

BRUKL Output Document



Compliance with England Building Regulations Part L 2021

Project name

Napier Road Base plus PV 100

As designed

Date: Wed Jul 10 17:45:49 2024

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: 7.0.26

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.26

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

Foundation area [m²]: 371.41

The 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	1.62
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	1.47
Target primary energy rate (TPER), kWh _{PE} /m ² annum	17.33
Building primary energy rate (BPER), kWh _{PE} /m ² annum	15.71
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	0.16	0.16	RL000000:Surf[2]
Floors	0.18	0.1	0.1	RI000000:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.1	0.1	L0000099:Surf[32]
Windows** and roof windows	1.6	1.22	1.22	GY000000:Surf[2]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors [^]	1.6	1.21	1.21	RL000000: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-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
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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 to 0.95

1- DX COOLING (COMMS)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.88	6.8	0	-	0.75
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.					

2- VRF HEATING/COOLING

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.88	6.8	0	-	0.75
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.					

3- ELECTRIC PANEL HEATER WITH NATURAL VENTILATION

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.1	-	-
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					NO

1- DHW VIA ELECTRIC POINT OF USE

	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		Zone	Standard
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1			
L00 : Primary comms room	-	-	-	1.6	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1		
L00 : Gym		-	-	-	1.6	-	-	-	-	-	-	N/A
L00 : Cinema Room		-	-	-	1.6	-	-	-	-	-	-	N/A
L00 : Secondary comms Room		-	-	-	1.6	-	-	-	-	-	-	N/A
L00 : WC		-	-	-	1.6	-	-	-	-	-	-	N/A
L00 : WC		-	-	-	1.6	-	-	-	-	-	-	N/A
L00 : Studio		-	-	-	1.6	-	-	-	-	-	-	N/A
L00 : Office Reception		-	-	-	1.6	-	-	-	-	-	-	N/A
L00 : WC		-	-	-	1.6	-	-	-	-	-	-	N/A
L00 : Entrance Lobby		-	-	-	1.6	-	-	-	-	-	-	N/A
L11 : Meeting Room		-	-	-	1.6	-	-	-	-	-	-	N/A
L11 : Office		-	-	-	1.6	-	-	-	-	-	-	N/A
L11 : Lounge		-	-	-	1.6	-	-	-	-	-	-	N/A
L11 : Meeting Room		-	-	-	1.6	-	-	-	-	-	-	N/A
L11 : WC		-	-	-	1.6	-	-	-	-	-	-	N/A
L11 : Lounge		-	-	-	1.6	-	-	-	-	-	-	N/A
L11 : WC		-	-	-	1.6	-	-	-	-	-	-	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 : Refuse		110	-	-
L00 : Stairs		110	-	-
L00 : Primary Switchroom		110	-	-
L00 : Primary comms room		110	-	-
L00 : Gym		110	-	-
L00 : Store		110	-	-
L00 : Cycle Store		110	-	-
L00 : Cleaners		110	-	-
L00 : Post Room		110	-	-
L00 : Post Room		110	-	-
L00 : Parcel Store		110	-	-
L00 : Cinema Room		110	-	-
L00 : Cycle Store		110	-	-
L00 : Refuse		110	-	-
L00 : Domestic Cold Water		110	-	-
L00 : Refuse (Satellite)		110	-	-
L00 : Secondary comms Room		110	-	-
L00 : Generator		110	-	-
L00 : Substation		110	-	-
L00 : Corridor		110	-	-
L00 : Corridor		110	-	-
L00 : Corridor		110	-	-
L00 : Corridor		110	-	-

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
L00 : Corridor		110	-	-
L00 : Corridor		110	-	-
L00 : Corridor		110	-	-
L00 : Corridor		110	-	-
L00 : WC		110	-	-
L00 : WC		110	-	-
L00 : Stairs		110	-	-
L00 : Stairs		110	-	-
L00 : Corridor		110	-	-
L00 : Refuse (Satellite)		110	-	-
L00 : Sprinklers		110	-	-
L00 : Studio		110	-	-
L00 : Corridor		110	-	-
L00 : Office Reception		110	85	1.588
L00 : WC		110	-	-
L00 : Corridor		110	-	-
L00 : Stairs		110	-	-
L00 : Corridor		110	-	-
L00 : Secondary Switch room		110	-	-
L00 : Corridor		110	-	-
L00 : Corridor		110	-	-
L00 : Corridor		110	-	-
L00 : Entrance Lobby		110	-	-
L00 : Corridor		110	-	-
L01 : STAIRS		110	-	-
L01 : STAIRS		110	-	-
L01 : STAIRS		110	-	-
L01 : STAIRS		110	-	-
L01 : Corridor		110	-	-
L01 : Corridor		110	-	-
L01 : Corridor		110	-	-
L01 : Corridor		110	-	-
L01 : Corridor		110	-	-
L01 : Corridor		110	-	-
L01 : Corridor		110	-	-
L01 : Corridor		110	-	-
L01 : Corridor		110	-	-
L02 : STAIRS		110	-	-
L02 : STAIRS		110	-	-
L02 : STAIRS		110	-	-
L02 : STAIRS		110	-	-
L02 : Corridor		110	-	-
L02 : Corridor		110	-	-
L02 : Corridor		110	-	-
L02 : Corridor		110	-	-

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
L02 : Corridor		110	-	-
L02 : Corridor		110	-	-
L02 : Corridor		110	-	-
L03 : STAIRS		110	-	-
L03 : STAIRS		110	-	-
L03 : STAIRS		110	-	-
L03 : STAIRS		110	-	-
L03 : Corridor		110	-	-
L03 : Corridor		110	-	-
L03 : Corridor		110	-	-
L03 : Corridor		110	-	-
L03 : Corridor		110	-	-
L03 : Corridor		110	-	-
L03 : Corridor		110	-	-
L03 : Corridor		110	-	-
L04 : STAIRS		110	-	-
L04 : STAIRS		110	-	-
L04 : STAIRS		110	-	-
L04 : STAIRS		110	-	-
L04 : Corridor		110	-	-
L04 : Corridor		110	-	-
L04 : Corridor		110	-	-
L04 : Corridor		110	-	-
L04 : Corridor		110	-	-
L04 : Corridor		110	-	-
L04 : Corridor		110	-	-
L04 : Corridor		110	-	-
L04 : Corridor		110	-	-
L05 : STAIRS		110	-	-
L05 : STAIRS		110	-	-
L05 : STAIRS		110	-	-
L05 : STAIRS		110	-	-
L05 : Corridor		110	-	-
L05 : Corridor		110	-	-
L05 : Corridor		110	-	-
L05 : Corridor		110	-	-
L05 : Corridor		110	-	-
L05 : Corridor		110	-	-
L05 : Corridor		110	-	-
L05 : Corridor		110	-	-
L06 : STAIRS		110	-	-
L06 : STAIRS		110	-	-
L06 : STAIRS		110	-	-
L06 : STAIRS		110	-	-
L06 : Corridor		110	-	-
L06 : Corridor		110	-	-
L06 : Corridor		110	-	-

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
L06 : Corridor		110	-	-
L06 : Corridor		110	-	-
L06 : Corridor		110	-	-
L06 : Corridor		110	-	-
L07 : STAIRS		110	-	-
L07 : STAIRS		110	-	-
L07 : STAIRS		110	-	-
L07 : STAIRS		110	-	-
L07 : Corridor		110	-	-
L07 : Corridor		110	-	-
L07 : Corridor		110	-	-
L07 : Corridor		110	-	-
L07 : Corridor		110	-	-
L07 : Corridor		110	-	-
L07 : Corridor		110	-	-
L07 : Corridor		110	-	-
L08 : STAIRS		110	-	-
L08 : STAIRS		110	-	-
L08 : STAIRS		110	-	-
L08 : STAIRS		110	-	-
L08 : Corridor		110	-	-
L08 : Corridor		110	-	-
L08 : Corridor		110	-	-
L08 : Corridor		110	-	-
L08 : Corridor		110	-	-
L08 : Corridor		110	-	-
L08 : Corridor		110	-	-
L08 : Corridor		110	-	-
L08 : Corridor		110	-	-
L09 : STAIRS		110	-	-
L09 : STAIRS		110	-	-
L09 : STAIRS		110	-	-
L09 : STAIRS		110	-	-
L09 : Corridor		110	-	-
L09 : Corridor		110	-	-
L09 : Corridor		110	-	-
L09 : Corridor		110	-	-
L09 : Corridor		110	-	-
L09 : Corridor		110	-	-
L09 : Corridor		110	-	-
L09 : Corridor		110	-	-
L10 : STAIRS		110	-	-
L10 : STAIRS		110	-	-
L10 : STAIRS		110	-	-
L10 : STAIRS		110	-	-
L10 : Corridor		110	-	-
L10 : Corridor		110	-	-

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
L10 : Corridor		110	-	-
L10 : Corridor		110	-	-
L10 : Corridor		110	-	-
L10 : Corridor		110	-	-
L10 : Corridor		110	-	-
L11 : Stairs		110	-	-
L11 : Meeting Room		110	-	-
L11 : Office		110	-	-
L11 : Lounge		110	-	-
L11 : Meeting Room		110	-	-
L11 : Stairs		110	-	-
L11 : WC		110	-	-
L11 : Corridor		110	-	-
L11 : Lounge		110	-	-
L11 : Corridor		110	-	-
L11 : Corridor		110	-	-
L11 : Corridor		110	-	-
L11 : Corridor		110	-	-
L11 : WC		110	-	-
L11 : Corridor		110	-	-

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 : Primary comms room	N/A	N/A
L00 : Gym	NO (-29.6%)	NO
L00 : Cinema Room	NO (-81.8%)	NO
L00 : Secondary comms Room	N/A	N/A
L00 : WC	N/A	N/A
L00 : WC	N/A	N/A
L00 : Studio	NO (-33.7%)	NO
L00 : Office Reception	NO (-22.1%)	NO
L00 : WC	N/A	N/A
L00 : Entrance Lobby	NO (-0.2%)	NO
L11 : Meeting Room	NO (-39.1%)	NO
L11 : Office	YES (+1.2%)	NO
L11 : Lounge	NO (-21.9%)	NO
L11 : Meeting Room	YES (+11.5%)	NO
L11 : WC	N/A	N/A
L11 : Lounge	NO (-21.2%)	NO
L11 : 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?	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]	6134.5	6134.5
External area [m ²]	4782.7	4782.7
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	3
Average conductance [W/K]	1110.46	1508.16
Average U-value [W/m ² K]	0.23	0.32
Alpha value* [%]	25.6	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
2	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
72	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
26	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/m²]

	Actual	Notional
Heating	1.58	1.98
Cooling	1.55	1.25
Auxiliary	2.39	0.62
Lighting	7.02	7.7
Hot water	0.73	0.62
Equipment*	35.05	35.05
TOTAL**	13.27	12.18

* 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	2.89	0.52
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>2.89</i>	<i>0.52</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	38.62	34.97
Primary energy [kWh _{PE} /m ²]	15.71	17.33
Total emissions [kg/m ²]	1.48	1.62

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	5.2	0	1.8	0	0	0.8	0	1	0
Notional	10.1	0	2	0	0	1.41	0	----	----
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	60.7	68.7	3.7	4	16.5	4.55	4.83	4.88	6.8
Notional	58.2	43.8	5.8	2.6	4.2	2.78	4.63	----	----
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	0	3775.4	0	217.2	13.5	4.55	4.83	4.88	6.8
Notional	0	3202.7	0	192.1	7.2	2.78	4.63	----	----
[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

Energy Performance Certificate

Non-Domestic Building



Address 1
Address 2
Address 3
Address 4
City
Postcode

Certificate Reference Number:
1313-6362-9830-8801-3884

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient



Net zero CO₂ emissions

A 0-25

◀ **12**

This is how energy efficient the building is.

B 26-50

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Heating and Natural Ventilation
Total useful floor area (m ²):	6134.521
Building complexity:	Level 5

Benchmarks

Buildings similar to this one could have ratings as follows:

14 If newly built

Administrative information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

Assessment Software: Virtual Environment v7.0.26 using calculation engine ApacheSim v7.0.26

Property Reference: UPRN-000000000000

Assessor Name: Name

Assessor Number: ABCD123456

Accreditation Scheme: Information not available

Assessor Qualifications: NOS5

Employer/Trading Name: Trading Name

Employer/Trading Address: Trading Address

Issue Date: 10 Jul 2024

Valid Until: 09 Jul 2034 (unless superseded by a later certificate)

Related Party Disclosure: Not related to the owner

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report: 0593-1957-6602-7041-8232

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by Information not available. You can obtain contact details of the Accreditation Scheme at Information not available.

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at www.opendatacommunities.org.

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. For further information about how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at:

www.gov.uk/government/collections/energy-performance-certificates. It explains the content and use of this document and advises on how to identify the authenticity of a certificate and how to make a complaint.

Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property - whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.