BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Finchey Road - Baseline

As designed

Date: Fri Aug 12 15:58:41 2022

Administrative information

Building Details

Address: London, N2

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.16

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.16

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

Certifier details

Name: Alexandros Grigoropoulos

Telephone number: 07837047051

Address: Unit A37 Aerodrome Studios, 2-8 Airfield Way, Christchurch, BH23 3TS

Foundation area [m^2]: 194.2

The CO_2 emission and primary energy rates of the building must not exceed the targets

The building does not comply with England Building Regulations Part L 2021

Target CO_2 emission rate (TER), $kgCO_2/m^2$.annum	2.02	
Building CO_2 emission rate (BER), $kgCO_2/m^2$.annum	3.22	
Target primary energy rate (TPER), kWh/m^2.annum	19.7	
Building primary energy rate (BPER), kWh/m^2.annum	31.64	
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	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.18	0.18	60000000:Surf[3]
Floors	0.18	0.15	0.15	60000000:Surf[6]
Pitched roofs	0.16	-	-	No Pitched roofs in building
Flat roofs	0.18	0.15	0.15	60000000:Surf[5]
Windows** and roof windows	1.6	1.4	1.4	60000000:Surf[0]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No Personnel doors in building
Vehicle access & similar large doors	1.3	-	-	No Vehicle access doors in building
High usage entrance doors	3	-	-	No High usage entrance doors in building

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

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

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

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

** Display windows and similar glazing are excluded from the U-value check.

*** Values for rooflights refer to the horizontal position.

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

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	5

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- HVAC1. VRF and MVHR (RETAIL/SCHOOL)

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	0.81	5.5	0	-	0.8
Standard value	0.93*	5	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 gas single boiler systems <=2 MW output and overall for multi-boiler systems. For single boiler systems >2 MW or any individual boiler in a multi-boiler system, limiting efficiency is 0.88.					

2- HVAC2. EH and NV (Communal corridors)

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	1	-	0	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- DHW1 (SCHOOL/DWELLINGS)

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	1	-
Standard value	1	N/A

2- DHW2

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	1	-
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**
Classroom	-	-	-	1.1	-	-	-	-	-	-	N/A
Classroom	-	-	-	1.1	-	-	-	-	-	-	N/A
Kitchen	-	-	-	1.1	-	-	-	-	-	-	N/A
WC	-	-	0.4	-	-	-	-	-	-	-	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
Circulation	-	-	-	1.1	-	-	-	-	-	-	N/A
Circulation	-	-	-	1.1	-	-	-	-	-	-	N/A
Unit 1	-	-	-	1.1	-	-	-	-	-	-	N/A
Circulation	-	-	-	1.1	-	-	-	-	-	-	N/A
Circulation	-	-	-	1.1	-	-	-	-	-	-	N/A
School accomodation	-	-	-	1.1	-	-	-	-	-	-	N/A
School accomodation	-	-	-	1.1	-	-	-	-	-	-	N/A
WC	-	-	0.4	-	-	-	-	-	-	-	N/A

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Classroom	120	-	-
Plantroom	120	-	-
Classroom	120	-	-
LIFT	120	-	-
Kitchen	120	-	-
WC	120	-	-
Store	120	-	-
Store	120	-	-
Circulation	120	-	-
LIFT	120	-	-
Swithcroom	120	-	-
Circulation	120	-	-
Unit 1	120	120	1.25
Circulation	120	-	-
Store	120	-	-
Circulation	120	-	-
Substation	120	-	-
School accomodation	120	-	-
School accomodation	120	-	-
01.04 Corridor	120	-	-
01 Staircase	120	-	-
01 Corridor	120	-	-
04.05 Corridor	120	-	-
04 Staircase	120	-	-
WC	120	-	-
04 Corridor	120	-	-
Ceiling Void	120	-	-
Ceiling Void	120	-	-
Ceiling Void	120	-	-
01.04 Corridor	120	-	-
01 Staircase	120	-	-

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
01 Corridor	120	-	-
Ceiling Void	120	-	-
Ceiling Void	120	-	-
Ceiling Void	120	-	-
01.04 Corridor	120	-	-
01 Staircase	120	-	-
01 Corridor	120	-	-
Ceiling Void	120	-	-
Ceiling Void	120	-	-
Ceiling Void	120	-	-
04 Ceiling Void	120	-	-
04 Ceiling Void	120	-	-
04 Ceiling Void	120	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Classroom	NO (-91.1%)	NO
Classroom	NO (-65.4%)	NO
LIFT	N/A	N/A
Kitchen	N/A	N/A
WC	N/A	N/A
Circulation	N/A	N/A
LIFT	N/A	N/A
Circulation	N/A	N/A
Unit 1	NO (-60.2%)	NO
Circulation	N/A	N/A
Circulation	N/A	N/A
School accomodation	NO (-13.9%)	NO
School accomodation	NO (-15.3%)	NO
WC	N/A	N/A

Regulation 25A: Consideration of high efficiency 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
Floor area [m^2]	1130.6	1130.6
External area [m^2]	1317.5	1317.5
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	5	3
Average conductance [W/K]	336.82	359.49
Average U-value [W/m^2K]	0.26	0.27
Alpha value* [%]	25.18	10

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

Building Use

% Area	Building Type
24	**Retail/Financial and Professional Services**
	Restaurants and Cafes/Drinking Establishments/Takeaways
1	**Offices and Workshop Businesses**
	General Industrial and Special Industrial Groups
	Storage or Distribution
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
42	**Residential Spaces**
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
33	**Non-residential Institutions: Education**
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
	Others: Miscellaneous 24hr Activities
	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

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

	Actual	Notional
Heating	3.21	1.96
Cooling	2.69	2.93
Auxiliary	4.14	1.41
Lighting	6.61	8.45
Hot water	5.63	4.78
Equipment*	45.49	45.49
TOTAL**	**22.27**	**19.52**

* 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	0	5.65
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*5.65*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	48.98	55.44
Primary energy [kWh/m^2]	31.64	19.7
Total emissions [kg/m^2]	3.22	2.02

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] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	20.2	90.3	7.1	6.1	9.4	0.79	4.11	0.81	5.5
	Notional	11.9	147.5	3.7	8.8	2.1	0.91	4.63	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	0.8	0	0.2	0	0	1	0	1	0
	Notional	1.4	0	0.3	0	0	1.41	0	----	----
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0	0	0	0	0
	Notional	0	0	0	0	0	0	0	----	----

Key to terms

Heat dem [MJ/m2] = Heating energy demand
Cool dem [MJ/m2] = Cooling energy demand
Heat con [kWh/m2] = Heating energy consumption
Cool con [kWh/m2] = Cooling energy consumption
Aux con [kWh/m2] = Auxiliary energy consumption
Heat SSEFF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER = Cooling system seasonal energy efficiency ratio
Heat gen SSEFF = Heating generator seasonal efficiency
Cool gen SSEER = Cooling generator seasonal energy efficiency ratio
ST = System type
HS = Heat source
HFT = Heating fuel type
CFT = Cooling fuel type