BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Storage World

As built

Date: Thu Aug 06 10:16:31 2026

Administrative information

Building Details

Address: Unit 4, Ambrose House, Ambrose Street, Manchester, M12 5DD

Certifier details

Name: Liam Bartlett

Telephone number: 0330 055 3405

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

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.2

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.31

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

Foundation area [m^2]: 87.82

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

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	2.66	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	2.63	
Target primary energy rate (TPER), $kWh_{PE}/m^2.annum$	28.95	
Building primary energy rate (BPER), $kWh_{PE}/m^2.annum$	28.61	
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	1.01	ST00000C_W0_O0
Floors	0.18	0.12	0.13	ST00000B_F
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.18	0.18	ST00000A_C
Windows** and roof windows	1.6	1.01	1.01	ST00000C_W0_O1
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = 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	5.27

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	<0.9

1- Daikin FTXM20A

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	5.1	8.65	-	1.8	0.89
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- Daikin FTXM50A

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	4.71	7.41	-	1.8	0.89
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.

3- Panel heaters

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	1	-	-	-	-
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					YES

1- SYST0002-DHW

	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**
Staff 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	2.3	2	0.5	0.5	0.4	1	Zone	Standard
IT Room	-	-	-	-	-	-	-	0.3	-	-	N/A
Reception	-	-	-	-	-	-	-	0.3	-	-	N/A
WC	-	-	0.4	-	-	-	-	-	-	-	N/A
WC Acc	-	-	0.4	-	-	-	-	-	-	-	N/A
Shower	-	-	0.4	-	-	-	-	-	-	-	N/A
01_Storage Area	-	-	-	-	1.2	-	-	-	-	-	N/A
02_Storage Area	-	-	-	-	1.2	-	-	-	-	-	N/A
03_Storage Area	-	-	-	-	1.2	-	-	-	-	-	N/A
04_Storage Area	-	-	-	-	1.2	-	-	-	-	-	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
Staff Room	98	-	-
IT Room	98	-	-
Reception	98	98	1.378
WC	121	-	-
WC Acc	121	-	-
Shower	121	-	-
Cupboard	124	-	-
Riser 3	157	-	-
Stairwell 3	157	-	-
Stairwell 2	157	-	-
Riser 2	157	-	-
Stairwell 1	157	-	-
Riser 1	157	-	-
Storage Area	157	-	-
01_Storage Area	157	-	-
02_Storage Area	157	-	-
03_Storage Area	157	-	-
04_Storage Area	157	-	-

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?
Staff Room	N/A	N/A
IT Room	N/A	N/A
Reception	YES (+7.3%)	YES
Riser 3	N/A	N/A
Stairwell 3	N/A	N/A
Stairwell 1	N/A	N/A
Riser 1	N/A	N/A
Storage Area	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
01_Storage Area	NO (-91.1%)	NO
02_Storage Area	NO (-88.3%)	NO
03_Storage Area	NO (-88.3%)	NO
04_Storage Area	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?	YES
Is evidence of such assessment available as a separate submission?	NO
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]	11071.4	11071.4
External area [m^2]	27441.4	27441.4
Weather	MAN	MAN
Infiltration [m^3/hm^2@ 50Pa]	5	5
Average conductance [W/K]	4704.4	6456.11
Average U-value [W/m^2K]	0.17	0.24
Alpha value* [%]	5.73	10.28

* 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
100	**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	0.33	0.34
Cooling	0.02	0.02
Auxiliary	4.36	3.18
Lighting	5.88	7.61
Hot water	8.96	8.96
Equipment*	29.77	29.77
TOTAL**	**19.55**	**20.11**

* 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	0.66	0.5
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0.66*	*0.5*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	98.14	119.42
Primary energy [kWh_{PE}/m^2]	28.61	28.95
Total emissions [kg/m^2]	2.63	2.66

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] Fan coil systems, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	22.8	58.9	1.4	2.6	20.3	4.41	6.36	5.1	8.65
	Notional	157.5	58.5	16.6	6	0	2.64	2.7	----	----
[ST] Fan coil systems, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	67.1	77	4.6	3.9	29.4	4.07	5.45	4.71	7.41
	Notional	202.1	22.3	21.3	2.3	0	2.64	2.7	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	437.4	10	144.3	0	14.6	0.84	0	1	0
	Notional	505.9	19.1	104.9	0	22.5	1.34	0	----	----
[ST] No Heating or Cooling										
	Actual	76.7	20.6	0	0	4.2	0	0	0	0
	Notional	72.8	45.1	0	0	3.2	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