

Project name

Proposed Wholesale Warehouse**As designed****Date:** Wed Aug 24 17:58:05 2022**Administrative information****Building Details****Address:** 7 Bradstone Road, Cheetham Hill, Manchester,
M8 8WA**Certification tool****Calculation engine:** SBEM**Calculation engine version:** v5.6.b.0**Interface to calculation engine:** DesignBuilder SBEM**Interface to calculation engine version:** v6.1.8**BRUKL compliance check version:** v5.6.b.0**Certifier details****Name:** CSR Sustain**Telephone number:** 0161 762 5670**Address:** 269 Walmersley Road, Bury, BL9 6NX**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	19.3
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	19.3
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	12
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	0.2	0.2	"Unit B - Unit B Retail_W_8"
Floor	0.25	0.12	0.25	"1F - Ancillary Storage_F_4"
Roof	0.25	0.15	0.15	"1F 1 - Ancillary Storage_R_4"
Windows***, roof windows, and rooflights	2.2	1.3	1.3	"Unit B - Unit B Retail_G_11"
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 -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- Project HVAC

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.5	5	-	-	-
Standard value	2.5*	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 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- Project DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	-
Standard value	1	N/A

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

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
Unit B - Unit B Retail		-	95	95	9673
Unit B - Stair Core		-	95	-	65
Unit B - WC		-	95	-	71
Unit C - Unit C Retail		-	95	95	9908
Unit C - Stair		-	95	-	40
Unit C - WC		-	95	-	28
Unit A - Unit A Retail		-	95	95	2831
Unit A - Stair 1		-	95	-	42
Unit A - WC		-	95	-	28
1F - Ancillary Storage		95	-	-	2225
1F - Stair 1		-	95	-	32
1F - WC 2		-	95	-	27
1F - WC 3		-	95	-	54
1F - Stair and lift core		-	95	-	56
1F - Stair 2		-	95	-	30
1F - WC		-	95	-	27
1F 1 - Ancillary Storage		95	-	-	2225
1F 1 - Stair 1		-	95	-	32
1F 1 - WC 2		-	95	-	27
1F 1 - WC 3		-	95	-	54
1F 1 - Stair and lift core		-	95	-	56
1F 1 - Stair 2		-	95	-	30
1F 1 - WC		-	95	-	27

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?
Unit B - Unit B Retail	NO (-92%)	NO
Unit B - Stair Core	N/A	N/A
Unit B - WC	N/A	N/A
Unit C - Unit C Retail	NO (-92.2%)	NO
Unit C - Stair	N/A	N/A
Unit C - WC	N/A	N/A
Unit A - Unit A Retail	NO (-65.1%)	NO
Unit A - Stair 1	N/A	N/A
Unit A - WC	N/A	N/A
1F - Ancillary Storage	NO (-85.5%)	NO
1F - Stair 1	NO (-75.5%)	NO
1F - WC 2	N/A	N/A
1F - WC 3	N/A	N/A
1F - Stair and lift core	N/A	N/A
1F - Stair 2	N/A	N/A
1F - WC	N/A	N/A
1F 1 - Ancillary Storage	NO (-85.5%)	NO
1F 1 - Stair 1	NO (-75.5%)	NO
1F 1 - WC 2	N/A	N/A
1F 1 - WC 3	N/A	N/A
1F 1 - Stair and lift core	N/A	N/A
1F 1 - Stair 2	N/A	N/A
1F 1 - WC	N/A	N/A

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]	8417.4	8417.4
External area [m ²]	10260.4	10260.4
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	5	3
Average conductance [W/K]	1962.47	2447.01
Average U-value [W/m ² K]	0.19	0.24
Alpha value* [%]	93.74	20.11

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

Building Use

% Area Building Type

100	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
	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/m²]

	Actual	Notional
Heating	7.12	9.08
Cooling	2.98	5.06
Auxiliary	0	0
Lighting	12.47	23.63
Hot water	0.48	0.56
Equipment*	6.06	6.06
TOTAL **	23.06	38.33

* 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]	145.66	145.04
Primary energy* [kWh/m ²]	70.79	113.67
Total emissions [kg/m ²]	12	19.3

* 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] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	107.5	38.1	7.1	3	0	4.19	3.55	4.5	5
	Notional	79.5	65.6	9.1	5.1	0	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	0.2	"Unit B - Unit B Retail_W_8"
Floor	0.2	0.09	"Unit B - Unit B Retail_S_3"
Roof	0.15	0.15	"1F 1 - Ancillary Storage_R_4"
Windows, roof windows, and rooflights	1.5	1.3	"Unit B - Unit B Retail_G_11"
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-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