

Project name

Whitehouse**As built****Date:** Thu Sep 02 14:51:58 2021**Administrative information****Building Details**

Address: Whitehouse, Information not provided by the user,
Information not provided by the user

Certification tool**Calculation engine:** SBEM**Calculation engine version:** v5.6.b.0**Interface to calculation engine:** G-ISBEM**Interface to calculation engine version:** v24.0**BRUKL compliance check version:** v5.6.b.0**Certifier details****Name:** Guy Shorrocks**Telephone number:** 01254 774943**Address:** Unit 5, Cunningham Court Lions Drive, Blackburn,
BB1 2QS**Criterion 1: The calculated CO₂ emission rate for the building must not exceed the target**

CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	37
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	37
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	32
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 -Limit	U _a -Calc	U _i -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.26	0.48	"z0/Doorman/ni"
Floor	0.25	0.22	0.22	"z0/Store1/f"
Roof	0.25	0.13	0.13	"z2/Circulation1_A/c"
Windows***, roof windows, and rooflights	2.2	1.8	1.8	"z2/Circulation1_A/e/g"
Personnel doors	2.2	2	2	"z0/Circulation1_B/s/d"
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 -Limit = Limiting area-weighted average U-values [W/(m ² K)] U _a -Calc = Calculated area-weighted average U-values [W/(m ² K)] U _i -Calc = Calculated maximum individual element U-values [W/(m ² K)]				
* 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	5

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

1- Heating System

	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					NO

2- Air Conditioning

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	7.14	7.14	-	-	-
Standard value	2.5*	2.6	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. For types <=12 kW output, refer to EN 14825 for limiting standards.

1- HW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	3.5	0.015
Standard value	2*	N/A

* Standard shown is for all types except absorption and gas engine heat pumps.

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	Zone	Standard
	Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1		
z0/Toilet1_A		0.3	-	-	-	-	-	-	-	-	-	N/A
z1/Toilet2_A		0.3	-	-	-	-	-	-	-	-	-	N/A
z0/Toilet1_B		0.3	-	-	-	-	-	-	-	-	-	N/A
z1/Toilet2_B		0.3	-	-	-	-	-	-	-	-	-	N/A
z2/CellOff1_A		0.3	-	-	-	-	-	-	-	-	-	N/A
z0/Toilet1_C		0.3	-	-	-	-	-	-	-	-	-	N/A
z1/Toilet2_C		0.3	-	-	-	-	-	-	-	-	-	N/A
z0/Doorman		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	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
z2/DomBath1		0.3	-	-	-	-	-	-	-	-	-	N/A
z0/Concert Bar		-	-	-	1	-	-	-	-	-	0.75	0.5
z0/Concert Rm		-	-	-	1	-	-	-	-	-	0.75	0.5
z1/Bar_A		-	-	-	1	-	-	-	-	-	0.75	0.5
z1/Bar_B		-	-	-	1	-	-	-	-	-	0.75	0.5
z1/Lounge_A		-	-	-	1	-	-	-	-	-	0.75	0.5
z1/Lounge_B		-	-	-	1	-	-	-	-	-	0.75	0.5
z1/Games Room_A		-	-	-	1	-	-	-	-	-	0.75	0.5
z1/Games Room_B		-	-	-	1	-	-	-	-	-	0.75	0.5

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
z0/Cellar		125	-	-	17
z0/Plant1		122	-	-	45
z2/Circulation1_A		-	90	-	42
z2/Store1_A		77	-	-	15
z0/Store1		81	-	-	18
z1/Store1_A		81	-	-	18
z0/Circulation1_B		-	98	-	39
z1/Circulation1_B		-	98	-	39
z0/Toilet1_A		-	99	-	77
z1/Toilet2_A		-	99	-	77
z2/DomBed1_A		-	90	-	41
z0/Toilet1_B		-	99	-	75
z1/Toilet2_B		-	99	-	76
z2/Celloff1_A		77	-	-	107
z0/Circulation1_C		-	113	-	11
z1/Circulation1_C		-	99	-	12
z0/Toilet1_C		-	99	-	37
z1/Toilet2_C		-	99	-	37
z2/Circulation1_B		-	90	-	73
z2/Store1_B		77	-	-	15
z0/Doorman		86	-	-	72
z2/DomBed1_B		-	90	-	38
z2/DomBed1_C		-	90	-	32
z2/DomBed1_D		-	90	-	34
z2/DomBath1		-	90	-	39
z2/Celloff1_B		77	-	-	125
z2/DomCirculation1		-	90	-	43
z2/DomKitchen1		-	90	-	88
z2/DomLounge1		-	90	-	80
z0/Circulation1_A		-	113	-	129

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
z1/Circulation1_A		-	113	-	129
z0/Concert Bar		-	115	-	228
z0/PA System		114	-	-	8
z0/Concert Rm		-	133	-	821
z0/Artist Rm		-	132	-	17
z1/Store1_B		81	-	-	10
z1/Bar_A		-	113	-	106
z1/Bar_B		-	99	-	157
z1/Lounge_A		-	90	-	91
z1/Lounge_B		-	90	-	287
z1/Games Room_A		-	90	-	94
z1/Games Room_B		-	90	-	286

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?
z2/DomBed1_A	NO (-76.8%)	NO
z2/CellOff1_A	NO (-64.7%)	NO
z0/Doorman	NO (-76%)	NO
z2/DomBed1_B	NO (-74.2%)	NO
z2/DomBed1_C	NO (-65.2%)	NO
z2/DomBed1_D	NO (-68.8%)	NO
z2/CellOff1_B	NO (-86.5%)	NO
z2/DomKitchen1	NO (-86.9%)	NO
z2/DomLounge1	NO (-11.2%)	NO
z0/Circulation1_A	YES (+20.3%)	NO
z1/Circulation1_A	YES (+20.3%)	NO
z0/Concert Bar	N/A	N/A
z0/PA System	N/A	N/A
z0/Concert Rm	N/A	N/A
z0/Artist Rm	N/A	N/A
z1/Store1_B	N/A	N/A
z1/Bar_A	N/A	N/A
z1/Bar_B	N/A	N/A
z1/Lounge_A	N/A	N/A
z1/Lounge_B	NO (-69.4%)	NO
z1/Games Room_A	N/A	N/A
z1/Games Room_B	NO (-70.1%)	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]	1005.5	1005.5
External area [m ²]	1671.7	1671.7
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	5	3
Average conductance [W/K]	527.87	811.07
Average U-value [W/m ² K]	0.32	0.49
Alpha value* [%]	11.43	14.51

* 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
2	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
	B1 Offices and Workshop businesses
	B2 to B7 General Industrial and Special Industrial Groups
	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
11	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
87	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/m²]

	Actual	Notional
Heating	17.3	24.92
Cooling	4.53	8.09
Auxiliary	5.6	4.7
Lighting	13.87	15.52
Hot water	20.42	27.25
Equipment*	37.02	37.02
TOTAL **	61.7	80.48

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

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	220.25	262.3
Primary energy* [kWh/m ²]	189.43	203.6
Total emissions [kg/m ²]	32	37

* 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 SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER	
[ST] No Heating or Cooling										
	Actual	340.4	0	0	0	0	0	0	0	0
	Notional	317.9	22.8	0	0	0	0	----	----	----
[ST] Other local room heater - fanned, [HS] Room heater, [HFT] Electricity, [CFT] Electricity										
	Actual	143.7	91.5	49.9	0	6.3	0.8	0	1	0
	Notional	181.2	129.6	61.5	0	7.1	0.82	0	----	----
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	48.5	157.6	2	7	5.5	6.65	6.23	7.14	8.77
	Notional	71	162.8	8.1	12.6	3.7	2.43	3.6	----	----

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-Typ}	U _{i-Min}	Surface where the minimum value occurs*
Wall	0.23	0.25	"z2/Circulation1_A/e"
Floor	0.2	0.22	"z0/Store1/f"
Roof	0.15	0.13	"z2/Circulation1_A/c"
Windows, roof windows, and rooflights	1.5	1.8	"z2/Circulation1_A/e/g"
Personnel doors	1.5	2	"z0/Circulation1_B/s/d"
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-Typ} = Typical individual element U-values [W/(m²K)]		U _{i-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	5