BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

14 Bedford Row Exisitng

As built

Date: Mon Apr 29 08:17:59 2024

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.22

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.22

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

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m^2]: 268.08

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), $kgCO_2/m^2.annum$	51.86	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	68.4	
Target primary energy rate (TPER), $kWh_{PE}/m^2.annum$	281.41	
Building primary energy rate (BPER), $kWh_{PE}/m^2.annum$	380.19	
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	0.35	1.43	F2000000:Surf[20]
Floors	0.18	0.25	0.25	GF000004:Surf[0]
Pitched roofs	0.16	0.18	0.18	F4000001:Surf[10]
Flat roofs	0.18	0.18	0.18	F3000000:Surf[1]
Windows** and roof windows	1.6	1.42	1.6	F2000000:Surf[1]
Rooflights***	2.2	2.3	2.3	GF000004:Surf[1]
Personnel doors^	1.6	2.2	2.2	F2000006:Surf[2]
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	25

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	<0.9

1- Existing main system

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	-	0.04	-	0.7
Standard value	0.93*	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 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.

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

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

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
F4 - Plant	50	-	-
GF - Corridor	106	-	-
F2 - Stair	81	-	-
F1 - Stair	89	-	-
F3 - Stair	79	-	-
GF - Stairs	86	-	-
F -1 - Stair	80	-	-
F1 - (1) - Stairs	71	-	-
F2 - Stair	115	-	-
F -1 - Corridor	115	-	-
GF - Data room	73	-	-
GF - Corridor	134	-	-
GF - Bike Store	49	-	-
GF - Store room	52	-	-
F -1 - Corridor	78	-	-
F -1 - corridor	99	-	-
F -1 - Office	65	-	-
F -1 - Office	62	-	-
F -1 - corridor	94	-	-
F -1 - Meeting room	63	-	-
F -1 - Showers	65	-	-
F -1 - Plant	49	-	-
F -1 - Plant	46	-	-
F -1 - Plant	43	-	-
F -1 - store	44	-	-
F -1 - Stair + corridor	69	-	-
GF - Entrace corridor	76	-	-

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
GF - Stairs	69	-	-
GF - Corridor	94	-	-
GF - Office	63	-	-
GF - Corridor	85	-	-
GF - WC	112	-	-
GF - WC	91	-	-
GF - Medic Space	77	-	-
GF - Meeting Hall	61	-	-
Store	121	-	-
GF - Corridor	87	-	-
GF - Office	69	-	-
GF - Office	68	-	-
GF - WC	106	-	-
F1 - (1) - Small Office	68	-	-
GF - Stairs	68	-	-
GF - Corridor	108	-	-
F1 - Store	83	-	-
F1 - Small Office	73	-	-
F1 - Office	59	-	-
F1 - Meeting room	74	-	-
F1 - Store	69	-	-
F1 - office	63	-	-
F1 - office	71	-	-
F1 - Office	61	-	-
F1 - Corridor	84	-	-
F1 - Office	72	-	-
F1 - office	68	-	-
F1 - office	73	-	-
F1 - Store	121	-	-
F1 - Corridor	124	-	-
F1 - Corridor	87	-	-
F2 - Corridor	87	-	-
F2 - Office	67	-	-
F2 - office	70	-	-
F2 - Office	64	-	-
F2 - Small Office	73	-	-
F2 - Small Ofice	72	-	-
F1 - WC	70	-	-
F1 - Stair	70	-	-
F2 - Stair	70	-	-
F2 - Store	83	-	-
F2 - WC	70	-	-
F2 - Small Office	68	-	-

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
F2 - Office	58	-	-
F2 - Store	65	-	-
F2 - small office	78	-	-
F2 - Small office	84	-	-
F2	95	-	-
F2	80	-	-
F2 - Office	68	-	-
F2 - Office	62	-	-
F3 - WC	73	-	-
F3 - Corridor	174	-	-
F3 - Store	66	-	-
F3 - Office	59	-	-
F3 - Small Office	75	-	-
F3 - Office	62	-	-
F3 - Office	65	-	-
F3 - Corridor	88	-	-
F3 - Corridor	107	-	-
F3 - Small Office	76	-	-
F3 - Office	64	-	-
F3 - office	67	-	-
F3 - Small Office	78	-	-
F3 - Corridor	92	-	-
F3 - small office	83	-	-
F4 - Office	61	-	-
F4 - Stair	72	-	-
F4 - HWT Plant	55	-	-
F4 - store	53	-	-
F -1 - Meeting Room	62	-	-
F1 - WC	129	-	-
F1 - WC	161	-	-
F1 - WC	128	-	-
GF - Corridor	85	-	-
GF - Enterance	67	-	-

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?
F -1 - Office	NO (-87.9%)	NO
F -1 - Office	NO (-75.5%)	NO
F -1 - Meeting room	N/A	N/A
GF - Office	NO (-62.9%)	NO
GF - Medic Space	N/A	N/A
GF - Meeting Hall	YES (+16.8%)	NO
GF - Office	NO (-93.7%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
GF - Office	NO (-48.8%)	NO
F1 - (1) - Small Office	NO (-66.6%)	NO
F1 - Small Office	NO (-65.2%)	NO
F1 - Office	NO (-39.8%)	NO
F1 - Meeting room	N/A	N/A
F1 - office	N/A	N/A
F1 - office	NO (-53.9%)	NO
F1 - Office	NO (-55.1%)	NO
F1 - Office	NO (-25.8%)	NO
F1 - office	NO (-27.6%)	NO
F1 - office	NO (-64.3%)	NO
F2 - Office	NO (-52.8%)	NO
F2 - office	NO (-51.8%)	NO
F2 - Office	NO (-47.9%)	NO
F2 - Small Office	NO (-47.8%)	NO
F2 - Small Ofice	NO (-48.9%)	NO
F2 - Small Office	NO (-59.8%)	NO
F2 - Office	NO (-37.6%)	NO
F2 - small office	NO (-44.4%)	NO
F2 - Small office	NO (-38.3%)	NO
F2	N/A	N/A
F2	NO (-23.7%)	NO
F2 - Office	NO (-32.9%)	NO
F2 - Office	NO (-55.6%)	NO
F3 - Office	NO (-34.6%)	NO
F3 - Small Office	N/A	N/A
F3 - Office	NO (-37.9%)	NO
F3 - Office	NO (-42.7%)	NO
F3 - Small Office	NO (-40%)	NO
F3 - Office	NO (-62.8%)	NO
F3 - office	NO (-27.7%)	NO
F3 - Small Office	NO (-6.6%)	NO
F3 - small office	NO (-33.9%)	NO
F4 - Office	NO (-75.4%)	NO
F -1 - Meeting Room	NO (-88%)	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]	2144.7	2144.7
External area [m^2]	2489.5	2489.5
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	25	3
Average conductance [W/K]	1126.33	983.91
Average U-value [W/m^2K]	0.45	0.4
Alpha value* [%]	25.2	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
100	**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	95.37	53.71
Cooling	0	0
Auxiliary	4.63	2.81
Lighting	12.84	5.91
Hot water	218.77	190.16
Equipment*	30.24	30.24
TOTAL**	**331.61**	**252.59**

* 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	4.11
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*4.11*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	278.79	175.04
Primary energy [kWh_{PE}/m^2]	380.19	281.41
Total emissions [kg/m^2]	68.4	51.86

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] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	278.8	0	95.4	0	4.6	0.81	0	0.91	0
	Notional	175	0	53.7	0	2.2	0.91	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