

Project name

Tesco Superstore**As designed****Date:** Wed Oct 31 11:20:38 2018**Administrative information****Building Details****Address:** Wombwell Lane, Barnsley, S70 3NS**Owner Details****Name:** Name**Telephone number:** Phone**Address:** Street Address, City, Postcode**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**Certifier details****Name:** Mr Zachary Paul Taylor**Telephone number:** 01482 226444**Address:** 11 Caroline Place, Hull, HU2 8DR**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	34.2
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	34.2
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	28.9
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	0.24	0.25	X_00000C_W3_A0
Floor	0.25	0.22	0.22	X_00000C_F
Roof	0.25	0.18	0.18	RF000001_C
Windows***, roof windows, and rooflights	2.2	1.6	1.6	RF000001_W10_O0
Personnel doors	2.2	1.6	1.6	RF000001_W3_O0
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	3

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 to 0.95

1- Lossnay LGH50RVX-E

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	0.9	0.83
Standard value	N/A	N/A	N/A	1.5^	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.					

2- AHU TRG045L

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	-	-	1.25	0.65
Standard value	0.91*	N/A	N/A	1.5^	0.5
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. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.					
^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.					

1- SYST0000-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.001
Standard value	1	N/A

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		
Unloading Area		-	-	-	-	-	-	-	-	-	-	N/A
Lobby		-	-	-	-	-	-	-	-	-	-	N/A
Secure Stage		-	-	-	-	-	-	-	-	-	-	N/A
Meat Chiller		-	-	-	-	-	-	-	-	-	-	N/A
Produce Dairy Chiller		-	-	-	-	-	-	-	-	-	-	N/A
Freezer		-	-	-	-	-	-	-	-	-	-	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
IT Server Cage Large	-	-	-	-	-	-	-	-	-	-	N/A
Bulk Store 2	-	-	-	-	-	-	-	-	-	-	N/A
Bulk Store	-	-	-	-	-	-	-	-	-	-	N/A
WC's	-	-	0.4	-	-	-	-	-	-	-	N/A
Washroom Area	-	-	0.4	-	-	-	-	-	-	-	N/A
Circulation Area	-	-	-	-	-	-	-	-	-	-	N/A
Exit Air Lobby	-	-	-	-	-	-	-	-	-	-	N/A
Bakery Freezer	-	-	-	-	-	-	-	-	-	-	N/A
Entrance Air Lobby	-	-	-	-	-	-	-	-	-	-	N/A
Multi Functional Office	-	-	-	-	-	-	-	-	-	-	N/A
Colleague Room	-	-	-	-	-	-	-	-	-	-	N/A
Cash Room	-	-	-	-	-	-	-	-	-	-	N/A
Net Sales Area	-	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
Standard value		60	60	22	
Unloading Area		-	223	-	129
Lobby		-	100	-	68
Secure Stage		124	-	-	58
Meat Chiller		230	-	-	33
Produce Dairy Chiller		207	-	-	67
Freezer		178	-	-	63
IT Server Cage Large		110	-	-	74
Bulk Store 2		136	-	-	278
Bulk Store		135	-	-	252
WC's		-	196	-	72
Washroom Area		-	201	-	59
Circulation Area		-	262	-	76
Exit Air Lobby		-	100	-	66
Bakery Freezer		187	-	-	41
Entrance Air Lobby		-	100	-	70
Multi Functional Office		203	-	-	59
Colleague Room		163	-	-	146
Cash Room		196	-	-	77
Net Sales Area		-	110	60	12330

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?
Multi Functional Office	N/A	N/A
Colleague Room	N/A	N/A
Net Sales Area	NO (-82.2%)	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]	1984.6	1984.6
External area [m ²]	5595.6	5595.6
Weather	LEE	LEE
Infiltration [m ³ /hm ² @ 50Pa]	3	3
Average conductance [W/K]	1304.66	1533.82
Average U-value [W/m ² K]	0.23	0.27
Alpha value* [%]	6.02	5.87

* 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	9.48	8.51
Cooling	0	0
Auxiliary	20.33	10.46
Lighting	29.75	52.07
Hot water	1.45	1.61
Equipment*	17.25	17.25
TOTAL **	61.01	72.65

* 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]	160.64	227.05
Primary energy* [kWh/m ²]	170.41	199.11
Total emissions [kg/m ²]	28.9	34.2

* 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	230.7	15	0	0	0.1	0	0	0	0
	Notional	240.5	15.3	0	0	0.1	0	0	----	----
[ST] Central heating using air distribution, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	187.6	43.9	63	0	33.6	0.83	0	1	0
	Notional	278.3	176	94.4	0	20.8	0.82	0	----	----
[ST] Central heating using air distribution, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	34.3	102.6	10.6	0	25.2	0.9	0	0.91	0
	Notional	25.3	188.7	8.6	0	12.9	0.82	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-Typ}	U _{i-Min}	Surface where the minimum value occurs*
Wall	0.23	0.22	RF000001_W5_A0
Floor	0.2	0.22	X_00000C_F
Roof	0.15	0.18	RF000001_C
Windows, roof windows, and rooflights	1.5	1.6	RF000001_W10_O0
Personnel doors	1.5	1.6	RF000001_W3_O0
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	3