



### Project name

**The Star**

**As designed**

**Date:** Fri Apr 08 11:30:44 2022

### Administrative information

#### Building Details

**Address:** Uxbridge Road, Uxbridge, Greater London, UB10 0LY

#### 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:** Joshua Cunningham

**Telephone number:** 07757 804 531

**Address:** Unit 3-4 Cockenach Estate Barkway, Cambridge, SG8 8DL

### Criterion 1: The calculated CO<sub>2</sub> emission rate for the building must not exceed the target

CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum	39
Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	39
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	38.4
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 <sub>a</sub> -Limit	U <sub>a</sub> -Calc	U <sub>i</sub> -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.24	0.24	"Block 3 - Store_W_6"
Floor	0.25	0.14	0.15	"Block 3 - WC & Shower_S_3"
Roof	0.25	-	-	"No heat loss roofs"
Windows***, roof windows, and rooflights	2.2	1.2	1.2	"Block 3 - Commercial Floor_G_8"
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<sub>a</sub>-Limit = Limiting area-weighted average U-values [W/(m<sup>2</sup>K)]

U<sub>a</sub>-Calc = Calculated area-weighted average U-values [W/(m<sup>2</sup>K)]

U<sub>i</sub>-Calc = Calculated maximum individual element U-values [W/(m<sup>2</sup>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 <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa	10	10

## 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.

<b>Whole building lighting automatic monitoring &amp; targeting with alarms for out-of-range values</b>	NO
<b>Whole building electric power factor achieved by power factor correction</b>	<0.9

### 1- Project HVAC

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	1	-	-	-	-
<b>Standard value</b>	N/A	N/A	N/A	N/A	N/A
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					NO

### 1- Project DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
<b>This building</b>	Hot water provided by HVAC system	0.008
<b>Standard value</b>	N/A	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	
	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
Block 3 - Store	-	-	-	0.6	-	-	-	-	-	0.94	0.5
Block 3 - WC & Shower	-	-	-	0.6	-	-	-	-	-	0.94	0.5
Block 3 - Commercial Floor	-	-	-	0.6	-	-	-	-	-	0.94	0.5

General lighting and display lighting		Luminous efficacy [lm/W]				
Zone name	Standard value	Luminaire	Lamp	Display lamp	General lighting [W]	
Block 3 - Store	100	-	-	-	9	
Block 3 - WC & Shower	-	100	-	-	15	
Block 3 - Commercial Floor	100	-	-	-	585	

### 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?
Block 3 - Commercial Floor	YES (+19.5%)	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**

<b>Were alternative energy systems considered and analysed as part of the design process?</b>	<b>YES</b>
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		Building Use	
	Actual	Notional	% Area
Area [m <sup>2</sup> ]	105.7	105.7	A1/A2 Retail/Financial and Professional services
External area [m <sup>2</sup> ]	252.8	252.8	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
Weather	LON	LON	<b>100</b>
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	10	5	<b>B1 Offices and Workshop businesses</b>
Average conductance [W/K]	93.17	124.37	B2 to B7 General Industrial and Special Industrial Groups
Average U-value [W/m <sup>2</sup> K]	0.37	0.49	B8 Storage or Distribution
Alpha value* [%]	22.28	17.74	C1 Hotels
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging			
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<sup>2</sup>]

	Actual	Notional
Heating	15.21	30.5
Cooling	0	0
Auxiliary	4.45	3.58
Lighting	17.54	19.35
Hot water	58.44	55.27
Equipment*	38.59	38.59
<b>TOTAL**</b>	<b>95.64</b>	<b>108.7</b>

\* 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<sup>2</sup>]

	Actual	Notional
Photovoltaic systems	21.74	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

## Energy & CO<sub>2</sub> Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m <sup>2</sup> ]	328.84	230.51
Primary energy* [kWh/m <sup>2</sup> ]	293.61	162.99
Total emissions [kg/m <sup>2</sup> ]	38.4	39

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

## HVAC Systems Performance

System Type	Heat dem MJ/m <sup>2</sup>	Cool dem MJ/m <sup>2</sup>	Heat con kWh/m <sup>2</sup>	Cool con kWh/m <sup>2</sup>	Aux con kWh/m <sup>2</sup>	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Central heating using water: floor heating, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Natural Gas									
Actual	48.8	280	15.2	0	4.5	0.89	0	1	0
Notional	89.9	140.6	30.5	0	3.6	0.82	0	----	----

### Key to terms

Heat dem [MJ/m <sup>2</sup> ]	= Heating energy demand
Cool dem [MJ/m <sup>2</sup> ]	= Cooling energy demand
Heat con [kWh/m <sup>2</sup> ]	= Heating energy consumption
Cool con [kWh/m <sup>2</sup> ]	= Cooling energy consumption
Aux con [kWh/m <sup>2</sup> ]	= Auxiliary energy consumption
Heat SSEEF	= 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 <sub>i-Typ</sub>	U <sub>i-Min</sub>	Surface where the minimum value occurs*
Wall	0.23	0.24	"Block 3 - Store_W_6"
Floor	0.2	0.13	"Block 3 - Commercial Floor_S_3"
Roof	0.15	-	"No heat loss roofs"
Windows, roof windows, and rooflights	1.5	1.2	"Block 3 - Commercial Floor_G_8"
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<sub>i-Typ</sub> = Typical individual element U-values [W/(m<sup>2</sup>K)]      U<sub>i-Min</sub> = Minimum individual element U-values [W/(m<sup>2</sup>K)]

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

Air Permeability	Typical value	This building
m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa	5	10