	-	-	-	-	-	-	N/A
F02-Circulation-R02-06		-	-	-	0.3	-	-	-	-	-	-	N/A
F02-Cleaners Store-R02-17		0.3	-	-	-	-	-	-	-	-	-	N/A
F02-Dis WC-R02-20		0.3	-	-	-	-	-	-	-	-	-	N/A
F02-General Classroom-R02-13		-	-	-	0.3	-	-	-	-	-	-	N/A
F02-General Classroom-R02-15		-	-	-	0.3	-	-	-	-	-	-	N/A
F02-ICT-R02-09		-	-	-	-	-	-	-	0.2	-	-	N/A
F02-ICT-R02-12		-	-	-	-	-	-	-	0.2	-	-	N/A
F02-ICT-R02-14		-	-	-	-	-	-	-	0.2	-	-	N/A
F02-Plant-R02-25		-	-	-	0.3	-	-	-	-	-	-	N/A
F02-Server-R02-18		0.3	-	-	-	-	-	-	-	-	-	N/A
F02-Staff Office-R02-08		-	-	-	0.3	-	-	-	-	-	-	N/A
F02-Staff Room-R02-07		-	-	-	0.3	-	-	-	-	-	-	N/A
F02-WC-R02-21		0.3	-	-	-	-	-	-	-	-	-	N/A
F02-WC-R02-22		0.3	-	-	-	-	-	-	-	-	-	N/A
F02-WC-R02-23		0.3	-	-	-	-	-	-	-	-	-	N/A
F03-Acc WC-R03-23		0.3	-	-	-	-	-	-	-	-	-	N/A
F03-Circulation-R03-05		-	-	-	0.3	-	-	-	-	-	-	N/A
F03-Cleaners Room-R03-16		0.3	-	-	-	-	-	-	-	-	-	N/A
F03-Dis WC-R03-19		0.3	-	-	-	-	-	-	-	-	-	N/A
F03-Engineering&Technology Labs-R03-08		-	-	-	-	-	-	-	0.2	-	-	N/A
F03-Engineering&Technology Labs-R03-13		-	-	-	-	-	-	-	0.2	-	-	N/A
F03-General Classroom-R03-11		-	-	-	0.3	-	-	-	-	-	-	N/A
F03-ICT-R03-14		-	-	-	-	-	-	-	0.2	-	-	N/A
F03-Plant-R03-24		-	-	-	0.3	-	-	-	-	-	-	N/A
F03-Project Based Learning Space-R03-06		-	-	-	0.3	-	-	-	-	-	-	N/A
F03-Server-R03-17		0.3	-	-	-	-	-	-	-	-	-	N/A
F03-Technician Room-R03-12		-	-	-	0.3	-	-	-	-	-	-	N/A
F03-WC-R03-20		0.3	-	-	-	-	-	-	-	-	-	N/A
F03-WC-R03-21		0.3	-	-	-	-	-	-	-	-	-	N/A
F03-WC-R03-22		0.3	-	-	-	-	-	-	-	-	-	N/A

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
F00-Bricklaying Workshop-R00-09		115	-	-

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
F00-Circulation-R00-03		115	-	-
F00-Circulation-R00-16		115	-	-
F00-Circulation-R00-17		115	-	-
F00-Cleaners Store-R00-19		115	-	-
F00-Dis Changing Room-R00-04		115	-	-
F00-Dis WC-R00-05		115	-	-
F00-Engineering Workshop-R00-11		115	-	-
F00-Entrance/Reception-R00-01		115	115	1.174
F00-LV Switchroom-R00-21		115	-	-
F00-Stairs-R00-02		115	-	-
F00-Stairs-R00-20		115	-	-
F00-Workshop Office-R00-14		115	-	-
F00-Workshop Store-R00-10		115	-	-
F00-Workshop Store-R00-15		115	-	-
F01-Changing Area-R01-17		115	-	-
F01-Circulation-R01-02		115	-	-
F01-Circulation-R01-16		115	-	-
F01-Circulation-R01-18		115	-	-
F01-Circulation-R01-07		115	-	-
F01-Dis WC-R01-24		115	-	-
F01-Electrical Installation Workshop-R01-08		115	-	-
F01-General Classroom-R01-06		115	-	-
F01-Heating&Plumbing Workshop-R01-11		115	-	-
F01-Plant-R01-27		115	-	-
F01-Server-R01-20		115	-	-
F01-Stairs-R01-01		115	-	-
F01-Stairs-R01-28		115	-	-
F01-Store-R01-19		115	-	-
F01-WC-R01-25		115	-	-
F01-WC-R01-26		115	-	-
F01-Workshop Office-R01-09		115	-	-
F01-Workshop Office-R01-14		115	-	-
F01-Workshop Store-R01-10		115	-	-
F01-Workshop Store-R01-15		115	-	-
F02-Acc WC-R02-24		115	-	-
F02-Circulation-R02-02		115	-	-
F02-Circulation-R02-06		115	-	-
F02-Circulation-R02-16		115	-	-
F02-Cleaners Store-R02-17		115	-	-
F02-Dis WC-R02-20		115	-	-
F02-General Classroom-R02-13		115	-	-
F02-General Classroom-R02-15		115	-	-
F02-ICT-R02-09		115	-	-

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
F02-ICT-R02-12		115	-	-
F02-ICT-R02-14		115	-	-
F02-Plant-R02-25		115	-	-
F02-Server-R02-18		115	-	-
F02-Staff Office-R02-08		115	-	-
F02-Staff Room-R02-07		115	-	-
F02-Stairs-R02-01		115	-	-
F02-Stairs-R02-26		115	-	-
F02-WC-R02-21		115	-	-
F02-WC-R02-22		115	-	-
F02-WC-R02-23		115	-	-
F03-Acc WC-R03-23		115	-	-
F03-Circulation-R01-02		115	-	-
F03-Circulation-R03-05		115	-	-
F03-Circulation-R03-15		115	-	-
F03-Cleaners Room-R03-16		115	-	-
F03-Dis WC-R03-19		115	-	-
F03-Engineering&Technology Labs-R03-08		115	-	-
F03-Engineering&Technology Labs-R03-13		115	-	-
F03-Genaral Classroom-R03-11		115	-	-
F03-ICT-R03-14		115	-	-
F03-Plant-R03-24		115	-	-
F03-Project Based Learning Space-R03-06		115	-	-
F03-Server-R03-17		115	-	-
F03-Stairs-R03-01		115	-	-
F03-Stairs-R03-25		115	-	-
F03-Technician Room-R03-12		115	-	-
F03-WC-R03-20		115	-	-
F03-WC-R03-21		115	-	-
F03-WC-R03-22		115	-	-
F04-Circulation-R04-02		115	-	-
F04-Stairs-R04-01		115	-	-
F04-Enclosed Plant-R04-07		115	-	-

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?
F00-Bricklaying Workshop-R00-09	NO (-53.7%)	NO
F00-Circulation-R00-16	N/A	N/A
F00-Circulation-R00-17	NO (-99.9%)	NO
F00-Engineering Workshop-R00-11	NO (-46.2%)	NO
F00-Entrance/Reception-R00-01	NO (-6.7%)	NO
F00-LV Switchroom-R00-21	NO (-71.8%)	NO
F00-Workshop Office-R00-14	NO (-71.6%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
F00-Workshop Store-R00-10	NO (-59.7%)	NO
F00-Workshop Store-R00-15	N/A	N/A
F01-Circulation-R01-16	N/A	N/A
F01-Circulation-R01-07	N/A	N/A
F01-Electrical Installation Workshop-R01-08	NO (-48%)	NO
F01-General Classroom-R01-06	NO (-19.2%)	NO
F01-Heating&Plumbing Workshop-R01-11	NO (-21.9%)	NO
F01-Server-R01-20	NO (-99.9%)	NO
F01-Workshop Office-R01-09	NO (-71.6%)	NO
F01-Workshop Office-R01-14	NO (-26.3%)	NO
F01-Workshop Store-R01-10	N/A	N/A
F01-Workshop Store-R01-15	N/A	N/A
F02-Circulation-R02-06	NO (-28.5%)	NO
F02-General Classroom-R02-13	NO (-61.4%)	NO
F02-General Classroom-R02-15	NO (-72.3%)	NO
F02-ICT-R02-09	NO (-14.1%)	NO
F02-ICT-R02-12	NO (-27.9%)	NO
F02-ICT-R02-14	NO (-34.4%)	NO
F02-Plant-R02-25	N/A	N/A
F02-Server-R02-18	N/A	N/A
F02-Staff Office-R02-08	NO (-12.1%)	NO
F02-Staff Room-R02-07	NO (-22.7%)	NO
F03-Circulation-R03-05	NO (-26.9%)	NO
F03-Engineering&Technology Labs-R03-08	NO (-7.6%)	NO
F03-Engineering&Technology Labs-R03-13	NO (-13.9%)	NO
F03-General Classroom-R03-11	NO (-57.9%)	NO
F03-ICT-R03-14	NO (-70.6%)	NO
F03-Plant-R03-24	N/A	N/A
F03-Project Based Learning Space-R03-06	NO (-18.5%)	NO
F03-Server-R03-17	N/A	N/A
F03-Technician Room-R03-12	NO (-0.1%)	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

	Actual	Notional
Floor area [m ²]	2307.2	2307.2
External area [m ²]	3590.8	3590.8
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	1	3
Average conductance [W/K]	1035	0
Average U-value [W/m ² K]	0.29	0
Alpha value* [%]	12.35	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
 Offices and Workshop Businesses
 General Industrial and Special Industrial Groups
 Storage or Distribution
 Hotels
 Residential Institutions: Hospitals and Care Homes
 Residential Institutions: Residential Schools

99 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

1 Others: Miscellaneous 24hr Activities

Others: Car Parks 24 hrs
 Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	3.81	8.17
Cooling	3.96	2.35
Auxiliary	12.54	9.78
Lighting	10.59	13.28
Hot water	5.78	5.84
Equipment*	36.01	36.01
TOTAL**	36.67	39.41

* 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	11.73	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>11.73</i>	<i>0</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	110.69	120.97
Primary energy [kWh _{PE} /m ²]	37.06	58.67
Total emissions [kg/m ²]	3.52	5.47

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] Indoor packaged cabinet (VAV), [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	29.7	60.2	2.5	3.7	16	3.3	4.5	3.3	4.5
Notional	56.2	28.3	5.6	1.7	11.6	2.78	4.63	----	----
[ST] Fan coil systems, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	4.8	105.4	0.4	6.5	11.9	3.3	4.5	3.3	4.5
Notional	13.3	78.9	1.3	4.7	10.8	2.78	4.63	----	----
[ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	135.4	0	11.4	0	2.8	3.3	0	3.3	0
Notional	249.5	0	24.9	0	1.7	2.78	0	----	----
[ST] Other local room heater - unfanned, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	42.2	0	3.6	0	0.8	3.3	0	3.3	0
Notional	95.2	0	9.5	0	1	2.78	0	----	----
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	0	1073.8	0	59.7	2.1	3.3	5	3.3	5
Notional	0	804	0	48.2	2.7	2.78	4.63	----	----
[ST] Central heating using air distribution, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	65.1	0	5.5	0	9.5	3.3	0	3.3	0
Notional	78.4	0	7.8	0	10.4	2.78	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

11.2 Appendix B: GLA's Carbon Reporting Spreadsheet

NON-RESIDENTIAL CO ₂ ANALYSIS (PART L2)																				
				Baseline		'Be Lean'	'Be Clean'	'Be Green'			Baseline		'Be Lean'			'Be Clean'			'Be Green'	
Building Use	Model Area	Number of units	Total area represented by model	BRUKL TER	BRUKL Displaced electricity (-)	BRUKL BER	BRUKL BER	BRUKL BER			Part L 2021 CO ₂ emissions	Energy saving/generation technologies	Part L 2021 CO ₂ emissions	Part L 2021 CO ₂ emissions with Notional PV savings included	'Be Lean' savings	Part L 2021 CO ₂ emissions	Part L 2021 CO ₂ emissions with Notional PV savings included	'Be Clean' savings	Part L 2021 CO ₂ emissions	'Be Green' savings
	(m ²)		(m ²)	(kgCO ₂ / m ²)	(kWh / m ²)	(kgCO ₂ / m ²)	(kgCO ₂ / m ²)	(kgCO ₂ / m ²)			(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	
CCCG Tottenham	2307.2	1	2307.2	5.47	0.00	5.30	5.30	3.52			12,620	0.00	12,228.16	12,228	392	12,228	12,228	0	8,121	4,107

Part L 2021 Performance

Residential

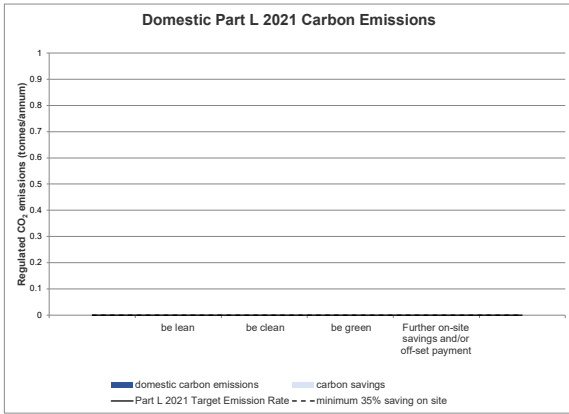
Table 1: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for residential building

	Carbon Dioxide Emissions for residential buildings (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	0.0	
After energy demand reduction (be lean)	0.0	
After heat network connection (be clean)	0.0	
After renewable energy (be green)	0.0	

Table 2: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for residential building

	Regulated residential carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Be lean: savings from energy demand reduction	0.0	0%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	0.0	0%
Cumulative on site savings	0.0	0%
Annual savings from off-set payment	0.0	-
(Tonnes CO ₂)		
Cumulative savings for off-set payment	0	-
Cash in-lieu contribution (£)	0	

*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development Information' tab



Non-residential

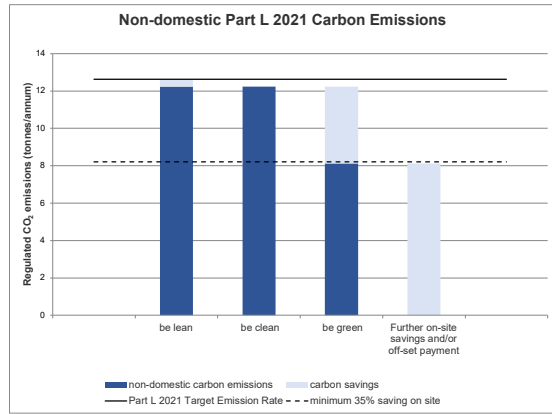
Table 3: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for non-residential building

	Carbon Dioxide Emissions for non-residential buildings (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	12.6	11.3
After energy demand reduction (be lean)	12.2	11.3
After heat network connection (be clean)	12.2	11.3
After renewable energy (be green)	8.1	11.3

Table 4: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for non-residential building

	Regulated non-residential carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Be lean: savings from energy demand reduction	0.4	3%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	4.1	33%
Total Cumulative Savings	4.5	36%
Annual savings from off-set payment	8.1	-
(Tonnes CO ₂)		
Cumulative savings for off-set payment	244	-
Cash in-lieu contribution (£)	23,146	

*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development Information' tab



SITE-WIDE

	Total regulated emissions (Tonnes CO ₂ / year)	CO ₂ savings (Tonnes CO ₂ / year)	Percentage savings (%)
Part L 2021 baseline	12.6		
Be lean	12.2	0.4	3%
Be clean	12.2	0.0	0%
Be green	8.1	4.1	33%
Total Savings	-	4.5	36%
	-	CO₂ savings off-set (Tonnes CO₂)	-
Off-set	-	243.6	-

	Target Fabric Energy Efficiency (kWh/m ²)	Dwelling Fabric Energy Efficiency (kWh/m ²)	Improvement (%)
Development total	0.00	0.00	

	Area weighted non-residential cooling demand (MJ/m ²)	Total non-residential cooling demand (MJ/year)
Actual	14.256	32891.4432
Notional	8.46	19518.912

11.3 Appendix C: Heat Network Reference

Giuseppe Borgia

From: Graham Day
Sent: 29 January 2024 15:38
To: Giuseppe Borgia
Cc: Marguerita Chorafa; Ceyda Davidson
Subject: FW: CONEL Tottenham Centre: Future DEN Connection
Attachments: 10379-IRB-XX-04-D-M-5001.pdf

Hi Giuseppe

Correspondence regarding the district energy network FYI.

Graham Day BEng (Hons), CEng, MCIBSE
Associate Principal



London, United Kingdom

T +44 (0) 203 697 9309
M +44 (0) 791 227 0390

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From: Louise Morton <lm@quadranttowntnplanning.com>
Sent: Monday, January 29, 2024 3:06 PM
To: Riyaz Ali <Riyaz@petermarshconsulting.com>; Louie Kattenhorn <louie@petermarshconsulting.com>; Graham Day <graham.day@introba.com>; Cameron Steel <cameron.steel@introba.com>; Ashley Furlong <Ashley.Furlong@capitalcce.co.uk>
Cc: Mo Poswall <mo@petermarshconsulting.com>
Subject: FW: CONEL Tottenham Centre: Future DEN Connection

FYI

From: Louise Morton
Sent: Monday, January 29, 2024 1:22 PM
To: Hamish McDonald <Hamish.McDonald@haringey.gov.uk>; Tim Starley-Grainger <Tim.Starley-Grainger@haringey.gov.uk>; Henrietta Cooke <Henrietta.Cooke@haringey.gov.uk>
Cc: Suzanne Kimman <Suzanne.Kimman@haringey.gov.uk>; John Kaimakamis <john.kaimakamis@haringey.gov.uk>
Subject: CONEL Tottenham Centre: Future DEN Connection

Hi Hamish

We were pleased to meet you and your colleagues on 11th January to discuss the potential for CONEL to connect into Haringey's proposed DEN.

We understand the position is as follows:

1. Haringey anticipate the DEN will be available adjacent the college in 2030, subject to two rounds of funding approvals.
2. Haringey noted the network currently operates at 85C and connects a number of existing and proposed energy centres. The system currently uses waste heat and has gas boilers for top-up and backup. It is anticipated the network will be decarbonised in future by lowering the temperature and using electric boilers, hydrogen, or other technology to eliminate fossil fuels. Timeframe for this is not clear.
3. Haringey requires the proposed Construction Centre and Engineering Centre to make a provision for future connection in the design, but this would not bind the College into any connection agreement or mean they have to make the connection in future, as this would be dependent on a range of other factors. Nonetheless, it would demonstrate a commitment from the College to the potential of a DEN connection.
4. The required design provision for the connection is to allow for valve connections to the proposed heating system and to allocate a space provision for the heat exchanger plant. The space requirement is a 5 sq m standalone plantroom which can be at roof level. Appropriate maintenance access and riser space for the pipes is to be allowed.
5. It was noted that the designed system operates at lower temperatures than the heat network and it would be acceptable to step down the temperature to suit the building design via an injection circuit.
6. It was noted that regardless of the DEN connection the same ASHP plant would still be required, so the DEN would not displace any plant if implemented, unless the building use or load profile changes in future.

Having regard to the above considerations, it is proposed to allocate an area at roof level to accommodate a potential future connection, as shown indicatively on the attached plan.

I trust the above is an accurate reflection of our discussion and look forward to progressing matters with you in due course.

Regards

Louise Morton MSc MRICS
Director
QUADRANT TOWN PLANNING LTD

T: 01491 571 123
M: 07989 048 771
E: lm@quadranttowntownplanning.com



11.4 Appendix D: Be Seen Spreadsheet

OVERALL PROGRESS86%

CURRENT REPORTING STAGE

Planning

CONTEXTUAL DATA

Progress: 94%

ORGANISATION & CONTACT DETAILS

DEVELOPMENT INFORMATION

OVERALL DEVELOPMENT DETAILS

Planning Reference Number

Must complete ->

Name of Whole Development

Tottenham Campus

DEVELOPMENT LOCATION

Development Address

Address Line 1

High Road, London

Address Line 2

Address Line 3

Address Line 4

London Borough

Haringey

Postcode

N15 4RU

Ordinance Survey Reference

Development UPRN (if available)

Please add (if available) ->

Geo-Location Coordinates

Latitude (to 6 decimal places)

51.586

Longitude (to 6 decimal places, +ve or -ve)

-0.072

DEVELOPMENT TOTAL AREA BREAKDOWN

Residential

Total Residential Floor Area

GIA m2

0

Dwelling Counts

Flats

number

House

number

Non-Residential

Non-Residential Floor Area Breakdown

Please include complete non-resi details below

Landlord Circulation (in Residential Blocks)

GIA m2

General office (A2, B1, B8, D1 planning classes)

GIA m2

High street agency (A2 planning classes)

GIA m2

General retail (A1, S6 planning classes)

GIA m2

Large non-food shop (A1 planning classes)

GIA m2

Small food store

GIA m2

Large food store

GIA m2

Restaurant (A3, A5 planning classes)

GIA m2

Bar, pub or licensed club (A4 planning classes)

GIA m2

Hotel (C1 planning classes)

GIA m2

Cultural Activities

GIA m2

Entertainment halls (D2 planning classes)

GIA m2

Swimming pool centre

GIA m2

Fitness and health centre

GIA m2

Dry sports and leisure facility (D2 planning classes)

GIA m2

Covered car park

GIA m2

Public buildings with light usage (D1, S6 planning class

GIA m2

Schools and seasonal public buildings (D1, D2 planning

GIA m2

University campus

GIA m2

2,307

Clinic (D1 planning classes)

GIA m2

Hospital (clinical and research)

GIA m2

Long term residential (C1, C2, C2A planning classes)

GIA m2

General accommodation (C1, C2, C3 planning classes)

GIA m2

Emergency services (S6 planning classes)

GIA m2

Laboratory or operating theatre

GIA m2

Public waiting or circulation (S6 planning classes)

GIA m2

Terminal (B8 planning classes)

GIA m2

Workshop (B1, B2 planning classes)

GIA m2

Storage Facility (B8 planning classes)

GIA m2

Cold Storage (B8 planning classes)

GIA m2

Overall Development Summary

Total Development Floor Area

Residential

GIA m2

0

Non-Residential

GIA m2

2,307

Total

GIA m2

2,307

Total Non-Residential Uses

University campus

SUPPLEMENTARY FILES AND UPCOMING REPORTING STAGES

SUPPLEMENTARY FILES

Site Plan

Does the development have a site plan?

Yes

What is the site plan filename?

Design & Access Statement

Best Practice Documents

Does the development have a predicted DEC?

No

ANTICIPATED DATES FOR UPCOMING REPORTING STAGES

As-Built Stage

01.02.2029

Operational Year 1 End

01.02.2030

DEVELOPMENT PERFORMANCE AND EMISSIONS

Progress: 75%

DEVELOPMENT PERFORMANCE

DEVELOPMENT OVERALL PREDICTED PERFORMANCE

Predicted Performance Calculation Details

Fuel Carbon Intensity Source (aligned with planning energy staseme)

SAP 10.0

Residential Elements of the development

Predicted Annual Energy Use

Fill in all applicable fuels below

Annual Electricity Use

kWh/yr

0

Annual Gas Use

kWh/yr

0

Annual Oil Use (if applicable)

kWh/yr

Annual Biomass Use (if applicable)

kWh/yr

Annual District Htg Use (if applicable)

kWh/yr

Annual District Clg Use (if applicable)

kWh/yr

Elec Generation, Gross (if applicable)

kWh/yr

Solar Thermal Generation (if applicable)

kWh/yr

Predicted Annual Carbon Emissions

tCO2/yr

0

Non-Residential Elements of the development (Part L Calculation)

Predicted Annual Energy Use

Fill in all applicable fuels below

Annual Electricity Use

kWh/yr

167,698

Annual Gas Use

kWh/yr

0

Annual Oil Use (if applicable)

kWh/yr

Annual Biomass Use (if applicable)

kWh/yr

Annual District Htg Use (if applicable)

kWh/yr

Annual District Clg Use (if applicable)

kWh/yr

Elec Generation, Gross (if applicable)

kWh/yr

Solar Thermal Generation (if applicable)

kWh/yr

Predicted Annual Carbon Emissions

tCO2/yr

23

Non-Residential Elements of the development (TM54 Calculation)

Predicted Annual Energy Use

Fill in all applicable fuels below

Annual Electricity Use

kWh/yr

Must complete ->

Annual Gas Use

kWh/yr

Must complete ->

Annual Oil Use (if applicable)

kWh/yr

Annual Biomass Use (if applicable)

kWh/yr

Annual District Htg Use (if applicable)

kWh/yr

Annual District Clg Use (if applicable)

kWh/yr

Elec Generation, Gross (if applicable)

kWh/yr

Solar Thermal Generation (if applicable)

kWh/yr

Predicted Annual Carbon Emissions

tCO2/yr

Must complete ->

CARBON OFFSETTING

Predicted Carbon Shortfall (aligned with planning energy t CO2

8

Total Committed Carbon Offset

£

23,146

END

