

Calculation Sheet

No. of Sheets: 24

Project Title: UoM Fallowfields

Project No. C5219

File No. V:\Contract Files\C5219
Fallowfield\7.0 Design\7.03
Calculations\Thermal
central\ESD\Incoming\BRUKL
EPCs\As Built\Block 102 Honey

Subject: Block 102 'As Built' BRUKL and EPC

Calc No. UoM-HES-102-XX-CA-Y-80-01-AF1

Design Manager: Geoff Evans

Design Phase:

A – Concept or preliminary ☐
B – Analysis and Detailed design ☐
C – Design verification ☐
D – Other (specify) 'As Built' ☒

Designer: Neil Hamilton
Environmental Services Design (ESD)

Computer Applications Used
IES VE

Version/Date
2019

Scope of Checking for Manual & Computer Generated Calculations:

Desktop review against results of Stage 3 and 'As Designed' SBEM calculations.

Sheets Checked*	Calculations by			Checked by		
	Name	Signature	Date	Name	Signature	Date
All	ESD		2019-11-21	Geoff Evans		2019-11-21

*If an Excel spreadsheet or other computer file has been checked and has not been attached, enter the name, date and full file path or server location of the file that was checked.

a) Basic Design Information or Source and Reference:

Documents generated from the IES VE Model referenced as;

1. 2019-11-25T103924 EJ1141 S2 B102 Fallowfield 12-08-19 [VE2018] cab

b) Identify documents/technical records where output will be used:

Documents required to demonstrate compliance with the following;

1. Building Regulations 2013 Part L2A
2. The Energy Performance of Buildings (England and Wales) Regulations 2018

Approved by

Design Manager Geoff Evans

Signature



Date

2019-11-21

Distribution:

Matt Stockton, Vinci Construction UK Ltd

Energy Performance Certificate

Non-Domestic Building



Honey Court
Unsworth Park
20 Chancellors Way
MANCHESTER
M14 6FZ

Certificate Reference Number:
0660-0631-3219-6001-7002

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient

A+

Net zero CO₂ emissions

A 0-25

B 26-50

27

This is how energy efficient the building is.

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

Less energy efficient

Technical Information

Main heating fuel:	District Heating
Building environment:	Heating and Natural Ventilation
Total useful floor area (m ²):	4055
Assessment Level:	5
Building emission rate (kgCO ₂ /m ² per year):	36.34
Primary energy use (kWh/m ² per year):	209.9

Benchmarks

Buildings similar to this one could have ratings as follows:

32

If newly built

85

If typical of the existing stock

Administrative Information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

Assessment Software:	Virtual Environment v7.0.11 using calculation engine ApacheSim v7.0.11
Property Reference:	661276030000
Assessor Name:	Neil Hamilton
Assessor Number:	STRO007864
Accreditation Scheme:	Stroma Certification Ltd
Employer/Trading Name:	Environmental Services Design Ltd
Employer/Trading Address:	Courtyard East, Wharfebank House, Wharfebank Business Centre, Ilkley Road, Otley, LS21 3JP
Issue Date:	18 Nov 2019
Valid Until:	17 Nov 2029 (unless superseded by a later certificate)
Related Party Disclosure:	Not related to the owner.

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report - 0796-0613-1040-6200-6103.

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by Stroma Certification Ltd. You can obtain contact details of the Accreditation Scheme at www.stroma.com.

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at www.opendatacommunities.org.

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. Any personal data it contains will be processed in accordance with the General Data Protection Regulation and all applicable laws and regulations relating to the processing of personal data and privacy. For further information about this and how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at: www.gov.uk/government/collections/energy-performance-certificates. It explains the content and use of this document, advises on how to identify the authenticity of a certificate and how to make a complaint.

Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property – whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.

Project name

Honey Court**As built****Date:** Mon Nov 18 14:45:21 2019

Administrative information

Building Details

Address: MANCHESTER, M14 6FZ

Certification tool

Calculation engine: Apache**Calculation engine version:** 7.0.11**Interface to calculation engine:** IES Virtual Environment**Interface to calculation engine version:** 7.0.11**BRUKL compliance check version:** v5.6.a.1

Owner Details

Name: The University of Manchester**Telephone number:** 0161 306 60000**Address:** Oxford Road, Manchester, M13 9PL

Certifier details

Name: Neil Hamilton**Telephone number:** 01943 851016**Address:** Enviromental Services Design Ltd, Courtyard East, Wharfebank House, Wharfebank Business Centre, Ilkley Road, Otley, LS21 3JPCriterion 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	42.9
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	42.9
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	35.2
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	0.15	0.15	WN000025:Surf[3]
Floor	0.25	0.14	0.14	WN000031:Surf[7]
Roof	0.25	0.13	0.13	WN000031:Surf[8]
Windows***, roof windows, and rooflights	2.2	1.4	1.4	10000189:Surf[0]
Personnel doors	2.2	1.48	2.2	WN000001:Surf[2]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building
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	4

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- Central Heating Using Water: Radiators - District Heating + DHW

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	0	-
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

"No HWS in project, or hot water is provided by HVAC system"

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		
102.1.04.001a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.04.002a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.04.003a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.04.004a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.04.005a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.04.006a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.04.007a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.04.008a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.04.009a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.04.010a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.04.011 Kitchen, Dining & Lounge		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.05.001a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.05.002a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.05.003a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.05.004a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.05.005a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.05.006a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.05.007a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.05.008a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
102.1.05.009a En-Suite		-	-	0.4	-	-	-	-	-	-	-	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	
102.1.05.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.1.05.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.1.06.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.06.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.06.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.06.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.06.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.06.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.06.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.06.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.06.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.06.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.06.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.1.11.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.11.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.11.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.11.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.11.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.11.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.11.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.11.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.11.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.11.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.1.11.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.08.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.08.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.08.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.08.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.08.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.08.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.08.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.08.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.08.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.08.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.08.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.09.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.09.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.09.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.09.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.09.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.09.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.09.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.09.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	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	
102.2.09.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.09.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.09.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.10.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.10.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.10.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.10.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.10.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.10.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.10.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.10.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.10.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.10.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.10.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.2.11.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.11.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.11.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.11.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.11.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.11.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.11.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.11.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.11.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.11.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.2.11.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.12.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.12.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.12.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.12.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.12.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.12.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.12.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.12.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.12.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.12.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.12.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.13.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.13.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.13.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.13.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.13.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.13.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.3.13.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	

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		
102.3.13.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
102.3.13.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
102.3.13.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
102.3.13.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A
102.3.14.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.14.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.14.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.14.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.14.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.14.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.14.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.14.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.14.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.14.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.14.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A
102.3.15.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.15.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.15.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.15.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.15.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.15.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.15.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.15.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.15.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.15.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.3.15.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A
102.G.01.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
102.G.01.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
102.G.01.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
102.G.01.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
102.G.01.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
102.G.01.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
102.G.01.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
102.G.01.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
102.G.01.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
102.G.01.010 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A
102.G.02.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.G.02.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.G.02.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.G.02.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.G.02.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.G.02.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
102.G.02.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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	
102.G.02.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.G.02.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.G.02.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.G.02.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.G.03.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.G.03.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.G.03.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.G.03.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.G.03.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.G.03.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.G.03.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.G.03.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.G.03.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
102.G.03.010 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.G.WA.001 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.G.WA.002a Bathroom	-	-	0.4	-	-	-	-	-	-	-	N/A	
102.G.WA.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	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	
102.1.00.001 Circulation		-	79	-	332
102.1.00.002 Circulation		-	79	-	332
102.1.04.001 Standard Room		-	79	-	38
102.1.04.001a En-Suite		-	105	-	10
102.1.04.002 Standard Room		-	79	-	38
102.1.04.002a En-Suite		-	105	-	10
102.1.04.003 Standard Room		-	79	-	38
102.1.04.003a En-Suite		-	105	-	10
102.1.04.004 Standard Room		-	79	-	38
102.1.04.004a En-Suite		-	105	-	10
102.1.04.005 Standard Room		-	79	-	38
102.1.04.005a En-Suite		-	105	-	10
102.1.04.006 Standard Room		-	79	-	38
102.1.04.006a En-Suite		-	105	-	10
102.1.04.007 Standard Room		-	79	-	38
102.1.04.007a En-Suite		-	105	-	10
102.1.04.008 Standard Room		-	79	-	38
102.1.04.008a En-Suite		-	105	-	10
102.1.04.009 Standard Room		-	79	-	38
102.1.04.009a En-Suite		-	105	-	10
102.1.04.010 Standard Room		-	79	-	38
102.1.04.010a En-Suite		-	105	-	10

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	Luminaire	Lamp	Display lamp	General lighting [W]
Standard value	60	60	22	
102.1.04.011 Kitchen, Dining & Lounge	-	63	-	108
102.1.04.018 Circulation	-	79	-	52
102.1.05.001 Standard Room	-	79	-	38
102.1.05.001a En-Suite	-	105	-	10
102.1.05.002 Standard Room	-	79	-	38
102.1.05.002a En-Suite	-	105	-	10
102.1.05.003 Standard Room	-	79	-	38
102.1.05.003a En-Suite	-	105	-	10
102.1.05.004 Standard Room	-	79	-	38
102.1.05.004a En-Suite	-	105	-	10
102.1.05.005 Standard Room	-	79	-	38
102.1.05.005a En-Suite	-	105	-	10
102.1.05.006 Standard Room	-	79	-	38
102.1.05.006a En-Suite	-	105	-	10
102.1.05.007 Standard Room	-	79	-	38
102.1.05.007a En-Suite	-	105	-	10
102.1.05.008 Standard Room	-	79	-	38
102.1.05.008a En-Suite	-	105	-	10
102.1.05.009 Standard Room	-	79	-	38
102.1.05.009a En-Suite	-	105	-	10
102.1.05.010 Standard Room	-	79	-	38
102.1.05.010a En-Suite	-	105	-	10
102.1.05.011 Kitchen, Dining & Lounge	-	63	-	220
102.1.05.017 Circulation	-	79	-	65
102.1.06.001 Standard Room	-	79	-	38
102.1.06.001a En-Suite	-	105	-	10
102.1.06.002 Standard Room	-	79	-	38
102.1.06.002a En-Suite	-	105	-	10
102.1.06.003 Standard Room	-	79	-	38
102.1.06.003a En-Suite	-	105	-	10
102.1.06.004 Standard Room	-	79	-	38
102.1.06.004a En-Suite	-	105	-	10
102.1.06.005 Standard Room	-	79	-	38
102.1.06.005a En-Suite	-	105	-	10
102.1.06.006 Standard Room	-	79	-	38
102.1.06.006a En-Suite	-	105	-	10
102.1.06.007 Standard Room	-	79	-	38
102.1.06.007a En-Suite	-	105	-	10
102.1.06.008 Standard Room	-	79	-	38
102.1.06.008a En-Suite	-	105	-	10
102.1.06.009 Standard Room	-	79	-	38
102.1.06.009a En-Suite	-	105	-	10
102.1.06.010 Standard Room	-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
102.1.06.010a En-Suite		-	105	-	10
102.1.06.011 Kitchen, Dining & Lounge		-	63	-	108
102.1.06.018 Circulation		-	79	-	94
102.1.11.001 Standard Room		-	79	-	38
102.1.11.001a En-Suite		-	105	-	10
102.1.11.002 Standard Room		-	79	-	38
102.1.11.002a En-Suite		-	105	-	10
102.1.11.003 Standard Room		-	79	-	38
102.1.11.003a En-Suite		-	105	-	10
102.1.11.004 Standard Room		-	79	-	38
102.1.11.004a En-Suite		-	105	-	10
102.1.11.005 Standard Room		-	79	-	38
102.1.11.005a En-Suite		-	105	-	10
102.1.11.006 Standard Room		-	79	-	38
102.1.11.006a En-Suite		-	105	-	10
102.1.11.007 Standard Room		-	79	-	38
102.1.11.007a En-Suite		-	105	-	10
102.1.11.008 Standard Room		-	79	-	38
102.1.11.008a En-Suite		-	105	-	10
102.1.11.009 Standard Room		-	79	-	38
102.1.11.009a En-Suite		-	105	-	10
102.1.11.010 Standard Room		-	79	-	38
102.1.11.010a En-Suite		-	105	-	10
102.1.11.011 Kitchen, Dining & Lounge		-	63	-	181
102.1.11.018 Circulation		-	79	-	69
102.2.00.001 Circulation		-	79	-	332
102.2.00.002 Circulation		-	79	-	332
102.2.08.001 Standard Room		-	79	-	38
102.2.08.001a En-Suite		-	105	-	10
102.2.08.002 Standard Room		-	79	-	38
102.2.08.002a En-Suite		-	105	-	10
102.2.08.003 Standard Room		-	79	-	38
102.2.08.003a En-Suite		-	105	-	10
102.2.08.004 Standard Room		-	79	-	38
102.2.08.004a En-Suite		-	105	-	10
102.2.08.005 Standard Room		-	79	-	38
102.2.08.005a En-Suite		-	105	-	10
102.2.08.006 Standard Room		-	79	-	38
102.2.08.006a En-Suite		-	105	-	10
102.2.08.007 Standard Room		-	79	-	38
102.2.08.007a En-Suite		-	105	-	10
102.2.08.008 Standard Room		-	79	-	38
102.2.08.008a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
102.2.08.009 Standard Room		-	79	-	38
102.2.08.009a En-Suite		-	105	-	10
102.2.08.010 Standard Room		-	79	-	38
102.2.08.010a En-Suite		-	105	-	10
102.2.08.011 Kitchen, Dining & Lounge		-	63	-	108
102.2.09.001 Standard Room		-	79	-	38
102.2.09.001a En-Suite		-	105	-	10
102.2.09.002 Standard Room		-	79	-	38
102.2.09.002a En-Suite		-	105	-	10
102.2.09.003 Standard Room		-	79	-	38
102.2.09.003a En-Suite		-	105	-	10
102.2.09.004 Standard Room		-	79	-	38
102.2.09.004a En-Suite		-	105	-	10
102.2.09.005 Standard Room		-	79	-	38
102.2.09.005a En-Suite		-	105	-	10
102.2.09.006 Standard Room		-	79	-	38
102.2.09.006a En-Suite		-	105	-	10
102.2.09.007 Standard Room		-	79	-	38
102.2.09.007a En-Suite		-	105	-	10
102.2.09.008 Standard Room		-	79	-	38
102.2.09.008a En-Suite		-	105	-	10
102.2.09.009 Standard Room		-	79	-	38
102.2.09.009a En-Suite		-	105	-	10
102.2.09.010 Standard Room		-	79	-	38
102.2.09.010a En-Suite		-	105	-	10
102.2.09.011 Kitchen, Dining & Lounge		-	63	-	220
102.2.09.017 Circulation		-	79	-	65
102.2.10.001 Standard Room		-	79	-	38
102.2.10.001a En-Suite		-	105	-	10
102.2.10.002 Standard Room		-	79	-	38
102.2.10.002a En-Suite		-	105	-	10
102.2.10.003 Standard Room		-	79	-	38
102.2.10.003a En-Suite		-	105	-	10
102.2.10.004 Standard Room		-	79	-	38
102.2.10.004a En-Suite		-	105	-	10
102.2.10.005 Standard Room		-	79	-	38
102.2.10.005a En-Suite		-	105	-	10
102.2.10.006 Standard Room		-	79	-	38
102.2.10.006a En-Suite		-	105	-	10
102.2.10.007 Standard Room		-	79	-	38
102.2.10.007a En-Suite		-	105	-	10
102.2.10.008 Standard Room		-	79	-	38
102.2.10.008a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
102.2.10.009 Standard Room		-	79	-	38
102.2.10.009a En-Suite		-	105	-	10
102.2.10.010 Standard Room		-	79	-	38
102.2.10.010a En-Suite		-	105	-	10
102.2.10.011 Kitchen, Dining & Lounge		-	63	-	108
102.2.10.018 Circulation		-	79	-	94
102.2.11.001 Standard Room		-	79	-	38
102.2.11.001a En-Suite		-	105	-	10
102.2.11.002 Standard Room		-	79	-	38
102.2.11.002a En-Suite		-	105	-	10
102.2.11.003 Standard Room		-	79	-	38
102.2.11.003a En-Suite		-	105	-	10
102.2.11.004 Standard Room		-	79	-	38
102.2.11.004a En-Suite		-	105	-	10
102.2.11.005 Standard Room		-	79	-	38
102.2.11.005a En-Suite		-	105	-	10
102.2.11.006 Standard Room		-	79	-	38
102.2.11.006a En-Suite		-	105	-	10
102.2.11.007 Standard Room		-	79	-	38
102.2.11.007a En-Suite		-	105	-	10
102.2.11.008 Standard Room		-	79	-	38
102.2.11.008a En-Suite		-	105	-	10
102.2.11.009 Standard Room		-	79	-	38
102.2.11.009a En-Suite		-	105	-	10
102.2.11.010 Standard Room		-	79	-	38
102.2.11.010a En-Suite		-	105	-	10
102.2.11.011 Kitchen, Dining & Lounge		-	63	-	181
102.2.11.018 Circulation		-	79	-	69
102.3.00.001 Circulation		-	79	-	332
102.3.00.002 Circulation		-	79	-	332
102.3.12.001 Standard Room		-	79	-	38
102.3.12.001a En-Suite		-	105	-	10
102.3.12.002 Standard Room		-	79	-	38
102.3.12.002a En-Suite		-	105	-	10
102.3.12.003 Standard Room		-	79	-	38
102.3.12.003a En-Suite		-	105	-	10
102.3.12.004 Standard Room		-	79	-	38
102.3.12.004a En-Suite		-	105	-	10
102.3.12.005 Standard Room		-	79	-	38
102.3.12.005a En-Suite		-	105	-	10
102.3.12.006 Standard Room		-	79	-	38
102.3.12.006a En-Suite		-	105	-	10
102.3.12.007 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
102.3.12.007a En-Suite		-	105	-	10
102.3.12.008 Standard Room		-	79	-	38
102.3.12.008a En-Suite		-	105	-	10
102.3.12.009 Standard Room		-	79	-	38
102.3.12.009a En-Suite		-	105	-	10
102.3.12.010 Standard Room		-	79	-	38
102.3.12.010a En-Suite		-	105	-	10
102.3.12.011 Kitchen, Dining & Lounge		-	63	-	108
102.3.12.018 Circulation		-	79	-	52
102.3.12.018 Circulation		-	79	-	52
102.3.13.001 Standard Room		-	79	-	38
102.3.13.001a En-Suite		-	105	-	10
102.3.13.002 Standard Room		-	79	-	38
102.3.13.002a En-Suite		-	105	-	10
102.3.13.003 Standard Room		-	79	-	38
102.3.13.003a En-Suite		-	105	-	10
102.3.13.004 Standard Room		-	79	-	38
102.3.13.004a En-Suite		-	105	-	10
102.3.13.005 Standard Room		-	79	-	38
102.3.13.005a En-Suite		-	105	-	10
102.3.13.006 Standard Room		-	79	-	38
102.3.13.006a En-Suite		-	105	-	10
102.3.13.007 Standard Room		-	79	-	38
102.3.13.007a En-Suite		-	105	-	10
102.3.13.008 Standard Room		-	79	-	38
102.3.13.008a En-Suite		-	105	-	10
102.3.13.009 Standard Room		-	79	-	38
102.3.13.009a En-Suite		-	105	-	10
102.3.13.010 Standard Room		-	79	-	38
102.3.13.010a En-Suite		-	105	-	10
102.3.13.011 Kitchen, Dining & Lounge		-	63	-	220
102.3.13.017 Circulation		-	79	-	65
102.3.14.001 Standard Room		-	79	-	38
102.3.14.001a En-Suite		-	105	-	10
102.3.14.002 Standard Room		-	79	-	38
102.3.14.002a En-Suite		-	105	-	10
102.3.14.003 Standard Room		-	79	-	38
102.3.14.003a En-Suite		-	105	-	10
102.3.14.004 Standard Room		-	79	-	38
102.3.14.004a En-Suite		-	105	-	10
102.3.14.005 Standard Room		-	79	-	38
102.3.14.005a En-Suite		-	105	-	10
102.3.14.006 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
102.3.14.006a En-Suite		-	105	-	10
102.3.14.007 Standard Room		-	79	-	38
102.3.14.007a En-Suite		-	105	-	10
102.3.14.008 Standard Room		-	79	-	38
102.3.14.008a En-Suite		-	105	-	10
102.3.14.009 Standard Room		-	79	-	38
102.3.14.009a En-Suite		-	105	-	10
102.3.14.010 Standard Room		-	79	-	38
102.3.14.010a En-Suite		-	105	-	10
102.3.14.011 Kitchen, Dining & Lounge		-	63	-	108
102.3.14.018 Circulation		-	79	-	94
102.3.15.001 Standard Room		-	79	-	38
102.3.15.001a En-Suite		-	105	-	10
102.3.15.002 Standard Room		-	79	-	38
102.3.15.002a En-Suite		-	105	-	10
102.3.15.003 Standard Room		-	79	-	38
102.3.15.003a En-Suite		-	105	-	10
102.3.15.004 Standard Room		-	79	-	38
102.3.15.004a En-Suite		-	105	-	10
102.3.15.005 Standard Room		-	79	-	38
102.3.15.005a En-Suite		-	105	-	10
102.3.15.006 Standard Room		-	79	-	38
102.3.15.006a En-Suite		-	105	-	10
102.3.15.007 Standard Room		-	79	-	38
102.3.15.007a En-Suite		-	105	-	10
102.3.15.008 Standard Room		-	79	-	38
102.3.15.008a En-Suite		-	105	-	10
102.3.15.009 Standard Room		-	79	-	38
102.3.15.009a En-Suite		-	105	-	10
102.3.15.010 Standard Room		-	79	-	38
102.3.15.010a En-Suite		-	105	-	10
102.3.15.011 Kitchen, Dining & Lounge		-	63	-	181
102.3.15.018 Circulation		-	79	-	52
102.G.00.001 Circulation		-	79	-	332
102.G.00.002 Circulation		-	79	-	332
102.G.00.003 Plant		67	-	-	88
102.G.00.004 Bike Store		65	-	-	176
102.G.00.005 Linen Store		65	-	-	26
102.G.00.006 Plant		67	-	-	88
102.G.00.007 Plant		67	-	-	44
102.G.01.001 Standard Room		-	79	-	38
102.G.01.001a En-Suite		-	105	-	10
102.G.01.002 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
102.G.01.002a En-Suite		-	105	-	10
102.G.01.003 Standard Room		-	79	-	38
102.G.01.003a En-Suite		-	105	-	10
102.G.01.004 Standard Room		-	79	-	38
102.G.01.004a En-Suite		-	105	-	10
102.G.01.005 Standard Room		-	79	-	38
102.G.01.005a En-Suite		-	105	-	10
102.G.01.006 Standard Room		-	79	-	38
102.G.01.006a En-Suite		-	105	-	10
102.G.01.007 Standard Room		-	79	-	38
102.G.01.007a En-Suite		-	105	-	10
102.G.01.008 Standard Room		-	79	-	38
102.G.01.008a En-Suite		-	105	-	10
102.G.01.009 Standard Room		-	79	-	38
102.G.01.009a En-Suite		-	105	-	10
102.G.01.010 Kitchen, Dining & Lounge		-	63	-	220
102.G.01.017 Circulation		-	79	-	65
102.G.01.018 Plant		67	-	-	88
102.G.02.001 Standard Room		-	79	-	38
102.G.02.001a En-Suite		-	105	-	10
102.G.02.002 Standard Room		-	79	-	38
102.G.02.002a En-Suite		-	105	-	10
102.G.02.003 Standard Room		-	79	-	38
102.G.02.003a En-Suite		-	105	-	10
102.G.02.004 Standard Room		-	79	-	38
102.G.02.004a En-Suite		-	105	-	10
102.G.02.005 Standard Room		-	79	-	38
102.G.02.005a En-Suite		-	105	-	10
102.G.02.006 Standard Room		-	79	-	38
102.G.02.006a En-Suite		-	105	-	10
102.G.02.007 Standard Room		-	79	-	38
102.G.02.007a En-Suite		-	105	-	10
102.G.02.008 Standard Room		-	79	-	38
102.G.02.008a En-Suite		-	105	-	10
102.G.02.009 Standard Room		-	79	-	38
102.G.02.009a En-Suite		-	105	-	10
102.G.02.010 Standard Room		-	79	-	38
102.G.02.010a En-Suite		-	105	-	10
102.G.02.011 Kitchen, Dining & Lounge		-	63	-	108
102.G.02.018 Circulation		-	79	-	78
102.G.03.001 Standard Room		-	79	-	38
102.G.03.001a En-Suite		-	105	-	10
102.G.03.002 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
102.G.03.002a En-Suite		-	105	-	10
102.G.03.003 Standard Room		-	79	-	38
102.G.03.003a En-Suite		-	105	-	10
102.G.03.004 Standard Room		-	79	-	38
102.G.03.004a En-Suite		-	105	-	10
102.G.03.005 Standard Room		-	79	-	38
102.G.03.005a En-Suite		-	105	-	10
102.G.03.006 Standard Room		-	79	-	38
102.G.03.006a En-Suite		-	105	-	10
102.G.03.007 Standard Room		-	79	-	38
102.G.03.007a En-Suite		-	105	-	10
102.G.03.008 Standard Room		-	79	-	38
102.G.03.008a En-Suite		-	105	-	10
102.G.03.009 Standard Room		-	79	-	38
102.G.03.009a En-Suite		-	105	-	10
102.G.03.010 Kitchen, Dining & Lounge		-	63	-	108
102.G.03.017 Circulation		-	79	-	52
102.G.03.019 Storage		65	-	-	13
102.G.WA.001 Kitchen, Dining & Lounge		-	63	-	156
102.G.WA.002 Bedroom		-	79	-	52
102.G.WA.002a Bathroom		-	105	-	26
102.G.WA.003 Bedroom		-	79	-	31
102.G.WA.003a En-Suite		-	105	-	10
102.G.WA.004 Store		65	-	-	13

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?
102.1.04.001 Standard Room	NO (-79.9%)	NO
102.1.04.002 Standard Room	NO (-92.3%)	NO
102.1.04.003 Standard Room	NO (-71%)	NO
102.1.04.004 Standard Room	NO (-89.4%)	NO
102.1.04.005 Standard Room	NO (-70.9%)	NO
102.1.04.006 Standard Room	NO (-80.4%)	NO
102.1.04.007 Standard Room	NO (-70.9%)	NO
102.1.04.008 Standard Room	NO (-89.2%)	NO
102.1.04.009 Standard Room	NO (-80.4%)	NO
102.1.04.010 Standard Room	NO (-87.6%)	NO
102.1.05.001 Standard Room	NO (-80.4%)	NO
102.1.05.002 Standard Room	NO (-92.1%)	NO
102.1.05.003 Standard Room	NO (-72.9%)	NO
102.1.05.004 Standard Room	NO (-80.7%)	NO
102.1.05.005 Standard Room	NO (-73.8%)	NO
102.1.05.006 Standard Room	NO (-80.7%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
102.1.05.007 Standard Room	NO (-75.5%)	NO
102.1.05.008 Standard Room	NO (-89.5%)	NO
102.1.05.009 Standard Room	NO (-80.8%)	NO
102.1.05.010 Standard Room	NO (-89.4%)	NO
102.1.06.001 Standard Room	NO (-82.1%)	NO
102.1.06.002 Standard Room	NO (-88.6%)	NO
102.1.06.003 Standard Room	NO (-76%)	NO
102.1.06.004 Standard Room	NO (-84.2%)	NO
102.1.06.005 Standard Room	NO (-77.2%)	NO
102.1.06.006 Standard Room	NO (-70%)	NO
102.1.06.007 Standard Room	NO (-84.3%)	NO
102.1.06.008 Standard Room	NO (-70.1%)	NO
102.1.06.009 Standard Room	NO (-89.4%)	NO
102.1.06.010 Standard Room	NO (-80.7%)	NO
102.1.11.001 Standard Room	NO (-80%)	NO
102.1.11.002 Standard Room	NO (-79.6%)	NO
102.1.11.003 Standard Room	NO (-69.9%)	NO
102.1.11.004 Standard Room	NO (-84.3%)	NO
102.1.11.005 Standard Room	NO (-68.6%)	NO
102.1.11.006 Standard Room	NO (-70%)	NO
102.1.11.007 Standard Room	NO (-68.3%)	NO
102.1.11.008 Standard Room	NO (-84.3%)	NO
102.1.11.009 Standard Room	NO (-79.8%)	NO
102.1.11.010 Standard Room	NO (-88.9%)	NO
102.2.08.001 Standard Room	NO (-79.7%)	NO
102.2.08.002 Standard Room	NO (-86.5%)	NO
102.2.08.003 Standard Room	NO (-70.8%)	NO
102.2.08.004 Standard Room	NO (-89.3%)	NO
102.2.08.005 Standard Room	NO (-70.8%)	NO
102.2.08.006 Standard Room	NO (-80.6%)	NO
102.2.08.007 Standard Room	NO (-70.7%)	NO
102.2.08.008 Standard Room	NO (-80.3%)	NO
102.2.08.009 Standard Room	NO (-80.2%)	NO
102.2.08.010 Standard Room	NO (-92.3%)	NO
102.2.09.001 Standard Room	NO (-80.1%)	NO
102.2.09.002 Standard Room	NO (-86.6%)	NO
102.2.09.003 Standard Room	NO (-71.7%)	NO
102.2.09.004 Standard Room	NO (-89.4%)	NO
102.2.09.005 Standard Room	NO (-72.3%)	NO
102.2.09.006 Standard Room	NO (-89.4%)	NO
102.2.09.007 Standard Room	NO (-73.1%)	NO
102.2.09.008 Standard Room	NO (-80.8%)	NO
102.2.09.009 Standard Room	NO (-89.4%)	NO
102.2.09.010 Standard Room	NO (-80.9%)	NO
102.2.10.001 Standard Room	NO (-81%)	NO
102.2.10.002 Standard Room	NO (-79.8%)	NO
102.2.10.003 Standard Room	NO (-73.8%)	NO
102.2.10.004 Standard Room	NO (-84.4%)	NO
102.2.10.005 Standard Room	NO (-76.4%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
102.2.10.006 Standard Room	NO (-70.4%)	NO
102.2.10.007 Standard Room	NO (-70.4%)	NO
102.2.10.008 Standard Room	NO (-84.3%)	NO
102.2.10.009 Standard Room	NO (-82.1%)	NO
102.2.10.010 Standard Room	NO (-89.4%)	NO
102.2.11.001 Standard Room	NO (-79.8%)	NO
102.2.11.002 Standard Room	NO (-88.7%)	NO
102.2.11.003 Standard Room	NO (-69.5%)	NO
102.2.11.004 Standard Room	NO (-69.8%)	NO
102.2.11.005 Standard Room	NO (-68.3%)	NO
102.2.11.006 Standard Room	NO (-84.1%)	NO
102.2.11.007 Standard Room	NO (-68.1%)	NO
102.2.11.008 Standard Room	NO (-69.1%)	NO
102.2.11.009 Standard Room	NO (-79.6%)	NO
102.2.11.010 Standard Room	NO (-80.8%)	NO
102.3.12.001 Standard Room	NO (-79.5%)	NO
102.3.12.002 Standard Room	NO (-92%)	NO
102.3.12.003 Standard Room	NO (-70.5%)	NO
102.3.12.004 Standard Room	NO (-80.3%)	NO
102.3.12.005 Standard Room	NO (-70.4%)	NO
102.3.12.006 Standard Room	NO (-89.1%)	NO
102.3.12.007 Standard Room	NO (-70.3%)	NO
102.3.12.008 Standard Room	NO (-80.2%)	NO
102.3.12.009 Standard Room	NO (-80.1%)	NO
102.3.12.010 Standard Room	NO (-87.3%)	NO
102.3.13.001 Standard Room	NO (-79.7%)	NO
102.3.13.002 Standard Room	NO (-91.9%)	NO
102.3.13.003 Standard Room	NO (-71.1%)	NO
102.3.13.004 Standard Room	NO (-80.2%)	NO
102.3.13.005 Standard Room	NO (-71.3%)	NO
102.3.13.006 Standard Room	NO (-80.2%)	NO
102.3.13.007 Standard Room	NO (-71.4%)	NO
102.3.13.008 Standard Room	NO (-89%)	NO
102.3.13.009 Standard Room	NO (-80.3%)	NO
102.3.13.010 Standard Room	NO (-89%)	NO
102.3.14.001 Standard Room	NO (-79.9%)	NO
102.3.14.002 Standard Room	NO (-88.4%)	NO
102.3.14.003 Standard Room	NO (-71.2%)	NO
102.3.14.004 Standard Room	NO (-69.8%)	NO
102.3.14.005 Standard Room	NO (-72.4%)	NO
102.3.14.006 Standard Room	NO (-84%)	NO
102.3.14.007 Standard Room	NO (-84%)	NO
102.3.14.008 Standard Room	NO (-69.8%)	NO
102.3.14.009 Standard Room	NO (-89%)	NO
102.3.14.010 Standard Room	NO (-80.3%)	NO
102.3.15.001 Standard Room	NO (-78.8%)	NO
102.3.15.002 Standard Room	NO (-88.6%)	NO
102.3.15.003 Standard Room	NO (-68.3%)	NO
102.3.15.004 Standard Room	NO (-84%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
102.3.15.005 Standard Room	NO (-67.6%)	NO
102.3.15.006 Standard Room	NO (-69%)	NO
102.3.15.007 Standard Room	NO (-67.5%)	NO
102.3.15.008 Standard Room	NO (-69%)	NO
102.3.15.009 Standard Room	NO (-79.3%)	NO
102.3.15.010 Standard Room	NO (-88.8%)	NO
102.G.01.001 Standard Room	NO (-81.2%)	NO
102.G.01.002 Standard Room	NO (-80.1%)	NO
102.G.01.003 Standard Room	NO (-73.6%)	NO
102.G.01.004 Standard Room	NO (-80.1%)	NO
102.G.01.005 Standard Room	NO (-74.8%)	NO
102.G.01.006 Standard Room	NO (-80.4%)	NO
102.G.01.007 Standard Room	NO (-76.4%)	NO
102.G.01.008 Standard Room	NO (-80.2%)	NO
102.G.01.009 Standard Room	NO (-80.5%)	NO
102.G.02.001 Standard Room	NO (-82.8%)	NO
102.G.02.002 Standard Room	NO (-79.9%)	NO
102.G.02.003 Standard Room	NO (-76.1%)	NO
102.G.02.004 Standard Room	NO (-70%)	NO
102.G.02.005 Standard Room	NO (-77.5%)	NO
102.G.02.006 Standard Room	NO (-70%)	NO
102.G.02.007 Standard Room	NO (-70%)	NO
102.G.02.008 Standard Room	NO (-69.8%)	NO
102.G.02.009 Standard Room	NO (-81.3%)	NO
102.G.02.010 Standard Room	NO (-80.3%)	NO
102.G.03.001 Standard Room	NO (-80.5%)	NO
102.G.03.002 Standard Room	NO (-69.9%)	NO
102.G.03.003 Standard Room	NO (-70.6%)	NO
102.G.03.004 Standard Room	NO (-69.5%)	NO
102.G.03.005 Standard Room	NO (-69.3%)	NO
102.G.03.006 Standard Room	NO (-69.8%)	NO
102.G.03.007 Standard Room	NO (-68.7%)	NO
102.G.03.008 Standard Room	NO (-80.8%)	NO
102.G.03.009 Standard Room	NO (-83.9%)	NO
102.G.WA.002 Bedroom	NO (-89.2%)	NO
102.G.WA.003 Bedroom	NO (-97.3%)	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?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	4055.4	4055.4
External area [m ²]	4935.7	4935.7
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	4	3
Average conductance [W/K]	4515.83	2587.78
Average U-value [W/m ² K]	0.91	0.52
Alpha value* [%]	3.87	10

* 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
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
100 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	68.56	78.8
Cooling	0	0
Auxiliary	6.41	4.28
Lighting	10.26	10.8
Hot water	108.43	107
Equipment*	15.93	15.93
TOTAL **	193.65	200.88

* 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]	220.23	283.69
Primary energy* [kWh/m ²]	203.38	203.08
Total emissions [kg/m ²]	35.2	42.9

* 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] Central heating using water: radiators, [HS] District heating, [HFT] District Heating, [CFT] Electricity										
	Actual	275.2	0	85.7	0	6	0.89	0	1	0
	Notional	0	0	0	0	0	0	0	----	----
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0	0	0	0	0
	Notional	354.5	0	98.5	0	5.3	1	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	0.15	WN000025:Surf[3]
Floor	0.2	0.14	WN000031:Surf[7]
Roof	0.15	0.13	1000028E:Surf[5]
Windows, roof windows, and rooflights	1.5	1.4	10000189:Surf[0]
Personnel doors	1.5	1.4	WN000025:Surf[0]
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building
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	4

Calculation Sheet

No. of Sheets: 33

Project Title: UoM Fallowfields

Project No. C5219

File No. V:\Contract Files\C5219
Fallowfield\7.0 Design\7.03
Calculations\Thermal
central\ESD\Incoming\BRUKL
EPCs\As Built\Block 103 Tawny

Subject: Block 103 'As Built' BRUKL and EPC

Calc No. UoM-HES-103-XX-CA-Y-80-01-AF1

Design Manager: Geoff Evans

Design Phase:

A – Concept or preliminary ☐
B – Analysis and Detailed design ☐
C – Design verification ☐
D – Other (specify) 'As Built' ☒

Designer: Neil Hamilton
Environmental Services Design (ESD)

Computer Applications Used
IES VE

Version/Date
2019

Scope of Checking for Manual & Computer Generated Calculations:

Desktop review against results of Stage 3 and 'As Designed' SBEM calculations.

Sheets Checked*	Calculations by			Checked by		
	Name	Signature	Date	Name	Signature	Date
All	ESD		2019-11-21	Geoff Evans		2019-11-21

*If an Excel spreadsheet or other computer file has been checked and has not been attached, enter the name, date and full file path or server location of the file that was checked.

a) Basic Design Information or Source and Reference:

Documents generated from the IES VE Model referenced as;

1. 2019-11-25T104002 EJ1141 S2 B103 Fallowfield 12-08-19 [VE2018] cab

b) Identify documents/technical records where output will be used:

Documents required to demonstrate compliance with the following;

1. Building Regulations 2013 Part L2A
2. The Energy Performance of Buildings (England and Wales) Regulations 2018

Approved by

Design Manager Geoff Evans

Signature



Date

2019-11-21

Distribution:

Matt Stockton, Vinci Construction UK Ltd

Energy Performance Certificate

Non-Domestic Building



Tawny Court
Unsworth Park
20 Chancellors Way
MANCHESTER
M14 6FZ

Certificate Reference Number:
9382-3001-0017-0900-6101

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient



Net zero CO₂ emissions

A 0-25

B 26-50

27

This is how energy efficient the building is.

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

Less energy efficient

Technical Information

Main heating fuel:	District Heating
Building environment:	Heating and Natural Ventilation
Total useful floor area (m ²):	6569
Assessment Level:	5
Building emission rate (kgCO ₂ /m ² per year):	34.73
Primary energy use (kWh/m ² per year):	200.8

Benchmarks

Buildings similar to this one could have ratings as follows:

32

If newly built

85

If typical of the existing stock

Administrative Information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

Assessment Software:	Virtual Environment v7.0.11 using calculation engine ApacheSim v7.0.11
Property Reference:	327019080000
Assessor Name:	Neil Hamilton
Assessor Number:	STRO007864
Accreditation Scheme:	Stroma Certification Ltd
Employer/Trading Name:	Environmental Services Design Ltd
Employer/Trading Address:	Courtyard East, Wharfebank House, Wharfebank Business Centre, Ilkley Road, Oltley, LS21 3JP
Issue Date:	19 Nov 2019
Valid Until:	18 Nov 2029 (unless superseded by a later certificate)
Related Party Disclosure:	Not related to the owner.

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report - 0630-0941-8079-2001-1002.

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by Stroma Certification Ltd. You can obtain contact details of the Accreditation Scheme at www.stroma.com.

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at www.opendatacommunities.org.

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. Any personal data it contains will be processed in accordance with the General Data Protection Regulation and all applicable laws and regulations relating to the processing of personal data and privacy. For further information about this and how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at: www.gov.uk/government/collections/energy-performance-certificates. It explains the content and use of this document, advises on how to identify the authenticity of a certificate and how to make a complaint.

Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property – whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.

Project name

Tawny Court**As built****Date:** Tue Nov 19 11:09:20 2019

Administrative information

Building Details

Address: MANCHESTER, M14 6FZ

Certification tool

Calculation engine: Apache**Calculation engine version:** 7.0.11**Interface to calculation engine:** IES Virtual Environment**Interface to calculation engine version:** 7.0.11**BRUKL compliance check version:** v5.6.a.1

Owner Details

Name: The University of Manchester**Telephone number:** 0161 306 6000**Address:** Oxford Road, Manchester, M13 9PL

Certifier details

Name: Neil Hamilton**Telephone number:** 01943 851016**Address:** Environmental Services Design Ltd, Courtyard East, Wharfebank House, Wharfebank Business Centre, Ilkley Road, Otley, LS21 3JPCriterion 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	40.9
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	40.9
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	34.7
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	0.15	0.15	10000000:Surf[12]
Floor	0.25	0.14	0.14	10000008:Surf[0]
Roof	0.25	0.13	0.13	10000008:Surf[1]
Windows***, roof windows, and rooflights	2.2	1.4	1.4	10000000:Surf[0]
Personnel doors	2.2	2.2	2.2	10000251:Surf[1]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building
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	4

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- Central Heating Using Water: Radiators - District Heating + DHW

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	0	-
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

"No HWS in project, or hot water is provided by HVAC system"

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		
103.1.05.001a Part M En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.05.002a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.05.003a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.05.004a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.05.005a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.05.006a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.05.007a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.05.008a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.05.009a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.05.010a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.05.011 Kitchen, Dining & Lounge		-	-	0.4	-	-	-	-	-	-	-	N/A
103.1.06.001a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.06.002a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.06.003a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.06.004a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.06.005a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.06.006a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.06.007a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.06.008a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
103.1.06.009a En-Suite		-	-	0.5	-	-	-	-	-	-	-	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	
103.1.06.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.06.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.1.07.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.07.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.07.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.07.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.07.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.07.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.07.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.07.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.07.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.07.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.07.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.1.08.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.08.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.08.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.08.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.08.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.08.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.08.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.08.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.08.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.08.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.1.08.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.2.09.001a Part M En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.09.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.09.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.09.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.09.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.09.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.09.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.09.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.09.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.09.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.09.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.2.10.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.10.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.10.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.10.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.10.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.10.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.10.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.2.10.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	

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		
103.2.10.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.10.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.10.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A
103.2.11.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.11.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.11.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.11.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.11.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.11.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.11.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.11.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.11.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.11.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.11.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A
103.2.12.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.12.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.12.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.12.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.12.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.12.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.12.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.12.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.12.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.12.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.2.12.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A
103.3.13.001a Part M En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.3.13.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.3.13.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.3.13.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.3.13.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.3.13.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.3.13.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.3.13.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.3.13.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.3.13.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.3.13.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A
103.3.14.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.3.14.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.3.14.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.3.14.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.3.14.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.3.14.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
103.3.14.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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	
103.3.14.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.14.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.14.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.14.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.3.15.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.15.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.15.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.15.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.15.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.15.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.15.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.15.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.15.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.15.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.15.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.3.16.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.16.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.16.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.16.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.16.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.16.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.16.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.16.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.16.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.16.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.3.16.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.4.17.001a Part M En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.17.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.17.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.17.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.17.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.17.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.17.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.17.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.17.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.17.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.17.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.4.18.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.18.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.18.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.18.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.18.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.18.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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	
103.4.18.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.18.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.18.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.18.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.18.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.4.19.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.19.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.19.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.19.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.19.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.19.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.19.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.19.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.19.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.19.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.19.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.4.20.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.20.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.20.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.20.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.20.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.20.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.20.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.20.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.20.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.20.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.4.20.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.5.21.001a Part M En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.21.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.21.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.21.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.21.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.21.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.21.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.21.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.21.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.21.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.21.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.5.22.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.22.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.22.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.22.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.22.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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	
103.5.22.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.22.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.22.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.22.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.22.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.22.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.5.23.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.23.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.23.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.23.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.23.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.23.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.23.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.23.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.23.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.23.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.23.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.5.24.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.24.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.24.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.24.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.24.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.24.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.24.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.24.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.24.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.24.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.5.24.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.G.01.001a Part M En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.01.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.01.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.01.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.01.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.01.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.01.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.01.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.01.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.01.010 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.G.02.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.02.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.02.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.02.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.02.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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	
103.G.02.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.02.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.02.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.02.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.02.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.02.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.G.03.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.03.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.03.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.03.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.03.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.03.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.03.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.03.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.03.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.03.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.03.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
103.G.04.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.04.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.04.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.04.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.04.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.04.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.04.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.04.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.04.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
103.G.04.010 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	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	
103.1.00.001 Stair Core A		-	64	-	574
103.1.00.002 Circulation		-	74	-	26
103.1.00.003 Circulation		-	63	-	66
103.1.00.004 Stair Core B		-	67	-	534
103.1.05.001 Part M Room		-	76	-	38
103.1.05.001a Part M En-Suite		-	93	-	10
103.1.05.002 Standard Room		-	80	-	38
103.1.05.002a En-Suite		-	170	-	10
103.1.05.003 Standard Room		-	79	-	38
103.1.05.003a En-Suite		-	162	-	10
103.1.05.004 Standard Room		-	78	-	38
103.1.05.004a En-Suite		-	162	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
103.1.05.005 Standard Room		-	79	-	38
103.1.05.005a En-Suite		-	162	-	10
103.1.05.006 Standard Room		-	79	-	38
103.1.05.006a En-Suite		-	162	-	10
103.1.05.007 Standard Room		-	79	-	38
103.1.05.007a En-Suite		-	162	-	10
103.1.05.008 Standard Room		-	79	-	38
103.1.05.008a En-Suite		-	162	-	10
103.1.05.009 Standard Room		-	80	-	38
103.1.05.009a En-Suite		-	162	-	10
103.1.05.010 Standard Room		-	80	-	38
103.1.05.010a En-Suite		-	162	-	10
103.1.05.011 Kitchen, Dining & Lounge		-	61	-	126
103.1.05.016 Circulation		-	91	-	52
103.1.06.001 Standard Room		-	78	-	38
103.1.06.001a En-Suite		-	162	-	10
103.1.06.002 Standard Room		-	79	-	38
103.1.06.002a En-Suite		-	162	-	10
103.1.06.003 Standard Room		-	79	-	38
103.1.06.003a En-Suite		-	164	-	10
103.1.06.004 Standard Room		-	79	-	38
103.1.06.004a En-Suite		-	162	-	10
103.1.06.005 Standard Room		-	79	-	38
103.1.06.005a En-Suite		-	162	-	10
103.1.06.006 Standard Room		-	79	-	38
103.1.06.006a En-Suite		-	162	-	10
103.1.06.007 Standard Room		-	79	-	38
103.1.06.007a En-Suite		-	162	-	10
103.1.06.008 Standard Room		-	79	-	38
103.1.06.008a En-Suite		-	162	-	10
103.1.06.009 Standard Room		-	79	-	38
103.1.06.009a En-Suite		-	162	-	10
103.1.06.010 Standard Room		-	79	-	38
103.1.06.010a En-Suite		-	162	-	10
103.1.06.011 Kitchen, Dining & Lounge		-	62	-	108
103.1.06.017 Circulation		-	87	-	78
103.1.06.019 Plant		120	-	-	97
103.1.06.021 Plant		97	-	-	176
103.1.06.022 Sluice		-	139	-	44
103.1.07.001 Standard Room		-	81	-	38
103.1.07.001a En-Suite		-	162	-	10
103.1.07.002 Standard Room		-	81	-	38
103.1.07.002a En-Suite		-	162	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
103.1.07.003 Standard Room		-	79	-	38
103.1.07.003a En-Suite		-	162	-	10
103.1.07.004 Standard Room		-	79	-	38
103.1.07.004a En-Suite		-	162	-	10
103.1.07.005 Standard Room		-	79	-	38
103.1.07.005a En-Suite		-	162	-	10
103.1.07.006 Standard Room		-	79	-	38
103.1.07.006a En-Suite		-	162	-	10
103.1.07.007 Standard Room		-	79	-	38
103.1.07.007a En-Suite		-	162	-	10
103.1.07.008 Standard Room		-	79	-	38
103.1.07.008a En-Suite		-	162	-	10
103.1.07.009 Standard Room		-	79	-	38
103.1.07.009a En-Suite		-	162	-	10
103.1.07.010 Standard Room		-	79	-	38
103.1.07.010a En-Suite		-	162	-	10
103.1.07.011 Kitchen, Dining & Lounge		-	61	-	126
103.1.07.017 Circulation		-	90	-	65
103.1.08.001 Standard Room		-	81	-	38
103.1.08.001a En-Suite		-	161	-	10
103.1.08.002 Standard Room		-	80	-	38
103.1.08.002a En-Suite		-	172	-	10
103.1.08.003 Standard Room		-	79	-	38
103.1.08.003a En-Suite		-	162	-	10
103.1.08.004 Standard Room		-	79	-	38
103.1.08.004a En-Suite		-	162	-	10
103.1.08.005 Standard Room		-	79	-	38
103.1.08.005a En-Suite		-	162	-	10
103.1.08.006 Standard Room		-	79	-	38
103.1.08.006a En-Suite		-	162	-	10
103.1.08.007 Standard Room		-	79	-	38
103.1.08.007a En-Suite		-	162	-	10
103.1.08.008 Standard Room		-	79	-	38
103.1.08.008a En-Suite		-	162	-	10
103.1.08.009 Standard Room		-	80	-	38
103.1.08.009a En-Suite		-	162	-	10
103.1.08.010 Standard Room		-	80	-	38
103.1.08.010a En-Suite		-	162	-	10
103.1.08.011 Kitchen, Dining & Lounge		-	62	-	126
103.1.08.018 Circulation		-	94	-	52
103.2.00.001 Stair Core A		-	64	-	574
103.2.00.002 Circulation		-	74	-	26
103.2.00.003 Circulation		-	63	-	66

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
103.2.00.004 Stair Core B		-	67	-	534
103.2.09.001 Part M Room		-	77	-	38
103.2.09.001a Part M En-Suite		-	90	-	10
103.2.09.002 Standard Room		-	80	-	38
103.2.09.002a En-Suite		-	170	-	10
103.2.09.003 Standard Room		-	78	-	38
103.2.09.003a En-Suite		-	162	-	10
103.2.09.004 Standard Room		-	78	-	38
103.2.09.004a En-Suite		-	162	-	10
103.2.09.005 Standard Room		-	79	-	38
103.2.09.005a En-Suite		-	162	-	10
103.2.09.006 Standard Room		-	79	-	38
103.2.09.006a En-Suite		-	162	-	10
103.2.09.007 Standard Room		-	79	-	38
103.2.09.007a En-Suite		-	162	-	10
103.2.09.008 Standard Room		-	79	-	38
103.2.09.008a En-Suite		-	162	-	10
103.2.09.009 Standard Room		-	80	-	38
103.2.09.009a En-Suite		-	162	-	10
103.2.09.010 Standard Room		-	80	-	38
103.2.09.010a En-Suite		-	162	-	10
103.2.09.011 Kitchen, Dining & Lounge		-	61	-	126
103.2.09.018 Circulation		-	92	-	52
103.2.10.001 Standard Room		-	78	-	38
103.2.10.001a En-Suite		-	162	-	10
103.2.10.002 Standard Room		-	79	-	38
103.2.10.002a En-Suite		-	162	-	10
103.2.10.003 Standard Room		-	79	-	38
103.2.10.003a En-Suite		-	164	-	10
103.2.10.004 Standard Room		-	79	-	38
103.2.10.004a En-Suite		-	162	-	10
103.2.10.005 Standard Room		-	79	-	38
103.2.10.005a En-Suite		-	162	-	10
103.2.10.006 Standard Room		-	79	-	38
103.2.10.006a En-Suite		-	162	-	10
103.2.10.007 Standard Room		-	79	-	38
103.2.10.007a En-Suite		-	162	-	10
103.2.10.008 Standard Room		-	79	-	38
103.2.10.008a En-Suite		-	162	-	10
103.2.10.009 Standard Room		-	79	-	38
103.2.10.009a En-Suite		-	162	-	10
103.2.10.010 Standard Room		-	79	-	38
103.2.10.010a En-Suite		-	162	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
103.2.10.011 Kitchen, Dining & Lounge		-	62	-	108
103.2.10.018 Circulation		-	87	-	78
103.2.10.019 Plant		120	-	-	97
103.2.10.020 Store		60	-	-	44
103.2.10.021 Plant		110	-	-	97
103.2.10.022 Sluice		-	139	-	44
103.2.11.001 Standard Room		-	81	-	38
103.2.11.001a En-Suite		-	162	-	10
103.2.11.002 Standard Room		-	81	-	38
103.2.11.002a En-Suite		-	162	-	10
103.2.11.003 Standard Room		-	79	-	38
103.2.11.003a En-Suite		-	162	-	10
103.2.11.004 Standard Room		-	79	-	38
103.2.11.004a En-Suite		-	162	-	10
103.2.11.005 Standard Room		-	79	-	38
103.2.11.005a En-Suite		-	162	-	10
103.2.11.006 Standard Room		-	79	-	38
103.2.11.006a En-Suite		-	162	-	10
103.2.11.007 Standard Room		-	79	-	38
103.2.11.007a En-Suite		-	162	-	10
103.2.11.008 Standard Room		-	79	-	38
103.2.11.008a En-Suite		-	162	-	10
103.2.11.009 Standard Room		-	79	-	38
103.2.11.009a En-Suite		-	162	-	10
103.2.11.010 Standard Room		-	79	-	38
103.2.11.010a En-Suite		-	162	-	10
103.2.11.011 Kitchen, Dining & Lounge		-	61	-	126
103.2.11.017 Circulation		-	90	-	65
103.2.12.001 Standard Room		-	80	-	38
103.2.12.001a En-Suite		-	161	-	10
103.2.12.002 Standard Room		-	80	-	38
103.2.12.002a En-Suite		-	172	-	10
103.2.12.003 Standard Room		-	79	-	38
103.2.12.003a En-Suite		-	162	-	10
103.2.12.004 Standard Room		-	79	-	38
103.2.12.004a En-Suite		-	162	-	10
103.2.12.005 Standard Room		-	79	-	38
103.2.12.005a En-Suite		-	162	-	10
103.2.12.006 Standard Room		-	79	-	38
103.2.12.006a En-Suite		-	162	-	10
103.2.12.007 Standard Room		-	79	-	38
103.2.12.007a En-Suite		-	162	-	10
103.2.12.008 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
103.2.12.008a En-Suite		-	162	-	10
103.2.12.009 Standard Room		-	80	-	38
103.2.12.009a En-Suite		-	162	-	10
103.2.12.010 Standard Room		-	80	-	38
103.2.12.010a En-Suite		-	162	-	10
103.2.12.011 Kitchen, Dining & Lounge		-	62	-	126
103.2.12.018 Circulation		-	94	-	52
103.3.00.001 Stair Core A		-	64	-	574
103.3.00.002 Circulation		-	74	-	26
103.3.00.003 Circulation		-	63	-	66
103.3.00.004 Stair Core B		-	67	-	534
103.3.13.001 Part M Room		-	76	-	38
103.3.13.001a Part M En-Suite		-	93	-	10
103.3.13.002 Standard Room		-	80	-	38
103.3.13.002a En-Suite		-	170	-	10
103.3.13.003 Standard Room		-	79	-	38
103.3.13.003a En-Suite		-	162	-	10
103.3.13.004 Standard Room		-	78	-	38
103.3.13.004a En-Suite		-	162	-	10
103.3.13.005 Standard Room		-	79	-	38
103.3.13.005a En-Suite		-	162	-	10
103.3.13.006 Standard Room		-	79	-	38
103.3.13.006a En-Suite		-	162	-	10
103.3.13.007 Standard Room		-	79	-	38
103.3.13.007a En-Suite		-	162	-	10
103.3.13.008 Standard Room		-	79	-	38
103.3.13.008a En-Suite		-	162	-	10
103.3.13.009 Standard Room		-	80	-	38
103.3.13.009a En-Suite		-	162	-	10
103.3.13.010 Standard Room		-	80	-	38
103.3.13.010a En-Suite		-	162	-	10
103.3.13.011 Kitchen, Dining & Lounge		-	61	-	126
103.3.13.016 Circulation		-	91	-	52
103.3.14.000 Circulation		-	87	-	78
103.3.14.001 Standard Room		-	78	-	38
103.3.14.001a En-Suite		-	162	-	10
103.3.14.002 Standard Room		-	79	-	38
103.3.14.002a En-Suite		-	162	-	10
103.3.14.003 Standard Room		-	79	-	38
103.3.14.003a En-Suite		-	164	-	10
103.3.14.004 Standard Room		-	79	-	38
103.3.14.004a En-Suite		-	162	-	10
103.3.14.005 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
103.3.14.005a En-Suite		-	162	-	10
103.3.14.006 Standard Room		-	79	-	38
103.3.14.006a En-Suite		-	162	-	10
103.3.14.007 Standard Room		-	79	-	38
103.3.14.007a En-Suite		-	162	-	10
103.3.14.008 Standard Room		-	79	-	38
103.3.14.008a En-Suite		-	162	-	10
103.3.14.009 Standard Room		-	79	-	38
103.3.14.009a En-Suite		-	162	-	10
103.3.14.010 Standard Room		-	79	-	38
103.3.14.010a En-Suite		-	162	-	10
103.3.14.011 Kitchen, Dining & Lounge		-	62	-	108
103.3.14.019 Plant		120	-	-	97
103.3.14.020 Plant		97	-	-	176
103.3.14.021 Sluice		-	139	-	44
103.3.15.001 Standard Room		-	81	-	38
103.3.15.001a En-Suite		-	162	-	10
103.3.15.002 Standard Room		-	81	-	38
103.3.15.002a En-Suite		-	162	-	10
103.3.15.003 Standard Room		-	79	-	38
103.3.15.003a En-Suite		-	162	-	10
103.3.15.004 Standard Room		-	79	-	38
103.3.15.004a En-Suite		-	162	-	10
103.3.15.005 Standard Room		-	79	-	38
103.3.15.005a En-Suite		-	162	-	10
103.3.15.006 Standard Room		-	79	-	38
103.3.15.006a En-Suite		-	162	-	10
103.3.15.007 Standard Room		-	79	-	38
103.3.15.007a En-Suite		-	162	-	10
103.3.15.008 Standard Room		-	79	-	38
103.3.15.008a En-Suite		-	162	-	10
103.3.15.009 Standard Room		-	79	-	38
103.3.15.009a En-Suite		-	162	-	10
103.3.15.010 Standard Room		-	79	-	38
103.3.15.010a En-Suite		-	162	-	10
103.3.15.011 Kitchen, Dining & Lounge		-	61	-	126
103.3.15.017 Circulation		-	90	-	65
103.3.16.000 Circulation		-	94	-	52
103.3.16.001 Standard Room		-	81	-	38
103.3.16.001a En-Suite		-	161	-	10
103.3.16.002 Standard Room		-	80	-	38
103.3.16.002a En-Suite		-	172	-	10
103.3.16.003 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
103.3.16.003a En-Suite		-	162	-	10
103.3.16.004 Standard Room		-	79	-	38
103.3.16.004a En-Suite		-	162	-	10
103.3.16.005 Standard Room		-	79	-	38
103.3.16.005a En-Suite		-	162	-	10
103.3.16.006 Standard Room		-	79	-	38
103.3.16.006a En-Suite		-	162	-	10
103.3.16.007 Standard Room		-	79	-	38
103.3.16.007a En-Suite		-	162	-	10
103.3.16.008 Standard Room		-	79	-	38
103.3.16.008a En-Suite		-	162	-	10
103.3.16.009 Standard Room		-	80	-	38
103.3.16.009a En-Suite		-	162	-	10
103.3.16.010 Standard Room		-	80	-	38
103.3.16.010a En-Suite		-	162	-	10
103.3.16.011 Kitchen, Dining & Lounge		-	62	-	126
103.4.00.001 Stair Core A		-	64	-	574
103.4.00.002 Circulation		-	74	-	26
103.4.00.003 Circulation		-	63	-	66
103.4.00.004 Stair Core B		-	67	-	534
103.4.17.001 Part M Room		-	77	-	38
103.4.17.001a Part M En-Suite		-	90	-	10
103.4.17.002 Standard Room		-	80	-	38
103.4.17.002a En-Suite		-	170	-	10
103.4.17.003 Standard Room		-	78	-	38
103.4.17.003a En-Suite		-	162	-	10
103.4.17.004 Standard Room		-	78	-	38
103.4.17.004a En-Suite		-	162	-	10
103.4.17.005 Standard Room		-	79	-	38
103.4.17.005a En-Suite		-	162	-	10
103.4.17.006 Standard Room		-	79	-	38
103.4.17.006a En-Suite		-	162	-	10
103.4.17.007 Standard Room		-	79	-	38
103.4.17.007a En-Suite		-	162	-	10
103.4.17.008 Standard Room		-	79	-	38
103.4.17.008a En-Suite		-	162	-	10
103.4.17.009 Standard Room		-	80	-	38
103.4.17.009a En-Suite		-	162	-	10
103.4.17.010 Standard Room		-	80	-	38
103.4.17.010a En-Suite		-	162	-	10
103.4.17.011 Kitchen, Dining & Lounge		-	61	-	126
103.4.17.018 Circulation		-	92	-	52
103.4.18.001 Standard Room		-	78	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
103.4.18.001a En-Suite		-	162	-	10
103.4.18.002 Standard Room		-	79	-	38
103.4.18.002a En-Suite		-	162	-	10
103.4.18.003 Standard Room		-	79	-	38
103.4.18.003a En-Suite		-	164	-	10
103.4.18.004 Standard Room		-	79	-	38
103.4.18.004a En-Suite		-	162	-	10
103.4.18.005 Standard Room		-	79	-	38
103.4.18.005a En-Suite		-	162	-	10
103.4.18.006 Standard Room		-	79	-	38
103.4.18.006a En-Suite		-	162	-	10
103.4.18.007 Standard Room		-	79	-	38
103.4.18.007a En-Suite		-	162	-	10
103.4.18.008 Standard Room		-	79	-	38
103.4.18.008a En-Suite		-	162	-	10
103.4.18.009 Standard Room		-	79	-	38
103.4.18.009a En-Suite		-	162	-	10
103.4.18.010 Standard Room		-	79	-	38
103.4.18.010a En-Suite		-	162	-	10
103.4.18.011 Kitchen, Dining & Lounge		-	62	-	108
103.4.18.018 Circulation		-	87	-	78
103.4.18.019 Plant		120	-	-	97
103.4.18.020 Plant		49	-	-	176
103.4.18.022 Sluice		-	139	-	44
103.4.19.001 Standard Room		-	81	-	38
103.4.19.001a En-Suite		-	162	-	10
103.4.19.002 Standard Room		-	81	-	38
103.4.19.002a En-Suite		-	162	-	10
103.4.19.003 Standard Room		-	79	-	38
103.4.19.003a En-Suite		-	162	-	10
103.4.19.004 Standard Room		-	79	-	38
103.4.19.004a En-Suite		-	162	-	10
103.4.19.005 Standard Room		-	79	-	38
103.4.19.005a En-Suite		-	162	-	10
103.4.19.006 Standard Room		-	79	-	38
103.4.19.006a En-Suite		-	162	-	10
103.4.19.007 Standard Room		-	79	-	38
103.4.19.007a En-Suite		-	162	-	10
103.4.19.008 Standard Room		-	79	-	38
103.4.19.008a En-Suite		-	162	-	10
103.4.19.009 Standard Room		-	79	-	38
103.4.19.009a En-Suite		-	162	-	10
103.4.19.010 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
103.4.19.010a En-Suite		-	162	-	10
103.4.19.011 Kitchen, Dining & Lounge		-	61	-	126
103.4.19.017 Circulation		-	90	-	65
103.4.20.000 Circulation		-	94	-	52
103.4.20.001 Standard Room		-	80	-	38
103.4.20.001a En-Suite		-	161	-	10
103.4.20.002 Standard Room		-	80	-	38
103.4.20.002a En-Suite		-	172	-	10
103.4.20.003 Standard Room		-	79	-	38
103.4.20.003a En-Suite		-	162	-	10
103.4.20.004 Standard Room		-	79	-	38
103.4.20.004a En-Suite		-	162	-	10
103.4.20.005 Standard Room		-	79	-	38
103.4.20.005a En-Suite		-	162	-	10
103.4.20.006 Standard Room		-	79	-	38
103.4.20.006a En-Suite		-	162	-	10
103.4.20.007 Standard Room		-	79	-	38
103.4.20.007a En-Suite		-	162	-	10
103.4.20.008 Standard Room		-	79	-	38
103.4.20.008a En-Suite		-	162	-	10
103.4.20.009 Standard Room		-	80	-	38
103.4.20.009a En-Suite		-	162	-	10
103.4.20.010 Standard Room		-	80	-	38
103.4.20.010a En-Suite		-	162	-	10
103.4.20.011 Kitchen, Dining & Lounge		-	62	-	126
103.5.00.001 Stair Core A		-	64	-	574
103.5.00.002 Circulation		-	74	-	26
103.5.00.003 Circulation		-	63	-	66
103.5.00.004 Stair Core B		-	67	-	534
103.5.21.001 Part M Room		-	76	-	38
103.5.21.001a Part M En-Suite		-	93	-	10
103.5.21.002 Standard Room		-	80	-	38
103.5.21.002a En-Suite		-	170	-	10
103.5.21.003 Standard Room		-	78	-	38
103.5.21.003a En-Suite		-	162	-	10
103.5.21.004 Standard Room		-	78	-	38
103.5.21.004a En-Suite		-	162	-	10
103.5.21.005 Standard Room		-	79	-	38
103.5.21.005a En-Suite		-	162	-	10
103.5.21.006 Standard Room		-	79	-	38
103.5.21.006a En-Suite		-	162	-	10
103.5.21.007 Standard Room		-	79	-	38
103.5.21.007a En-Suite		-	162	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
103.5.21.008 Standard Room		-	79	-	38
103.5.21.008a En-Suite		-	162	-	10
103.5.21.009 Standard Room		-	80	-	38
103.5.21.009a En-Suite		-	162	-	10
103.5.21.010 Standard Room		-	80	-	38
103.5.21.010a En-Suite		-	162	-	10
103.5.21.011 Kitchen, Dining & Lounge		-	61	-	126
103.5.21.018 Circulation		-	91	-	52
103.5.22.001 Standard Room		-	78	-	38
103.5.22.001a En-Suite		-	162	-	10
103.5.22.002 Standard Room		-	79	-	38
103.5.22.002a En-Suite		-	162	-	10
103.5.22.003 Standard Room		-	79	-	38
103.5.22.003a En-Suite		-	164	-	10
103.5.22.004 Standard Room		-	79	-	38
103.5.22.004a En-Suite		-	162	-	10
103.5.22.005 Standard Room		-	79	-	38
103.5.22.005a En-Suite		-	162	-	10
103.5.22.006 Standard Room		-	79	-	38
103.5.22.006a En-Suite		-	162	-	10
103.5.22.007 Standard Room		-	79	-	38
103.5.22.007a En-Suite		-	162	-	10
103.5.22.008 Standard Room		-	79	-	38
103.5.22.008a En-Suite		-	162	-	10
103.5.22.009 Standard Room		-	79	-	38
103.5.22.009a En-Suite		-	162	-	10
103.5.22.010 Standard Room		-	79	-	38
103.5.22.010a En-Suite		-	162	-	10
103.5.22.011 Kitchen, Dining & Lounge		-	62	-	108
103.5.22.018 Circulation		-	87	-	78
103.5.22.019 Plant		120	-	-	97
103.5.22.020 Plant		49	-	-	176
103.5.22.021 Sluice		-	139	-	44
103.5.23.001 Standard Room		-	81	-	38
103.5.23.001a En-Suite		-	162	-	10
103.5.23.002 Standard Room		-	81	-	38
103.5.23.002a En-Suite		-	162	-	10
103.5.23.003 Standard Room		-	79	-	38
103.5.23.003a En-Suite		-	162	-	10
103.5.23.004 Standard Room		-	79	-	38
103.5.23.004a En-Suite		-	162	-	10
103.5.23.005 Standard Room		-	79	-	38
103.5.23.005a En-Suite		-	162	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
103.5.23.006 Standard Room		-	79	-	38
103.5.23.006a En-Suite		-	162	-	10
103.5.23.007 Standard Room		-	79	-	38
103.5.23.007a En-Suite		-	162	-	10
103.5.23.008 Standard Room		-	79	-	38
103.5.23.008a En-Suite		-	162	-	10
103.5.23.009 Standard Room		-	79	-	38
103.5.23.009a En-Suite		-	162	-	10
103.5.23.010 Standard Room		-	79	-	38
103.5.23.010a En-Suite		-	162	-	10
103.5.23.011 Kitchen, Dining & Lounge		-	61	-	126
103.5.23.017 Circulation		-	90	-	65
103.5.24.000 Circulation		-	94	-	52
103.5.24.001 Standard Room		-	80	-	38
103.5.24.001a En-Suite		-	161	-	10
103.5.24.002 Standard Room		-	80	-	38
103.5.24.002a En-Suite		-	172	-	10
103.5.24.003 Standard Room		-	79	-	38
103.5.24.003a En-Suite		-	162	-	10
103.5.24.004 Standard Room		-	79	-	38
103.5.24.004a En-Suite		-	162	-	10
103.5.24.005 Standard Room		-	79	-	38
103.5.24.005a En-Suite		-	162	-	10
103.5.24.006 Standard Room		-	79	-	38
103.5.24.006a En-Suite		-	162	-	10
103.5.24.007 Standard Room		-	79	-	38
103.5.24.007a En-Suite		-	162	-	10
103.5.24.008 Standard Room		-	79	-	38
103.5.24.008a En-Suite		-	162	-	10
103.5.24.009 Standard Room		-	80	-	38
103.5.24.009a En-Suite		-	162	-	10
103.5.24.010 Standard Room		-	80	-	38
103.5.24.010a En-Suite		-	162	-	10
103.5.24.011 Kitchen, Dining & Lounge		-	62	-	126
103.G.00.001 Stair Core A		-	64	-	574
103.G.00.002 Circulation		-	74	-	26
103.G.00.002 Plant		53	-	-	88
103.G.00.003 Circulation		-	63	-	66
103.G.00.004 Stair Core B		-	67	-	534
103.G.00.006 Plant		59	-	-	97
103.G.00.007 Plant		53	-	-	97
103.G.01.001 Part M Room		-	77	-	38
103.G.01.001a Part M En-Suite		-	90	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
103.G.01.002 Standard Room		-	78	-	38
103.G.01.002a En-Suite		-	162	-	10
103.G.01.003 Standard Room		-	78	-	38
103.G.01.003a En-Suite		-	162	-	10
103.G.01.004 Standard Room		-	79	-	38
103.G.01.004a En-Suite		-	162	-	10
103.G.01.005 Standard Room		-	79	-	38
103.G.01.005a En-Suite		-	162	-	10
103.G.01.006 Standard Room		-	79	-	38
103.G.01.006a En-Suite		-	162	-	10
103.G.01.007 Standard Room		-	79	-	38
103.G.01.007a En-Suite		-	162	-	10
103.G.01.008 Standard Room		-	80	-	38
103.G.01.008a En-Suite		-	162	-	10
103.G.01.009 Standard Room		-	80	-	38
103.G.01.009a En-Suite		-	162	-	10
103.G.01.010 Kitchen, Dining & Lounge		-	62	-	126
103.G.01.017 Circulation		-	92	-	52
103.G.01.017 Store		88	-	-	44
103.G.02.001 Standard Room		-	78	-	38
103.G.02.001a En-Suite		-	162	-	10
103.G.02.002 Standard Room		-	79	-	38
103.G.02.002a En-Suite		-	162	-	10
103.G.02.003 Standard Room		-	79	-	38
103.G.02.003a En-Suite		-	164	-	10
103.G.02.004 Standard Room		-	79	-	38
103.G.02.004a En-Suite		-	162	-	10
103.G.02.005 Standard Room		-	79	-	38
103.G.02.005a En-Suite		-	162	-	10
103.G.02.006 Standard Room		-	79	-	38
103.G.02.006a En-Suite		-	162	-	10
103.G.02.007 Standard Room		-	79	-	38
103.G.02.007a En-Suite		-	162	-	10
103.G.02.008 Standard Room		-	79	-	38
103.G.02.008a En-Suite		-	162	-	10
103.G.02.009 Standard Room		-	79	-	38
103.G.02.009a En-Suite		-	162	-	10
103.G.02.010 Standard Room		-	79	-	38
103.G.02.010a En-Suite		-	162	-	10
103.G.02.011 Kitchen, Dining & Lounge		-	62	-	108
103.G.02.018 Circulation		-	87	-	78
103.G.02.019 Sluice		-	93	-	44
103.G.02.020 Plant		120	-	-	97

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
103.G.02.021 Linen Store		62	-	-	88
103.G.03.001 Standard Room		-	81	-	38
103.G.03.001a En-Suite		-	162	-	10
103.G.03.002 Standard Room		-	81	-	38
103.G.03.002a En-Suite		-	162	-	10
103.G.03.003 Standard Room		-	79	-	38
103.G.03.003a En-Suite		-	162	-	10
103.G.03.004 Standard Room		-	79	-	38
103.G.03.004a En-Suite		-	162	-	10
103.G.03.005 Standard Room		-	79	-	38
103.G.03.005a En-Suite		-	162	-	10
103.G.03.006 Standard Room		-	79	-	38
103.G.03.006a En-Suite		-	162	-	10
103.G.03.007 Standard Room		-	79	-	38
103.G.03.007a En-Suite		-	162	-	10
103.G.03.008 Standard Room		-	79	-	38
103.G.03.008a En-Suite		-	162	-	10
103.G.03.009 Standard Room		-	79	-	38
103.G.03.009a En-Suite		-	162	-	10
103.G.03.010 Standard Room		-	79	-	38
103.G.03.010a En-Suite		-	162	-	10
103.G.03.011 Kitchen, Dining & Lounge		-	61	-	126
103.G.03.017 Circulation		-	90	-	65
103.G.04.001 Standard Room		-	80	-	38
103.G.04.001a En-Suite		-	161	-	10
103.G.04.002 Standard Room		-	79	-	38
103.G.04.002a En-Suite		-	162	-	10
103.G.04.003 Standard Room		-	79	-	38
103.G.04.003a En-Suite		-	162	-	10
103.G.04.004 Standard Room		-	79	-	38
103.G.04.004a En-Suite		-	162	-	10
103.G.04.005 Standard Room		-	79	-	38
103.G.04.005a En-Suite		-	162	-	10
103.G.04.006 Standard Room		-	79	-	38
103.G.04.006a En-Suite		-	162	-	10
103.G.04.007 Standard Room		-	79	-	38
103.G.04.007a En-Suite		-	162	-	10
103.G.04.008 Standard Room		-	80	-	38
103.G.04.008a En-Suite		-	162	-	10
103.G.04.009 Standard Room		-	80	-	38
103.G.04.009a En-Suite		-	162	-	10
103.G.04.010 Kitchen, Dining & Lounge		-	62	-	126
103.G.04.017 Circulation		-	94	-	52

General lighting and display lighting		Luminous efficacy [lm/W]		
Zone name		Luminaire	Lamp	Display lamp
	Standard value	60	60	22
103.G.04.019 Store		88	-	-
				44

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?
103.1.05.001 Part M Room	NO (-91.3%)	NO
103.1.05.002 Standard Room	NO (-66.4%)	NO
103.1.05.003 Standard Room	NO (-89.1%)	NO
103.1.05.004 Standard Room	NO (-68%)	NO
103.1.05.005 Standard Room	NO (-74.7%)	NO
103.1.05.006 Standard Room	NO (-67.3%)	NO
103.1.05.007 Standard Room	NO (-86.9%)	NO
103.1.05.008 Standard Room	NO (-67.4%)	NO
103.1.05.009 Standard Room	NO (-83%)	NO
103.1.05.010 Standard Room	NO (-78.6%)	NO
103.1.06.001 Standard Room	NO (-68.5%)	NO
103.1.06.002 Standard Room	NO (-67.3%)	NO
103.1.06.003 Standard Room	NO (-69.7%)	NO
103.1.06.004 Standard Room	NO (-92.2%)	NO
103.1.06.005 Standard Room	NO (-70%)	NO
103.1.06.006 Standard Room	NO (-91.7%)	NO
103.1.06.007 Standard Room	NO (-70%)	NO
103.1.06.008 Standard Room	NO (-85.2%)	NO
103.1.06.009 Standard Room	NO (-69.9%)	NO
103.1.06.010 Standard Room	NO (-90.9%)	NO
103.1.07.001 Standard Room	NO (-81.8%)	NO
103.1.07.002 Standard Room	NO (-90.4%)	NO
103.1.07.003 Standard Room	NO (-70%)	NO
103.1.07.004 Standard Room	NO (-82.5%)	NO
103.1.07.005 Standard Room	NO (-70%)	NO
103.1.07.006 Standard Room	NO (-90.5%)	NO
103.1.07.007 Standard Room	NO (-70%)	NO
103.1.07.008 Standard Room	NO (-90.6%)	NO
103.1.07.009 Standard Room	NO (-83.2%)	NO
103.1.07.010 Standard Room	NO (-83.2%)	NO
103.1.08.001 Standard Room	NO (-90.4%)	NO
103.1.08.002 Standard Room	NO (-81.9%)	NO
103.1.08.003 Standard Room	NO (-81.1%)	NO
103.1.08.004 Standard Room	NO (-70%)	NO
103.1.08.005 Standard Room	NO (-80.8%)	NO
103.1.08.006 Standard Room	NO (-70%)	NO
103.1.08.007 Standard Room	NO (-90.1%)	NO
103.1.08.008 Standard Room	NO (-70%)	NO
103.1.08.009 Standard Room	NO (-87.9%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
103.1.08.010 Standard Room	NO (-81.3%)	NO
103.2.09.001 Part M Room	NO (-92.7%)	NO
103.2.09.002 Standard Room	NO (-66.4%)	NO
103.2.09.003 Standard Room	NO (-75.3%)	NO
103.2.09.004 Standard Room	NO (-68%)	NO
103.2.09.005 Standard Room	NO (-86.7%)	NO
103.2.09.006 Standard Room	NO (-67.3%)	NO
103.2.09.007 Standard Room	NO (-72.9%)	NO
103.2.09.008 Standard Room	NO (-67.4%)	NO
103.2.09.009 Standard Room	NO (-90.2%)	NO
103.2.09.010 Standard Room	NO (-78.6%)	NO
103.2.10.001 Standard Room	NO (-68.5%)	NO
103.2.10.002 Standard Room	NO (-67.3%)	NO
103.2.10.003 Standard Room	NO (-69.7%)	NO
103.2.10.004 Standard Room	NO (-86.4%)	NO
103.2.10.005 Standard Room	NO (-70%)	NO
103.2.10.006 Standard Room	NO (-85.4%)	NO
103.2.10.007 Standard Room	NO (-70%)	NO
103.2.10.008 Standard Room	NO (-91.2%)	NO
103.2.10.009 Standard Room	NO (-69.9%)	NO
103.2.10.010 Standard Room	NO (-83.7%)	NO
103.2.11.001 Standard Room	NO (-81.8%)	NO
103.2.11.002 Standard Room	NO (-81.4%)	NO
103.2.11.003 Standard Room	NO (-70%)	NO
103.2.11.004 Standard Room	NO (-90.4%)	NO
103.2.11.005 Standard Room	NO (-70%)	NO
103.2.11.006 Standard Room	NO (-90.6%)	NO
103.2.11.007 Standard Room	NO (-70%)	NO
103.2.11.008 Standard Room	NO (-82.3%)	NO
103.2.11.009 Standard Room	NO (-90.6%)	NO
103.2.11.010 Standard Room	NO (-83.2%)	NO
103.2.12.001 Standard Room	NO (-81.4%)	NO
103.2.12.002 Standard Room	NO (-81.9%)	NO
103.2.12.003 Standard Room	NO (-90.5%)	NO
103.2.12.004 Standard Room	NO (-70%)	NO
103.2.12.005 Standard Room	NO (-90.3%)	NO
103.2.12.006 Standard Room	NO (-70%)	NO
103.2.12.007 Standard Room	NO (-80.9%)	NO
103.2.12.008 Standard Room	NO (-70%)	NO
103.2.12.009 Standard Room	NO (-93.1%)	NO
103.2.12.010 Standard Room	NO (-81.3%)	NO
103.3.13.001 Part M Room	NO (-89.5%)	NO
103.3.13.002 Standard Room	NO (-66.4%)	NO
103.3.13.003 Standard Room	NO (-86.6%)	NO
103.3.13.004 Standard Room	NO (-68%)	NO
103.3.13.005 Standard Room	NO (-72%)	NO
103.3.13.006 Standard Room	NO (-67.3%)	NO
103.3.13.007 Standard Room	NO (-85.3%)	NO
103.3.13.008 Standard Room	NO (-67.4%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
103.3.13.009 Standard Room	NO (-82.3%)	NO
103.3.13.010 Standard Room	NO (-78.6%)	NO
103.3.14.001 Standard Room	NO (-68.5%)	NO
103.3.14.002 Standard Room	NO (-67.3%)	NO
103.3.14.003 Standard Room	NO (-69.7%)	NO
103.3.14.004 Standard Room	NO (-91.8%)	NO
103.3.14.005 Standard Room	NO (-70%)	NO
103.3.14.006 Standard Room	NO (-91.3%)	NO
103.3.14.007 Standard Room	NO (-70%)	NO
103.3.14.008 Standard Room	NO (-84%)	NO
103.3.14.009 Standard Room	NO (-69.9%)	NO
103.3.14.010 Standard Room	NO (-90.8%)	NO
103.3.15.001 Standard Room	NO (-81.8%)	NO
103.3.15.002 Standard Room	NO (-90.2%)	NO
103.3.15.003 Standard Room	NO (-70%)	NO
103.3.15.004 Standard Room	NO (-81.4%)	NO
103.3.15.005 Standard Room	NO (-70%)	NO
103.3.15.006 Standard Room	NO (-81.4%)	NO
103.3.15.007 Standard Room	NO (-70%)	NO
103.3.15.008 Standard Room	NO (-90.3%)	NO
103.3.15.009 Standard Room	NO (-82.1%)	NO
103.3.15.010 Standard Room	NO (-90.5%)	NO
103.3.16.001 Standard Room	NO (-90.3%)	NO
103.3.16.002 Standard Room	NO (-81.9%)	NO
103.3.16.003 Standard Room	NO (-80.3%)	NO
103.3.16.004 Standard Room	NO (-70%)	NO
103.3.16.005 Standard Room	NO (-80.2%)	NO
103.3.16.006 Standard Room	NO (-70%)	NO
103.3.16.007 Standard Room	NO (-90%)	NO
103.3.16.008 Standard Room	NO (-70%)	NO
103.3.16.009 Standard Room	NO (-87.6%)	NO
103.3.16.010 Standard Room	NO (-81.3%)	NO
103.4.17.001 Part M Room	NO (-91.4%)	NO
103.4.17.002 Standard Room	NO (-66.4%)	NO
103.4.17.003 Standard Room	NO (-72%)	NO
103.4.17.004 Standard Room	NO (-68%)	NO
103.4.17.005 Standard Room	NO (-71.3%)	NO
103.4.17.006 Standard Room	NO (-67.3%)	NO
103.4.17.007 Standard Room	NO (-71.2%)	NO
103.4.17.008 Standard Room	NO (-67.4%)	NO
103.4.17.009 Standard Room	NO (-81.9%)	NO
103.4.17.010 Standard Room	NO (-78.6%)	NO
103.4.18.001 Standard Room	NO (-68.5%)	NO
103.4.18.002 Standard Room	NO (-67.3%)	NO
103.4.18.003 Standard Room	NO (-69.7%)	NO
103.4.18.004 Standard Room	NO (-84.5%)	NO
103.4.18.005 Standard Room	NO (-70%)	NO
103.4.18.006 Standard Room	NO (-83.3%)	NO
103.4.18.007 Standard Room	NO (-70%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
103.4.18.008 Standard Room	NO (-82.5%)	NO
103.4.18.009 Standard Room	NO (-69.9%)	NO
103.4.18.010 Standard Room	NO (-81.9%)	NO
103.4.19.001 Standard Room	NO (-81.8%)	NO
103.4.19.002 Standard Room	NO (-80.2%)	NO
103.4.19.003 Standard Room	NO (-70%)	NO
103.4.19.004 Standard Room	NO (-80.6%)	NO
103.4.19.005 Standard Room	NO (-70%)	NO
103.4.19.006 Standard Room	NO (-80.7%)	NO
103.4.19.007 Standard Room	NO (-70%)	NO
103.4.19.008 Standard Room	NO (-80.9%)	NO
103.4.19.009 Standard Room	NO (-81.2%)	NO
103.4.19.010 Standard Room	NO (-81.4%)	NO
103.4.20.001 Standard Room	NO (-80.3%)	NO
103.4.20.002 Standard Room	NO (-81.9%)	NO
103.4.20.003 Standard Room	NO (-80%)	NO
103.4.20.004 Standard Room	NO (-70%)	NO
103.4.20.005 Standard Room	NO (-79.9%)	NO
103.4.20.006 Standard Room	NO (-70%)	NO
103.4.20.007 Standard Room	NO (-79.9%)	NO
103.4.20.008 Standard Room	NO (-70%)	NO
103.4.20.009 Standard Room	NO (-87.5%)	NO
103.4.20.010 Standard Room	NO (-81.3%)	NO
103.5.21.001 Part M Room	NO (-88%)	NO
103.5.21.002 Standard Room	NO (-66.4%)	NO
103.5.21.003 Standard Room	NO (-71%)	NO
103.5.21.004 Standard Room	NO (-68%)	NO
103.5.21.005 Standard Room	NO (-70.4%)	NO
103.5.21.006 Standard Room	NO (-67.3%)	NO
103.5.21.007 Standard Room	NO (-70.4%)	NO
103.5.21.008 Standard Room	NO (-67.4%)	NO
103.5.21.009 Standard Room	NO (-81.5%)	NO
103.5.21.010 Standard Room	NO (-78.6%)	NO
103.5.22.001 Standard Room	NO (-68.5%)	NO
103.5.22.002 Standard Room	NO (-67.3%)	NO
103.5.22.003 Standard Room	NO (-69.7%)	NO
103.5.22.004 Standard Room	NO (-81.9%)	NO
103.5.22.005 Standard Room	NO (-70%)	NO
103.5.22.006 Standard Room	NO (-81%)	NO
103.5.22.007 Standard Room	NO (-70%)	NO
103.5.22.008 Standard Room	NO (-80.7%)	NO
103.5.22.009 Standard Room	NO (-69.9%)	NO
103.5.22.010 Standard Room	NO (-80.4%)	NO
103.5.23.001 Standard Room	NO (-81.8%)	NO
103.5.23.002 Standard Room	NO (-79.9%)	NO
103.5.23.003 Standard Room	NO (-70%)	NO
103.5.23.004 Standard Room	NO (-79.8%)	NO
103.5.23.005 Standard Room	NO (-70%)	NO
103.5.23.006 Standard Room	NO (-79.9%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
103.5.23.007 Standard Room	NO (-70%)	NO
103.5.23.008 Standard Room	NO (-79.9%)	NO
103.5.23.009 Standard Room	NO (-80%)	NO
103.5.23.010 Standard Room	NO (-80.1%)	NO
103.5.24.001 Standard Room	NO (-80%)	NO
103.5.24.002 Standard Room	NO (-81.9%)	NO
103.5.24.003 Standard Room	NO (-79.8%)	NO
103.5.24.004 Standard Room	NO (-70%)	NO
103.5.24.005 Standard Room	NO (-79.8%)	NO
103.5.24.006 Standard Room	NO (-70%)	NO
103.5.24.007 Standard Room	NO (-79.8%)	NO
103.5.24.008 Standard Room	NO (-70%)	NO
103.5.24.009 Standard Room	NO (-87.4%)	NO
103.5.24.010 Standard Room	NO (-81.3%)	NO
103.G.01.001 Part M Room	NO (-94%)	NO
103.G.01.002 Standard Room	NO (-68%)	NO
103.G.01.003 Standard Room	NO (-78.3%)	NO
103.G.01.004 Standard Room	NO (-67.3%)	NO
103.G.01.005 Standard Room	NO (-75.5%)	NO
103.G.01.006 Standard Room	NO (-67.4%)	NO
103.G.01.007 Standard Room	NO (-74.4%)	NO
103.G.01.008 Standard Room	NO (-82.9%)	NO
103.G.01.009 Standard Room	NO (-83.5%)	NO
103.G.02.001 Standard Room	NO (-68.5%)	NO
103.G.02.002 Standard Room	NO (-67.3%)	NO
103.G.02.003 Standard Room	NO (-69.7%)	NO
103.G.02.004 Standard Room	NO (-86.6%)	NO
103.G.02.005 Standard Room	NO (-70%)	NO
103.G.02.006 Standard Room	NO (-85.7%)	NO
103.G.02.007 Standard Room	NO (-70%)	NO
103.G.02.008 Standard Room	NO (-85.2%)	NO
103.G.02.009 Standard Room	NO (-69.9%)	NO
103.G.02.010 Standard Room	NO (-84.1%)	NO
103.G.03.001 Standard Room	NO (-81.8%)	NO
103.G.03.002 Standard Room	NO (-82%)	NO
103.G.03.003 Standard Room	NO (-70%)	NO
103.G.03.004 Standard Room	NO (-82.2%)	NO
103.G.03.005 Standard Room	NO (-70%)	NO
103.G.03.006 Standard Room	NO (-82.6%)	NO
103.G.03.007 Standard Room	NO (-70%)	NO
103.G.03.008 Standard Room	NO (-82.7%)	NO
103.G.03.009 Standard Room	NO (-83.1%)	NO
103.G.03.010 Standard Room	NO (-83.2%)	NO
103.G.04.001 Standard Room	NO (-81.7%)	NO
103.G.04.002 Standard Room	NO (-70%)	NO
103.G.04.003 Standard Room	NO (-81%)	NO
103.G.04.004 Standard Room	NO (-70%)	NO
103.G.04.005 Standard Room	NO (-80.7%)	NO
103.G.04.006 Standard Room	NO (-70%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
103.G.04.007 Standard Room	NO (-80.8%)	NO
103.G.04.008 Standard Room	NO (-84.3%)	NO
103.G.04.009 Standard Room	NO (-87.8%)	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?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	6569.1	6569.1
External area [m ²]	6275.3	6275.3
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	4	3
Average conductance [W/K]	2662.6	3591.29
Average U-value [W/m ² K]	0.42	0.57
Alpha value* [%]	10.08	10

* 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
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
100 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	63.2	69.92
Cooling	0	0
Auxiliary	5.8	4.13
Lighting	12.06	11.06
Hot water	106.52	105.12
Equipment*	19.46	19.46
TOTAL **	187.58	190.23

* 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]	203.02	251.71
Primary energy* [kWh/m ²]	200.8	194.26
Total emissions [kg/m ²]	34.7	40.9

* 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] Central heating using water: radiators, [HS] District heating, [HFT] District Heating, [CFT] Electricity										
	Actual	264	0	82.2	0	6.2	0.89	0	1	0
	Notional	0	0	0	0	0	0	0	----	----
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0	0	0	0	0
	Notional	327.3	0	90.9	0	5.4	1	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	0.15	10000000:Surf[12]
Floor	0.2	0.14	10000008:Surf[0]
Roof	0.15	0.13	10000008:Surf[1]
Windows, roof windows, and rooflights	1.5	1.4	10000001:Surf[6]
Personnel doors	1.5	2.2	10000251:Surf[1]
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building
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	4

Calculation Sheet

No. of Sheets: 25

Project Title: UoM Fallowfields

Project No. C5219

File No. V:\Contract Files\C5219
Fallowfield\7.0 Design\7.03
Calculations\Thermal
central\ESD\Incoming\BRUKL
EPCs\As Built\Block 104 Heath

Subject: Block 104 'As Built' BRUKL and EPC

Calc No. UoM-HES-104-XX-CA-Y-80-01-AF1

Design Manager: Geoff Evans

Design Phase:

A – Concept or preliminary ☐
B – Analysis and Detailed design ☐
C – Design verification ☐
D – Other (specify) 'As Built' ☒

Designer: Neil Hamilton
Environmental Services Design (ESD)

Computer Applications Used
IES VE

Version/Date
2019

Scope of Checking for Manual & Computer Generated Calculations:

Desktop review against results of Stage 3 and 'As Designed' SBEM calculations.

Sheets Checked*	Calculations by			Checked by		
	Name	Signature	Date	Name	Signature	Date
All	ESD		2020-01-23	Geoff Evans		2020-01-23

*If an Excel spreadsheet or other computer file has been checked and has not been attached, enter the name, date and full file path or server location of the file that was checked.

a) Basic Design Information or Source and Reference:

Documents generated from the IES VE Model referenced as;

- 2020-01-23T133447 EJ1141 S2 B104 Fallowfield 05-11-19 [VE2019] cab

b) Identify documents/technical records where output will be used:

Documents required to demonstrate compliance with the following;

- Building Regulations 2013 Part L2A
- The Energy Performance of Buildings (England and Wales) Regulations 2018

Approved by

Design Manager Geoff Evans

Signature



Date

2020-01-23

Distribution:

Matt Stockton, Vinci Construction UK Ltd

Energy Performance Certificate

Non-Domestic Building



Heath Court
Unsworth Park
20 Chancellors Way
MANCHESTER
M14 6FZ

Certificate Reference Number:
9992-3029-0515-0400-2625

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient

A+

Net zero CO₂ emissions

A 0-25

B 26-50

27

This is how energy efficient the building is.

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

Less energy efficient

Technical Information

Main heating fuel:	District Heating
Building environment:	Heating and Natural Ventilation
Total useful floor area (m ²):	4176
Assessment Level:	5
Building emission rate (kgCO ₂ /m ² per year):	35.93
Primary energy use (kWh/m ² per year):	207.5

Benchmarks

Buildings similar to this one could have ratings as follows:

32

If newly built

85

If typical of the existing stock

Administrative Information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

Assessment Software:	Virtual Environment v7.0.11 using calculation engine ApacheSim v7.0.11
Property Reference:	925564290000
Assessor Name:	Neil Hamilton
Assessor Number:	STRO007864
Accreditation Scheme:	Stroma Certification Ltd
Employer/Trading Name:	Environmental Services Design Ltd
Employer/Trading Address:	Courtyard East, Wharfebank House, Wharfebank Business Centre, Ilkely Road, Otley, LS21 3JP
Issue Date:	22 Jan 2020
Valid Until:	21 Jan 2030 (unless superseded by a later certificate)
Related Party Disclosure:	Not related to the owner.

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report - 0290-0441-9559-2229-6006.

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by Stroma Certification Ltd. You can obtain contact details of the Accreditation Scheme at www.stroma.com.

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at www.opendatacommunities.org.

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. Any personal data it contains will be processed in accordance with the General Data Protection Regulation and all applicable laws and regulations relating to the processing of personal data and privacy. For further information about this and how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at: www.gov.uk/government/collections/energy-performance-certificates. It explains the content and use of this document, advises on how to identify the authenticity of a certificate and how to make a complaint.

Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property – whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.

Project name

Heath Court**As built****Date:** Wed Dec 11 11:21:42 2019**Administrative information****Building Details****Address:** MANCHESTER, M14 6FZ**Certification tool****Calculation engine:** Apache**Calculation engine version:** 7.0.11**Interface to calculation engine:** IES Virtual Environment**Interface to calculation engine version:** 7.0.11**BRUKL compliance check version:** v5.6.a.1**Owner Details****Name:** The University of Manchester**Telephone number:** 0161 306 6000**Address:** Oxford Road, Manchester, M13 9PL**Certifier details****Name:** Neil Hamilton**Telephone number:** 01943 851 016**Address:** Environmental Services Design Ltd, Courtyard East, Wharfebank House, Wharfebank Business Centre, Ilkley Road, Otley, LS21 3JP**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	42.8
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	42.8
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	34.8
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 _a -Limit	U _a -Calc	U _i -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.15	0.15	10000072:Surf[3]
Floor	0.25	0.13	0.13	1000007D:Surf[6]
Roof	0.25	0.13	0.13	1000007D:Surf[7]
Windows***, roof windows, and rooflights	2.2	1.4	1.4	1000000D:Surf[0]
Personnel doors	2.2	1.4	1.4	10000072:Surf[0]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building
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	4

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- Central Heating Using Water: Radiators - District Heating + DHW

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	0	-
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

1- Central Heating Using Water: Radiators - District Heating + DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	-
Standard value	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	
	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
104.1.05.001a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
104.1.05.002a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
104.1.05.003a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
104.1.05.004a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
104.1.05.005a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
104.1.05.006a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
104.1.05.007a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
104.1.05.008a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
104.1.05.009a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
104.1.05.010a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
104.1.05.011 Kitchen, Dining & Lounge		-	-	0.4	-	-	-	-	-	-	-	N/A
104.1.06.001a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
104.1.06.002a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
104.1.06.003a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
104.1.06.004a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
104.1.06.005a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
104.1.06.006a En-Suite		-	-	0.5	-	-	-	-	-	-	-	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	
104.1.06.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.1.06.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.1.06.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.1.06.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.1.06.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.07.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.07.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.07.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.07.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.07.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.07.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.07.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.07.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.07.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.07.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.07.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.07.020 Sluice	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.08.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.08.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.08.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.08.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.08.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.08.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.08.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.08.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.08.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.08.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.1.08.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.09.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.09.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.09.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.09.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.09.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.09.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.09.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.09.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.09.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.09.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.09.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.10.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.10.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.10.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.10.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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	
104.2.10.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.10.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.10.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.10.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.10.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.10.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.2.10.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.11.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.11.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.11.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.11.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.11.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.11.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.11.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.11.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.11.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.11.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.11.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.11.020 Sluice	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.12.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.12.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.12.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.12.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.12.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.12.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.12.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.12.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.12.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.12.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.2.12.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.13.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.13.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.13.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.13.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.13.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.13.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.13.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.13.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.13.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.13.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.13.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.14.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.14.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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	
104.3.14.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.14.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.14.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.14.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.14.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.14.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.14.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.14.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.3.14.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.15.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.15.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.15.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.15.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.15.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.15.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.15.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.15.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.15.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.15.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.15.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.15.021 Sluice	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.16.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.16.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.16.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.16.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.16.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.16.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.16.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.16.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.16.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.16.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.3.16.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.01.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.01.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.01.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.01.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.01.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.01.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.01.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.01.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.01.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.01.010 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.02.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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	
104.G.02.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.02.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.02.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.02.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.02.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.02.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.02.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.02.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.02.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
104.G.02.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.03.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.03.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.03.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.03.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.03.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.03.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.03.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.03.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.03.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.03.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.03.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.03.020 Sluice	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.04.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.04.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.04.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.04.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.04.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.04.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.04.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.04.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.04.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
104.G.04.010 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	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	
104.1.00.001 Circulation		-	79	-	332
104.1.00.002 Circulation		-	79	-	332
104.1.05.001 Standard Room		-	79	-	38
104.1.05.001a En-Suite		-	105	-	10
104.1.05.002 Standard Room		-	79	-	38
104.1.05.002a En-Suite		-	105	-	10
104.1.05.003 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
104.1.05.003a En-Suite		-	105	-	10
104.1.05.004 Standard Room		-	79	-	38
104.1.05.004a En-Suite		-	105	-	10
104.1.05.005 Standard Room		-	79	-	38
104.1.05.005a En-Suite		-	105	-	10
104.1.05.006 Standard Room		-	79	-	38
104.1.05.006a En-Suite		-	105	-	10
104.1.05.007 Standard Room		-	79	-	38
104.1.05.007a En-Suite		-	105	-	10
104.1.05.008 Standard Room		-	79	-	38
104.1.05.008a En-Suite		-	105	-	10
104.1.05.009 Standard Room		-	79	-	38
104.1.05.009a En-Suite		-	105	-	10
104.1.05.010 Standard Room		-	79	-	38
104.1.05.010a En-Suite		-	105	-	10
104.1.05.011 Kitchen, Dining & Lounge		-	63	-	126
104.1.05.018 Circulation		-	79	-	52
104.1.06.001 Standard Room		-	79	-	38
104.1.06.001a En-Suite		-	105	-	10
104.1.06.002 Standard Room		-	79	-	38
104.1.06.002a En-Suite		-	105	-	10
104.1.06.003 Standard Room		-	79	-	38
104.1.06.003a En-Suite		-	105	-	10
104.1.06.004 Standard Room		-	79	-	38
104.1.06.004a En-Suite		-	105	-	10
104.1.06.005 Standard Room		-	79	-	38
104.1.06.005a En-Suite		-	105	-	10
104.1.06.006 Standard Room		-	79	-	38
104.1.06.006a En-Suite		-	105	-	10
104.1.06.007 Standard Room		-	79	-	38
104.1.06.007a En-Suite		-	105	-	10
104.1.06.008 Standard Room		-	79	-	38
104.1.06.008a En-Suite		-	105	-	10
104.1.06.009 Standard Room		-	79	-	38
104.1.06.009a En-Suite		-	105	-	10
104.1.06.010 Standard Room		-	79	-	38
104.1.06.010a En-Suite		-	105	-	10
104.1.06.011 Kitchen, Dining & Lounge		-	63	-	108
104.1.06.017 Circulation		-	79	-	52
104.1.07.001 Standard Room		-	79	-	38
104.1.07.001a En-Suite		-	105	-	10
104.1.07.002 Standard Room		-	79	-	38
104.1.07.002a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
104.1.07.003 Standard Room		-	79	-	38
104.1.07.003a En-Suite		-	105	-	10
104.1.07.004 Standard Room		-	79	-	38
104.1.07.004a En-Suite		-	105	-	10
104.1.07.005 Standard Room		-	79	-	38
104.1.07.005a En-Suite		-	105	-	10
104.1.07.006 Standard Room		-	79	-	38
104.1.07.006a En-Suite		-	105	-	10
104.1.07.007 Standard Room		-	79	-	38
104.1.07.007a En-Suite		-	105	-	10
104.1.07.008 Standard Room		-	79	-	38
104.1.07.008a En-Suite		-	105	-	10
104.1.07.009 Standard Room		-	79	-	38
104.1.07.009a En-Suite		-	105	-	10
104.1.07.010 Standard Room		-	79	-	38
104.1.07.010a En-Suite		-	105	-	10
104.1.07.011 Kitchen, Dining & Lounge		-	63	-	108
104.1.07.018 Circulation		-	79	-	78
104.1.07.019 Plant		67	-	-	88
104.1.07.020 Sluice		-	108	-	44
104.1.07.022 Plant		67	-	-	88
104.1.08.001 Standard Room		-	79	-	38
104.1.08.001a En-Suite		-	105	-	10
104.1.08.002 Standard Room		-	79	-	38
104.1.08.002a En-Suite		-	105	-	10
104.1.08.003 Standard Room		-	79	-	38
104.1.08.003a En-Suite		-	105	-	10
104.1.08.004 Standard Room		-	79	-	38
104.1.08.004a En-Suite		-	105	-	10
104.1.08.005 Standard Room		-	79	-	38
104.1.08.005a En-Suite		-	105	-	10
104.1.08.006 Standard Room		-	79	-	38
104.1.08.006a En-Suite		-	105	-	10
104.1.08.007 Standard Room		-	79	-	38
104.1.08.007a En-Suite		-	105	-	10
104.1.08.008 Standard Room		-	79	-	38
104.1.08.008a En-Suite		-	105	-	10
104.1.08.009 Standard Room		-	79	-	38
104.1.08.009a En-Suite		-	105	-	10
104.1.08.010 Standard Room		-	79	-	38
104.1.08.010a En-Suite		-	105	-	10
104.1.08.011 Kitchen, Dining & Lounge		-	63	-	126
104.1.08.018 Circulation		-	79	-	52

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
104.2.00.001 Circulation		-	79	-	332
104.2.00.002 Circulation		-	79	-	332
104.2.09.001 Standard Room		-	79	-	38
104.2.09.001a En-Suite		-	105	-	10
104.2.09.002 Standard Room		-	79	-	38
104.2.09.002a En-Suite		-	105	-	10
104.2.09.003 Standard Room		-	79	-	38
104.2.09.003a En-Suite		-	105	-	10
104.2.09.004 Standard Room		-	79	-	38
104.2.09.004a En-Suite		-	105	-	10
104.2.09.005 Standard Room		-	79	-	38
104.2.09.005a En-Suite		-	105	-	10
104.2.09.006 Standard Room		-	79	-	38
104.2.09.006a En-Suite		-	105	-	10
104.2.09.007 Standard Room		-	79	-	38
104.2.09.007a En-Suite		-	105	-	10
104.2.09.008 Standard Room		-	79	-	38
104.2.09.008a En-Suite		-	105	-	10
104.2.09.009 Standard Room		-	79	-	38
104.2.09.009a En-Suite		-	105	-	10
104.2.09.010 Standard Room		-	79	-	38
104.2.09.010a En-Suite		-	105	-	10
104.2.09.011 Kitchen, Dining & Lounge		-	63	-	126
104.2.09.018 Circulation		-	79	-	52
104.2.10.001 Standard Room		-	79	-	38
104.2.10.001a En-Suite		-	105	-	10
104.2.10.002 Standard Room		-	79	-	38
104.2.10.002a En-Suite		-	105	-	10
104.2.10.003 Standard Room		-	79	-	38
104.2.10.003a En-Suite		-	105	-	10
104.2.10.004 Standard Room		-	79	-	38
104.2.10.004a En-Suite		-	105	-	10
104.2.10.005 Standard Room		-	79	-	38
104.2.10.005a En-Suite		-	105	-	10
104.2.10.006 Standard Room		-	79	-	38
104.2.10.006a En-Suite		-	105	-	10
104.2.10.007 Standard Room		-	79	-	38
104.2.10.007a En-Suite		-	105	-	10
104.2.10.008 Standard Room		-	79	-	38
104.2.10.008a En-Suite		-	105	-	10
104.2.10.009 Standard Room		-	79	-	38
104.2.10.009a En-Suite		-	105	-	10
104.2.10.010 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
104.2.10.010a En-Suite		-	105	-	10
104.2.10.011 Kitchen, Dining & Lounge		-	63	-	108
104.2.10.017 Circulation		-	79	-	52
104.2.11.001 Standard Room		-	79	-	38
104.2.11.001a En-Suite		-	105	-	10
104.2.11.002 Standard Room		-	79	-	38
104.2.11.002a En-Suite		-	105	-	10
104.2.11.003 Standard Room		-	79	-	38
104.2.11.003a En-Suite		-	105	-	10
104.2.11.004 Standard Room		-	79	-	38
104.2.11.004a En-Suite		-	105	-	10
104.2.11.005 Standard Room		-	79	-	38
104.2.11.005a En-Suite		-	105	-	10
104.2.11.006 Standard Room		-	79	-	38
104.2.11.006a En-Suite		-	105	-	10
104.2.11.007 Standard Room		-	79	-	38
104.2.11.007a En-Suite		-	105	-	10
104.2.11.008 Standard Room		-	79	-	38
104.2.11.008a En-Suite		-	105	-	10
104.2.11.009 Standard Room		-	79	-	38
104.2.11.009a En-Suite		-	105	-	10
104.2.11.010 Standard Room		-	79	-	38
104.2.11.010a En-Suite		-	105	-	10
104.2.11.011 Kitchen, Dining & Lounge		-	63	-	108
104.2.11.018 Circulation		-	79	-	78
104.2.11.019 Plant		67	-	-	88
104.2.11.020 Sluice		-	108	-	44
104.2.11.023 Plant		67	-	-	88
104.2.12.001 Standard Room		-	79	-	38
104.2.12.001a En-Suite		-	105	-	10
104.2.12.002 Standard Room		-	79	-	38
104.2.12.002a En-Suite		-	105	-	10
104.2.12.003 Standard Room		-	79	-	38
104.2.12.003a En-Suite		-	105	-	10
104.2.12.004 Standard Room		-	79	-	38
104.2.12.004a En-Suite		-	105	-	10
104.2.12.005 Standard Room		-	79	-	38
104.2.12.005a En-Suite		-	105	-	10
104.2.12.006 Standard Room		-	79	-	38
104.2.12.006a En-Suite		-	105	-	10
104.2.12.007 Standard Room		-	79	-	38
104.2.12.007a En-Suite		-	105	-	10
104.2.12.008 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
104.2.12.008a En-Suite		-	105	-	10
104.2.12.009 Standard Room		-	79	-	38
104.2.12.009a En-Suite		-	105	-	10
104.2.12.010 Standard Room		-	79	-	38
104.2.12.010a En-Suite		-	105	-	10
104.2.12.011 Kitchen, Dining & Lounge		-	63	-	126
104.2.12.018 Circulation		-	79	-	52
104.3.00.001 Circulation		-	79	-	332
104.3.00.002 Circulation		-	79	-	332
104.3.13.001 Standard Room		-	79	-	38
104.3.13.001a En-Suite		-	105	-	10
104.3.13.002 Standard Room		-	79	-	38
104.3.13.002a En-Suite		-	105	-	10
104.3.13.003 Standard Room		-	79	-	38
104.3.13.003a En-Suite		-	105	-	10
104.3.13.004 Standard Room		-	79	-	38
104.3.13.004a En-Suite		-	105	-	10
104.3.13.005 Standard Room		-	79	-	38
104.3.13.005a En-Suite		-	105	-	10
104.3.13.006 Standard Room		-	79	-	38
104.3.13.006a En-Suite		-	105	-	10
104.3.13.007 Standard Room		-	79	-	38
104.3.13.007a En-Suite		-	105	-	10
104.3.13.008 Standard Room		-	79	-	38
104.3.13.008a En-Suite		-	105	-	10
104.3.13.009 Standard Room		-	79	-	38
104.3.13.009a En-Suite		-	105	-	10
104.3.13.010 Standard Room		-	79	-	38
104.3.13.010a En-Suite		-	105	-	10
104.3.13.011 Kitchen, Dining & Lounge		-	63	-	126
104.3.13.018 Circulation		-	79	-	52
104.3.14.001 Standard Room		-	79	-	38
104.3.14.001a En-Suite		-	105	-	10
104.3.14.002 Standard Room		-	79	-	38
104.3.14.002a En-Suite		-	105	-	10
104.3.14.003 Standard Room		-	79	-	38
104.3.14.003a En-Suite		-	105	-	10
104.3.14.004 Standard Room		-	79	-	38
104.3.14.004a En-Suite		-	105	-	10
104.3.14.005 Standard Room		-	79	-	38
104.3.14.005a En-Suite		-	105	-	10
104.3.14.006 Standard Room		-	79	-	38
104.3.14.006a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
104.3.14.007 Standard Room		-	79	-	38
104.3.14.007a En-Suite		-	105	-	10
104.3.14.008 Standard Room		-	79	-	38
104.3.14.008a En-Suite		-	105	-	10
104.3.14.009 Standard Room		-	79	-	38
104.3.14.009a En-Suite		-	105	-	10
104.3.14.010 Standard Room		-	79	-	38
104.3.14.010a En-Suite		-	105	-	10
104.3.14.011 Kitchen, Dining & Lounge		-	63	-	108
104.3.14.017 Circulation		-	79	-	52
104.3.15.001 Standard Room		-	79	-	38
104.3.15.001a En-Suite		-	105	-	10
104.3.15.002 Standard Room		-	79	-	38
104.3.15.002a En-Suite		-	105	-	10
104.3.15.003 Standard Room		-	79	-	38
104.3.15.003a En-Suite		-	105	-	10
104.3.15.004 Standard Room		-	79	-	38
104.3.15.004a En-Suite		-	105	-	10
104.3.15.005 Standard Room		-	79	-	38
104.3.15.005a En-Suite		-	105	-	10
104.3.15.006 Standard Room		-	79	-	38
104.3.15.006a En-Suite		-	105	-	10
104.3.15.007 Standard Room		-	79	-	38
104.3.15.007a En-Suite		-	105	-	10
104.3.15.008 Standard Room		-	79	-	38
104.3.15.008a En-Suite		-	105	-	10
104.3.15.009 Standard Room		-	79	-	38
104.3.15.009a En-Suite		-	105	-	10
104.3.15.010 Standard Room		-	79	-	38
104.3.15.010a En-Suite		-	105	-	10
104.3.15.011 Kitchen, Dining & Lounge		-	63	-	108
104.3.15.018 Circulation		-	79	-	78
104.3.15.019 Plant		67	-	-	88
104.3.15.020 Plant		67	-	-	88
104.3.15.021 Sluice		-	108	-	44
104.3.16.001 Standard Room		-	79	-	38
104.3.16.001a En-Suite		-	105	-	10
104.3.16.002 Standard Room		-	79	-	38
104.3.16.002a En-Suite		-	105	-	10
104.3.16.003 Standard Room		-	79	-	38
104.3.16.003a En-Suite		-	105	-	10
104.3.16.004 Standard Room		-	79	-	38
104.3.16.004a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
104.3.16.005 Standard Room		-	79	-	38
104.3.16.005a En-Suite		-	105	-	10
104.3.16.006 Standard Room		-	79	-	38
104.3.16.006a En-Suite		-	105	-	10
104.3.16.007 Standard Room		-	79	-	38
104.3.16.007a En-Suite		-	105	-	10
104.3.16.008 Standard Room		-	79	-	38
104.3.16.008a En-Suite		-	105	-	10
104.3.16.009 Standard Room		-	79	-	38
104.3.16.009a En-Suite		-	105	-	10
104.3.16.010 Standard Room		-	79	-	38
104.3.16.010a En-Suite		-	105	-	10
104.3.16.011 Kitchen, Dining & Lounge		-	63	-	126
104.3.16.018 Circulation		-	79	-	52
104.G.00.001 Circulation		-	79	-	332
104.G.00.002 Circulation		-	79	-	332
104.G.00.003 Plant		67	-	-	88
104.G.00.004 Plant		67	-	-	88
104.G.00.005 Plant		67	-	-	97
104.G.01.001 Standard Room		-	79	-	38
104.G.01.001a En-Suite		-	105	-	10
104.G.01.002 Standard Room		-	79	-	38
104.G.01.002a En-Suite		-	105	-	10
104.G.01.003 Standard Room		-	79	-	38
104.G.01.003a En-Suite		-	105	-	10
104.G.01.004 Standard Room		-	79	-	38
104.G.01.004a En-Suite		-	105	-	10
104.G.01.005 Standard Room		-	79	-	38
104.G.01.005a En-Suite		-	105	-	10
104.G.01.006 Standard Room		-	79	-	38
104.G.01.006a En-Suite		-	105	-	10
104.G.01.007 Standard Room		-	79	-	38
104.G.01.007a En-Suite		-	105	-	10
104.G.01.008 Standard Room		-	79	-	38
104.G.01.008a En-Suite		-	105	-	10
104.G.01.009 Standard Room		-	79	-	38
104.G.01.009a En-Suite		-	105	-	10
104.G.01.010 Kitchen, Dining & Lounge		-	63	-	126
104.G.01.017Circulation		-	79	-	52
104.G.01.019 Storage		65	-	-	44
104.G.02.001 Standard Room		-	79	-	38
104.G.02.001a En-Suite		-	105	-	10
104.G.02.002 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
104.G.02.002a En-Suite		-	105	-	10
104.G.02.003 Standard Room		-	79	-	38
104.G.02.003a En-Suite		-	105	-	10
104.G.02.004 Standard Room		-	79	-	38
104.G.02.004a En-Suite		-	105	-	10
104.G.02.005 Standard Room		-	79	-	38
104.G.02.005a En-Suite		-	105	-	10
104.G.02.006 Standard Room		-	79	-	38
104.G.02.006a En-Suite		-	105	-	10
104.G.02.007 Standard Room		-	79	-	38
104.G.02.007a En-Suite		-	105	-	10
104.G.02.008 Standard Room		-	79	-	38
104.G.02.008a En-Suite		-	105	-	10
104.G.02.009 Standard Room		-	79	-	38
104.G.02.009a En-Suite		-	105	-	10
104.G.02.010 Standard Room		-	79	-	38
104.G.02.010a En-Suite		-	105	-	10
104.G.02.011 Kitchen, Dining & Lounge		-	63	-	108
104.G.02.017 Circulation		-	79	-	52
104.G.03.001 Standard Room		-	79	-	38
104.G.03.001a En-Suite		-	105	-	10
104.G.03.002 Standard Room		-	79	-	38
104.G.03.002a En-Suite		-	105	-	10
104.G.03.003 Standard Room		-	79	-	38
104.G.03.003a En-Suite		-	105	-	10
104.G.03.004 Standard Room		-	79	-	38
104.G.03.004a En-Suite		-	105	-	10
104.G.03.005 Standard Room		-	79	-	38
104.G.03.005a En-Suite		-	105	-	10
104.G.03.006 Standard Room		-	79	-	38
104.G.03.006a En-Suite		-	105	-	10
104.G.03.007 Standard Room		-	79	-	29
104.G.03.007a En-Suite		-	105	-	10
104.G.03.008 Standard Room		-	79	-	38
104.G.03.008a En-Suite		-	105	-	10
104.G.03.009 Standard Room		-	79	-	38
104.G.03.009a En-Suite		-	105	-	10
104.G.03.010 Standard Room		-	79	-	38
104.G.03.010a En-Suite		-	105	-	10
104.G.03.011 Kitchen, Dining & Lounge		-	63	-	108
104.G.03.018 Circulation		-	79	-	78
104.G.03.020 Sluice		-	108	-	44
104.G.03.021 Linen Store		65	-	-	57

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
104.G.04.001 Standard Room		-	79	-	38
104.G.04.001a En-Suite		-	105	-	10
104.G.04.002 Standard Room		-	79	-	38
104.G.04.002a En-Suite		-	105	-	10
104.G.04.003 Standard Room		-	79	-	38
104.G.04.003a En-Suite		-	105	-	10
104.G.04.004 Standard Room		-	79	-	38
104.G.04.004a En-Suite		-	105	-	10
104.G.04.005 Standard Room		-	79	-	38
104.G.04.005a En-Suite		-	105	-	10
104.G.04.006 Standard Room		-	79	-	38
104.G.04.006a En-Suite		-	105	-	10
104.G.04.007 Standard Room		-	79	-	38
104.G.04.007a En-Suite		-	105	-	10
104.G.04.008 Standard Room		-	79	-	38
104.G.04.008a En-Suite		-	105	-	10
104.G.04.009 Standard Room		-	79	-	38
104.G.04.009a En-Suite		-	105	-	10
104.G.04.010 Kitchen, Dining & Lounge		-	63	-	126
104.G.04.017 Circulation		-	79	-	52
104.G.04.019 Storage		65	-	-	57

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?
104.1.05.001 Standard Room	NO (-79.5%)	NO
104.1.05.002 Standard Room	NO (-86.2%)	NO
104.1.05.003 Standard Room	NO (-70.6%)	NO
104.1.05.004 Standard Room	NO (-90.2%)	NO
104.1.05.005 Standard Room	NO (-70.6%)	NO
104.1.05.006 Standard Room	NO (-80.8%)	NO
104.1.05.007 Standard Room	NO (-70.6%)	NO
104.1.05.008 Standard Room	NO (-90.3%)	NO
104.1.05.009 Standard Room	NO (-80.2%)	NO
104.1.05.010 Standard Room	NO (-87.6%)	NO
104.1.06.001 Standard Room	NO (-92.8%)	NO
104.1.06.002 Standard Room	NO (-79.7%)	NO
104.1.06.003 Standard Room	NO (-90.3%)	NO
104.1.06.004 Standard Room	NO (-70.9%)	NO
104.1.06.005 Standard Room	NO (-80.5%)	NO
104.1.06.006 Standard Room	NO (-71.3%)	NO
104.1.06.007 Standard Room	NO (-90.3%)	NO
104.1.06.008 Standard Room	NO (-71.6%)	NO
104.1.06.009 Standard Room	NO (-80.8%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
104.1.06.010 Standard Room	NO (-90.2%)	NO
104.1.07.001 Standard Room	NO (-88.5%)	NO
104.1.07.002 Standard Room	NO (-75.8%)	NO
104.1.07.003 Standard Room	NO (-91.2%)	NO
104.1.07.004 Standard Room	NO (-81.1%)	NO
104.1.07.005 Standard Room	NO (-90.3%)	NO
104.1.07.006 Standard Room	NO (-78.4%)	NO
104.1.07.007 Standard Room	NO (-80.5%)	NO
104.1.07.008 Standard Room	NO (-75.5%)	NO
104.1.07.009 Standard Room	NO (-90.3%)	NO
104.1.07.010 Standard Room	NO (-80.9%)	NO
104.1.08.001 Standard Room	NO (-83.1%)	NO
104.1.08.002 Standard Room	NO (-88.7%)	NO
104.1.08.003 Standard Room	NO (-72.2%)	NO
104.1.08.004 Standard Room	NO (-69.8%)	NO
104.1.08.005 Standard Room	NO (-71.1%)	NO
104.1.08.006 Standard Room	NO (-84.3%)	NO
104.1.08.007 Standard Room	NO (-70.7%)	NO
104.1.08.008 Standard Room	NO (-69.7%)	NO
104.1.08.009 Standard Room	NO (-81%)	NO
104.1.08.010 Standard Room	NO (-88.9%)	NO
104.2.09.001 Standard Room	NO (-79.5%)	NO
104.2.09.002 Standard Room	NO (-86.4%)	NO
104.2.09.003 Standard Room	NO (-70.5%)	NO
104.2.09.004 Standard Room	NO (-90.2%)	NO
104.2.09.005 Standard Room	NO (-70.5%)	NO
104.2.09.006 Standard Room	NO (-90.3%)	NO
104.2.09.007 Standard Room	NO (-70.5%)	NO
104.2.09.008 Standard Room	NO (-80.4%)	NO
104.2.09.009 Standard Room	NO (-80.1%)	NO
104.2.09.010 Standard Room	NO (-93.3%)	NO
104.2.10.001 Standard Room	NO (-86.4%)	NO
104.2.10.002 Standard Room	NO (-79.7%)	NO
104.2.10.003 Standard Room	NO (-80.2%)	NO
104.2.10.004 Standard Room	NO (-70.8%)	NO
104.2.10.005 Standard Room	NO (-80.8%)	NO
104.2.10.006 Standard Room	NO (-71%)	NO
104.2.10.007 Standard Room	NO (-90.3%)	NO
104.2.10.008 Standard Room	NO (-71.1%)	NO
104.2.10.009 Standard Room	NO (-90.2%)	NO
104.2.10.010 Standard Room	NO (-80.4%)	NO
104.2.11.001 Standard Room	NO (-88.5%)	NO
104.2.11.002 Standard Room	NO (-86.8%)	NO
104.2.11.003 Standard Room	NO (-83.9%)	NO
104.2.11.004 Standard Room	NO (-80.6%)	NO
104.2.11.005 Standard Room	NO (-90%)	NO
104.2.11.006 Standard Room	NO (-76.5%)	NO
104.2.11.007 Standard Room	NO (-80.7%)	NO
104.2.11.008 Standard Room	NO (-73.6%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
104.2.11.009 Standard Room	NO (-80.6%)	NO
104.2.11.010 Standard Room	NO (-90.3%)	NO
104.2.12.001 Standard Room	NO (-81.4%)	NO
104.2.12.002 Standard Room	NO (-79.7%)	NO
104.2.12.003 Standard Room	NO (-70.7%)	NO
104.2.12.004 Standard Room	NO (-84.3%)	NO
104.2.12.005 Standard Room	NO (-70.2%)	NO
104.2.12.006 Standard Room	NO (-70%)	NO
104.2.12.007 Standard Room	NO (-69.6%)	NO
104.2.12.008 Standard Room	NO (-84.2%)	NO
104.2.12.009 Standard Room	NO (-80.7%)	NO
104.2.12.010 Standard Room	NO (-80.7%)	NO
104.3.13.001 Standard Room	NO (-79.4%)	NO
104.3.13.002 Standard Room	NO (-92.4%)	NO
104.3.13.003 Standard Room	NO (-70.4%)	NO
104.3.13.004 Standard Room	NO (-80.4%)	NO
104.3.13.005 Standard Room	NO (-70.4%)	NO
104.3.13.006 Standard Room	NO (-90%)	NO
104.3.13.007 Standard Room	NO (-70.3%)	NO
104.3.13.008 Standard Room	NO (-80.3%)	NO
104.3.13.009 Standard Room	NO (-80.1%)	NO
104.3.13.010 Standard Room	NO (-93.1%)	NO
104.3.14.001 Standard Room	NO (-92.5%)	NO
104.3.14.002 Standard Room	NO (-79.5%)	NO
104.3.14.003 Standard Room	NO (-80.3%)	NO
104.3.14.004 Standard Room	NO (-70.5%)	NO
104.3.14.005 Standard Room	NO (-89.9%)	NO
104.3.14.006 Standard Room	NO (-70.6%)	NO
104.3.14.007 Standard Room	NO (-80.4%)	NO
104.3.14.008 Standard Room	NO (-70.9%)	NO
104.3.14.009 Standard Room	NO (-89.8%)	NO
104.3.14.010 Standard Room	NO (-80.1%)	NO
104.3.15.001 Standard Room	NO (-88.3%)	NO
104.3.15.002 Standard Room	NO (-75.2%)	NO
104.3.15.003 Standard Room	NO (-91.1%)	NO
104.3.15.004 Standard Room	NO (-75.6%)	NO
104.3.15.005 Standard Room	NO (-80.3%)	NO
104.3.15.006 Standard Room	NO (-73.3%)	NO
104.3.15.007 Standard Room	NO (-89.9%)	NO
104.3.15.008 Standard Room	NO (-72%)	NO
104.3.15.009 Standard Room	NO (-90.1%)	NO
104.3.15.010 Standard Room	NO (-80.3%)	NO
104.3.16.001 Standard Room	NO (-79.3%)	NO
104.3.16.002 Standard Room	NO (-88.5%)	NO
104.3.16.003 Standard Room	NO (-68.5%)	NO
104.3.16.004 Standard Room	NO (-69.2%)	NO
104.3.16.005 Standard Room	NO (-68.4%)	NO
104.3.16.006 Standard Room	NO (-84%)	NO
104.3.16.007 Standard Room	NO (-68.3%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
104.3.16.008 Standard Room	NO (-69.1%)	NO
104.3.16.009 Standard Room	NO (-79.8%)	NO
104.3.16.010 Standard Room	NO (-88.8%)	NO
104.G.01.001 Standard Room	NO (-79.5%)	NO
104.G.01.002 Standard Room	NO (-80.5%)	NO
104.G.01.003 Standard Room	NO (-70.6%)	NO
104.G.01.004 Standard Room	NO (-80.2%)	NO
104.G.01.005 Standard Room	NO (-70.6%)	NO
104.G.01.006 Standard Room	NO (-80.4%)	NO
104.G.01.007 Standard Room	NO (-70.6%)	NO
104.G.01.008 Standard Room	NO (-87.3%)	NO
104.G.01.009 Standard Room	NO (-84.2%)	NO
104.G.02.001 Standard Room	NO (-86.4%)	NO
104.G.02.002 Standard Room	NO (-79.9%)	NO
104.G.02.003 Standard Room	NO (-80.5%)	NO
104.G.02.004 Standard Room	NO (-71.3%)	NO
104.G.02.005 Standard Room	NO (-80.2%)	NO
104.G.02.006 Standard Room	NO (-71.8%)	NO
104.G.02.007 Standard Room	NO (-80.4%)	NO
104.G.02.008 Standard Room	NO (-72%)	NO
104.G.02.009 Standard Room	NO (-80.2%)	NO
104.G.02.010 Standard Room	NO (-80.5%)	NO
104.G.03.001 Standard Room	NO (-79.7%)	NO
104.G.03.002 Standard Room	NO (-75.4%)	NO
104.G.03.003 Standard Room	NO (-83.8%)	NO
104.G.03.004 Standard Room	NO (-81.2%)	NO
104.G.03.005 Standard Room	NO (-80.5%)	NO
104.G.03.006 Standard Room	NO (-78.7%)	NO
104.G.03.007 Standard Room	NO (-80.2%)	NO
104.G.03.008 Standard Room	NO (-76.4%)	NO
104.G.03.009 Standard Room	NO (-80.5%)	NO
104.G.03.010 Standard Room	NO (-80.2%)	NO
104.G.04.001 Standard Room	NO (-83.8%)	NO
104.G.04.002 Standard Room	NO (-69.5%)	NO
104.G.04.003 Standard Room	NO (-74.3%)	NO
104.G.04.004 Standard Room	NO (-69.8%)	NO
104.G.04.005 Standard Room	NO (-72.4%)	NO
104.G.04.006 Standard Room	NO (-69.5%)	NO
104.G.04.007 Standard Room	NO (-71.5%)	NO
104.G.04.008 Standard Room	NO (-80.8%)	NO
104.G.04.009 Standard Room	NO (-85%)	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?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	4175.9	4175.9
External area [m ²]	5051.4	5051.4
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	4	3
Average conductance [W/K]	4550.95	2672.89
Average U-value [W/m ² K]	0.9	0.53
Alpha value* [%]	3.92	10

* 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
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
100 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	65.85	76.62
Cooling	0	0
Auxiliary	6.37	4.32
Lighting	9.77	10.69
Hot water	110.38	108.91
Equipment*	20.56	20.56
TOTAL **	192.36	200.54

* 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]	211.52	275.83
Primary energy* [kWh/m ²]	201.1	202.64
Total emissions [kg/m ²]	34.8	42.8

* 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 SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER	
[ST] Central heating using water: radiators, [HS] District heating, [HFT] District Heating, [CFT] Electricity										
	Actual	265.8	0	82.7	0	6	0.89	0	1	0
	Notional	0	0	0	0	0	0	0	----	----
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0	0	0	0	0
	Notional	346.6	0	96.3	0	5.4	1	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	0.15	10000072:Surf[3]
Floor	0.2	0.13	1000007D:Surf[6]
Roof	0.15	0.13	1000032D:Surf[5]
Windows, roof windows, and rooflights	1.5	1.4	1000000D:Surf[0]
Personnel doors	1.5	1.4	10000072:Surf[0]
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building
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	4

Calculation Sheet

No. of Sheets: 16

Project Title: UoM Fallowfields

Project No. C5219

File No. V:\Contract Files\C5219
Fallowfield\7.0 Design\7.03
Calculations\Thermal
central\ESD\Incoming\BRUKL
EPCs\As Built\Block 105 Mason

Subject: Block 105 'As Built' BRUKL and EPC

Calc No. UoM-HES-105-XX-CA-Y-80-01-AF1

Design Manager: Geoff Evans

Design Phase:

A – Concept or preliminary ☐
B – Analysis and Detailed design ☐
C – Design verification ☐
D – Other (specify) 'As Built' ☒

Designer: Neil Hamilton
Environmental Services Design (ESD)

Computer Applications Used
IES VE

Version/Date
2019

Scope of Checking for Manual & Computer Generated Calculations:

Desktop review against results of Stage 3 and 'As Designed' SBEM calculations.

Sheets Checked*	Calculations by			Checked by		
	Name	Signature	Date	Name	Signature	Date
All	ESD		2020-02-05	Geoff Evans		2020-02-05

*If an Excel spreadsheet or other computer file has been checked and has not been attached, enter the name, date and full file path or server location of the file that was checked.

a) Basic Design Information or Source and Reference:

Documents generated from the IES VE Model referenced as;

- 2020-02-05T133704 EJ1141 S2 B105 Fallowfield 05-11-19 [VE2018] cab

b) Identify documents/technical records where output will be used:

Documents required to demonstrate compliance with the following;

- Building Regulations 2013 Part L2A
- The Energy Performance of Buildings (England and Wales) Regulations 2018

Approved by

Design Manager Geoff Evans

Signature



Date

2020-02-05

Distribution:

Matt Stockton, Vinci Construction UK Ltd

Energy Performance Certificate

Non-Domestic Building



Mason Court
Unsworth Park
20 Chancellors Way
MANCHESTER
M14 6FZ

Certificate Reference Number:
2372-3082-0909-0100-5305

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient

A+

Net zero CO₂ emissions

A 0-25

B 26-50

27

This is how energy efficient the building is.

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

Less energy efficient

Technical Information

Main heating fuel:	District Heating
Building environment:	Heating and Natural Ventilation
Total useful floor area (m ²):	1991
Assessment Level:	5
Building emission rate (kgCO ₂ /m ² per year):	38.53
Primary energy use (kWh/m ² per year):	222.68

Benchmarks

Buildings similar to this one could have ratings as follows:

32

If newly built

84

If typical of the existing stock

Administrative Information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

Assessment Software:	Virtual Environment v7.0.11 using calculation engine ApacheSim v7.0.11
Property Reference:	329931870000
Assessor Name:	Neil Hamilton
Assessor Number:	STRO007864
Accreditation Scheme:	Stroma Certification Ltd
Employer/Trading Name:	Environmental Services Design Ltd
Employer/Trading Address:	Courtyard East, Wharfebank House, Wharfebank Business Centre, Ilkley Road, Otley, LS21 3JP
Issue Date:	05 Feb 2020
Valid Until:	04 Feb 2030 (unless superseded by a later certificate)
Related Party Disclosure:	Not related to the owner.

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report - 0530-0140-7992-2802-3006.

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by Stroma Certification Ltd. You can obtain contact details of the Accreditation Scheme at www.stroma.com.

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at www.opendatacommunities.org.

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. Any personal data it contains will be processed in accordance with the General Data Protection Regulation and all applicable laws and regulations relating to the processing of personal data and privacy. For further information about this and how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at: www.gov.uk/government/collections/energy-performance-certificates. It explains the content and use of this document, advises on how to identify the authenticity of a certificate and how to make a complaint.

Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property – whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.

Project name

Mason Court**As built****Date:** Wed Feb 05 09:05:39 2020

Administrative information

Building Details

Address: MANCHESTER, M14 6FZ

Certification tool

Calculation engine: Apache**Calculation engine version:** 7.0.11**Interface to calculation engine:** IES Virtual Environment**Interface to calculation engine version:** 7.0.11**BRUKL compliance check version:** v5.6.a.1

Owner Details

Name: The University of Manchester**Telephone number:** 0161 306 6000**Address:** Oxford Road, Manchester, M13 9PL

Certifier details

Name: Neil Hamilton**Telephone number:** 01943 851016**Address:** Environmental Services Design Ltd, Courtyard East, Wharfebank House, Wharfebank Business Centre, Ilkley Road, Otley, LS21 3JPCriterion 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	44.7
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	44.7
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	37.3
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	0.15	0.15	1000017D:Surf[3]
Floor	0.25	0.13	0.13	10000190:Surf[7]
Roof	0.25	0.13	0.13	10000190:Surf[8]
Windows***, roof windows, and rooflights	2.2	1.4	1.4	10000199:Surf[0]
Personnel doors	2.2	1.5	2.2	1000015F:Surf[0]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building
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	4

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- Central Heating Using Water: Radiators - District Heating + DHW

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	0	-
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

1- Central Heating Using Water: Radiators - District Heating + DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	-
Standard value	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	
	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		
105.1.03.001a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
105.1.03.002a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
105.1.03.003a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
105.1.03.004a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
105.1.03.005a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
105.1.03.006a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
105.1.03.007a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
105.1.03.008a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
105.1.03.009a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
105.1.03.010a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
105.1.03.011 Kitchen, Dining & Lounge		-	-	0.4	-	-	-	-	-	-	-	N/A
105.1.04.001a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
105.1.04.002a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
105.1.04.003a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
105.1.04.004a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
105.1.04.005a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
105.1.04.006a En-Suite		-	-	0.4	-	-	-	-	-	-	-	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	
105.1.04.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.1.04.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.1.04.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.1.04.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.1.04.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.05.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.05.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.05.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.05.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.05.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.05.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.05.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.05.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.05.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.05.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.05.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.06.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.06.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.06.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.06.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.06.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.06.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.06.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.06.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.06.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.06.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.2.06.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.07.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.07.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.07.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.07.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.07.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.07.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.07.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.07.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.07.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.07.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.07.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.08.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.08.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.08.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.08.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.08.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	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	
105.3.08.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.08.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.08.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.08.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.08.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.3.08.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.01.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.01.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.01.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.01.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.01.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.01.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.01.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.01.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.01.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.01.010 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.02.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.02.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.02.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.02.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.02.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.02.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.02.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.02.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.02.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
105.G.02.010 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	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	
105.1.00.001 Circulation		-	79	-	352
105.1.03.001 Standard Room		-	79	-	38
105.1.03.001a En-Suite		-	105	-	10
105.1.03.002 Standard Room		-	79	-	38
105.1.03.002a En-Suite		-	105	-	10
105.1.03.003 Standard Room		-	79	-	38
105.1.03.003a En-Suite		-	105	-	10
105.1.03.004 Standard Room		-	79	-	38
105.1.03.004a En-Suite		-	105	-	10
105.1.03.005 Standard Room		-	79	-	38
105.1.03.005a En-Suite		-	105	-	10
105.1.03.006 Standard Room		-	79	-	38
105.1.03.006a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
105.1.03.007 Standard Room		-	79	-	38
105.1.03.007a En-Suite		-	105	-	10
105.1.03.008 Standard Room		-	79	-	38
105.1.03.008a En-Suite		-	105	-	10
105.1.03.009 Standard Room		-	79	-	38
105.1.03.009a En-Suite		-	105	-	10
105.1.03.010 Standard Room		-	79	-	38
105.1.03.010a En-Suite		-	105	-	10
105.1.03.011 Kitchen, Dining & Lounge		-	63	-	126
105.1.03.018 Circulation		-	79	-	52
105.1.04.001 Standard Room		-	79	-	38
105.1.04.001a En-Suite		-	105	-	10
105.1.04.002 Standard Room		-	79	-	38
105.1.04.002a En-Suite		-	105	-	10
105.1.04.003 Standard Room		-	79	-	38
105.1.04.003a En-Suite		-	105	-	10
105.1.04.004 Standard Room		-	79	-	38
105.1.04.004a En-Suite		-	105	-	10
105.1.04.005 Standard Room		-	79	-	38
105.1.04.005a En-Suite		-	105	-	10
105.1.04.006 Standard Room		-	79	-	38
105.1.04.006a En-Suite		-	105	-	10
105.1.04.007 Standard Room		-	79	-	38
105.1.04.007a En-Suite		-	105	-	10
105.1.04.008 Standard Room		-	79	-	38
105.1.04.008a En-Suite		-	105	-	10
105.1.04.009 Standard Room		-	79	-	38
105.1.04.009a En-Suite		-	105	-	10
105.1.04.010 Standard Room		-	79	-	38
105.1.04.010a En-Suite		-	105	-	10
105.1.04.011 Kitchen, Dining & Lounge		-	63	-	126
105.1.04.018 Circulation		-	79	-	52
105.2.00.001 Circulation		-	79	-	352
105.2.05.001 Standard Room		-	79	-	38
105.2.05.001a En-Suite		-	105	-	10
105.2.05.002 Standard Room		-	79	-	38
105.2.05.002a En-Suite		-	105	-	10
105.2.05.003 Standard Room		-	79	-	38
105.2.05.003a En-Suite		-	105	-	10
105.2.05.004 Standard Room		-	79	-	38
105.2.05.004a En-Suite		-	105	-	10
105.2.05.005 Standard Room		-	79	-	38
105.2.05.005a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
105.2.05.006 Standard Room		-	79	-	38
105.2.05.006a En-Suite		-	105	-	10
105.2.05.007 Standard Room		-	79	-	38
105.2.05.007a En-Suite		-	105	-	10
105.2.05.008 Standard Room		-	79	-	38
105.2.05.008a En-Suite		-	105	-	10
105.2.05.009 Standard Room		-	79	-	38
105.2.05.009a En-Suite		-	105	-	10
105.2.05.010 Standard Room		-	79	-	38
105.2.05.010a En-Suite		-	105	-	10
105.2.05.011 Kitchen, Dining & Lounge		-	63	-	126
105.2.05.018 Circulation		-	79	-	52
105.2.06.001 Standard Room		-	79	-	38
105.2.06.001a En-Suite		-	105	-	10
105.2.06.002 Standard Room		-	79	-	38
105.2.06.002a En-Suite		-	105	-	10
105.2.06.003 Standard Room		-	79	-	38
105.2.06.003a En-Suite		-	105	-	10
105.2.06.004 Standard Room		-	79	-	38
105.2.06.004a En-Suite		-	105	-	10
105.2.06.005 Standard Room		-	79	-	38
105.2.06.005a En-Suite		-	105	-	10
105.2.06.006 Standard Room		-	79	-	38
105.2.06.006a En-Suite		-	105	-	10
105.2.06.007 Standard Room		-	79	-	38
105.2.06.007a En-Suite		-	105	-	10
105.2.06.008 Standard Room		-	79	-	38
105.2.06.008a En-Suite		-	105	-	10
105.2.06.009 Standard Room		-	79	-	38
105.2.06.009a En-Suite		-	105	-	10
105.2.06.010 Standard Room		-	79	-	38
105.2.06.010a En-Suite		-	105	-	10
105.2.06.011 Kitchen, Dining & Lounge		-	63	-	126
105.2.06.018 Circulation		-	79	-	52
105.3.00.001 Circulation		-	79	-	352
105.3.07.001 Standard Room		-	79	-	38
105.3.07.001a En-Suite		-	105	-	10
105.3.07.002 Standard Room		-	79	-	38
105.3.07.002a En-Suite		-	105	-	10
105.3.07.003 Standard Room		-	79	-	38
105.3.07.003a En-Suite		-	105	-	10
105.3.07.004 Standard Room		-	79	-	38
105.3.07.004a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
105.3.07.005 Standard Room		-	79	-	38
105.3.07.005a En-Suite		-	105	-	10
105.3.07.006 Standard Room		-	79	-	38
105.3.07.006a En-Suite		-	105	-	10
105.3.07.007 Standard Room		-	79	-	38
105.3.07.007a En-Suite		-	105	-	10
105.3.07.008 Standard Room		-	79	-	38
105.3.07.008a En-Suite		-	105	-	10
105.3.07.009 Standard Room		-	79	-	38
105.3.07.009a En-Suite		-	105	-	10
105.3.07.010 Standard Room		-	79	-	38
105.3.07.010a En-Suite		-	105	-	10
105.3.07.011 Kitchen, Dining & Lounge		-	63	-	126
105.3.07.018 Circulation		-	79	-	52
105.3.08.001 Standard Room		-	79	-	38
105.3.08.001a En-Suite		-	105	-	10
105.3.08.002 Standard Room		-	79	-	38
105.3.08.002a En-Suite		-	105	-	10
105.3.08.003 Standard Room		-	79	-	38
105.3.08.003a En-Suite		-	105	-	10
105.3.08.004 Standard Room		-	79	-	38
105.3.08.004a En-Suite		-	105	-	10
105.3.08.005 Standard Room		-	79	-	38
105.3.08.005a En-Suite		-	105	-	10
105.3.08.006 Standard Room		-	79	-	38
105.3.08.006a En-Suite		-	105	-	10
105.3.08.007 Standard Room		-	79	-	38
105.3.08.007a En-Suite		-	105	-	10
105.3.08.008 Standard Room		-	79	-	38
105.3.08.008a En-Suite		-	105	-	10
105.3.08.009 Standard Room		-	79	-	38
105.3.08.009a En-Suite		-	105	-	10
105.3.08.010 Standard Room		-	79	-	38
105.3.08.010a En-Suite		-	105	-	10
105.3.08.011 Kitchen, Dining & Lounge		-	63	-	126
105.3.08.018 Circulation		-	79	-	52
105.G.00.001 Circulation		-	79	-	352
105.G.00.002 Plant		67	-	-	88
105.G.00.003 Plant		67	-	-	44
105.G.01.001 Standard Room		-	79	-	38
105.G.01.001a En-Suite		-	105	-	10
105.G.01.002 Standard Room		-	79	-	38
105.G.01.002a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
105.G.01.003 Standard Room		-	79	-	38
105.G.01.003a En-Suite		-	105	-	10
105.G.01.004 Standard Room		-	79	-	38
105.G.01.004a En-Suite		-	105	-	10
105.G.01.005 Standard Room		-	79	-	38
105.G.01.005a En-Suite		-	105	-	10
105.G.01.006 Standard Room		-	79	-	38
105.G.01.006a En-Suite		-	105	-	10
105.G.01.007 Standard Room		-	79	-	38
105.G.01.007a En-Suite		-	105	-	10
105.G.01.008 Standard Room		-	79	-	38
105.G.01.008a En-Suite		-	105	-	10
105.G.01.009 Standard Room		-	79	-	38
105.G.01.009a En-Suite		-	105	-	10
105.G.01.010 Kitchen, Dining & Lounge		-	63	-	126
105.G.01.017 Circulation		-	79	-	52
105.G.01.018 Sluice		-	108	-	44
105.G.02.001 Standard Room		-	79	-	38
105.G.02.001a En-Suite		-	105	-	10
105.G.02.002 Standard Room		-	79	-	38
105.G.02.002a En-Suite		-	105	-	10
105.G.02.003 Standard Room		-	79	-	38
105.G.02.003a En-Suite		-	105	-	10
105.G.02.004 Standard Room		-	79	-	38
105.G.02.004a En-Suite		-	105	-	10
105.G.02.005 Standard Room		-	79	-	38
105.G.02.005a En-Suite		-	105	-	10
105.G.02.006 Standard Room		-	79	-	38
105.G.02.006a En-Suite		-	105	-	10
105.G.02.007 Standard Room		-	79	-	38
105.G.02.007a En-Suite		-	105	-	10
105.G.02.008 Standard Room		-	79	-	38
105.G.02.008a En-Suite		-	105	-	10
105.G.02.009 Standard Room		-	79	-	38
105.G.02.009a En-Suite		-	105	-	10
105.G.02.010 Kitchen, Dining & Lounge		-	63	-	126
105.G.02.017 Circulation		-	79	-	52
105.G.02.018 Plant		67	-	-	88

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?
105.1.03.001 Standard Room	NO (-77.8%)	NO
105.1.03.002 Standard Room	NO (-88.3%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
105.1.03.003 Standard Room	NO (-67.8%)	NO
105.1.03.004 Standard Room	NO (-84.3%)	NO
105.1.03.005 Standard Room	NO (-67.8%)	NO
105.1.03.006 Standard Room	NO (-69.8%)	NO
105.1.03.007 Standard Room	NO (-67.8%)	NO
105.1.03.008 Standard Room	NO (-84.3%)	NO
105.1.03.009 Standard Room	NO (-79%)	NO
105.1.03.010 Standard Room	NO (-81.1%)	NO
105.1.04.001 Standard Room	NO (-77.3%)	NO
105.1.04.002 Standard Room	NO (-79%)	NO
105.1.04.003 Standard Room	NO (-67.2%)	NO
105.1.04.004 Standard Room	NO (-84.4%)	NO
105.1.04.005 Standard Room	NO (-67.2%)	NO
105.1.04.006 Standard Room	NO (-70%)	NO
105.1.04.007 Standard Room	NO (-67.2%)	NO
105.1.04.008 Standard Room	NO (-84.2%)	NO
105.1.04.009 Standard Room	NO (-79.1%)	NO
105.1.04.010 Standard Room	NO (-88.9%)	NO
105.2.05.001 Standard Room	NO (-77.8%)	NO
105.2.05.002 Standard Room	NO (-79.4%)	NO
105.2.05.003 Standard Room	NO (-67.8%)	NO
105.2.05.004 Standard Room	NO (-84.4%)	NO
105.2.05.005 Standard Room	NO (-67.8%)	NO
105.2.05.006 Standard Room	NO (-70.2%)	NO
105.2.05.007 Standard Room	NO (-67.8%)	NO
105.2.05.008 Standard Room	NO (-70.2%)	NO
105.2.05.009 Standard Room	NO (-79%)	NO
105.2.05.010 Standard Room	NO (-89.2%)	NO
105.2.06.001 Standard Room	NO (-77.3%)	NO
105.2.06.002 Standard Room	NO (-88.4%)	NO
105.2.06.003 Standard Room	NO (-67.2%)	NO
105.2.06.004 Standard Room	NO (-70%)	NO
105.2.06.005 Standard Room	NO (-67.2%)	NO
105.2.06.006 Standard Room	NO (-84.1%)	NO
105.2.06.007 Standard Room	NO (-67.2%)	NO
105.2.06.008 Standard Room	NO (-69.1%)	NO
105.2.06.009 Standard Room	NO (-79.1%)	NO
105.2.06.010 Standard Room	NO (-80.7%)	NO
105.3.07.001 Standard Room	NO (-77.8%)	NO
105.3.07.002 Standard Room	NO (-88.1%)	NO
105.3.07.003 Standard Room	NO (-67.8%)	NO
105.3.07.004 Standard Room	NO (-69.8%)	NO
105.3.07.005 Standard Room	NO (-67.8%)	NO
105.3.07.006 Standard Room	NO (-84%)	NO
105.3.07.007 Standard Room	NO (-67.8%)	NO
105.3.07.008 Standard Room	NO (-84%)	NO
105.3.07.009 Standard Room	NO (-79%)	NO
105.3.07.010 Standard Room	NO (-80.7%)	NO
105.3.08.001 Standard Room	NO (-77.3%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
105.3.08.002 Standard Room	NO (-78.5%)	NO
105.3.08.003 Standard Room	NO (-67.2%)	NO
105.3.08.004 Standard Room	NO (-84%)	NO
105.3.08.005 Standard Room	NO (-67.2%)	NO
105.3.08.006 Standard Room	NO (-69.1%)	NO
105.3.08.007 Standard Room	NO (-67.2%)	NO
105.3.08.008 Standard Room	NO (-69%)	NO
105.3.08.009 Standard Room	NO (-79.1%)	NO
105.3.08.010 Standard Room	NO (-88.8%)	NO
105.G.01.001 Standard Room	NO (-77.8%)	NO
105.G.01.002 Standard Room	NO (-70.2%)	NO
105.G.01.003 Standard Room	NO (-67.8%)	NO
105.G.01.004 Standard Room	NO (-69.8%)	NO
105.G.01.005 Standard Room	NO (-67.8%)	NO
105.G.01.006 Standard Room	NO (-69.8%)	NO
105.G.01.007 Standard Room	NO (-67.8%)	NO
105.G.01.008 Standard Room	NO (-80.7%)	NO
105.G.01.009 Standard Room	NO (-83.5%)	NO
105.G.02.001 Standard Room	NO (-77.5%)	NO
105.G.02.002 Standard Room	NO (-70%)	NO
105.G.02.003 Standard Room	NO (-67.5%)	NO
105.G.02.004 Standard Room	NO (-69.6%)	NO
105.G.02.005 Standard Room	NO (-67.5%)	NO
105.G.02.006 Standard Room	NO (-69.7%)	NO
105.G.02.007 Standard Room	NO (-67.4%)	NO
105.G.02.008 Standard Room	NO (-80.8%)	NO
105.G.02.009 Standard Room	NO (-83.3%)	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?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	1990.7	1990.7
External area [m ²]	2569.3	2569.3
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	4	3
Average conductance [W/K]	2239.29	1408.75
Average U-value [W/m ² K]	0.87	0.55
Alpha value* [%]	4.01	10

* 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
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

100 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	69.96	83.85
Cooling	0	0
Auxiliary	8.02	4.46
Lighting	10.77	10.02
Hot water	113.51	112.6
Equipment*	17.3	17.3
TOTAL **	202.26	210.94

* 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]	224.73	301.88
Primary energy* [kWh/m ²]	215.45	210.32
Total emissions [kg/m ²]	37.3	44.7

* 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] Central heating using water: radiators, [HS] District heating, [HFT] District Heating, [CFT] Electricity										
	Actual	274.1	0	85.3	0	5.8	0.89	0	1	0
	Notional	0	0	0	0	0	0	0	----	----
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0	0	0	0	0
	Notional	368.1	0	102.3	0	5.4	1	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	0.15	1000017D:Surf[3]
Floor	0.2	0.13	10000190:Surf[7]
Roof	0.15	0.13	100001BA:Surf[5]
Windows, roof windows, and rooflights	1.5	1.4	10000199:Surf[0]
Personnel doors	1.5	1.4	1000017D:Surf[0]
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building
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	4

Calculation Sheet

No. of Sheets: 24

Project Title: UoM Fallowfields

Project No. C5219

File No. V:\Contract Files\C5219
Fallowfield\7.0 Design\7.03
Calculations\Thermal
central\ESD\Incoming\BRUKL
EPCs\As Built\Block 106 Bumble

Subject: Block 106 'As Built' BRUKL and EPC

Calc No. UoM-HES-106-XX-CA-Y-80-01-AF1

Design Manager: Geoff Evans

Design Phase:

A – Concept or preliminary ☐
B – Analysis and Detailed design ☐
C – Design verification ☐
D – Other (specify) 'As Built' ☒

Designer: Neil Hamilton
Environmental Services Design (ESD)

Computer Applications Used
IES VE

Version/Date
2019

Scope of Checking for Manual & Computer Generated Calculations:

Desktop review against results of Stage 3 and 'As Designed' SBEM calculations.

Sheets Checked*	Calculations by			Checked by		
	Name	Signature	Date	Name	Signature	Date
All	ESD		2020-01-23	Geoff Evans		2020-01-23

*If an Excel spreadsheet or other computer file has been checked and has not been attached, enter the name, date and full file path or server location of the file that was checked.

a) Basic Design Information or Source and Reference:

Documents generated from the IES VE Model referenced as;

- 2020-01-23T133307 EJ1141 S2 B106 Fallowfield 05-11-19 [VE2019] cab

b) Identify documents/technical records where output will be used:

Documents required to demonstrate compliance with the following;

- Building Regulations 2013 Part L2A
- The Energy Performance of Buildings (England and Wales) Regulations 2018

Approved by

Design Manager Geoff Evans

Signature



Date

2020-01-23

Distribution:

Matt Stockton, Vinci Construction UK Ltd

Energy Performance Certificate

Non-Domestic Building



Bumble Court
Unsworth Park
20 Chancellors Way
MANCHESTER
M14 6FZ

Certificate Reference Number:
2297-3019-0801-0700-2125

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient

A+

Net zero CO₂ emissions

A 0-25

B 26-50

26

This is how energy efficient the building is.

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

Less energy efficient

Technical Information

Main heating fuel:	District Heating
Building environment:	Heating and Natural Ventilation
Total useful floor area (m ²):	4084
Assessment Level:	5
Building emission rate (kgCO ₂ /m ² per year):	34.86
Primary energy use (kWh/m ² per year):	201.24

Benchmarks

Buildings similar to this one could have ratings as follows:

32

If newly built

86

If typical of the existing stock

Administrative Information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

Assessment Software:	Virtual Environment v7.0.12 using calculation engine ApacheSim v7.0.12
Property Reference:	271817190000
Assessor Name:	Neil Hamilton
Assessor Number:	STRO007864
Accreditation Scheme:	Stroma Certification Ltd
Employer/Trading Name:	Environmental Services Design Ltd
Employer/Trading Address:	Courtyard East, Wharfebank House, Wharfebank Business Centre, Ilkley Road, Otley, LS21 3JP
Issue Date:	23 Jan 2020
Valid Until:	22 Jan 2030 (unless superseded by a later certificate)
Related Party Disclosure:	Not related to the owner.

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report - 0220-0740-9812-7129-1006.

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by Stroma Certification Ltd. You can obtain contact details of the Accreditation Scheme at www.stroma.com.

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at www.opendatacommunities.org.

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. Any personal data it contains will be processed in accordance with the General Data Protection Regulation and all applicable laws and regulations relating to the processing of personal data and privacy. For further information about this and how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at: www.gov.uk/government/collections/energy-performance-certificates. It explains the content and use of this document, advises on how to identify the authenticity of a certificate and how to make a complaint.

Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property – whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.

Project name

Bumble Court**As built****Date:** Wed Jan 22 14:44:48 2020

Administrative information

Building Details

Address: MANCHESTER, M14 6FZ

Certification tool

Calculation engine: Apache**Calculation engine version:** 7.0.11**Interface to calculation engine:** IES Virtual Environment**Interface to calculation engine version:** 7.0.11**BRUKL compliance check version:** v5.6.a.1

Owner Details

Name: The University of Manchester**Telephone number:** 0161 306 6000**Address:** Oxford Road, Manchester, M13 9PL

Certifier details

Name: Neil Hamilton**Telephone number:** 0161 851016**Address:** Environmental Services Design, Courtyard East, Wharfebank House, Wharfebank Business Centre, Ilkley Road, Otley, LS21 3JPCriterion 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	43.2
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	43.2
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	33.8
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 _a -Limit	U _a -Calc	U _i -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.15	0.15	10000060:Surf[0]
Floor	0.25	0.13	0.13	1000005D:Surf[6]
Roof	0.25	0.13	0.13	1000013B:Surf[0]
Windows***, roof windows, and rooflights	2.2	1.4	1.4	1000005A:Surf[0]
Personnel doors	2.2	1.46	2.2	WN00000C:Surf[1]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building
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	4

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- Central Heating Using Water: Radiators - District Heating + DHW

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	0	-
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

1- Central Heating Using Water: Radiators - District Heating + DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.005
Standard value	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	
	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		
106.1.05.001a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.05.002a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.05.003a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.05.004a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.05.005a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.05.006a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.05.007a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.05.008a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.05.009a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.05.010a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.06.001a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.06.002a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.06.003a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.06.004a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.06.005a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.06.006a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.06.007a En-Suite		-	-	0.4	-	-	-	-	-	-	-	N/A

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		
106.1.06.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.06.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.06.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.07.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.07.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.07.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.07.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.07.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.07.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.07.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.07.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.07.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.07.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.1.08.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.08.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.08.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.08.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.08.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.08.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.08.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.08.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.08.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.1.08.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.2.09.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.09.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.09.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.09.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.09.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.09.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.09.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.09.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.09.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.09.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.10.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.10.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.10.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.10.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.10.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.10.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.10.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.10.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.10.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.2.10.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	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	
106.2.11.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.11.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.11.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.11.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.11.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.11.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.11.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.11.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.11.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.2.11.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.2.12.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.12.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.12.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.12.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.12.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.12.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.12.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.12.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.12.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.2.12.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.3.13.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.13.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.13.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.13.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.13.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.13.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.13.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.13.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.13.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.13.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.14.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.14.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.14.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.14.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.14.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.14.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.14.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.14.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.14.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.14.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.3.15.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.3.15.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.3.15.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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
106.3.15.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.3.15.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.3.15.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.3.15.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.3.15.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.3.15.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.3.15.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.3.16.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.3.16.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.3.16.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.3.16.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.3.16.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.3.16.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.3.16.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.3.16.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.3.16.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.3.16.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.G.01.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.01.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.01.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.01.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.01.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.01.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.01.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.01.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.01.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.02.001a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.02.002a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.02.003a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.02.004a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.02.005a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.02.006a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.02.007a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.02.008a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.02.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A
106.G.03.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.G.03.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.G.03.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.G.03.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.G.03.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.G.03.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.G.03.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A
106.G.03.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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	
106.G.03.009a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.G.03.010a En-Suite	-	-	0.4	-	-	-	-	-	-	-	N/A	
106.G.04.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.G.04.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.G.04.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.G.04.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.G.04.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.G.04.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.G.04.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.G.04.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
106.G.04.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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	
106.1.00.001 Circulation		-	79	-	332
106.1.00.002 Circulation		-	79	-	276
106.1.05.001 Standard Room		-	79	-	38
106.1.05.001a En-Suite		-	105	-	10
106.1.05.002 Standard Room		-	79	-	38
106.1.05.002a En-Suite		-	105	-	10
106.1.05.003 Standard Room		-	79	-	38
106.1.05.003a En-Suite		-	105	-	10
106.1.05.004 Standard Room		-	79	-	38
106.1.05.004a En-Suite		-	105	-	10
106.1.05.005 Standard Room		-	79	-	38
106.1.05.005a En-Suite		-	105	-	10
106.1.05.006 Standard Room		-	79	-	38
106.1.05.006a En-Suite		-	105	-	10
106.1.05.007 Standard Room		-	79	-	38
106.1.05.007a En-Suite		-	105	-	10
106.1.05.008 Standard Room		-	79	-	38
106.1.05.008a En-Suite		-	105	-	10
106.1.05.009 Standard Room		-	79	-	38
106.1.05.009a En-Suite		-	105	-	10
106.1.05.010 Standard Room		-	79	-	38
106.1.05.010a En-Suite		-	105	-	10
106.1.05.011 Kitchen, Dining & Lounge		-	63	-	126
106.1.05.018 Circulation		-	79	-	52
106.1.06.001 Standard Room		-	79	-	38
106.1.06.001a En-Suite		-	105	-	10
106.1.06.002 Standard Room		-	79	-	38
106.1.06.002a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
106.1.06.003 Standard Room		-	79	-	38
106.1.06.003a En-Suite		-	105	-	10
106.1.06.004 Standard Room		-	79	-	38
106.1.06.004a En-Suite		-	105	-	10
106.1.06.005 Standard Room		-	79	-	38
106.1.06.005a En-Suite		-	105	-	10
106.1.06.006 Standard Room		-	79	-	38
106.1.06.006a En-Suite		-	105	-	10
106.1.06.007 Standard Room		-	79	-	38
106.1.06.007a En-Suite		-	105	-	10
106.1.06.008 Standard Room		-	79	-	38
106.1.06.008a En-Suite		-	105	-	10
106.1.06.009 Standard Room		-	79	-	38
106.1.06.009a En-Suite		-	105	-	10
106.1.06.010 Standard Room		-	79	-	38
106.1.06.010a En-Suite		-	105	-	10
106.1.06.017 Circulation		-	79	-	65
106.1.07.001 Standard Room		-	79	-	38
106.1.07.001a En-Suite		-	105	-	10
106.1.07.002 Standard Room		-	79	-	38
106.1.07.002a En-Suite		-	105	-	10
106.1.07.003 Standard Room		-	79	-	38
106.1.07.003a En-Suite		-	105	-	10
106.1.07.004 Standard Room		-	79	-	38
106.1.07.004a En-Suite		-	105	-	10
106.1.07.005 Standard Room		-	79	-	38
106.1.07.005a En-Suite		-	105	-	10
106.1.07.006 Standard Room		-	79	-	38
106.1.07.006a En-Suite		-	105	-	10
106.1.07.007 Standard Room		-	79	-	38
106.1.07.007a En-Suite		-	105	-	10
106.1.07.008 Standard Room		-	79	-	38
106.1.07.008a En-Suite		-	105	-	10
106.1.07.009 Standard Room		-	79	-	38
106.1.07.009a En-Suite		-	105	-	10
106.1.07.010 Standard Room		-	79	-	38
106.1.07.010a En-Suite		-	105	-	10
106.1.07.011 Kitchen, Dining & Lounge		-	63	-	180
106.1.07.018 Circulation		-	79	-	78
106.1.07.018 Plant		67	-	-	88
106.1.07.019 Sluice		-	108	-	44
106.1.07.020 Store		65	-	-	44
106.1.08.001 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
106.1.08.001a En-Suite		-	105	-	10
106.1.08.002 Standard Room		-	79	-	38
106.1.08.002a En-Suite		-	105	-	10
106.1.08.003 Standard Room		-	79	-	38
106.1.08.003a En-Suite		-	105	-	10
106.1.08.004 Standard Room		-	79	-	38
106.1.08.004a En-Suite		-	105	-	10
106.1.08.005 Standard Room		-	79	-	38
106.1.08.005a En-Suite		-	105	-	10
106.1.08.006 Standard Room		-	79	-	38
106.1.08.006a En-Suite		-	105	-	10
106.1.08.007 Standard Room		-	79	-	38
106.1.08.007a En-Suite		-	105	-	10
106.1.08.008 Standard Room		-	79	-	38
106.1.08.008a En-Suite		-	105	-	10
106.1.08.009 Standard Room		-	79	-	38
106.1.08.009a En-Suite		-	105	-	10
106.1.08.010 Standard Room		-	79	-	38
106.1.08.010a En-Suite		-	105	-	10
106.1.08.011 Kitchen, Dining & Lounge		-	63	-	126
106.1.08.018 Circulation		-	79	-	52
106.1.10.011 Kitchen, Dining & Lounge		-	63	-	176
106.2.00.001 Circulation		-	79	-	332
106.2.00.002 Circulation		-	79	-	276
106.2.06.017 Circulation		-	79	-	65
106.2.09.001 Standard Room		-	79	-	38
106.2.09.001a En-Suite		-	105	-	10
106.2.09.002 Standard Room		-	79	-	38
106.2.09.002a En-Suite		-	105	-	10
106.2.09.003 Standard Room		-	79	-	38
106.2.09.003a En-Suite		-	105	-	10
106.2.09.004 Standard Room		-	79	-	38
106.2.09.004a En-Suite		-	105	-	10
106.2.09.005 Standard Room		-	79	-	38
106.2.09.005a En-Suite		-	105	-	10
106.2.09.006 Standard Room		-	79	-	38
106.2.09.006a En-Suite		-	105	-	10
106.2.09.007 Standard Room		-	79	-	38
106.2.09.007a En-Suite		-	105	-	10
106.2.09.008 Standard Room		-	79	-	38
106.2.09.008a En-Suite		-	105	-	10
106.2.09.009 Standard Room		-	79	-	38
106.2.09.009a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
106.2.09.010 Standard Room		-	79	-	38
106.2.09.010a En-Suite		-	105	-	10
106.2.09.011 Kitchen, Dining & Lounge		-	63	-	126
106.2.09.018 Circulation		-	79	-	52
106.2.10.001 Standard Room		-	79	-	38
106.2.10.001a En-Suite		-	105	-	10
106.2.10.002 Standard Room		-	79	-	38
106.2.10.002a En-Suite		-	105	-	10
106.2.10.003 Standard Room		-	79	-	38
106.2.10.003a En-Suite		-	105	-	10
106.2.10.004 Standard Room		-	79	-	38
106.2.10.004a En-Suite		-	105	-	10
106.2.10.005 Standard Room		-	79	-	38
106.2.10.005a En-Suite		-	105	-	10
106.2.10.006 Standard Room		-	79	-	38
106.2.10.006a En-Suite		-	105	-	10
106.2.10.007 Standard Room		-	79	-	38
106.2.10.007a En-Suite		-	105	-	10
106.2.10.008 Standard Room		-	79	-	38
106.2.10.008a En-Suite		-	105	-	10
106.2.10.009 Standard Room		-	79	-	38
106.2.10.009a En-Suite		-	105	-	10
106.2.10.010 Standard Room		-	79	-	38
106.2.10.010a En-Suite		-	105	-	10
106.2.10.011 Kitchen, Dining & Lounge		-	63	-	176
106.2.11.001 Standard Room		-	79	-	38
106.2.11.001a En-Suite		-	105	-	10
106.2.11.002 Standard Room		-	79	-	38
106.2.11.002a En-Suite		-	105	-	10
106.2.11.003 Standard Room		-	79	-	38
106.2.11.003a En-Suite		-	105	-	10
106.2.11.004 Standard Room		-	79	-	38
106.2.11.004a En-Suite		-	105	-	10
106.2.11.005 Standard Room		-	79	-	38
106.2.11.005a En-Suite		-	105	-	10
106.2.11.006 Standard Room		-	79	-	38
106.2.11.006a En-Suite		-	105	-	10
106.2.11.007 Standard Room		-	79	-	38
106.2.11.007a En-Suite		-	105	-	10
106.2.11.008 Standard Room		-	79	-	38
106.2.11.008a En-Suite		-	105	-	10
106.2.11.009 Standard Room		-	79	-	38
106.2.11.009a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
106.2.11.010 Standard Room		-	79	-	38
106.2.11.010a En-Suite		-	105	-	10
106.2.11.011 Kitchen, Dining & Lounge		-	63	-	180
106.2.11.018 Circulation		-	79	-	78
106.2.11.018 Plant		67	-	-	88
106.2.11.019 Sluice		-	108	-	44
106.2.11.020 Store		65	-	-	44
106.2.12.001 Standard Room		-	79	-	38
106.2.12.001a En-Suite		-	105	-	10
106.2.12.002 Standard Room		-	79	-	38
106.2.12.002a En-Suite		-	105	-	10
106.2.12.003 Standard Room		-	79	-	38
106.2.12.003a En-Suite		-	105	-	10
106.2.12.004 Standard Room		-	79	-	38
106.2.12.004a En-Suite		-	105	-	10
106.2.12.005 Standard Room		-	79	-	38
106.2.12.005a En-Suite		-	105	-	10
106.2.12.006 Standard Room		-	79	-	38
106.2.12.006a En-Suite		-	105	-	10
106.2.12.007 Standard Room		-	79	-	38
106.2.12.007a En-Suite		-	105	-	10
106.2.12.008 Standard Room		-	79	-	38
106.2.12.008a En-Suite		-	105	-	10
106.2.12.009 Standard Room		-	79	-	38
106.2.12.009a En-Suite		-	105	-	10
106.2.12.010 Standard Room		-	79	-	38
106.2.12.010a En-Suite		-	105	-	10
106.2.12.011 Kitchen, Dining & Lounge		-	63	-	126
106.2.12.018 Circulation		-	79	-	52
106.3.00.001 Circulation		-	79	-	332
106.3.00.002 Circulation		-	79	-	276
106.3.13.001 Standard Room		-	79	-	38
106.3.13.001a En-Suite		-	105	-	10
106.3.13.002 Standard Room		-	79	-	38
106.3.13.002a En-Suite		-	105	-	10
106.3.13.003 Standard Room		-	79	-	38
106.3.13.003a En-Suite		-	105	-	10
106.3.13.004 Standard Room		-	79	-	38
106.3.13.004a En-Suite		-	105	-	10
106.3.13.005 Standard Room		-	79	-	38
106.3.13.005a En-Suite		-	105	-	10
106.3.13.006 Standard Room		-	79	-	38
106.3.13.006a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
106.3.13.007 Standard Room		-	79	-	38
106.3.13.007a En-Suite		-	105	-	10
106.3.13.008 Standard Room		-	79	-	38
106.3.13.008a En-Suite		-	105	-	10
106.3.13.009 Standard Room		-	79	-	38
106.3.13.009a En-Suite		-	105	-	10
106.3.13.010 Standard Room		-	79	-	38
106.3.13.010a En-Suite		-	105	-	10
106.3.13.011 Kitchen, Dining & Lounge		-	63	-	126
106.3.13.018 Circulation		-	79	-	52
106.3.14.001 Standard Room		-	79	-	38
106.3.14.001a En-Suite		-	105	-	10
106.3.14.002 Standard Room		-	79	-	38
106.3.14.002a En-Suite		-	105	-	10
106.3.14.003 Standard Room		-	79	-	38
106.3.14.003a En-Suite		-	105	-	10
106.3.14.004 Standard Room		-	79	-	38
106.3.14.004a En-Suite		-	105	-	10
106.3.14.005 Standard Room		-	79	-	38
106.3.14.005a En-Suite		-	105	-	10
106.3.14.006 Standard Room		-	79	-	38
106.3.14.006a En-Suite		-	105	-	10
106.3.14.007 Standard Room		-	79	-	38
106.3.14.007a En-Suite		-	105	-	10
106.3.14.008 Standard Room		-	79	-	38
106.3.14.008a En-Suite		-	105	-	10
106.3.14.009 Standard Room		-	79	-	38
106.3.14.009a En-Suite		-	105	-	10
106.3.14.010 Standard Room		-	79	-	38
106.3.14.010a En-Suite		-	105	-	10
106.3.14.011 Kitchen, Dining & Lounge		-	63	-	176
106.3.14.017 Circulation		-	79	-	65
106.3.15.001 Standard Room		-	79	-	38
106.3.15.001a En-Suite		-	105	-	10
106.3.15.002 Standard Room		-	79	-	38
106.3.15.002a En-Suite		-	105	-	10
106.3.15.003 Standard Room		-	79	-	38
106.3.15.003a En-Suite		-	105	-	10
106.3.15.004 Standard Room		-	79	-	38
106.3.15.004a En-Suite		-	105	-	10
106.3.15.005 Standard Room		-	79	-	38
106.3.15.005a En-Suite		-	105	-	10
106.3.15.006 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
106.3.15.006a En-Suite		-	105	-	10
106.3.15.007 Standard Room		-	79	-	38
106.3.15.007a En-Suite		-	105	-	10
106.3.15.008 Standard Room		-	79	-	38
106.3.15.008a En-Suite		-	105	-	10
106.3.15.009 Standard Room		-	79	-	38
106.3.15.009a En-Suite		-	105	-	10
106.3.15.010 Standard Room		-	79	-	38
106.3.15.010a En-Suite		-	105	-	10
106.3.15.011 Kitchen, Dining & Lounge		-	63	-	180
106.3.15.018 Circulation		-	79	-	78
106.3.15.018 Plant		67	-	-	88
106.3.15.019 Sluice		-	108	-	44
106.3.15.020 Store		65	-	-	44
106.3.16.001 Standard Room		-	79	-	38
106.3.16.001a En-Suite		-	105	-	10
106.3.16.002 Standard Room		-	79	-	38
106.3.16.002a En-Suite		-	105	-	10
106.3.16.003 Standard Room		-	79	-	38
106.3.16.003a En-Suite		-	105	-	10
106.3.16.004 Standard Room		-	79	-	38
106.3.16.004a En-Suite		-	105	-	10
106.3.16.005 Standard Room		-	79	-	38
106.3.16.005a En-Suite		-	105	-	10
106.3.16.006 Standard Room		-	79	-	38
106.3.16.006a En-Suite		-	105	-	10
106.3.16.007 Standard Room		-	79	-	38
106.3.16.007a En-Suite		-	105	-	10
106.3.16.008 Standard Room		-	79	-	38
106.3.16.008a En-Suite		-	105	-	10
106.3.16.009 Standard Room		-	79	-	38
106.3.16.009a En-Suite		-	105	-	10
106.3.16.010 Standard Room		-	79	-	38
106.3.16.010a En-Suite		-	105	-	10
106.3.16.011 Kitchen, Dining & Lounge		-	63	-	126
106.3.16.018 Circulation		-	79	-	52
106.G.00.001 Circulation		-	79	-	332
106.G.00.002 Circulation		-	79	-	276
106.G.00.003 Plant		67	-	-	88
106.G.00.004 Plant		67	-	-	88
106.G.00.005 Plant		67	-	-	88
106.G.00.019 Store		65	-	-	44
106.G.01.001 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
106.G.01.001a En-Suite		-	105	-	10
106.G.01.002 Standard Room		-	79	-	38
106.G.01.002a En-Suite		-	105	-	10
106.G.01.003 Standard Room		-	79	-	38
106.G.01.003a En-Suite		-	105	-	10
106.G.01.004 Standard Room		-	79	-	38
106.G.01.004a En-Suite		-	105	-	10
106.G.01.005 Standard Room		-	79	-	38
106.G.01.005a En-Suite		-	105	-	10
106.G.01.006 Standard Room		-	79	-	38
106.G.01.006a En-Suite		-	105	-	10
106.G.01.007 Standard Room		-	79	-	38
106.G.01.007a En-Suite		-	105	-	10
106.G.01.008 Standard Room		-	79	-	38
106.G.01.008a En-Suite		-	105	-	10
106.G.01.009 Standard Room		-	79	-	38
106.G.01.009a En-Suite		-	105	-	10
106.G.01.010 Kitchen, Dining & Lounge		-	63	-	126
106.G.01.017 Circulation		-	79	-	52
106.G.01.019 Store		65	-	-	44
106.G.02.001 Standard Room		-	79	-	38
106.G.02.001a En-Suite		-	105	-	10
106.G.02.002 Standard Room		-	79	-	38
106.G.02.002a En-Suite		-	105	-	10
106.G.02.003 Standard Room		-	79	-	38
106.G.02.003a En-Suite		-	105	-	10
106.G.02.004 Standard Room		-	79	-	38
106.G.02.004a En-Suite		-	105	-	10
106.G.02.005 Standard Room		-	79	-	38
106.G.02.005a En-Suite		-	105	-	10
106.G.02.006 Standard Room		-	79	-	38
106.G.02.006a En-Suite		-	105	-	10
106.G.02.007 Standard Room		-	79	-	38
106.G.02.007a En-Suite		-	105	-	10
106.G.02.008 Standard Room		-	79	-	38
106.G.02.008a En-Suite		-	105	-	10
106.G.02.009 Standard Room		-	79	-	38
106.G.02.009a En-Suite		-	105	-	10
106.G.02.010 Kitchen, Dining & Lounge		-	63	-	176
106.G.02.017 Circulation		-	79	-	65
106.G.02.018 Plant		67	-	-	88
106.G.03.001 Standard Room		-	79	-	38
106.G.03.001a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
106.G.03.002 Standard Room		-	79	-	38
106.G.03.002a En-Suite		-	105	-	10
106.G.03.003 Standard Room		-	79	-	38
106.G.03.003a En-Suite		-	105	-	10
106.G.03.004 Standard Room		-	79	-	38
106.G.03.004a En-Suite		-	105	-	10
106.G.03.005 Standard Room		-	79	-	38
106.G.03.005a En-Suite		-	105	-	10
106.G.03.006 Standard Room		-	79	-	38
106.G.03.006a En-Suite		-	105	-	10
106.G.03.007 Standard Room		-	79	-	38
106.G.03.007a En-Suite		-	105	-	10
106.G.03.008 Standard Room		-	79	-	38
106.G.03.008a En-Suite		-	105	-	10
106.G.03.009 Standard Room		-	79	-	38
106.G.03.009a En-Suite		-	105	-	10
106.G.03.010 Standard Room		-	79	-	38
106.G.03.010a En-Suite		-	105	-	10
106.G.03.011 Kitchen, Dining & Lounge		-	63	-	180
106.G.03.018 Circulation		-	79	-	78
106.G.03.018 Plant		67	-	-	88
106.G.03.019 Sluice		-	108	-	44
106.G.03.020 Store		65	-	-	44
106.G.04.001 Standard Room		-	79	-	38
106.G.04.001a En-Suite		-	105	-	10
106.G.04.002 Standard Room		-	79	-	38
106.G.04.002a En-Suite		-	105	-	10
106.G.04.003 Standard Room		-	79	-	38
106.G.04.003a En-Suite		-	105	-	10
106.G.04.004 Standard Room		-	79	-	38
106.G.04.004a En-Suite		-	105	-	10
106.G.04.005 Standard Room		-	79	-	38
106.G.04.005a En-Suite		-	105	-	10
106.G.04.006 Standard Room		-	79	-	38
106.G.04.006a En-Suite		-	105	-	10
106.G.04.007 Standard Room		-	79	-	38
106.G.04.007a En-Suite		-	105	-	10
106.G.04.008 Standard Room		-	79	-	38
106.G.04.008a En-Suite		-	105	-	10
106.G.04.009 Standard Room		-	79	-	38
106.G.04.009a En-Suite		-	105	-	10
106.G.04.010 Kitchen, Dining & Lounge		-	63	-	126
106.G.04.017 Circulation		-	79	-	52

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?
106.1.05.001 Standard Room	NO (-87%)	NO
106.1.05.002 Standard Room	NO (-79.2%)	NO
106.1.05.003 Standard Room	NO (-81.2%)	NO
106.1.05.004 Standard Room	NO (-70.3%)	NO
106.1.05.005 Standard Room	NO (-81.2%)	NO
106.1.05.006 Standard Room	NO (-70.3%)	NO
106.1.05.007 Standard Room	NO (-81.2%)	NO
106.1.05.008 Standard Room	NO (-70.3%)	NO
106.1.05.009 Standard Room	NO (-87.6%)	NO
106.1.05.010 Standard Room	NO (-81.5%)	NO
106.1.06.001 Standard Room	NO (-87.3%)	NO
106.1.06.002 Standard Room	NO (-79%)	NO
106.1.06.003 Standard Room	NO (-82.6%)	NO
106.1.06.004 Standard Room	NO (-70.3%)	NO
106.1.06.005 Standard Room	NO (-82.9%)	NO
106.1.06.006 Standard Room	NO (-70.3%)	NO
106.1.06.007 Standard Room	NO (-83.9%)	NO
106.1.06.008 Standard Room	NO (-70.3%)	NO
106.1.06.009 Standard Room	NO (-70.3%)	NO
106.1.06.010 Standard Room	NO (-70.4%)	NO
106.1.07.001 Standard Room	NO (-81.2%)	NO
106.1.07.002 Standard Room	NO (-77.7%)	NO
106.1.07.003 Standard Room	NO (-76.2%)	NO
106.1.07.004 Standard Room	NO (-68.3%)	NO
106.1.07.005 Standard Room	NO (-81.6%)	NO
106.1.07.006 Standard Room	NO (-68.3%)	NO
106.1.07.007 Standard Room	NO (-68.3%)	NO
106.1.07.008 Standard Room	NO (-68.3%)	NO
106.1.07.009 Standard Room	NO (-73.2%)	NO
106.1.07.010 Standard Room	NO (-70.8%)	NO
106.1.08.001 Standard Room	NO (-79.6%)	NO
106.1.08.002 Standard Room	NO (-77.9%)	NO
106.1.08.003 Standard Room	NO (-70.5%)	NO
106.1.08.004 Standard Room	NO (-68.3%)	NO
106.1.08.005 Standard Room	NO (-70.1%)	NO
106.1.08.006 Standard Room	NO (-68.3%)	NO
106.1.08.007 Standard Room	NO (-70.1%)	NO
106.1.08.008 Standard Room	NO (-68.4%)	NO
106.1.08.009 Standard Room	NO (-80.9%)	NO
106.1.08.010 Standard Room	NO (-79.8%)	NO
106.2.09.001 Standard Room	NO (-86.8%)	NO
106.2.09.002 Standard Room	NO (-79.2%)	NO
106.2.09.003 Standard Room	NO (-81.1%)	NO
106.2.09.004 Standard Room	NO (-70.3%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
106.2.09.005 Standard Room	NO (-81.1%)	NO
106.2.09.006 Standard Room	NO (-70.3%)	NO
106.2.09.007 Standard Room	NO (-80.8%)	NO
106.2.09.008 Standard Room	NO (-70.3%)	NO
106.2.09.009 Standard Room	NO (-87.4%)	NO
106.2.09.010 Standard Room	NO (-81.5%)	NO
106.2.10.001 Standard Room	NO (-87.2%)	NO
106.2.10.002 Standard Room	NO (-79%)	NO
106.2.10.003 Standard Room	NO (-81.9%)	NO
106.2.10.004 Standard Room	NO (-70.3%)	NO
106.2.10.005 Standard Room	NO (-82.4%)	NO
106.2.10.006 Standard Room	NO (-70.3%)	NO
106.2.10.007 Standard Room	NO (-82.9%)	NO
106.2.10.008 Standard Room	NO (-70.3%)	NO
106.2.10.009 Standard Room	NO (-70.3%)	NO
106.2.10.010 Standard Room	NO (-70.3%)	NO
106.2.11.001 Standard Room	NO (-79.8%)	NO
106.2.11.002 Standard Room	NO (-77.7%)	NO
106.2.11.003 Standard Room	NO (-73.7%)	NO
106.2.11.004 Standard Room	NO (-68.3%)	NO
106.2.11.005 Standard Room	NO (-79.7%)	NO
106.2.11.006 Standard Room	NO (-68.3%)	NO
106.2.11.007 Standard Room	NO (-68.3%)	NO
106.2.11.008 Standard Room	NO (-68.3%)	NO
106.2.11.009 Standard Room	NO (-73.2%)	NO
106.2.11.010 Standard Room	NO (-70.6%)	NO
106.2.12.001 Standard Room	NO (-79.3%)	NO
106.2.12.002 Standard Room	NO (-77.9%)	NO
106.2.12.003 Standard Room	NO (-70.2%)	NO
106.2.12.004 Standard Room	NO (-68.3%)	NO
106.2.12.005 Standard Room	NO (-69.9%)	NO
106.2.12.006 Standard Room	NO (-68.3%)	NO
106.2.12.007 Standard Room	NO (-70%)	NO
106.2.12.008 Standard Room	NO (-68.4%)	NO
106.2.12.009 Standard Room	NO (-80.6%)	NO
106.2.12.010 Standard Room	NO (-79.8%)	NO
106.3.13.001 Standard Room	NO (-86.5%)	NO
106.3.13.002 Standard Room	NO (-79.2%)	NO
106.3.13.003 Standard Room	NO (-80.7%)	NO
106.3.13.004 Standard Room	NO (-70.3%)	NO
106.3.13.005 Standard Room	NO (-80.6%)	NO
106.3.13.006 Standard Room	NO (-70.3%)	NO
106.3.13.007 Standard Room	NO (-80.4%)	NO
106.3.13.008 Standard Room	NO (-70.3%)	NO
106.3.13.009 Standard Room	NO (-87.2%)	NO
106.3.13.010 Standard Room	NO (-81.5%)	NO
106.3.14.001 Standard Room	NO (-86.6%)	NO
106.3.14.002 Standard Room	NO (-79%)	NO
106.3.14.003 Standard Room	NO (-81.3%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
106.3.14.004 Standard Room	NO (-70.3%)	NO
106.3.14.005 Standard Room	NO (-81.4%)	NO
106.3.14.006 Standard Room	NO (-70.3%)	NO
106.3.14.007 Standard Room	NO (-81.5%)	NO
106.3.14.008 Standard Room	NO (-70.3%)	NO
106.3.14.009 Standard Room	NO (-70.3%)	NO
106.3.14.010 Standard Room	NO (-70.3%)	NO
106.3.15.001 Standard Room	NO (-79.1%)	NO
106.3.15.002 Standard Room	NO (-77.7%)	NO
106.3.15.003 Standard Room	NO (-71.1%)	NO
106.3.15.004 Standard Room	NO (-68.3%)	NO
106.3.15.005 Standard Room	NO (-72.4%)	NO
106.3.15.006 Standard Room	NO (-68.3%)	NO
106.3.15.007 Standard Room	NO (-68.3%)	NO
106.3.15.008 Standard Room	NO (-68.3%)	NO
106.3.15.009 Standard Room	NO (-71.2%)	NO
106.3.15.010 Standard Room	NO (-70.4%)	NO
106.3.16.001 Standard Room	NO (-78.9%)	NO
106.3.16.002 Standard Room	NO (-77.9%)	NO
106.3.16.003 Standard Room	NO (-69.7%)	NO
106.3.16.004 Standard Room	NO (-68.3%)	NO
106.3.16.005 Standard Room	NO (-69.3%)	NO
106.3.16.006 Standard Room	NO (-68.3%)	NO
106.3.16.007 Standard Room	NO (-69.4%)	NO
106.3.16.008 Standard Room	NO (-68.4%)	NO
106.3.16.009 Standard Room	NO (-80.4%)	NO
106.3.16.010 Standard Room	NO (-79.8%)	NO
106.G.01.001 Standard Room	NO (-87.2%)	NO
106.G.01.002 Standard Room	NO (-70.3%)	NO
106.G.01.003 Standard Room	NO (-81.4%)	NO
106.G.01.004 Standard Room	NO (-70.3%)	NO
106.G.01.005 Standard Room	NO (-81.3%)	NO
106.G.01.006 Standard Room	NO (-70.3%)	NO
106.G.01.007 Standard Room	NO (-81.1%)	NO
106.G.01.008 Standard Room	NO (-81.5%)	NO
106.G.01.009 Standard Room	NO (-90.1%)	NO
106.G.02.001 Standard Room	NO (-87.6%)	NO
106.G.02.002 Standard Room	NO (-70.3%)	NO
106.G.02.003 Standard Room	NO (-82.8%)	NO
106.G.02.004 Standard Room	NO (-70.3%)	NO
106.G.02.005 Standard Room	NO (-83.4%)	NO
106.G.02.006 Standard Room	NO (-70.3%)	NO
106.G.02.007 Standard Room	NO (-84.2%)	NO
106.G.02.008 Standard Room	NO (-70.3%)	NO
106.G.02.009 Standard Room	NO (-70.3%)	NO
106.G.03.001 Standard Room	NO (-82.6%)	NO
106.G.03.002 Standard Room	NO (-77.7%)	NO
106.G.03.003 Standard Room	NO (-78.4%)	NO
106.G.03.004 Standard Room	NO (-68.3%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
106.G.03.005 Standard Room	NO (-81.5%)	NO
106.G.03.006 Standard Room	NO (-68.3%)	NO
106.G.03.007 Standard Room	NO (-68.3%)	NO
106.G.03.008 Standard Room	NO (-68.3%)	NO
106.G.03.009 Standard Room	NO (-71.9%)	NO
106.G.03.010 Standard Room	NO (-70.7%)	NO
106.G.04.001 Standard Room	NO (-80.3%)	NO
106.G.04.002 Standard Room	NO (-68.4%)	NO
106.G.04.003 Standard Room	NO (-71.1%)	NO
106.G.04.004 Standard Room	NO (-68.4%)	NO
106.G.04.005 Standard Room	NO (-70.4%)	NO
106.G.04.006 Standard Room	NO (-68.5%)	NO
106.G.04.007 Standard Room	NO (-70.3%)	NO
106.G.04.008 Standard Room	NO (-79.8%)	NO
106.G.04.009 Standard Room	NO (-84.7%)	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?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	4083.9	4083.9
External area [m ²]	4841	4841
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	4	3
Average conductance [W/K]	4600.1	2578.05
Average U-value [W/m ² K]	0.95	0.53
Alpha value* [%]	4.03	10

* 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
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

100 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	69.68	79.03
Cooling	0	0
Auxiliary	4.82	3.78
Lighting	9.75	10.78
Hot water	104.92	109.81
Equipment*	15.93	15.93
TOTAL **	189.17	203.39

* 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]	223.83	284.5
Primary energy* [kWh/m ²]	194.9	204.08
Total emissions [kg/m ²]	33.8	43.2

* 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 SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER	
[ST] Central heating using water: radiators, [HS] District heating, [HFT] District Heating, [CFT] Electricity										
	Actual	279	0	86.9	0	4.7	0.89	0	1	0
	Notional	0	0	0	0	0	0	0	----	----
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0	0	0	0	0
	Notional	354.7	0	98.5	0	4.7	1	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	0.15	10000060:Surf[0]
Floor	0.2	0.13	1000005D:Surf[6]
Roof	0.15	0.13	1000043C:Surf[6]
Windows, roof windows, and rooflights	1.5	1.4	1000005A:Surf[0]
Personnel doors	1.5	1.4	10000060:Surf[1]
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building
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	4

Calculation Sheet

No. of Sheets: 20

Project Title: UoM Fallowfields

Project No. C5219

File No. V:\Contract Files\C5219
Fallowfield\7.0 Design\7.03
Calculations\Thermal
central\ESD\Incoming\BRUKL
EPCs\As Built\Block 107 Carder

Subject: Block 107 'As Built' BRUKL and EPC

Calc No. UoM-HES-107-XX-CA-Y-80-01-AF1

Design Manager: Geoff Evans

Design Phase:

A – Concept or preliminary ☐
B – Analysis and Detailed design ☐
C – Design verification ☐
D – Other (specify) 'As Built' ☒

Designer: Neil Hamilton
Environmental Services Design (ESD)

Computer Applications Used
IES VE

Version/Date
2019

Scope of Checking for Manual & Computer Generated Calculations:

Desktop review against results of Stage 3 and 'As Designed' SBEM calculations.

Sheets Checked*	Calculations by			Checked by		
	Name	Signature	Date	Name	Signature	Date
All	ESD		2019-09-30	Geoff Evans		2019-10-01

*If an Excel spreadsheet or other computer file has been checked and has not been attached, enter the name, date and full file path or server location of the file that was checked.

a) Basic Design Information or Source and Reference:

Documents generated from the IES VE Model referenced as;

- 2019-10-02T091431 EJ1141 S2 B107 Fallowfield 13-08-19 [VE2018]cab

b) Identify documents/technical records where output will be used:

Documents required to demonstrate compliance with the following;

- Building Regulations 2013 Part L2A
- The Energy Performance of Buildings (England and Wales) Regulations 2018

Approved by

Design Manager Geoff Evans

Signature



Date

2019-10-01

Distribution:

Matt Stockton, Vinci Construction UK Ltd

Energy Performance Certificate

Non-Domestic Building



Carder Court
Unsworth Park
20 Chancellors Way
MANCHESTER
M14 6FZ

Certificate Reference Number:
9135-3051-0519-0600-0971

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient



Net zero CO₂ emissions

A 0-25

B 26-50

27

This is how energy efficient the building is.

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

Less energy efficient

Technical Information

Main heating fuel:	District Heating
Building environment:	Heating and Natural Ventilation
Total useful floor area (m ²):	3088
Assessment Level:	5
Building emission rate (kgCO ₂ /m ² per year):	36.8
Primary energy use (kWh/m ² per year):	212.69

Benchmarks

Buildings similar to this one could have ratings as follows:

31

If newly built

83

If typical of the existing stock

Administrative Information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

Assessment Software:	Virtual Environment v7.0.11 using calculation engine ApacheSim v7.0.11
Property Reference:	159596530000
Assessor Name:	Neil Hamilton
Assessor Number:	STRO007864
Accreditation Scheme:	Stroma Certification Ltd
Employer/Trading Name:	Environmental Services Design Ltd
Employer/Trading Address:	Courtyard East, Wharfebank House, Wharfebank Business Centre, Ilkley Road, Otley, LS21 3JP
Issue Date:	30 Sep 2019
Valid Until:	29 Sep 2029 (unless superseded by a later certificate)
Related Party Disclosure:	Not related to the owner.

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report - 0010-0641-3599-5571-9002.

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by Stroma Certification Ltd. You can obtain contact details of the Accreditation Scheme at www.stroma.com.

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at www.opendatacommunities.org.

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. Any personal data it contains will be processed in accordance with the General Data Protection Regulation and all applicable laws and regulations relating to the processing of personal data and privacy. For further information about this and how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at: www.gov.uk/government/collections/energy-performance-certificates. It explains the content and use of this document, advises on how to identify the authenticity of a certificate and how to make a complaint.

Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property – whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.

Project name

Carder Court**As built****Date:** Fri Sep 27 11:40:41 2019

Administrative information

Building Details

Address: MANCHESTER, M14 6FZ

Certification tool

Calculation engine: Apache**Calculation engine version:** 7.0.11**Interface to calculation engine:** IES Virtual Environment**Interface to calculation engine version:** 7.0.11**BRUKL compliance check version:** v5.6.a.1

Owner Details

Name: The University of Manchester**Telephone number:** 0161 306 6000**Address:** Oxford Road, Manchester, M13 9PL

Certifier details

Name: Neil Hamilton**Telephone number:** 01943 851016**Address:** Environmental Services Design Ltd, Courtyard East, Wharfebank House, Wharfebank Business Centre, Ilkley Road, Otley, LS21 3JPCriterion 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	43.1
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	43.1
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	35.7
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	0.15	0.15	10000000:Surf[6]
Floor	0.25	0.13	0.13	10000017:Surf[7]
Roof	0.25	0.13	0.13	100000B2:Surf[0]
Windows***, roof windows, and rooflights	2.2	1.4	1.4	10000000:Surf[0]
Personnel doors	2.2	2.2	2.2	1000010D:Surf[1]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building
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- Central Heating Using Water: Radiators - District Heating + DHW

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	0	-
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

"No HWS in project, or hot water is provided by HVAC system"

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		
107.1.04.001a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.04.002a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.04.003a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.04.004a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.04.005a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.04.006a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.04.007a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.04.008a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.04.009a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.04.010a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.04.011 Kitchen, Dining & Lounge		-	-	0.4	-	-	-	-	-	-	-	N/A
107.1.05.001a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.05.002a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.05.003a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.05.004a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.05.005a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.05.006a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.05.007a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.05.008a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
107.1.05.009a En-Suite		-	-	0.5	-	-	-	-	-	-	-	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	
107.1.05.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.1.05.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
107.1.06.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.1.06.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.1.06.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.1.06.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.1.06.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.1.06.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.1.06.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.1.06.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.1.06.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.1.06.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.1.06.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
107.2.06.103 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
107.2.07.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.07.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.07.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.07.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.07.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.07.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.07.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.07.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.07.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.07.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.07.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
107.2.08.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.08.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.08.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.08.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.08.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.08.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.08.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.08.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.08.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.08.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.09.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.09.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.09.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.09.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.09.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.09.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.09.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.09.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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	
107.2.09.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.09.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.2.09.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
107.3.10.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.10.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.10.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.10.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.10.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.10.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.10.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.10.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.10.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.10.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.10.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
107.3.11.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.11.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.11.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.11.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.11.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.11.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.11.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.11.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.11.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.11.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.11.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
107.3.12.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.12.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.12.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.12.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.12.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.12.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.12.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.12.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.12.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.12.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.3.12.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
107.G.01.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.01.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.01.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.01.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.01.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.01.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.01.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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	
107.G.01.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.01.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.01.010 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
107.G.02.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.02.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.02.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.02.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.02.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.02.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.02.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.02.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.02.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.02.010 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
107.G.03.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.03.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.03.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.03.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.03.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.03.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.03.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.03.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.03.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
107.G.03.010 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	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	
107.1.00.001 Circulation		-	69	-	71
107.1.00.002 Circulation		-	66	-	332
107.1.02.018 Circulation		-	98	-	55
107.1.04.001 Standard Room		-	79	-	38
107.1.04.001a En-Suite		-	106	-	10
107.1.04.002 Standard Room		-	79	-	38
107.1.04.002a En-Suite		-	105	-	10
107.1.04.003 Standard Room		-	79	-	38
107.1.04.003a En-Suite		-	105	-	10
107.1.04.004 Standard Room		-	79	-	38
107.1.04.004a En-Suite		-	105	-	10
107.1.04.005 Standard Room		-	79	-	38
107.1.04.005a En-Suite		-	105	-	10
107.1.04.006 Standard Room		-	79	-	38
107.1.04.006a En-Suite		-	105	-	10
107.1.04.007 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
107.1.04.007a En-Suite		-	105	-	10
107.1.04.008 Standard Room		-	79	-	38
107.1.04.008a En-Suite		-	105	-	10
107.1.04.009 Standard Room		-	80	-	38
107.1.04.009a En-Suite		-	105	-	10
107.1.04.010 Standard Room		-	80	-	38
107.1.04.010a En-Suite		-	105	-	10
107.1.04.011 Kitchen, Dining & Lounge		-	64	-	108
107.1.04.017 Circulation		-	97	-	56
107.1.05.001 Standard Room		-	80	-	38
107.1.05.001a En-Suite		-	106	-	10
107.1.05.002 Standard Room		-	79	-	38
107.1.05.002a En-Suite		-	105	-	10
107.1.05.003 Standard Room		-	79	-	38
107.1.05.003a En-Suite		-	105	-	10
107.1.05.004 Standard Room		-	79	-	38
107.1.05.004a En-Suite		-	105	-	10
107.1.05.005 Standard Room		-	79	-	38
107.1.05.005a En-Suite		-	104	-	10
107.1.05.006 Standard Room		-	79	-	38
107.1.05.006a En-Suite		-	105	-	10
107.1.05.007 Standard Room		-	79	-	38
107.1.05.007a En-Suite		-	113	-	10
107.1.05.008 Standard Room		-	79	-	38
107.1.05.008a En-Suite		-	105	-	10
107.1.05.009 Standard Room		-	81	-	38
107.1.05.009a En-Suite		-	106	-	10
107.1.05.010 Standard Room		-	81	-	38
107.1.05.010a En-Suite		-	105	-	10
107.1.05.011 Kitchen, Dining & Lounge		-	64	-	108
107.1.05.018 Circulation		-	91	-	82
107.1.05.020 Sluice Room		-	80	-	29
107.1.05.021 Linen Store		81	-	-	9
107.1.05.022 Switch Room		129	-	-	0
107.1.06.001 Standard Room		-	80	-	38
107.1.06.001a En-Suite		-	111	-	10
107.1.06.002 Standard Room		-	80	-	38
107.1.06.002a En-Suite		-	104	-	10
107.1.06.003 Standard Room		-	79	-	38
107.1.06.003a En-Suite		-	105	-	10
107.1.06.004 Standard Room		-	79	-	38
107.1.06.004a En-Suite		-	105	-	10
107.1.06.005 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
107.1.06.005a En-Suite		-	105	-	10
107.1.06.006 Standard Room		-	79	-	38
107.1.06.006a En-Suite		-	105	-	10
107.1.06.007 Standard Room		-	79	-	38
107.1.06.007a En-Suite		-	105	-	10
107.1.06.008 Standard Room		-	79	-	38
107.1.06.008a En-Suite		-	105	-	10
107.1.06.009 Standard Room		-	80	-	38
107.1.06.009a En-Suite		-	105	-	10
107.1.06.010 Standard Room		-	80	-	38
107.1.06.010a En-Suite		-	105	-	10
107.1.06.011 Kitchen, Dining & Lounge		-	64	-	108
107.2.00.001 Circulation		-	69	-	71
107.2.00.002 Circulation		-	66	-	332
107.2.02.052 Circulation		-	98	-	55
107.2.06.103 Kitchen, Dining & Lounge		-	64	-	108
107.2.07.001 Standard Room		-	79	-	38
107.2.07.001a En-Suite		-	106	-	10
107.2.07.002 Standard Room		-	79	-	38
107.2.07.002a En-Suite		-	105	-	10
107.2.07.003 Standard Room		-	79	-	38
107.2.07.003a En-Suite		-	105	-	10
107.2.07.004 Standard Room		-	79	-	38
107.2.07.004a En-Suite		-	105	-	10
107.2.07.005 Standard Room		-	79	-	38
107.2.07.005a En-Suite		-	105	-	10
107.2.07.006 Standard Room		-	79	-	38
107.2.07.006a En-Suite		-	105	-	10
107.2.07.007 Standard Room		-	79	-	38
107.2.07.007a En-Suite		-	105	-	10
107.2.07.008 Standard Room		-	79	-	38
107.2.07.008a En-Suite		-	105	-	10
107.2.07.009 Standard Room		-	80	-	38
107.2.07.009a En-Suite		-	105	-	10
107.2.07.010 Standard Room		-	80	-	38
107.2.07.010a En-Suite		-	105	-	10
107.2.07.011 Kitchen, Dining & Lounge		-	64	-	108
107.2.07.018 Circulation		-	97	-	56
107.2.08.001 Standard Room		-	80	-	38
107.2.08.001a En-Suite		-	106	-	10
107.2.08.002 Standard Room		-	79	-	38
107.2.08.002a En-Suite		-	105	-	10
107.2.08.003 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
107.2.08.003a En-Suite		-	105	-	10
107.2.08.004 Standard Room		-	79	-	38
107.2.08.004a En-Suite		-	105	-	10
107.2.08.005 Standard Room		-	79	-	38
107.2.08.005a En-Suite		-	104	-	10
107.2.08.006 Standard Room		-	79	-	38
107.2.08.006a En-Suite		-	105	-	10
107.2.08.007 Standard Room		-	79	-	38
107.2.08.007a En-Suite		-	113	-	10
107.2.08.008 Standard Room		-	79	-	38
107.2.08.008a En-Suite		-	105	-	10
107.2.08.009 Standard Room		-	81	-	38
107.2.08.009a En-Suite		-	106	-	10
107.2.08.010 Standard Room		-	81	-	38
107.2.08.010a En-Suite		-	105	-	10
107.2.08.018 Circulation		-	91	-	82
107.2.08.020 Sluice Room		-	80	-	29
107.2.08.021 Linen Store		81	-	-	9
107.2.08.022 Switch Room		129	-	-	0
107.2.09.001 Standard Room		-	80	-	38
107.2.09.001a En-Suite		-	111	-	10
107.2.09.002 Standard Room		-	80	-	38
107.2.09.002a En-Suite		-	104	-	10
107.2.09.003 Standard Room		-	79	-	38
107.2.09.003a En-Suite		-	105	-	10
107.2.09.004 Standard Room		-	79	-	38
107.2.09.004a En-Suite		-	105	-	10
107.2.09.005 Standard Room		-	79	-	38
107.2.09.005a En-Suite		-	105	-	10
107.2.09.006 Standard Room		-	79	-	38
107.2.09.006a En-Suite		-	105	-	10
107.2.09.007 Standard Room		-	79	-	38
107.2.09.007a En-Suite		-	105	-	10
107.2.09.008 Standard Room		-	79	-	38
107.2.09.008a En-Suite		-	105	-	10
107.2.09.009 Standard Room		-	80	-	38
107.2.09.009a En-Suite		-	105	-	10
107.2.09.010 Standard Room		-	80	-	38
107.2.09.010a En-Suite		-	105	-	10
107.2.09.011 Kitchen, Dining & Lounge		-	64	-	108
107.3.00.001 Circulation		-	69	-	71
107.3.00.002 Circulation		-	66	-	332
107.3.02.052 Circulation		-	98	-	55

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
107.3.10.001 Standard Room		-	79	-	38
107.3.10.001a En-Suite		-	106	-	10
107.3.10.002 Standard Room		-	79	-	38
107.3.10.002a En-Suite		-	105	-	10
107.3.10.003 Standard Room		-	79	-	38
107.3.10.003a En-Suite		-	105	-	10
107.3.10.004 Standard Room		-	79	-	38
107.3.10.004a En-Suite		-	105	-	10
107.3.10.005 Standard Room		-	79	-	38
107.3.10.005a En-Suite		-	105	-	10
107.3.10.006 Standard Room		-	79	-	38
107.3.10.006a En-Suite		-	105	-	10
107.3.10.007 Standard Room		-	79	-	38
107.3.10.007a En-Suite		-	105	-	10
107.3.10.008 Standard Room		-	79	-	38
107.3.10.008a En-Suite		-	105	-	10
107.3.10.009 Standard Room		-	80	-	38
107.3.10.009a En-Suite		-	105	-	10
107.3.10.010 Standard Room		-	80	-	38
107.3.10.010a En-Suite		-	105	-	10
107.3.10.011 Kitchen, Dining & Lounge		-	64	-	108
107.3.10.018 Circulation		-	97	-	56
107.3.11.001 Standard Room		-	80	-	38
107.3.11.001a En-Suite		-	106	-	10
107.3.11.002 Standard Room		-	79	-	38
107.3.11.002a En-Suite		-	105	-	10
107.3.11.003 Standard Room		-	79	-	38
107.3.11.003a En-Suite		-	105	-	10
107.3.11.004 Standard Room		-	79	-	38
107.3.11.004a En-Suite		-	105	-	10
107.3.11.005 Standard Room		-	79	-	38
107.3.11.005a En-Suite		-	104	-	10
107.3.11.006 Standard Room		-	79	-	38
107.3.11.006a En-Suite		-	105	-	10
107.3.11.007 Standard Room		-	79	-	38
107.3.11.007a En-Suite		-	113	-	10
107.3.11.008 Standard Room		-	79	-	38
107.3.11.008a En-Suite		-	105	-	10
107.3.11.009 Standard Room		-	81	-	38
107.3.11.009a En-Suite		-	106	-	10
107.3.11.010 Standard Room		-	81	-	38
107.3.11.010a En-Suite		-	105	-	10
107.3.11.011 Kitchen, Dining & Lounge		-	64	-	108

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
107.3.11.018 Circulation		-	91	-	82
107.3.11.020 Sluice Room		-	80	-	29
107.3.11.021 Linen Store		81	-	-	9
107.3.11.022 Switch Room		129	-	-	0
107.3.12.001 Standard Room		-	80	-	38
107.3.12.001a En-Suite		-	111	-	10
107.3.12.002 Standard Room		-	80	-	38
107.3.12.002a En-Suite		-	104	-	10
107.3.12.003 Standard Room		-	79	-	38
107.3.12.003a En-Suite		-	105	-	10
107.3.12.004 Standard Room		-	79	-	38
107.3.12.004a En-Suite		-	105	-	10
107.3.12.005 Standard Room		-	79	-	38
107.3.12.005a En-Suite		-	105	-	10
107.3.12.006 Standard Room		-	79	-	38
107.3.12.006a En-Suite		-	105	-	10
107.3.12.007 Standard Room		-	79	-	38
107.3.12.007a En-Suite		-	105	-	10
107.3.12.008 Standard Room		-	79	-	38
107.3.12.008a En-Suite		-	105	-	10
107.3.12.009 Standard Room		-	80	-	38
107.3.12.009a En-Suite		-	105	-	10
107.3.12.010 Standard Room		-	80	-	38
107.3.12.010a En-Suite		-	105	-	10
107.3.12.011 Kitchen, Dining & Lounge		-	64	-	108
107.G.00.001 Circulation		-	69	-	292
107.G.00.002 Circulation		-	66	-	332
107.G.00.003 Plant		60	-	-	88
107.G.00.004 Switch Room		69	-	-	44
107.G.01.001 Standard Room		-	79	-	38
107.G.01.001a En-Suite		-	106	-	10
107.G.01.002 Standard Room		-	79	-	38
107.G.01.002a En-Suite		-	105	-	10
107.G.01.003 Standard Room		-	79	-	38
107.G.01.003a En-Suite		-	105	-	10
107.G.01.004 Standard Room		-	79	-	38
107.G.01.004a En-Suite		-	105	-	10
107.G.01.005 Standard Room		-	79	-	38
107.G.01.005a En-Suite		-	105	-	10
107.G.01.006 Standard Room		-	79	-	38
107.G.01.006a En-Suite		-	105	-	10
107.G.01.007 Standard Room		-	79	-	38
107.G.01.007a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
107.G.01.008 Standard Room		-	80	-	38
107.G.01.008a En-Suite		-	105	-	10
107.G.01.009 Standard Room		-	80	-	38
107.G.01.009a En-Suite		-	105	-	10
107.G.01.010 Kitchen, Dining & Lounge		-	64	-	108
107.G.01.017 Circulation		-	97	-	52
107.G.01.019 Plant (Comms)		61	-	-	88
107.G.01.029 Circulation		-	90	-	104
107.G.02.001 Standard Room		-	80	-	38
107.G.02.001a En-Suite		-	106	-	10
107.G.02.002 Standard Room		-	79	-	38
107.G.02.002a En-Suite		-	105	-	10
107.G.02.003 Standard Room		-	79	-	38
107.G.02.003a En-Suite		-	105	-	10
107.G.02.004 Standard Room		-	78	-	38
107.G.02.004a En-Suite		-	105	-	10
107.G.02.005 Standard Room		-	79	-	38
107.G.02.005a En-Suite		-	105	-	10
107.G.02.006 Standard Room		-	79	-	38
107.G.02.006a En-Suite		-	105	-	10
107.G.02.007 Standard Room		-	79	-	38
107.G.02.007a En-Suite		-	105	-	10
107.G.02.008 Standard Room		-	79	-	38
107.G.02.008a En-Suite		-	105	-	10
107.G.02.009 Standard Room		-	81	-	38
107.G.02.009a En-Suite		-	105	-	10
107.G.02.010 Kitchen, Dining & Lounge		-	64	-	126
107.G.02.020 Linen Store		70	-	-	88
107.G.02.021 Switch Room		129	-	-	0
107.G.02.052 Circulation		-	98	-	52
107.G.03.001 Standard Room		-	80	-	38
107.G.03.001a En-Suite		-	111	-	10
107.G.03.002 Standard Room		-	79	-	38
107.G.03.002a En-Suite		-	105	-	10
107.G.03.003 Standard Room		-	79	-	38
107.G.03.003a En-Suite		-	105	-	10
107.G.03.004 Standard Room		-	79	-	38
107.G.03.004a En-Suite		-	105	-	10
107.G.03.005 Standard Room		-	79	-	38
107.G.03.005a En-Suite		-	105	-	10
107.G.03.006 Standard Room		-	79	-	38
107.G.03.006a En-Suite		-	105	-	10
107.G.03.007 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			
Zone name		Luminaire	Lamp	Display lamp	General lighting [W]
	Standard value	60	60	22	
107.G.03.007a En-Suite		-	105	-	10
107.G.03.008 Standard Room		-	80	-	38
107.G.03.008a En-Suite		-	105	-	10
107.G.03.009 Standard Room		-	80	-	38
107.G.03.009a En-Suite		-	105	-	10
107.G.03.010 Kitchen, Dining & Lounge		-	64	-	108
107.G.03.018 Sluice Room		-	76	-	44

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?
107.1.04.001 Standard Room	NO (-86.9%)	NO
107.1.04.002 Standard Room	NO (-88.3%)	NO
107.1.04.003 Standard Room	NO (-80.1%)	NO
107.1.04.004 Standard Room	NO (-72.5%)	NO
107.1.04.005 Standard Room	NO (-80.1%)	NO
107.1.04.006 Standard Room	NO (-71.8%)	NO
107.1.04.007 Standard Room	NO (-80.1%)	NO
107.1.04.008 Standard Room	NO (-71.4%)	NO
107.1.04.009 Standard Room	NO (-86.8%)	NO
107.1.04.010 Standard Room	NO (-81.9%)	NO
107.1.05.001 Standard Room	NO (-86.7%)	NO
107.1.05.002 Standard Room	NO (-80.4%)	NO
107.1.05.003 Standard Room	NO (-80.7%)	NO
107.1.05.004 Standard Room	NO (-69%)	NO
107.1.05.005 Standard Room	NO (-84%)	NO
107.1.05.006 Standard Room	NO (-69%)	NO
107.1.05.007 Standard Room	NO (-77%)	NO
107.1.05.008 Standard Room	NO (-69%)	NO
107.1.05.009 Standard Room	NO (-82.4%)	NO
107.1.05.010 Standard Room	NO (-79%)	NO
107.1.06.001 Standard Room	NO (-78.7%)	NO
107.1.06.002 Standard Room	NO (-79.6%)	NO
107.1.06.003 Standard Room	NO (-68.4%)	NO
107.1.06.004 Standard Room	NO (-69.1%)	NO
107.1.06.005 Standard Room	NO (-68.4%)	NO
107.1.06.006 Standard Room	NO (-68.8%)	NO
107.1.06.007 Standard Room	NO (-68.4%)	NO
107.1.06.008 Standard Room	NO (-68.2%)	NO
107.1.06.009 Standard Room	NO (-79.3%)	NO
107.1.06.010 Standard Room	NO (-79.8%)	NO
107.2.07.001 Standard Room	NO (-86.9%)	NO
107.2.07.002 Standard Room	NO (-87.6%)	NO
107.2.07.003 Standard Room	NO (-80.1%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
107.2.07.004 Standard Room	NO (-71.6%)	NO
107.2.07.005 Standard Room	NO (-80.1%)	NO
107.2.07.006 Standard Room	NO (-71%)	NO
107.2.07.007 Standard Room	NO (-80.1%)	NO
107.2.07.008 Standard Room	NO (-70.9%)	NO
107.2.07.009 Standard Room	NO (-86.8%)	NO
107.2.07.010 Standard Room	NO (-81.8%)	NO
107.2.08.001 Standard Room	NO (-86.7%)	NO
107.2.08.002 Standard Room	NO (-80.4%)	NO
107.2.08.003 Standard Room	NO (-81.1%)	NO
107.2.08.004 Standard Room	NO (-69%)	NO
107.2.08.005 Standard Room	NO (-82.5%)	NO
107.2.08.006 Standard Room	NO (-69%)	NO
107.2.08.007 Standard Room	NO (-76.2%)	NO
107.2.08.008 Standard Room	NO (-69%)	NO
107.2.08.009 Standard Room	NO (-81.5%)	NO
107.2.08.010 Standard Room	NO (-79%)	NO
107.2.09.001 Standard Room	NO (-78.7%)	NO
107.2.09.002 Standard Room	NO (-79.3%)	NO
107.2.09.003 Standard Room	NO (-68.4%)	NO
107.2.09.004 Standard Room	NO (-68.7%)	NO
107.2.09.005 Standard Room	NO (-68.4%)	NO
107.2.09.006 Standard Room	NO (-68.4%)	NO
107.2.09.007 Standard Room	NO (-68.4%)	NO
107.2.09.008 Standard Room	NO (-68.1%)	NO
107.2.09.009 Standard Room	NO (-79.3%)	NO
107.2.09.010 Standard Room	NO (-79.7%)	NO
107.3.10.001 Standard Room	NO (-86.9%)	NO
107.3.10.002 Standard Room	NO (-87.1%)	NO
107.3.10.003 Standard Room	NO (-80.1%)	NO
107.3.10.004 Standard Room	NO (-70.5%)	NO
107.3.10.005 Standard Room	NO (-80.1%)	NO
107.3.10.006 Standard Room	NO (-70.3%)	NO
107.3.10.007 Standard Room	NO (-80.1%)	NO
107.3.10.008 Standard Room	NO (-70.3%)	NO
107.3.10.009 Standard Room	NO (-86.8%)	NO
107.3.10.010 Standard Room	NO (-81.4%)	NO
107.3.11.001 Standard Room	NO (-86.7%)	NO
107.3.11.002 Standard Room	NO (-80.3%)	NO
107.3.11.003 Standard Room	NO (-80.6%)	NO
107.3.11.004 Standard Room	NO (-69%)	NO
107.3.11.005 Standard Room	NO (-73.7%)	NO
107.3.11.006 Standard Room	NO (-69%)	NO
107.3.11.007 Standard Room	NO (-71.1%)	NO
107.3.11.008 Standard Room	NO (-69%)	NO
107.3.11.009 Standard Room	NO (-79.5%)	NO
107.3.11.010 Standard Room	NO (-79%)	NO
107.3.12.001 Standard Room	NO (-78.7%)	NO
107.3.12.002 Standard Room	NO (-78.4%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
107.3.12.003 Standard Room	NO (-68.4%)	NO
107.3.12.004 Standard Room	NO (-67.8%)	NO
107.3.12.005 Standard Room	NO (-68.4%)	NO
107.3.12.006 Standard Room	NO (-67.7%)	NO
107.3.12.007 Standard Room	NO (-68.4%)	NO
107.3.12.008 Standard Room	NO (-67.5%)	NO
107.3.12.009 Standard Room	NO (-79.3%)	NO
107.3.12.010 Standard Room	NO (-79.3%)	NO
107.G.01.001 Standard Room	NO (-86.9%)	NO
107.G.01.002 Standard Room	NO (-73.3%)	NO
107.G.01.003 Standard Room	NO (-80.1%)	NO
107.G.01.004 Standard Room	NO (-72.5%)	NO
107.G.01.005 Standard Room	NO (-80.1%)	NO
107.G.01.006 Standard Room	NO (-71.9%)	NO
107.G.01.007 Standard Room	NO (-80.1%)	NO
107.G.01.008 Standard Room	NO (-82.2%)	NO
107.G.01.009 Standard Room	NO (-89.6%)	NO
107.G.02.001 Standard Room	NO (-86.7%)	NO
107.G.02.002 Standard Room	NO (-80.4%)	NO
107.G.02.003 Standard Room	NO (-80.6%)	NO
107.G.02.004 Standard Room	NO (-89.4%)	NO
107.G.02.005 Standard Room	NO (-69%)	NO
107.G.02.006 Standard Room	NO (-69%)	NO
107.G.02.007 Standard Room	NO (-69%)	NO
107.G.02.008 Standard Room	NO (-69%)	NO
107.G.02.009 Standard Room	NO (-79%)	NO
107.G.03.001 Standard Room	NO (-78.9%)	NO
107.G.03.002 Standard Room	NO (-69.9%)	NO
107.G.03.003 Standard Room	NO (-68.7%)	NO
107.G.03.004 Standard Room	NO (-69.5%)	NO
107.G.03.005 Standard Room	NO (-68.7%)	NO
107.G.03.006 Standard Room	NO (-68.8%)	NO
107.G.03.007 Standard Room	NO (-68.6%)	NO
107.G.03.008 Standard Room	NO (-80.1%)	NO
107.G.03.009 Standard Room	NO (-83.9%)	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?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	3087.9	3087.9
External area [m ²]	3681.5	3681.5
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	5	3
Average conductance [W/K]	1248.19	1965.08
Average U-value [W/m ² K]	0.34	0.53
Alpha value* [%]	10.07	10

* 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
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
100 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	71.68	79.58
Cooling	0	0
Auxiliary	7.12	4.31
Lighting	11.11	10.34
Hot water	103.2	108.43
Equipment*	16.07	16.07
TOTAL **	193.12	202.66

* 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]	230.26	286.5
Primary energy* [kWh/m ²]	206.38	203.64
Total emissions [kg/m ²]	35.7	43.1

* 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] Central heating using water: radiators, [HS] District heating, [HFT] District Heating, [CFT] Electricity										
	Actual	290.1	0	90.3	0	6.3	0.89	0	1	0
	Notional	0	0	0	0	0	0	0	----	----
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0	0	0	0	0
	Notional	360.9	0	100.3	0	5.4	1	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	0.15	10000000:Surf[6]
Floor	0.2	0.13	10000017:Surf[7]
Roof	0.15	0.13	100000B2:Surf[0]
Windows, roof windows, and rooflights	1.5	1.4	10000003:Surf[2]
Personnel doors	1.5	2.2	1000010D:Surf[1]
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building
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

Calculation Sheet

No. of Sheets: 22

Project Title: UoM Fallowfields

Project No. C5219

File No. V:\Contract Files\C5219
Fallowfield\7.0 Design\7.03
Calculations\Thermal
central\ESD\Incoming\BRUKL
EPCs\As Built\Block 108 Bilberry

Subject: Block 108 'As Built' BRUKL and EPC

Calc No. UoM-HES-108-XX-CA-Y-80-01-AF1

Design Manager: Geoff Evans

Design Phase:

A – Concept or preliminary ☐
B – Analysis and Detailed design ☐
C – Design verification ☐
D – Other (specify) 'As Built' ☒

Designer: Neil Hamilton
Environmental Services Design (ESD)

Computer Applications Used
IES VE

Version/Date
2019

Scope of Checking for Manual & Computer Generated Calculations:

Desktop review against results of Stage 3 and 'As Designed' SBEM calculations.

Sheets Checked*	Calculations by			Checked by		
	Name	Signature	Date	Name	Signature	Date
All	ESD		2019-11-21	Geoff Evans		2019-11-21

*If an Excel spreadsheet or other computer file has been checked and has not been attached, enter the name, date and full file path or server location of the file that was checked.

a) Basic Design Information or Source and Reference:

Documents generated from the IES VE Model referenced as;

- 2019-11-25T104042 EJ1141 S2 B108 Fallowfield 13-08-19 [VE2018] cab

b) Identify documents/technical records where output will be used:

Documents required to demonstrate compliance with the following;

- Building Regulations 2013 Part L2A
- The Energy Performance of Buildings (England and Wales) Regulations 2018

Approved by

Design Manager Geoff Evans

Signature



Date

2019-11-21

Distribution:

Matt Stockton, Vinci Construction UK Ltd

Energy Performance Certificate

Non-Domestic Building



Bilberry Court
Unsworth Park
20 Chancellors Way
MANCHESTER
M14 6FZ

Certificate Reference Number:
0010-8908-0301-4680-4014

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient



Net zero CO₂ emissions

A 0-25

B 26-50

27

This is how energy efficient the building is.

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

Less energy efficient

Technical Information

Main heating fuel:	District Heating
Building environment:	Heating and Natural Ventilation
Total useful floor area (m ²):	3319
Assessment Level:	5
Building emission rate (kgCO ₂ /m ² per year):	33.65
Primary energy use (kWh/m ² per year):	194.53

Benchmarks

Buildings similar to this one could have ratings as follows:

32

If newly built

85

If typical of the existing stock

Administrative Information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

Assessment Software:	Virtual Environment v7.0.11 using calculation engine ApacheSim v7.0.11
Property Reference:	810084840000
Assessor Name:	Neil Hamilton
Assessor Number:	STRO007864
Accreditation Scheme:	Stroma Certification Ltd
Employer/Trading Name:	Environmental Services Design Ltd
Employer/Trading Address:	Courtyard East, Wharfebank House, Wharfebank Business Centrem Ilkley Road, Otley, LS21 3JP
Issue Date:	18 Nov 2019
Valid Until:	17 Nov 2029 (unless superseded by a later certificate)
Related Party Disclosure:	Not related to the owner.

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report - 9841-4081-0010-0400-6805.

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by Stroma Certification Ltd. You can obtain contact details of the Accreditation Scheme at www.stroma.com.

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at www.opendatacommunities.org.

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. Any personal data it contains will be processed in accordance with the General Data Protection Regulation and all applicable laws and regulations relating to the processing of personal data and privacy. For further information about this and how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at: www.gov.uk/government/collections/energy-performance-certificates. It explains the content and use of this document, advises on how to identify the authenticity of a certificate and how to make a complaint.

Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property – whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.

Project name

Bilberry Court**As built****Date:** Mon Nov 18 15:58:20 2019

Administrative information

Building Details

Address: MANCHESTER, M14 6FZ

Certification tool

Calculation engine: Apache**Calculation engine version:** 7.0.11**Interface to calculation engine:** IES Virtual Environment**Interface to calculation engine version:** 7.0.11**BRUKL compliance check version:** v5.6.a.1

Owner Details

Name: The University of Manchester**Telephone number:** 0161 306 6000**Address:** Oxford Road, Manchester, M13 9PL

Certifier details

Name: Neil Hamilton**Telephone number:** 01943 851016**Address:** Environmental Services Design Ltd, Courtyard East, Wharfebankhouse, Wharfebank Business Centre, Ilkley Road, Otley, LS21 3JPCriterion 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	39.3
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	39.3
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	32.7
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	0.15	0.15	10000193:Surf[3]
Floor	0.25	0.14	0.14	100001CD:Surf[6]
Roof	0.25	0.13	0.13	1000023D:Surf[3]
Windows***, roof windows, and rooflights	2.2	1.4	1.4	100001C8:Surf[0]
Personnel doors	2.2	1.47	2.2	WN000029:Surf[1]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building
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- Central Heating Using Water: Radiators - District Heating + DHW (Nat Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	0	-
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- Central Heating Using Water: Radiators - District Heating + DHW (HRU-108.6)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	0	0.78
Standard value	N/A	N/A	N/A	N/A	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

3- Central Heating Using Water: Radiators - District Heating + DHW (HRU-108.4 & 108.5)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	0	0.78
Standard value	N/A	N/A	N/A	N/A	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

4- Central Heating Using Water: Radiators - District Heating + DHW (HRU-108.3)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	0	0.77
Standard value	N/A	N/A	N/A	N/A	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

5- Warm Air Electric Resistance Heater (Laundry)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	0	-
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

6- Central Heating Using Water: Radiators - District Heating + DHW (HRU-108.1)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	0	0.78
Standard value	N/A	N/A	N/A	N/A	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

7- Central Heating Using Water: Radiators - District Heating + DHW (HRU-108.2)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	0	0.78
Standard value	N/A	N/A	N/A	N/A	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

"No HWS in project, or hot water is provided by HVAC system"

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		
108.1.03.001a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.03.002a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.03.003a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.03.004a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.03.005a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.03.006a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.03.007a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.03.008a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.03.009a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.03.010a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.03.011 Kitchen, Dining & Lounge		-	-	0.4	-	-	-	-	-	-	-	N/A
108.1.04.001a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.04.002a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.04.003a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.04.004a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.04.005a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.04.006a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.04.007a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.04.008a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.04.009a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.04.010a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.04.011 Kitchen, Dining & Lounge		-	-	0.4	-	-	-	-	-	-	-	N/A
108.1.05.001a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.05.002a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.05.003a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.05.004a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.05.005a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.05.006a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.05.007a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.05.008a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
108.1.05.009a En-Suite		-	-	0.5	-	-	-	-	-	-	-	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	
108.1.05.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.1.05.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
108.2.06.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.06.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.06.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.06.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.06.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.06.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.06.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.06.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.06.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.06.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.06.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
108.2.07.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.07.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.07.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.07.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.07.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.07.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.07.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.07.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.07.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.07.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.07.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
108.2.08.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.08.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.08.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.08.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.08.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.08.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.08.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.08.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.08.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.08.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.2.08.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
108.3.09.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.09.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.09.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.09.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.09.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.09.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.09.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.09.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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	
108.3.09.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.09.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.09.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
108.3.10.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.10.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.10.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.10.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.10.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.10.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.10.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.10.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.10.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.10.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.10.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
108.3.11.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.11.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.11.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.11.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.11.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.11.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.11.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.11.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.11.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.11.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.3.11.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
108.G.01.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.01.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.01.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.01.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.01.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.01.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.01.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.01.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.01.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.01.010 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
108.G.02.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.02.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.02.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.02.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.02.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.02.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.02.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.02.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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	
108.G.02.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.02.010 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
108.G.ST.011 Store	-	-	-	1.5	-	-	-	-	-	-	N/A	
108.G.DA.001 Study	-	-	-	1.3	-	-	-	-	-	-	N/A	
108.G.WC.009 WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.TL.001a Small Seminar Room	-	-	-	1.6	-	-	-	-	-	-	N/A	
108.G.WC.008 WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.WC.007 WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.WC.006 WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.WC.005 WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.WC.027 Change/Shower	-	-	-	1.5	-	-	-	-	-	-	N/A	
108.G.WC.026 WC	-	-	-	1.5	-	-	-	-	-	-	N/A	
108.G.WC.025 WC	-	-	-	1.5	-	-	-	-	-	-	N/A	
108.G.WC.028 Change/Shower	-	-	-	1.5	-	-	-	-	-	-	N/A	
108.G.ST.024 Lockers	-	-	-	1.5	-	-	-	-	-	-	N/A	
108.G.ST.020 Staff Area	-	-	-	1.6	-	-	-	-	-	-	N/A	
108.G.AD.021 Meeting Room	-	-	-	1.6	-	-	-	-	-	-	N/A	
108.G.AD.021 Open Offices	-	-	-	1.6	-	-	-	-	-	-	N/A	
108.G.ST.010 Laundry	-	-	0.5	-	-	-	-	-	-	-	N/A	
108.G.DA.002 Lounge	-	-	-	1.4	-	-	-	-	-	-	N/A	
108.G.DA.002 Black Box Cinema	-	-	-	1.4	-	-	-	-	-	-	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	
108.1.00.001 Circulation		-	79	-	332
108.1.00.002 Circulation		-	79	-	252
108.1.03.001 Standard Room		-	79	-	38
108.1.03.001a En-Suite		-	105	-	10
108.1.03.002 Standard Room		-	79	-	38
108.1.03.002a En-Suite		-	105	-	10
108.1.03.003 Standard Room		-	79	-	38
108.1.03.003a En-Suite		-	105	-	10
108.1.03.004 Standard Room		-	79	-	38
108.1.03.004a En-Suite		-	105	-	10
108.1.03.005 Standard Room		-	79	-	38
108.1.03.005a En-Suite		-	105	-	10
108.1.03.006 Standard Room		-	79	-	38
108.1.03.006a En-Suite		-	105	-	10
108.1.03.007 Standard Room		-	79	-	38
108.1.03.007a En-Suite		-	105	-	10
108.1.03.008 Standard Room		-	79	-	38
108.1.03.008a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
108.1.03.009 Standard Room		-	79	-	38
108.1.03.009a En-Suite		-	105	-	10
108.1.03.010 Standard Room		-	79	-	38
108.1.03.010a En-Suite		-	105	-	10
108.1.03.011 Kitchen, Dining & Lounge		63	-	-	108
108.1.03.018 Circulation		-	79	-	69
108.1.04.001 Standard Room		-	79	-	38
108.1.04.001a En-Suite		-	105	-	10
108.1.04.002 Standard Room		-	79	-	38
108.1.04.002a En-Suite		-	105	-	10
108.1.04.003 Standard Room		-	79	-	38
108.1.04.003a En-Suite		-	105	-	10
108.1.04.004 Standard Room		-	79	-	38
108.1.04.004a En-Suite		-	105	-	10
108.1.04.005 Standard Room		-	79	-	38
108.1.04.005a En-Suite		-	105	-	10
108.1.04.006 Standard Room		-	79	-	38
108.1.04.006a En-Suite		-	105	-	10
108.1.04.007 Standard Room		-	79	-	38
108.1.04.007a En-Suite		-	105	-	10
108.1.04.008 Standard Room		-	79	-	38
108.1.04.008a En-Suite		-	105	-	10
108.1.04.009 Standard Room		-	79	-	38
108.1.04.009a En-Suite		-	105	-	10
108.1.04.010 Standard Room		-	79	-	38
108.1.04.010a En-Suite		-	105	-	10
108.1.04.011 Kitchen, Dining & Lounge		63	-	-	126
108.1.04.018 Circulation		-	79	-	104
108.1.04.019 Plant		67	-	-	88
108.1.04.021 Sluice Room		-	108	-	44
108.1.04.022 Linen Store		65	-	-	11
108.1.05.001 Standard Room		-	79	-	38
108.1.05.001a En-Suite		-	105	-	10
108.1.05.002 Standard Room		-	79	-	38
108.1.05.002a En-Suite		-	105	-	10
108.1.05.003 Standard Room		-	79	-	38
108.1.05.003a En-Suite		-	105	-	10
108.1.05.004 Standard Room		-	79	-	38
108.1.05.004a En-Suite		-	105	-	10
108.1.05.005 Standard Room		-	79	-	38
108.1.05.005a En-Suite		-	105	-	10
108.1.05.006 Standard Room		-	79	-	38
108.1.05.006a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
108.1.05.007 Standard Room		-	79	-	38
108.1.05.007a En-Suite		-	105	-	10
108.1.05.008 Standard Room		-	79	-	38
108.1.05.008a En-Suite		-	105	-	10
108.1.05.009 Standard Room		-	79	-	38
108.1.05.009a En-Suite		-	105	-	10
108.1.05.010 Standard Room		-	79	-	38
108.1.05.010a En-Suite		-	105	-	10
108.1.05.011 Kitchen, Dining & Lounge		63	-	-	108
108.1.05.018 Circulation		-	79	-	69
108.2.00.001 Circulation		-	79	-	332
108.2.00.002 Circulation		-	79	-	252
108.2.06.001 Standard Room		-	79	-	38
108.2.06.001a En-Suite		-	105	-	10
108.2.06.002 Standard Room		-	79	-	38
108.2.06.002a En-Suite		-	105	-	10
108.2.06.003 Standard Room		-	79	-	38
108.2.06.003a En-Suite		-	105	-	10
108.2.06.004 Standard Room		-	79	-	38
108.2.06.004a En-Suite		-	105	-	10
108.2.06.005 Standard Room		-	79	-	38
108.2.06.005a En-Suite		-	105	-	10
108.2.06.006 Standard Room		-	79	-	38
108.2.06.006a En-Suite		-	105	-	10
108.2.06.007 Standard Room		-	79	-	38
108.2.06.007a En-Suite		-	105	-	10
108.2.06.008 Standard Room		-	79	-	38
108.2.06.008a En-Suite		-	105	-	10
108.2.06.009 Standard Room		-	79	-	38
108.2.06.009a En-Suite		-	105	-	10
108.2.06.010 Standard Room		-	79	-	38
108.2.06.010a En-Suite		-	105	-	10
108.2.06.011 Kitchen, Dining & Lounge		63	-	-	108
108.2.06.018 Circulation		-	79	-	69
108.2.07.001 Standard Room		-	79	-	38
108.2.07.001a En-Suite		-	105	-	10
108.2.07.002 Standard Room		-	79	-	38
108.2.07.002a En-Suite		-	105	-	10
108.2.07.003 Standard Room		-	79	-	38
108.2.07.003a En-Suite		-	105	-	10
108.2.07.004 Standard Room		-	79	-	38
108.2.07.004a En-Suite		-	105	-	10
108.2.07.005 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
108.2.07.005a En-Suite		-	105	-	10
108.2.07.006 Standard Room		-	79	-	38
108.2.07.006a En-Suite		-	105	-	10
108.2.07.007 Standard Room		-	79	-	38
108.2.07.007a En-Suite		-	105	-	10
108.2.07.008 Standard Room		-	79	-	38
108.2.07.008a En-Suite		-	105	-	10
108.2.07.009 Standard Room		-	79	-	38
108.2.07.009a En-Suite		-	105	-	10
108.2.07.010 Standard Room		-	79	-	38
108.2.07.010a En-Suite		-	105	-	10
108.2.07.011 Kitchen, Dining & Lounge		63	-	-	126
108.2.07.018 Circulation		-	79	-	104
108.2.07.019 Plant		67	-	-	88
108.2.07.021 Sluice Room		-	108	-	44
108.2.07.022 Linen Store		65	-	-	11
108.2.08.001 Standard Room		-	79	-	38
108.2.08.001a En-Suite		-	105	-	10
108.2.08.002 Standard Room		-	79	-	38
108.2.08.002a En-Suite		-	105	-	10
108.2.08.003 Standard Room		-	79	-	38
108.2.08.003a En-Suite		-	105	-	10
108.2.08.004 Standard Room		-	79	-	38
108.2.08.004a En-Suite		-	105	-	10
108.2.08.005 Standard Room		-	79	-	38
108.2.08.005a En-Suite		-	105	-	10
108.2.08.006 Standard Room		-	79	-	38
108.2.08.006a En-Suite		-	105	-	10
108.2.08.007 Standard Room		-	79	-	38
108.2.08.007a En-Suite		-	105	-	10
108.2.08.008 Standard Room		-	79	-	38
108.2.08.008a En-Suite		-	105	-	10
108.2.08.009 Standard Room		-	79	-	38
108.2.08.009a En-Suite		-	105	-	10
108.2.08.010 Standard Room		-	79	-	38
108.2.08.010a En-Suite		-	105	-	10
108.2.08.011 Kitchen, Dining & Lounge		63	-	-	108
108.2.08.018 Circulation		-	79	-	69
108.3.00.001 Circulation		-	79	-	332
108.3.00.002 Circulation		-	79	-	252
108.3.09.001 Standard Room		-	79	-	38
108.3.09.001a En-Suite		-	105	-	10
108.3.09.002 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
108.3.09.002a En-Suite		-	105	-	10
108.3.09.003 Standard Room		-	79	-	38
108.3.09.003a En-Suite		-	105	-	10
108.3.09.004 Standard Room		-	79	-	38
108.3.09.004a En-Suite		-	105	-	10
108.3.09.005 Standard Room		-	79	-	38
108.3.09.005a En-Suite		-	105	-	10
108.3.09.006 Standard Room		-	79	-	38
108.3.09.006a En-Suite		-	105	-	10
108.3.09.007 Standard Room		-	79	-	38
108.3.09.007a En-Suite		-	105	-	10
108.3.09.008 Standard Room		-	79	-	38
108.3.09.008a En-Suite		-	105	-	10
108.3.09.009 Standard Room		-	79	-	38
108.3.09.009a En-Suite		-	105	-	10
108.3.09.010 Standard Room		-	79	-	38
108.3.09.010a En-Suite		-	105	-	10
108.3.09.011 Kitchen, Dining & Lounge		63	-	-	108
108.3.09.018 Circulation		-	79	-	69
108.3.10.001 Standard Room		-	79	-	38
108.3.10.001a En-Suite		-	105	-	10
108.3.10.002 Standard Room		-	79	-	38
108.3.10.002a En-Suite		-	105	-	10
108.3.10.003 Standard Room		-	79	-	38
108.3.10.003a En-Suite		-	105	-	10
108.3.10.004 Standard Room		-	79	-	38
108.3.10.004a En-Suite		-	105	-	10
108.3.10.005 Standard Room		-	79	-	38
108.3.10.005a En-Suite		-	105	-	10
108.3.10.006 Standard Room		-	79	-	38
108.3.10.006a En-Suite		-	105	-	10
108.3.10.007 Standard Room		-	79	-	38
108.3.10.007a En-Suite		-	105	-	10
108.3.10.008 Standard Room		-	79	-	38
108.3.10.008a En-Suite		-	105	-	10
108.3.10.009 Standard Room		-	79	-	38
108.3.10.009a En-Suite		-	105	-	10
108.3.10.010 Standard Room		-	79	-	38
108.3.10.010a En-Suite		-	105	-	10
108.3.10.011 Kitchen, Dining & Lounge		63	-	-	126
108.3.10.018 Circulation		-	79	-	104
108.3.10.019 Plant		67	-	-	88
108.3.10.021 Sluice Room		-	108	-	44

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
108.3.10.022 Linen Store		65	-	-	11
108.3.11.001 Standard Room		-	79	-	38
108.3.11.001a En-Suite		-	105	-	10
108.3.11.002 Standard Room		-	79	-	38
108.3.11.002a En-Suite		-	105	-	10
108.3.11.003 Standard Room		-	79	-	38
108.3.11.003a En-Suite		-	105	-	10
108.3.11.004 Standard Room		-	79	-	38
108.3.11.004a En-Suite		-	105	-	10
108.3.11.005 Standard Room		-	79	-	38
108.3.11.005a En-Suite		-	105	-	10
108.3.11.006 Standard Room		-	79	-	38
108.3.11.006a En-Suite		-	105	-	10
108.3.11.007 Standard Room		-	79	-	38
108.3.11.007a En-Suite		-	105	-	10
108.3.11.008 Standard Room		-	79	-	38
108.3.11.008a En-Suite		-	105	-	10
108.3.11.009 Standard Room		-	79	-	38
108.3.11.009a En-Suite		-	105	-	10
108.3.11.010 Standard Room		-	79	-	38
108.3.11.010a En-Suite		-	105	-	10
108.3.11.011 Kitchen, Dining & Lounge		63	-	-	108
108.3.11.018 Circulation		-	79	-	69
108.G.00.001 Circulation		-	79	-	332
108.G.00.002 Circulation		-	79	-	252
108.G.00.003 Switch Room		65	-	-	44
108.G.00.004 Plant		67	-	-	88
108.G.01.001 Standard Room		-	79	-	38
108.G.01.001a En-Suite		-	105	-	10
108.G.01.002 Standard Room		-	79	-	38
108.G.01.002a En-Suite		-	105	-	10
108.G.01.003 Standard Room		-	79	-	38
108.G.01.003a En-Suite		-	105	-	10
108.G.01.004 Standard Room		-	79	-	38
108.G.01.004a En-Suite		-	105	-	10
108.G.01.005 Standard Room		-	79	-	38
108.G.01.005a En-Suite		-	105	-	10
108.G.01.006 Standard Room		-	79	-	38
108.G.01.006a En-Suite		-	105	-	10
108.G.01.007 Standard Room		-	79	-	38
108.G.01.007a En-Suite		-	105	-	10
108.G.01.008 Standard Room		-	79	-	38
108.G.01.008a En-Suite		-	105	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
108.G.01.009 Standard Room		-	79	-	38
108.G.01.009a En-Suite		-	105	-	10
108.G.01.010 Kitchen, Dining & Lounge		63	-	-	108
108.G.01.017 Circulation		-	79	-	65
108.G.01.018 Sluice Room		-	108	-	44
108.G.02.001 Standard Room		-	79	-	38
108.G.02.001a En-Suite		-	105	-	10
108.G.02.002 Standard Room		-	79	-	38
108.G.02.002a En-Suite		-	105	-	10
108.G.02.003 Standard Room		-	79	-	38
108.G.02.003a En-Suite		-	105	-	10
108.G.02.004 Standard Room		-	79	-	38
108.G.02.004a En-Suite		-	105	-	10
108.G.02.005 Standard Room		-	79	-	38
108.G.02.005a En-Suite		-	105	-	10
108.G.02.006 Standard Room		-	79	-	38
108.G.02.006a En-Suite		-	105	-	10
108.G.02.007 Standard Room		-	79	-	38
108.G.02.007a En-Suite		-	105	-	10
108.G.02.008 Standard Room		-	79	-	38
108.G.02.008a En-Suite		-	105	-	10
108.G.02.009 Standard Room		-	79	-	38
108.G.02.009a En-Suite		-	105	-	10
108.G.02.010 Kitchen, Dining & Lounge		63	-	-	126
108.G.02.018 Circulation		-	79	-	104
108.G.02.019 Plant		67	-	-	88
108.G.02.021 Linen Store		65	-	-	44
108.G.PL.033 Plant		67	-	-	88
108.G.ST.003 Post		100	-	-	118
108.G.ST.011 Store		65	-	-	44
108.G.ST.012 Cleaners Store		65	-	-	44
108.G.DA.001 Study		100	-	-	733
108.G.WC.009 WC		-	105	-	26
108.G.TL.001a Small Seminar Room		100	-	-	88
108.G.WC.008 WC		-	105	-	13
108.G.WC.007 WC		-	105	-	13
108.G.WC.006 WC		-	105	-	13
108.G.WC.005 WC		-	105	-	13
108.G.WC.027 Change/Shower		-	105	-	26
108.G.WC.026 WC		-	105	-	26
108.G.WC.025 WC		-	105	-	26
108.G.ST.023 FM Store		65	-	-	20
108.G.WC.028 Change/Shower		-	105	-	26

General lighting and display lighting		Luminous efficacy [lm/W]			
Zone name		Luminaire	Lamp	Display lamp	General lighting [W]
	Standard value	60	60	22	
108.G.ST.024 Lockers		100	-	-	60
108.G.ST.020 Staff Area		100	-	-	120
108.G.AD.021 Meeting Room		73	-	-	40
108.G.AD.021 Open Offices		100	-	-	168
108.G.CC.030 Circulation		-	79	-	109
108.G.ST.010 Laundry		-	100	-	160
108.G.DA.002 Lounge		100	-	-	619
108.G.DA.002 Black Box Cinema		100	-	-	111

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?
108.1.03.001 Standard Room	NO (-79.2%)	NO
108.1.03.002 Standard Room	NO (-92.4%)	NO
108.1.03.003 Standard Room	NO (-70.1%)	NO
108.1.03.004 Standard Room	NO (-82.8%)	NO
108.1.03.005 Standard Room	NO (-70.1%)	NO
108.1.03.006 Standard Room	NO (-82.4%)	NO
108.1.03.007 Standard Room	NO (-70.1%)	NO
108.1.03.008 Standard Room	NO (-81.9%)	NO
108.1.03.009 Standard Room	NO (-81.4%)	NO
108.1.03.010 Standard Room	NO (-88%)	NO
108.1.03.011 Kitchen, Dining & Lounge	NO (-86.1%)	NO
108.1.04.001 Standard Room	NO (-79.2%)	NO
108.1.04.002 Standard Room	NO (-70.2%)	NO
108.1.04.003 Standard Room	NO (-71.4%)	NO
108.1.04.004 Standard Room	NO (-67.8%)	NO
108.1.04.005 Standard Room	NO (-88%)	NO
108.1.04.006 Standard Room	NO (-67.7%)	NO
108.1.04.007 Standard Room	NO (-82.1%)	NO
108.1.04.008 Standard Room	NO (-67.8%)	NO
108.1.04.009 Standard Room	NO (-86.9%)	NO
108.1.04.010 Standard Room	NO (-77.3%)	NO
108.1.04.011 Kitchen, Dining & Lounge	NO (-80%)	NO
108.1.05.001 Standard Room	NO (-81.1%)	NO
108.1.05.002 Standard Room	NO (-86%)	NO
108.1.05.003 Standard Room	NO (-72.9%)	NO
108.1.05.004 Standard Room	NO (-76.1%)	NO
108.1.05.005 Standard Room	NO (-72.9%)	NO
108.1.05.006 Standard Room	NO (-75.6%)	NO
108.1.05.007 Standard Room	NO (-73%)	NO
108.1.05.008 Standard Room	NO (-75.3%)	NO
108.1.05.009 Standard Room	NO (-82.7%)	NO
108.1.05.010 Standard Room	NO (-84.1%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
108.1.05.011 Kitchen, Dining & Lounge	NO (-89.3%)	NO
108.2.06.001 Standard Room	NO (-79.2%)	NO
108.2.06.002 Standard Room	NO (-92.1%)	NO
108.2.06.003 Standard Room	NO (-70.1%)	NO
108.2.06.004 Standard Room	NO (-82.2%)	NO
108.2.06.005 Standard Room	NO (-70.1%)	NO
108.2.06.006 Standard Room	NO (-81.7%)	NO
108.2.06.007 Standard Room	NO (-70.1%)	NO
108.2.06.008 Standard Room	NO (-81.4%)	NO
108.2.06.009 Standard Room	NO (-81.4%)	NO
108.2.06.010 Standard Room	NO (-87.8%)	NO
108.2.06.011 Kitchen, Dining & Lounge	NO (-85.4%)	NO
108.2.07.001 Standard Room	NO (-79.2%)	NO
108.2.07.002 Standard Room	NO (-70.2%)	NO
108.2.07.003 Standard Room	NO (-70.9%)	NO
108.2.07.004 Standard Room	NO (-67.8%)	NO
108.2.07.005 Standard Room	NO (-87.6%)	NO
108.2.07.006 Standard Room	NO (-67.7%)	NO
108.2.07.007 Standard Room	NO (-80.1%)	NO
108.2.07.008 Standard Room	NO (-67.8%)	NO
108.2.07.009 Standard Room	NO (-85.6%)	NO
108.2.07.010 Standard Room	NO (-77.3%)	NO
108.2.07.011 Kitchen, Dining & Lounge	NO (-71.4%)	NO
108.2.08.001 Standard Room	NO (-81.1%)	NO
108.2.08.002 Standard Room	NO (-85.4%)	NO
108.2.08.003 Standard Room	NO (-72.9%)	NO
108.2.08.004 Standard Room	NO (-75.5%)	NO
108.2.08.005 Standard Room	NO (-72.9%)	NO
108.2.08.006 Standard Room	NO (-75.5%)	NO
108.2.08.007 Standard Room	NO (-73%)	NO
108.2.08.008 Standard Room	NO (-75.2%)	NO
108.2.08.009 Standard Room	NO (-82.7%)	NO
108.2.08.010 Standard Room	NO (-84.1%)	NO
108.2.08.011 Kitchen, Dining & Lounge	NO (-86%)	NO
108.3.09.001 Standard Room	NO (-79.2%)	NO
108.3.09.002 Standard Room	NO (-91.7%)	NO
108.3.09.003 Standard Room	NO (-70.1%)	NO
108.3.09.004 Standard Room	NO (-81.7%)	NO
108.3.09.005 Standard Room	NO (-70.1%)	NO
108.3.09.006 Standard Room	NO (-81.2%)	NO
108.3.09.007 Standard Room	NO (-70.1%)	NO
108.3.09.008 Standard Room	NO (-81.1%)	NO
108.3.09.009 Standard Room	NO (-81.4%)	NO
108.3.09.010 Standard Room	NO (-87.7%)	NO
108.3.09.011 Kitchen, Dining & Lounge	NO (-86%)	NO
108.3.10.001 Standard Room	NO (-79.2%)	NO
108.3.10.002 Standard Room	NO (-70.2%)	NO
108.3.10.003 Standard Room	NO (-70.9%)	NO
108.3.10.004 Standard Room	NO (-67.8%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
108.3.10.005 Standard Room	NO (-79.3%)	NO
108.3.10.006 Standard Room	NO (-67.7%)	NO
108.3.10.007 Standard Room	NO (-74.4%)	NO
108.3.10.008 Standard Room	NO (-67.8%)	NO
108.3.10.009 Standard Room	NO (-83.7%)	NO
108.3.10.010 Standard Room	NO (-77.3%)	NO
108.3.10.011 Kitchen, Dining & Lounge	NO (-76.7%)	NO
108.3.11.001 Standard Room	NO (-81.1%)	NO
108.3.11.002 Standard Room	NO (-84.9%)	NO
108.3.11.003 Standard Room	NO (-72.9%)	NO
108.3.11.004 Standard Room	NO (-75.2%)	NO
108.3.11.005 Standard Room	NO (-72.9%)	NO
108.3.11.006 Standard Room	NO (-75%)	NO
108.3.11.007 Standard Room	NO (-73%)	NO
108.3.11.008 Standard Room	NO (-75%)	NO
108.3.11.009 Standard Room	NO (-82.7%)	NO
108.3.11.010 Standard Room	NO (-83.9%)	NO
108.3.11.011 Kitchen, Dining & Lounge	NO (-92.1%)	NO
108.G.01.001 Standard Room	NO (-79.2%)	NO
108.G.01.002 Standard Room	NO (-83.1%)	NO
108.G.01.003 Standard Room	NO (-70.1%)	NO
108.G.01.004 Standard Room	NO (-82.6%)	NO
108.G.01.005 Standard Room	NO (-70.1%)	NO
108.G.01.006 Standard Room	NO (-82.3%)	NO
108.G.01.007 Standard Room	NO (-70.1%)	NO
108.G.01.008 Standard Room	NO (-90.5%)	NO
108.G.01.009 Standard Room	NO (-81.4%)	NO
108.G.01.010 Kitchen, Dining & Lounge	NO (-84.4%)	NO
108.G.02.001 Standard Room	NO (-79.2%)	NO
108.G.02.002 Standard Room	NO (-70.2%)	NO
108.G.02.003 Standard Room	NO (-70.6%)	NO
108.G.02.004 Standard Room	NO (-88.9%)	NO
108.G.02.005 Standard Room	NO (-67.8%)	NO
108.G.02.006 Standard Room	NO (-67.9%)	NO
108.G.02.007 Standard Room	NO (-67.9%)	NO
108.G.02.008 Standard Room	NO (-68.1%)	NO
108.G.02.009 Standard Room	NO (-77.8%)	NO
108.G.02.010 Kitchen, Dining & Lounge	NO (-83.7%)	NO
108.G.ST.003 Post	N/A	N/A
108.G.DA.001 Study	NO (-1.4%)	NO
108.G.TL.001a Small Seminar Room	N/A	N/A
108.G.ST.020 Staff Area	NO (-26%)	NO
108.G.AD.021 Meeting Room	N/A	N/A
108.G.AD.021 Open Offices	NO (-44.5%)	NO
108.G.DA.002 Lounge	NO (-20.4%)	NO
108.G.DA.002 Black Box Cinema	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?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	3318.6	3318.6
External area [m ²]	4610.4	4610.4
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	5	3
Average conductance [W/K]	4648.01	2317.26
Average U-value [W/m ² K]	1.01	0.5
Alpha value* [%]	3.94	10

* 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
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
100 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	57.99	65.35
Cooling	0	0
Auxiliary	7.06	4.08
Lighting	10.01	11.95
Hot water	100.89	98.71
Equipment*	25.02	25.02
TOTAL **	175.95	180.1

* 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]	186.28	235.28
Primary energy* [kWh/m ²]	189.05	187.45
Total emissions [kg/m ²]	32.7	39.3

* 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 SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER	
[ST] Central heating using water: radiators, [HS] District heating, [HFT] District Heating, [CFT] Electricity										
Actual	250.2	0	77.9	0	6	0.89	0	1	0	
Notional	0	0	0	0	0	0	0	----	----	
[ST] Central heating using air distribution, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
Actual	0.4	0	0.1	0	2.2	1.07	0	1	0	
Notional	328.5	0	91.3	0	5.2	1	0	----	----	
[ST] Central heating using water: radiators, [HS] District heating, [HFT] District Heating, [CFT] Electricity										
Actual	190.4	0	59.3	0	9.9	0.89	0	1	0	
Notional	0	0	0	0	8	0.86	0	----	----	
[ST] Central heating using water: radiators, [HS] District heating, [HFT] District Heating, [CFT] Electricity										
Actual	121.1	0	37.7	0	9.9	0.89	0	1	0	
Notional	117.1	0	32.5	0	4.2	1	0	----	----	
[ST] Central heating using water: radiators, [HS] District heating, [HFT] District Heating, [CFT] Electricity										
Actual	118.4	0	36.9	0	11	0.89	0	1	0	
Notional	59	0	16.4	0	4.2	1	0	----	----	
[ST] Central heating using water: radiators, [HS] District heating, [HFT] District Heating, [CFT] Electricity										
Actual	129.2	0	40.2	0	9.4	0.89	0	1	0	
Notional	84.4	0	23.4	0	4.2	1	0	----	----	
[ST] Central heating using water: radiators, [HS] District heating, [HFT] District Heating, [CFT] Electricity										
Actual	47.4	0	14.7	0	7.6	0.89	0	1	0	
Notional	73.8	0	20.5	0	4.2	1	0	----	----	
[ST] No Heating or Cooling										
Actual	0	0	0	0	0	0	0	0	0	
Notional	43.4	0	12.1	0	4.1	1	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	0.15	10000193:Surf[3]
Floor	0.2	0.14	100001CD:Surf[6]
Roof	0.15	0.13	1000024B:Surf[5]
Windows, roof windows, and rooflights	1.5	1.4	100001C8:Surf[0]
Personnel doors	1.5	1.4	10000195:Surf[1]
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building
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

Calculation Sheet

No. of Sheets: 21

Project Title: UoM Fallowfields

Project No. C5219

File No. V:\Contract Files\C5219
Fallowfield\7.0 Design\7.03
Calculations\Thermal
central\ESD\Incoming\BRUKL
EPCs\As Built\Block 101 Marsham

Subject: Block 101 'As Built' BRUKL and EPC

Calc No. UoM-HES-101-XX-CA-Y-80-01-AF1

Design Manager: Geoff Evans

Design Phase:

A – Concept or preliminary ☐
B – Analysis and Detailed design ☐
C – Design verification ☐
D – Other (specify) 'As Built' ☒

Designer: Neil Hamilton
Environmental Services Design (ESD)

Computer Applications Used
IES VE

Version/Date
2019

Scope of Checking for Manual & Computer Generated Calculations:

Desktop review against results of Stage 3 and 'As Designed' SBEM calculations.

Sheets Checked*	Calculations by			Checked by		
	Name	Signature	Date	Name	Signature	Date
All	ESD		2019-09-30	Geoff Evans		2019-10-01

*If an Excel spreadsheet or other computer file has been checked and has not been attached, enter the name, date and full file path or server location of the file that was checked.

a) Basic Design Information or Source and Reference:

Documents generated from the IES VE Model referenced as;

1. 2019-10-02T091347 EJ1141 S2 B101 V2018 Fallowfield 12-08-19 [VE2018].cab

b) Identify documents/technical records where output will be used:

Documents required to demonstrate compliance with the following;

1. Building Regulations 2013 Part L2A
2. The Energy Performance of Buildings (England and Wales) Regulations 2018

Approved by

Design Manager Geoff Evans

Signature



Date

2019-10-01

Distribution:

Matt Stockton, Vinci Construction UK Ltd

Energy Performance Certificate

Non-Domestic Building



Marsham Court
Unsworth Park
20 Chancellors Way
MANCHESTER
M14 6FZ

Certificate Reference Number:
0710-5979-0301-8080-1040

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient



Net zero CO₂ emissions

A 0-25

B 26-50

26

This is how energy efficient the building is.

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

Less energy efficient

Technical Information

Main heating fuel:	District Heating
Building environment:	Heating and Natural Ventilation
Total useful floor area (m ²):	3079
Assessment Level:	5
Building emission rate (kgCO ₂ /m ² per year):	35.64
Primary energy use (kWh/m ² per year):	206.09

Benchmarks

Buildings similar to this one could have ratings as follows:

32

If newly built

85

If typical of the existing stock

Administrative Information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

Assessment Software:	Virtual Environment v7.0.11 using calculation engine ApacheSim v7.0.11
Property Reference:	540791880000
Assessor Name:	Neil Hamilton
Assessor Number:	STRO007864
Accreditation Scheme:	Stroma Certification Ltd
Employer/Trading Name:	Environmental Services Design Ltd
Employer/Trading Address:	Courtyard East, Wharfebank House, Wharfebank Business Centre, Ilkley Road, Otley, LS21 3JP
Issue Date:	30 Sep 2019
Valid Until:	29 Sep 2029 (unless superseded by a later certificate)
Related Party Disclosure:	Not related to the owner.

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report - 9584-4081-0710-0100-0971.

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by Stroma Certification Ltd. You can obtain contact details of the Accreditation Scheme at www.stroma.com.

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at www.opendatacommunities.org.

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. Any personal data it contains will be processed in accordance with the General Data Protection Regulation and all applicable laws and regulations relating to the processing of personal data and privacy. For further information about this and how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at: www.gov.uk/government/collections/energy-performance-certificates. It explains the content and use of this document, advises on how to identify the authenticity of a certificate and how to make a complaint.

Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property – whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.

BRUKL Output Document



Compliance with England Building Regulations Part L 2013

Project name

Marsham Court

As built

Date: Fri Sep 27 11:57:19 2019

Administrative information

Building Details

Address: MANCHESTER, M14 6FZ

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.11

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.11

BRUKL compliance check version: v5.6.a.1

Owner Details

Name: The University of Manchester

Telephone number: 0161 306 6000

Address: Oxford Road, Manchester, M13 9PL

Certifier details

Name: Neil Hamilton

Telephone number: 019143 851016

Address: Environmental Services Design Ltd, Courtyard East, Wharfebank House, Wharfebank Business Centre, Ilkley Road, Otley, LS21 3JP

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	43.1
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	43.1
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	35.6
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	0.15	0.15	10000000:Surf[4]
Floor	0.25	0.13	0.13	10000058:Surf[6]
Roof	0.25	0.13	0.13	100000B2:Surf[5]
Windows***, roof windows, and rooflights	2.2	1.4	1.4	10000000:Surf[0]
Personnel doors	2.2	2.2	2.2	RM000059:Surf[0]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building
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	4

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- Central Heating Using Water: Radiators - District Heating + DHW

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	0	-
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

"No HWS in project, or hot water is provided by HVAC system"

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		
101.1.04.001a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.04.002a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.04.003a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.04.004a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.04.005a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.04.006a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.04.007a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.04.008a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.04.009a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.04.010a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.04.011 Kitchen, Dining & Lounge		-	-	0.4	-	-	-	-	-	-	-	N/A
101.1.05.001a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.05.002a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.05.003a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.05.004a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.05.005a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.05.006a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.05.007a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.05.008a En-Suite		-	-	0.5	-	-	-	-	-	-	-	N/A
101.1.05.009a En-Suite		-	-	0.5	-	-	-	-	-	-	-	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	
101.1.05.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.1.05.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
101.1.05.021a Sluice Room	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.1.06.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.1.06.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.1.06.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.1.06.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.1.06.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.1.06.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.1.06.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.1.06.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.1.06.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.1.06.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.1.06.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
101.2.07.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.07.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.07.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.07.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.07.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.07.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.07.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.07.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.07.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.07.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.07.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
101.2.08.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.08.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.08.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.08.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.08.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.08.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.08.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.08.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.08.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.08.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.08.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
101.2.08.021a Sluice Room	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.09.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.09.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.09.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.09.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.09.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.09.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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	
101.2.09.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.09.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.09.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.09.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.2.09.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
101.3.10.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.10.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.10.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.10.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.10.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.10.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.10.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.10.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.10.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.10.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.10.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
101.3.11.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.11.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.11.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.11.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.11.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.11.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.11.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.11.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.11.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.11.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.11.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
101.3.11.021a Sluice Room	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.12.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.12.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.12.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.12.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.12.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.12.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.12.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.12.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.12.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.12.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.3.12.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
101.G.01.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.01.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.01.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.01.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	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	
101.G.01.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.01.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.01.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.01.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.01.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.01.010 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
101.G.01.019 Sluice Room	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.02.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.02.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.02.003a En-suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.02.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.02.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.02.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.02.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.02.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.02.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.02.010a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.02.011 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
101.G.03.001a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.03.002a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.03.003a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.03.004a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.03.005a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.03.006a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.03.007a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.03.008a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.03.009a En-Suite	-	-	0.5	-	-	-	-	-	-	-	N/A	
101.G.03.010 Kitchen, Dining & Lounge	-	-	0.4	-	-	-	-	-	-	-	N/A	
101.G.03.019 Sluice Room	-	-	0.5	-	-	-	-	-	-	-	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	
101.1.00.001 Circulation		-	66	-	163
101.1.00.002 Circulation		-	76	-	123
101.1.04.001 Standard Room		-	79	-	38
101.1.04.001a En-Suite		-	162	-	10
101.1.04.002 Standard Room		-	79	-	38
101.1.04.002a En-Suite		-	162	-	10
101.1.04.003 Standard Room		-	79	-	38
101.1.04.003a En-Suite		-	162	-	10
101.1.04.004 Standard Room		-	79	-	38
101.1.04.004a En-Suite		-	162	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
101.1.04.005 Standard Room		-	79	-	38
101.1.04.005a En-Suite		-	162	-	10
101.1.04.006 Standard Room		-	79	-	38
101.1.04.006a En-Suite		-	162	-	10
101.1.04.007 Standard Room		-	79	-	38
101.1.04.007a En-Suite		-	162	-	10
101.1.04.008 Standard Room		-	79	-	38
101.1.04.008a En-Suite		-	162	-	10
101.1.04.009 Standard Room		-	80	-	38
101.1.04.009a En-Suite		-	162	-	10
101.1.04.010 Standard Room		-	80	-	38
101.1.04.010a En-Suite		-	162	-	10
101.1.04.011 Kitchen, Dining & Lounge		-	61	-	108
101.1.04.018 Circulation		-	94	-	52
101.1.05.001 Standard Room		-	79	-	38
101.1.05.001a En-Suite		-	162	-	10
101.1.05.002 Standard Room		-	79	-	38
101.1.05.002a En-Suite		-	162	-	10
101.1.05.003 Standard Room		-	79	-	38
101.1.05.003a En-Suite		-	162	-	10
101.1.05.004 Plant (Switch)		120	-	-	0
101.1.05.004 Standard Room		-	79	-	38
101.1.05.004a En-Suite		-	162	-	10
101.1.05.005 Standard Room		-	79	-	38
101.1.05.005a En-Suite		-	162	-	10
101.1.05.006 Standard Room		-	79	-	38
101.1.05.006a En-Suite		-	162	-	10
101.1.05.007 Standard Room		-	79	-	38
101.1.05.007a En-Suite		-	162	-	10
101.1.05.008 Standard Room		-	79	-	38
101.1.05.008a En-Suite		-	162	-	10
101.1.05.009 Standard Room		-	79	-	38
101.1.05.009a En-Suite		-	162	-	10
101.1.05.010 Standard Room		-	79	-	38
101.1.05.010a En-Suite		-	162	-	10
101.1.05.011 Kitchen, Dining & Lounge		-	61	-	126
101.1.05.019 Circulation		-	92	-	52
101.1.05.021 Linen Store		61	-	-	57
101.1.05.021a Sluice Room		-	166	-	44
101.1.06.001 Standard Room		-	80	-	38
101.1.06.001a En-Suite		-	160	-	10
101.1.06.002 Standard Room		-	80	-	38
101.1.06.002a En-Suite		-	160	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
101.1.06.003 Standard Room		-	79	-	38
101.1.06.003a En-Suite		-	162	-	10
101.1.06.004 Standard Room		-	79	-	38
101.1.06.004a En-Suite		-	162	-	10
101.1.06.005 Standard Room		-	79	-	38
101.1.06.005a En-Suite		-	162	-	10
101.1.06.006 Standard Room		-	79	-	38
101.1.06.006a En-Suite		-	162	-	10
101.1.06.007 Standard Room		-	79	-	38
101.1.06.007a En-Suite		-	162	-	10
101.1.06.008 Standard Room		-	79	-	38
101.1.06.008a En-Suite		-	162	-	10
101.1.06.009 Standard Room		-	80	-	38
101.1.06.009a En-Suite		-	162	-	10
101.1.06.010 Standard Room		-	80	-	38
101.1.06.010a En-Suite		-	162	-	10
101.1.06.011 Kitchen, Dining & Lounge		-	61	-	108
101.1.06.018 Circulation		-	94	-	52
101.2.00.001 Circulation		-	66	-	163
101.2.00.002 Circulation		-	76	-	123
101.2.07.001 Standard Room		-	79	-	38
101.2.07.001a En-Suite		-	162	-	10
101.2.07.002 Standard Room		-	79	-	38
101.2.07.002a En-Suite		-	162	-	10
101.2.07.003 Standard Room		-	79	-	38
101.2.07.003a En-Suite		-	162	-	10
101.2.07.004 Standard Room		-	79	-	38
101.2.07.004a En-Suite		-	162	-	10
101.2.07.005 Standard Room		-	79	-	38
101.2.07.005a En-Suite		-	162	-	10
101.2.07.006 Standard Room		-	79	-	38
101.2.07.006a En-Suite		-	162	-	10
101.2.07.007 Standard Room		-	79	-	38
101.2.07.007a En-Suite		-	162	-	10
101.2.07.008 Standard Room		-	79	-	38
101.2.07.008a En-Suite		-	162	-	10
101.2.07.009 Standard Room		-	80	-	38
101.2.07.009a En-Suite		-	162	-	10
101.2.07.010 Standard Room		-	80	-	38
101.2.07.010a En-Suite		-	162	-	10
101.2.07.011 Kitchen, Dining & Lounge		-	61	-	108
101.2.07.018 Circulation		-	94	-	52
101.2.08.001 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
101.2.08.001a En-Suite		-	162	-	10
101.2.08.002 Standard Room		-	79	-	38
101.2.08.002a En-Suite		-	162	-	10
101.2.08.003 Standard Room		-	79	-	38
101.2.08.003a En-Suite		-	162	-	10
101.2.08.004 Standard Room		-	79	-	38
101.2.08.004a En-Suite		-	162	-	10
101.2.08.005 Standard Room		-	79	-	38
101.2.08.005a En-Suite		-	162	-	10
101.2.08.006 Standard Room		-	79	-	38
101.2.08.006a En-Suite		-	162	-	10
101.2.08.007 Standard Room		-	79	-	38
101.2.08.007a En-Suite		-	162	-	10
101.2.08.008 Standard Room		-	79	-	38
101.2.08.008a En-Suite		-	162	-	10
101.2.08.009 Standard Room		-	79	-	38
101.2.08.009a En-Suite		-	162	-	10
101.2.08.010 Standard Room		-	79	-	38
101.2.08.010a En-Suite		-	162	-	10
101.2.08.011 Kitchen, Dining & Lounge		-	61	-	126
101.2.08.015 Plant (Switch)		120	-	-	0
101.2.08.019 Circulation		-	92	-	52
101.2.08.021 Linen Store		61	-	-	57
101.2.08.021a Sluice Room		-	166	-	44
101.2.09.001 Standard Room		-	80	-	38
101.2.09.001a En-Suite		-	160	-	10
101.2.09.002 Standard Room		-	80	-	38
101.2.09.002a En-Suite		-	160	-	10
101.2.09.003 Standard Room		-	79	-	38
101.2.09.003a En-Suite		-	162	-	10
101.2.09.004 Standard Room		-	79	-	38
101.2.09.004a En-Suite		-	162	-	10
101.2.09.005 Standard Room		-	79	-	38
101.2.09.005a En-Suite		-	162	-	10
101.2.09.006 Standard Room		-	79	-	38
101.2.09.006a En-Suite		-	162	-	10
101.2.09.007 Standard Room		-	79	-	38
101.2.09.007a En-Suite		-	162	-	10
101.2.09.008 Standard Room		-	79	-	38
101.2.09.008a En-Suite		-	162	-	10
101.2.09.009 Standard Room		-	80	-	38
101.2.09.009a En-Suite		-	162	-	10
101.2.09.010 Standard Room		-	80	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
101.2.09.010a En-Suite		-	162	-	10
101.2.09.011 Kitchen, Dining & Lounge		-	61	-	108
101.2.09.018 Circulation		-	94	-	52
101.3.00.001 Circulation		-	66	-	344
101.3.00.002 Circulation		-	76	-	123
101.3.10.001 Standard Room		-	79	-	38
101.3.10.001a En-Suite		-	162	-	10
101.3.10.002 Standard Room		-	79	-	38
101.3.10.002a En-Suite		-	162	-	10
101.3.10.003 Standard Room		-	79	-	38
101.3.10.003a En-Suite		-	162	-	10
101.3.10.004 Standard Room		-	79	-	38
101.3.10.004a En-Suite		-	162	-	10
101.3.10.005 Standard Room		-	79	-	38
101.3.10.005a En-Suite		-	162	-	10
101.3.10.006 Standard Room		-	79	-	38
101.3.10.006a En-Suite		-	162	-	10
101.3.10.007 Standard Room		-	79	-	38
101.3.10.007a En-Suite		-	162	-	10
101.3.10.008 Standard Room		-	79	-	38
101.3.10.008a En-Suite		-	162	-	10
101.3.10.009 Standard Room		-	80	-	38
101.3.10.009a En-Suite		-	162	-	10
101.3.10.010 Standard Room		-	80	-	38
101.3.10.010a En-Suite		-	162	-	10
101.3.10.011 Kitchen, Dining & Lounge		-	61	-	108
101.3.10.018 Circulation		-	94	-	52
101.3.11.001 Standard Room		-	79	-	38
101.3.11.001a En-Suite		-	162	-	10
101.3.11.002 Standard Room		-	79	-	38
101.3.11.002a En-Suite		-	162	-	10
101.3.11.003 Standard Room		-	79	-	38
101.3.11.003a En-Suite		-	162	-	10
101.3.11.004 Standard Room		-	79	-	38
101.3.11.004a En-Suite		-	162	-	10
101.3.11.005 Standard Room		-	79	-	38
101.3.11.005a En-Suite		-	162	-	10
101.3.11.006 Standard Room		-	79	-	38
101.3.11.006a En-Suite		-	162	-	10
101.3.11.007 Standard Room		-	79	-	38
101.3.11.007a En-Suite		-	162	-	10
101.3.11.008 Standard Room		-	79	-	38
101.3.11.008a En-Suite		-	162	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
101.3.11.009 Standard Room		-	79	-	38
101.3.11.009a En-Suite		-	162	-	10
101.3.11.010 Standard Room		-	79	-	38
101.3.11.010a En-Suite		-	162	-	10
101.3.11.011 Kitchen, Dining & Lounge		-	61	-	126
101.3.11.015 Plant (Switch)		120	-	-	0
101.3.11.019 Circulation		-	92	-	52
101.3.11.021 Linen Store		61	-	-	57
101.3.11.021a Sluice Room		-	166	-	44
101.3.12.001 Standard Room		-	80	-	38
101.3.12.001a En-Suite		-	160	-	10
101.3.12.002 Standard Room		-	80	-	38
101.3.12.002a En-Suite		-	160	-	10
101.3.12.003 Standard Room		-	79	-	38
101.3.12.003a En-Suite		-	162	-	10
101.3.12.004 Standard Room		-	79	-	38
101.3.12.004a En-Suite		-	162	-	10
101.3.12.005 Standard Room		-	79	-	38
101.3.12.005a En-Suite		-	162	-	10
101.3.12.006 Standard Room		-	79	-	38
101.3.12.006a En-Suite		-	162	-	10
101.3.12.007 Standard Room		-	79	-	38
101.3.12.007a En-Suite		-	162	-	10
101.3.12.008 Standard Room		-	79	-	38
101.3.12.008a En-Suite		-	162	-	10
101.3.12.009 Standard Room		-	80	-	38
101.3.12.009a En-Suite		-	162	-	10
101.3.12.010 Standard Room		-	80	-	38
101.3.12.010a En-Suite		-	162	-	10
101.3.12.011 Kitchen, Dining & Lounge		-	61	-	108
101.3.12.018 Circulation		-	94	-	52
101.G.00.001 Circulation		-	62	-	215
101.G.00.002 Circulation		-	64	-	191
101.G.00.003 Plant (Water)		107	-	-	88
101.G.00.004 Plant (Switch)		126	-	-	44
101.G.01.001 Standard Room		-	79	-	38
101.G.01.001a En-Suite		-	162	-	10
101.G.01.002 Standard Room		-	79	-	38
101.G.01.002a En-Suite		-	162	-	10
101.G.01.003 Standard Room		-	79	-	38
101.G.01.003a En-Suite		-	162	-	10
101.G.01.004 Standard Room		-	79	-	38
101.G.01.004a En-Suite		-	162	-	10

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
101.G.01.005 Standard Room		-	79	-	38
101.G.01.005a En-Suite		-	162	-	10
101.G.01.006 Standard Room		-	79	-	38
101.G.01.006a En-Suite		-	162	-	10
101.G.01.007 Standard Room		-	79	-	38
101.G.01.007a En-Suite		-	162	-	10
101.G.01.008 Standard Room		-	80	-	38
101.G.01.008a En-Suite		-	162	-	10
101.G.01.009 Standard Room		-	80	-	38
101.G.01.009a En-Suite		-	162	-	10
101.G.01.010 Kitchen, Dining & Lounge		-	62	-	108
101.G.01.017 Circulation		-	94	-	52
101.G.01.019 Sluice Room		-	120	-	44
101.G.02.001 Standard Room		-	79	-	38
101.G.02.001a En-Suite		-	162	-	10
101.G.02.002 Standard Room		-	79	-	38
101.G.02.002a En-Suite		-	162	-	10
101.G.02.003 Standard Room		-	79	-	38
101.G.02.003a En-suite		-	162	-	10
101.G.02.004 Standard Room		-	79	-	38
101.G.02.004a En-Suite		-	162	-	10
101.G.02.005 Standard Room		-	79	-	38
101.G.02.005a En-Suite		-	162	-	10
101.G.02.006 Standard Room		-	79	-	38
101.G.02.006a En-Suite		-	162	-	10
101.G.02.007 Standard Room		-	79	-	38
101.G.02.007a En-Suite		-	162	-	10
101.G.02.008 Standard Room		-	79	-	38
101.G.02.008a En-Suite		-	162	-	10
101.G.02.009 Standard Room		-	79	-	38
101.G.02.009a En-Suite		-	162	-	10
101.G.02.010 Standard Room		-	79	-	38
101.G.02.010a En-Suite		-	162	-	10
101.G.02.011 Kitchen, Dining & Lounge		-	61	-	126
101.G.02.018 Circulation		-	91	-	52
101.G.02.019 Linen Store		64	-	-	44
101.G.03.001 Standard Room		-	80	-	38
101.G.03.001a En-Suite		-	160	-	10
101.G.03.002 Standard Room		-	79	-	38
101.G.03.002a En-Suite		-	162	-	10
101.G.03.003 Standard Room		-	79	-	38
101.G.03.003a En-Suite		-	162	-	10
101.G.03.004 Standard Room		-	79	-	38

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
101.G.03.004a En-Suite		-	162	-	10
101.G.03.005 Standard Room		-	79	-	38
101.G.03.005a En-Suite		-	162	-	10
101.G.03.006 Standard Room		-	79	-	38
101.G.03.006a En-Suite		-	162	-	10
101.G.03.007 Standard Room		-	79	-	38
101.G.03.007a En-Suite		-	162	-	10
101.G.03.008 Standard Room		-	80	-	38
101.G.03.008a En-Suite		-	162	-	10
101.G.03.009 Standard Room		-	80	-	38
101.G.03.009a En-Suite		-	162	-	10
101.G.03.010 Kitchen, Dining & Lounge		-	62	-	108
101.G.03.017 Circulation		-	94	-	52
101.G.03.019 Sluice Room		-	113	-	44
101.G.03.020 Plant (Comms)		108	-	-	88

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?
101.1.04.001 Standard Room	NO (-71.8%)	NO
101.1.04.002 Standard Room	NO (-67.7%)	NO
101.1.04.003 Standard Room	NO (-70.2%)	NO
101.1.04.004 Standard Room	NO (-67.4%)	NO
101.1.04.005 Standard Room	NO (-70.2%)	NO
101.1.04.006 Standard Room	NO (-67.3%)	NO
101.1.04.007 Standard Room	NO (-70.2%)	NO
101.1.04.008 Standard Room	NO (-67.3%)	NO
101.1.04.009 Standard Room	NO (-81.4%)	NO
101.1.04.010 Standard Room	NO (-78.7%)	NO
101.1.05.001 Standard Room	NO (-80.2%)	NO
101.1.05.002 Standard Room	NO (-78.3%)	NO
101.1.05.003 Standard Room	NO (-70.2%)	NO
101.1.05.004 Standard Room	NO (-67.3%)	NO
101.1.05.005 Standard Room	NO (-70.2%)	NO
101.1.05.006 Standard Room	NO (-67.3%)	NO
101.1.05.007 Standard Room	NO (-70.2%)	NO
101.1.05.008 Standard Room	NO (-67.5%)	NO
101.1.05.009 Standard Room	NO (-70.1%)	NO
101.1.05.010 Standard Room	NO (-67.7%)	NO
101.1.06.001 Standard Room	NO (-79.4%)	NO
101.1.06.002 Standard Room	NO (-77.7%)	NO
101.1.06.003 Standard Room	NO (-69.7%)	NO
101.1.06.004 Standard Room	NO (-67.1%)	NO
101.1.06.005 Standard Room	NO (-69.7%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
101.1.06.006 Standard Room	NO (-67.4%)	NO
101.1.06.007 Standard Room	NO (-69.6%)	NO
101.1.06.008 Standard Room	NO (-67%)	NO
101.1.06.009 Standard Room	NO (-80.7%)	NO
101.1.06.010 Standard Room	NO (-79%)	NO
101.2.07.001 Standard Room	NO (-71.8%)	NO
101.2.07.002 Standard Room	NO (-67.5%)	NO
101.2.07.003 Standard Room	NO (-70.2%)	NO
101.2.07.004 Standard Room	NO (-67.4%)	NO
101.2.07.005 Standard Room	NO (-70.2%)	NO
101.2.07.006 Standard Room	NO (-67.3%)	NO
101.2.07.007 Standard Room	NO (-70.2%)	NO
101.2.07.008 Standard Room	NO (-67.3%)	NO
101.2.07.009 Standard Room	NO (-81.4%)	NO
101.2.07.010 Standard Room	NO (-78.7%)	NO
101.2.08.001 Standard Room	NO (-80.2%)	NO
101.2.08.002 Standard Room	NO (-78.3%)	NO
101.2.08.003 Standard Room	NO (-70.2%)	NO
101.2.08.004 Standard Room	NO (-67.3%)	NO
101.2.08.005 Standard Room	NO (-70.2%)	NO
101.2.08.006 Standard Room	NO (-67.3%)	NO
101.2.08.007 Standard Room	NO (-70.2%)	NO
101.2.08.008 Standard Room	NO (-67.5%)	NO
101.2.08.009 Standard Room	NO (-70.1%)	NO
101.2.08.010 Standard Room	NO (-68.1%)	NO
101.2.09.001 Standard Room	NO (-79.6%)	NO
101.2.09.002 Standard Room	NO (-77.7%)	NO
101.2.09.003 Standard Room	NO (-69.9%)	NO
101.2.09.004 Standard Room	NO (-67%)	NO
101.2.09.005 Standard Room	NO (-69.9%)	NO
101.2.09.006 Standard Room	NO (-67%)	NO
101.2.09.007 Standard Room	NO (-69.8%)	NO
101.2.09.008 Standard Room	NO (-67%)	NO
101.2.09.009 Standard Room	NO (-80.8%)	NO
101.2.09.010 Standard Room	NO (-79%)	NO
101.3.10.001 Standard Room	NO (-71.8%)	NO
101.3.10.002 Standard Room	NO (-67.5%)	NO
101.3.10.003 Standard Room	NO (-70.2%)	NO
101.3.10.004 Standard Room	NO (-67.4%)	NO
101.3.10.005 Standard Room	NO (-70.2%)	NO
101.3.10.006 Standard Room	NO (-67.3%)	NO
101.3.10.007 Standard Room	NO (-70.2%)	NO
101.3.10.008 Standard Room	NO (-67.3%)	NO
101.3.10.009 Standard Room	NO (-81.4%)	NO
101.3.10.010 Standard Room	NO (-78.7%)	NO
101.3.11.001 Standard Room	NO (-80.2%)	NO
101.3.11.002 Standard Room	NO (-78.3%)	NO
101.3.11.003 Standard Room	NO (-70.2%)	NO
101.3.11.004 Standard Room	NO (-67.3%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
101.3.11.005 Standard Room	NO (-70.2%)	NO
101.3.11.006 Standard Room	NO (-67.3%)	NO
101.3.11.007 Standard Room	NO (-70.2%)	NO
101.3.11.008 Standard Room	NO (-67.4%)	NO
101.3.11.009 Standard Room	NO (-70.1%)	NO
101.3.11.010 Standard Room	NO (-67.5%)	NO
101.3.12.001 Standard Room	NO (-79.4%)	NO
101.3.12.002 Standard Room	NO (-77.7%)	NO
101.3.12.003 Standard Room	NO (-69.6%)	NO
101.3.12.004 Standard Room	NO (-67%)	NO
101.3.12.005 Standard Room	NO (-69.6%)	NO
101.3.12.006 Standard Room	NO (-67%)	NO
101.3.12.007 Standard Room	NO (-69.6%)	NO
101.3.12.008 Standard Room	NO (-67%)	NO
101.3.12.009 Standard Room	NO (-80.6%)	NO
101.3.12.010 Standard Room	NO (-79%)	NO
101.G.01.001 Standard Room	NO (-71.8%)	NO
101.G.01.002 Standard Room	NO (-67.4%)	NO
101.G.01.003 Standard Room	NO (-70.2%)	NO
101.G.01.004 Standard Room	NO (-67.3%)	NO
101.G.01.005 Standard Room	NO (-70.2%)	NO
101.G.01.006 Standard Room	NO (-67.3%)	NO
101.G.01.007 Standard Room	NO (-70.2%)	NO
101.G.01.008 Standard Room	NO (-82.9%)	NO
101.G.01.009 Standard Room	NO (-81.4%)	NO
101.G.02.001 Standard Room	NO (-80.2%)	NO
101.G.02.002 Standard Room	NO (-78.3%)	NO
101.G.02.003 Standard Room	NO (-70.2%)	NO
101.G.02.004 Standard Room	NO (-67.3%)	NO
101.G.02.005 Standard Room	NO (-70.2%)	NO
101.G.02.006 Standard Room	NO (-67.4%)	NO
101.G.02.007 Standard Room	NO (-70.2%)	NO
101.G.02.008 Standard Room	NO (-67.6%)	NO
101.G.02.009 Standard Room	NO (-70.1%)	NO
101.G.02.010 Standard Room	NO (-68.1%)	NO
101.G.03.001 Standard Room	NO (-79.6%)	NO
101.G.03.002 Standard Room	NO (-67%)	NO
101.G.03.003 Standard Room	NO (-69.9%)	NO
101.G.03.004 Standard Room	NO (-67%)	NO
101.G.03.005 Standard Room	NO (-69.9%)	NO
101.G.03.006 Standard Room	NO (-67%)	NO
101.G.03.007 Standard Room	NO (-69.8%)	NO
101.G.03.008 Standard Room	NO (-79%)	NO
101.G.03.009 Standard Room	NO (-84.5%)	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

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	3078.8	3078.8
External area [m ²]	3892.1	3892.1
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	4	3
Average conductance [W/K]	4285.52	2014.61
Average U-value [W/m ² K]	1.1	0.52
Alpha value* [%]	3.38	10

* 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
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
100 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	69.04	77.57
Cooling	0	0
Auxiliary	7.23	4.41
Lighting	11.23	10.39
Hot water	104.67	109.98
Equipment*	16	16
TOTAL **	192.18	202.35

* 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]	221.79	279.25
Primary energy* [kWh/m ²]	206.09	203.73
Total emissions [kg/m ²]	35.6	43.1

* 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] Central heating using water: radiators, [HS] District heating, [HFT] District Heating, [CFT] Electricity										
	Actual	275.2	0	85.7	0	6.3	0.89	0	1	0
	Notional	0	0	0	0	0	0	0	----	----
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0	0	0	0	0
	Notional	346.5	0	96.2	0	5.5	1	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	0.15	10000000:Surf[4]
Floor	0.2	0.13	10000058:Surf[6]
Roof	0.15	0.13	100000DB:Surf[6]
Windows, roof windows, and rooflights	1.5	1.4	10000004:Surf[2]
Personnel doors	1.5	2.2	RM000059:Surf[0]
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building
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	4