BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2013

Project name

Hermes

As built

Date: Fri Feb 08 13:31:02 2019

Administrative information

Building Details

Address: Units H1-H12, LEE-ON-THE-SOLENT, PO13 9FX

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.4.b.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.10

BRUKL compliance check version: v5.4.b.0

Owner Details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certifier details

Name: Steven McLean-Chartered Engineer

Telephone number: Phone

Address: Street Address, City, Postcode

Criterion 1: The calculated CO_2 emission rate for the building must not exceed the target

CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	26.8
Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	26.8
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	20.4
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	-	-	"No heat loss walls"
Floor	0.25	-	-	"No heat loss floors"
Roof	0.25	-	-	"No heat loss roofs"
Windows***, roof windows, and rooflights	2.2	-	-	"No external windows/rooflights"
Personnel doors	2.2	-	-	"No external personnel doors"
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	3.5	-	-	"No external high usage entrance doors"

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

* There might be more than one surface where the maximum U-value occurs.
** 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.
N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
$m^3/(h.m^2)$ at 50 Pa	10	15

Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

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

"No HVAC systems in project"

1- SYST0001-DHW

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	0.5	-
Standard value	0.9*	N/A

* Standard shown is for gas boilers >30 kW output. For boilers <=30 kW output, limiting efficiency is 0.73.

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
A	Local supply or extract ventilation units serving a single area
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 supply and extract ventilation units serving a single room or zone with heating and heat recovery
E	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
H	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

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	1.9	1.6	0.5	1.1	0.5	1	**Zone**	**Standard**
Hermes H12	-	-	-	-	-	-	-	-	-	-	N/A
Hermes H11	-	-	-	-	-	-	-	-	-	-	N/A
Hermes H10	-	-	-	-	-	-	-	-	-	-	N/A
Hermes H9	-	-	-	-	-	-	-	-	-	-	N/A
Hermes H8	-	-	-	-	-	-	-	-	-	-	N/A
Hermes H7	-	-	-	-	-	-	-	-	-	-	N/A
Hermes H6	-	-	-	-	-	-	-	-	-	-	N/A
Hermes H5	-	-	-	-	-	-	-	-	-	-	N/A
Hermes H4	-	-	-	-	-	-	-	-	-	-	N/A
Hermes H3	-	-	-	-	-	-	-	-	-	-	N/A
Hermes H2	-	-	-	-	-	-	-	-	-	-	N/A
Hermes H1	-	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting

	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
Hermes H12	130	-	-	424
Hermes H11	130	-	-	398

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
Hermes H10	130	-	-	398
Hermes H9	130	-	-	398
Hermes H8	130	-	-	398
Hermes H7	130	-	-	398
Hermes H6	130	-	-	398
Hermes H5	130	-	-	398
Hermes H4	130	-	-	398
Hermes H3	130	-	-	398
Hermes H2	130	-	-	398
Hermes H1	130	-	-	424

Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Hermes H12	NO (-5%)	NO
Hermes H11	YES (+2.9%)	NO
Hermes H10	YES (+2.9%)	NO
Hermes H9	YES (+2.8%)	NO
Hermes H8	YES (+2.9%)	NO
Hermes H7	YES (+2.9%)	NO
Hermes H6	YES (+2.9%)	NO
Hermes H5	YES (+2.9%)	NO
Hermes H4	YES (+2.9%)	NO
Hermes H3	YES (+2.9%)	NO
Hermes H2	YES (+2.9%)	NO
Hermes H1	NO (-4.2%)	NO

Criterion 4: The performance of the building, as built, should be consistent with the calculated BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

EPBD (Recast): Consideration of 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
Area [m^2]	1191.5	1191.5
External area [m^2]	5364.5	5364.5
Weather	SOU	SOU
Infiltration [m^3/hm^2@ 50Pa]	15	7
Average conductance [W/K]	4632.87	1811.39
Average U-value [W/m^2K]	0.86	0.34
Alpha value* [%]	4.63	37.5

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

Building Use

% Area	Building Type
	A1/A2 Retail/Financial and Professional services
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
	B1 Offices and Workshop businesses
	B2 to B7 General Industrial and Special Industrial Groups
100	**B8 Storage or Distribution**
	C1 Hotels
	C2 Residential Institutions: Hospitals and Care Homes
	C2 Residential Institutions: Residential schools
	C2 Residential Institutions: Universities and colleges
	C2A Secure Residential Institutions
	Residential spaces
	D1 Non-residential Institutions: Community/Day Centre
	D1 Non-residential Institutions: Libraries, Museums, and Galleries
	D1 Non-residential Institutions: Education
	D1 Non-residential Institutions: Primary Health Care Building
	D1 Non-residential Institutions: Crown and County Courts
	D2 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	0
Cooling	0	0
Auxiliary	0	0
Lighting	35.49	50.7
Hot water	9.27	5.36
Equipment*	43.8	43.8
TOTAL**	**44.76**	**56.06**

* 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
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	806.05	480.35
Primary energy* [kWh/m^2]	120.26	158.29
Total emissions [kg/m^2]	20.4	26.8

* Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

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] No Heating or Cooling										
	Actual	729.1	77	0	0	0	0	0	0	0
	Notional	315.3	165.1	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

Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

Building fabric

Element	$U_{i\text{-}Typ}$	$U_{i\text{-}Min}$	Surface where the minimum value occurs*
Wall	0.23	-	"No heat loss walls"
Floor	0.2	-	"No heat loss floors"
Roof	0.15	-	"No heat loss roofs"
Windows, roof windows, and rooflights	1.5	-	"No external windows/rooflights"
Personnel doors	1.5	-	"No external personnel doors"
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"

$U_{i\text{-}Typ}$ = Typical individual element U-values [W/(m²K)] $U_{i\text{-}Min}$ = Minimum individual element U-values [W/(m²K)]

* There might be more than one surface where the minimum U-value occurs.

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	15