

## Project name

Capitol Park Phase 2 - Unit 17

As built

Date: Fri Dec 17 14:16:58 2021

## Administrative information

## Building Details

Address: Unit 17, Capitol Court, Barnsley, S75 3UD

## Certification tool

Calculation engine: SBEM

Calculation engine version: v5.6.b.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.13

BRUKL compliance check version: v5.6.b.0

## Certifier details

Name: Muhammed Hussain

Telephone number: 0115 976 5050

Address: Phoenix Business Park, Nottingham, NG8 6AS

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	15.8
Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	15.8
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	13.8
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	"0F000002_W1_O2"
Floor	0.25	0.25	0.25	"0F000002_F"
Roof	0.25	0.25	0.25	"CR000001_C_A0"
Windows***, roof windows, and rooflights	2.2	1.6	1.6	"0F000002_W1_O0"
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	3.5	3.5	"0F000002_W1_O1"
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	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- Combi Boiler

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	0.92	-	-	-	-
<b>Standard value</b>	0.91*	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
* 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.					

### 1- SYST0000-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
<b>This building</b>	0.84	-
<b>Standard value</b>	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	Zone	Standard
	<b>Standard value</b>	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1		
Dis. WC - 0F Unit 17		0.4	-	-	-	-	-	-	-	-	-	N/A
Dis. WC - 1F Unit 17		0.4	-	-	-	-	-	-	-	-	-	N/A
Kitchenette - 0F Unit 17		0.4	-	-	-	-	-	-	-	-	-	N/A
Kitchenette - 1F Unit 17		0.4	-	-	-	-	-	-	-	-	-	N/A
Toilets - 0F Unit 17		0.4	-	-	-	-	-	-	-	-	-	N/A

## General lighting and display lighting

Zone name	Luminous efficacy [lm/W]			General lighting [W]	
	Luminaire	Lamp	Display lamp		
	<b>Standard value</b>	60	60	22	
Circulation - 0F Unit 17		-	106	-	64
Circulation - 1F Unit 17		-	106	-	63
Dis. WC - 0F Unit 17		-	93	-	42
Dis. WC - 1F Unit 17		-	87	-	52
Kitchenette - 0F Unit 17		106	-	-	193

General lighting and display lighting	Luminous efficacy [lm/W]			General lighting [W]	
	Zone name	Luminaire	Lamp		Display lamp
	<b>Standard value</b>	60	60	22	
Kitchenette - 1F Unit 17	106	-	-		113
Open Place Office - 0F Unit 17	106	-	-		756
Open Place Office - 1F Unit 17	106	-	-		751
Store - 0F Unit 17	106	-	-		9
Store - 1F Unit 17	106	-	-		18
Store - 1F Unit 17	106	-	-		8
Toilets - 0F Unit 17	-	87	-		59
Warehouse Unit 17	133	-	-		6621

**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?
Kitchenette - 0F Unit 17	N/A	N/A
Kitchenette - 1F Unit 17	N/A	N/A
Open Place Office - 0F Unit 17	NO (-63%)	NO
Open Place Office - 1F Unit 17	NO (-45.7%)	NO
Warehouse Unit 17	NO (-54.2%)	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**

<b>Were alternative energy systems considered and analysed as part of the design process?</b>	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 <sup>2</sup> ]	2413.5	2413.5
External area [m <sup>2</sup> ]	6380.6	6380.7
Weather	LEE	LEE
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	5	7
Average conductance [W/K]	1896.87	2200.29
Average U-value [W/m <sup>2</sup> K]	0.3	0.34
Alpha value* [%]	6.06	28.46

\* 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
<b>100</b>	<b>B2 to B7 General Industrial and Special Industrial Groups</b>
	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<sup>2</sup>]

	Actual	Notional
Heating	12.31	19.12
Cooling	0	0
Auxiliary	0.68	0.36
Lighting	18.87	20.71
Hot water	4.82	4.69
Equipment*	31.98	31.98
<b>TOTAL**</b>	<b>36.68</b>	<b>44.88</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	0	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> ]	293.34	313.31
Primary energy* [kWh/m <sup>2</sup> ]	80.9	92.11
Total emissions [kg/m <sup>2</sup> ]	13.8	15.8

\* 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 SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
<b>[ST] Central heating using water: radiators, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity</b>									
<b>Actual</b>	201.1	134.3	68	0	3.7	0.82	0	0.92	0
<b>Notional</b>	311.6	120.9	105.7	0	2	0.82	0	----	----
<b>[ST] No Heating or Cooling</b>									
<b>Actual</b>	138.9	145.1	0	0	0	0	0	0	0
<b>Notional</b>	172.2	114.8	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 <sub>i-Typ</sub>	U <sub>i-Min</sub>	Surface where the minimum value occurs*
Wall	0.23	0.24	"0F000002_W1_O2"
Floor	0.2	0.24	"DS000001_F_A1"
Roof	0.15	0.25	"CR000001_C_A0"
Windows, roof windows, and rooflights	1.5	1.6	"0F000002_W1_O0"
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	3.5	"0F000002_W1_O1"
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	5