BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

6998-STRX_TOT-2026.05.22 (LEAN - WHOLE BUILDING)

As designed

Date: Tue May 26 10:10:29 2026

Administrative information

Building Details

Address: Address 1, City, Postcode

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.28

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.28

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

Foundation area [m²]: 72.31

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

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	1.01	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	0.86	
Target primary energy rate (TPER), $kWh_{PE}/m^2.annum$	11.03	
Building primary energy rate (BPER), $kWh_{PE}/m^2.annum$	9.33	
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	$U_{a\text{-Limit}}$	$U_{a\text{-Calc}}$	$U_{i\text{-Calc}}$	First surface with maximum value
Walls*	0.26	0.51	0.53	L0000035:Surf[1]
Floors	0.18	0.17	0.18	L0000035:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	L000000C:Surf[1]
Windows** and roof windows	1.6	1.19	1.6	L000002F:Surf[1]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	1.6	1.6	L000002F:Surf[1]
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/(m²K)]

$U_{a\text{-Calc}}$ = Calculated area-weighted average U-values [W/(m²K)]

$U_{i\text{-Calc}}$ = Calculated maximum individual element 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
m³/(h.m²) at 50 Pa	8	3

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- ELEC PANEL

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

2- SPLIT SYSTEM (1.14 SFP) BE LEAN

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.09	4.03	0	-	0.79
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.

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

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
L00 CHANGING (SHOWER)	-	-	0.3	-	-	-	-	-	-	-	N/A
L00 CHANGING (CIRC)	-	-	0.3	-	-	-	-	-	-	-	N/A
L00 SHOP	-	-	-	1.1	-	-	-	-	-	-	N/A
L00 BREAK ROOM	-	-	-	1.1	-	-	-	-	-	-	N/A
L00 IT ROOM	-	-	-	1.1	-	-	-	-	-	-	N/A

General lighting and display lighting	General luminaire	Display light source	
Zone name	**Efficacy [lm/W]**	**Efficacy [lm/W]**	**Power density [W/m²]**
Standard value	95	80	0.3
L00 (WAREHOUSE) LOBBY	120	-	-
L00 (WAREHOUSE) SELF-STORE	130	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	**Efficacy [lm/W]**	**Efficacy [lm/W]**	**Power density [W/m²]**
Standard value	95	80	0.3
L00 (WAREHOUSE) STAIR	120	-	-
L00 BIN	120	-	-
L00 FAB LAB 01	120	-	-
L00 FAB LAB 02	120	-	-
L00 FAB LAB 03	120	-	-
L00 PLANT	120	-	-
L01 (WAREHOUSE) LOBBY	120	-	-
L01 (WAREHOUSE) SELF-STORE	130	-	-
L01 (WAREHOUSE) STAIR	120	-	-
L01 CIRC	120	-	-
L01 CIRC	120	-	-
L01 FAB LAB 06	120	-	-
L01 FAB LAB 07	120	-	-
L01 FAB LAB 08	120	-	-
L02 LOBBY	120	-	-
L03 LOBBY	120	-	-
L04 LOBBY	120	-	-
L05 LOBBY	120	-	-
L06 LOBBY	120	-	-
L00 CIRC	120	-	-
L00 CLEANERS	120	-	-
L00 WC	120	-	-
L00 STAIR	120	-	-
L00 CHANGING (SHOWER)	120	-	-
L00 CHANGING (CIRC)	120	-	-
L00 SHOP	120	90	1.5
L00 BREAK ROOM	120	-	-
L00 IT ROOM	120	-	-
L00 SELF-STORE	130	-	-
L00 SELF-STORE	130	-	-
L00 FAB LAB 04	120	-	-
L00 CIRC	120	-	-
L01 STAIR	120	-	-
L01 FAB LAB 09	120	-	-
L01 SELF-STORE	130	-	-
L01 CIRC	120	-	-
L01 FAB LAB 05	120	-	-
L01 STAIR	120	-	-
L01 WC	120	-	-
L01 CIRC	120	-	-
L02 STAIR	120	-	-
L02 STAIR	120	-	-
L02 SELF-STORE	130	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	**Efficacy [lm/W]**	**Efficacy [lm/W]**	**Power density [W/m²]**
Standard value	95	80	0.3
L03 SELF-STORE	130	-	-
L03 STAIR	120	-	-
L03 SELF-STORE	130	-	-
L03 STAIR	120	-	-
L04 SELF-STORE	130	-	-
L04 STAIR	120	-	-
L04 STAIR	120	-	-
L04 SELF-STORE	130	-	-
L05 SELF-STORE	130	-	-
L05 STAIR	120	-	-
L05 SELF-STORE	130	-	-
L05 STAIR	120	-	-
L06 SELF-STORE	130	-	-
L06 STAIR	120	-	-
L06 SELF-STORE	130	-	-
L06 STAIR	120	-	-

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

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
L00 FAB LAB 01	NO (-63.6%)	NO
L00 FAB LAB 02	NO (-66.8%)	NO
L00 FAB LAB 03	NO (-64.6%)	NO
L01 FAB LAB 06	NO (-68.2%)	NO
L01 FAB LAB 07	NO (-69%)	NO
L01 FAB LAB 08	NO (-70%)	NO
L00 SHOP	NO (-91%)	NO
L00 BREAK ROOM	N/A	N/A
L00 IT ROOM	N/A	N/A
L00 FAB LAB 04	NO (-57%)	NO
L01 FAB LAB 09	NO (-61.7%)	NO
L01 FAB LAB 05	NO (-83.8%)	NO

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]	8408.7	8408.7
External area [m^2]	7668.3	7668.3
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	3	5
Average conductance [W/K]	2641.49	1528.79
Average U-value [W/m^2K]	0.34	0.2
Alpha value* [%]	25.07	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
4	**General Industrial and Special Industrial Groups**
96	**Storage or Distribution**
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
	Others: Miscellaneous 24hr Activities
	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

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

	Actual	Notional
Heating	0.07	0.13
Cooling	0.03	0.04
Auxiliary	0.74	0.49
Lighting	4.49	5.97
Hot water	0.99	0.94
Equipment*	2.8	2.8
TOTAL**	**6.32**	**7.57**

* 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	0.1
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*0.1*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	0.7	1.39
Primary energy [kWh_{PE}/m^2]	9.33	11.03
Total emissions [kg/m^2]	0.86	1.01

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	170	0	47.2	0	12	1	0	1	0
	Notional	405.6	0	79.9	0	22.8	1.41	0	----	----
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	37.5	33.8	3.7	3.3	6.9	2.78	2.86	3.09	4.03
	Notional	75.2	59.1	7.5	5.8	4.1	2.78	2.84	----	----
[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