



Energy Strategy Report & BREEAM Pre-Assessment



19-5217

112a Great
Russell Street,
London,
WC1B 3NP

April
2020

Quality Standards Control

The signatories below verify that this document has been prepared in accordance with our quality control requirements. These procedures do not affect the content and views expressed by the originator.

<i>Revision</i>	<i>Initial</i>	<i>Rev A</i>	<i>Rev B</i>	<i>Rev C</i>
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1. Executive Summary

The proposed development is **change of use from the existing basement car park to a hotel consisting of 208 rooms at 112a Great Russell Street, London, WC1B 3NP** within the London Borough of Camden.

The energy strategy report and BREEAM pre-assessment prepared by Hoare Lea (dated May 2015) were submitted as part of planning application. This report is to update design changes based on the information provided by the design team.

1.1. Planning Requirements

The table below compares the previous report and this updated report in relation to the planning requirement.

Previous Report	Updated Report
Total 25% carbon reduction achieved over Building Regulation Part L2A. It was achieved through energy efficient measures and Air Source Heat Pumps.	The proposed development has achieved an overall 32.92% carbon reduction over Building Regulation Part L2B via energy efficient measures and Air Source Heat Pumps. Detailed strategies can be found in the table below and section 5-7 of this report.
BREEAM Refurbishment and Fit-out “Very Good” was targeted, and the pre-assessment was submitted.	BREEAM Refurbishment and Fit-out “Very Good” is still targeted, and the updated pre-assessment is attached in appendix B of this report.

Table 1 Policy Requirements

1.2. Methodology and Strategies

The methodology used to determine the CO₂ emissions is in accordance with the London Plan’s three-step Energy Hierarchy (Policy 5.2). The below table shows the Energy Hierarchy and suggested strategies for the proposed development.

Stages	Strategies
BE LEAN Energy efficient design	- U-values and air permeability better than Building Regulations Part L2B. - Mechanical Ventilation with Heat Recovery system. - Low water consumption - Low energy lights
BE CLEAN District heat networks or CHP	Not feasible on the site. Details are in Section 7.
BE GREEN On-site renewable technologies	Air Source Heat Pumps for space heating, cooling and hot water. Details are in Section 8.2.

Table 2 Energy Hierarchy and suggested strategies

1.3. Assessment Results

After the application of all strategies based on the Energy Hierarchy, the regulated carbon dioxide emissions have been reduced as follows;

Energy Hierarchy		Regulated Carbon Emissions (Tonnes CO ₂ /yr)
BASELINE	Existing emissions	425.97
BE LEAN	After energy demand reduction	355.06
BE CLEAN	After CHP/ Communal Heating	355.06
BE GREEN	After renewable energy	285.73

Table 3 Carbon Emissions after each stage of the proposed strategy

The carbon savings from each stage can be calculated based on the results above. The table below clearly shows that the development meets the 25% targeted carbon reduction.

Energy Hierarchy		Regulated Carbon Savings	
		Tonnes CO ₂ /yr	%
BE LEAN	After energy demand reduction	70.91	16.65 %
BE CLEAN	After heat network/ CHP	0	0 %
BE GREEN	After renewable energy	69.33	19.53 %
Total Cumulative Savings		140.24	32.92 %
Total Target Savings		136.43	25 %

Table 4 Carbon dioxide Emissions after each stage of the Energy Hierarchy

Figure 1 below illustrates the hierarchical approach adopted and the resultant reduction in overall CO₂ emissions.

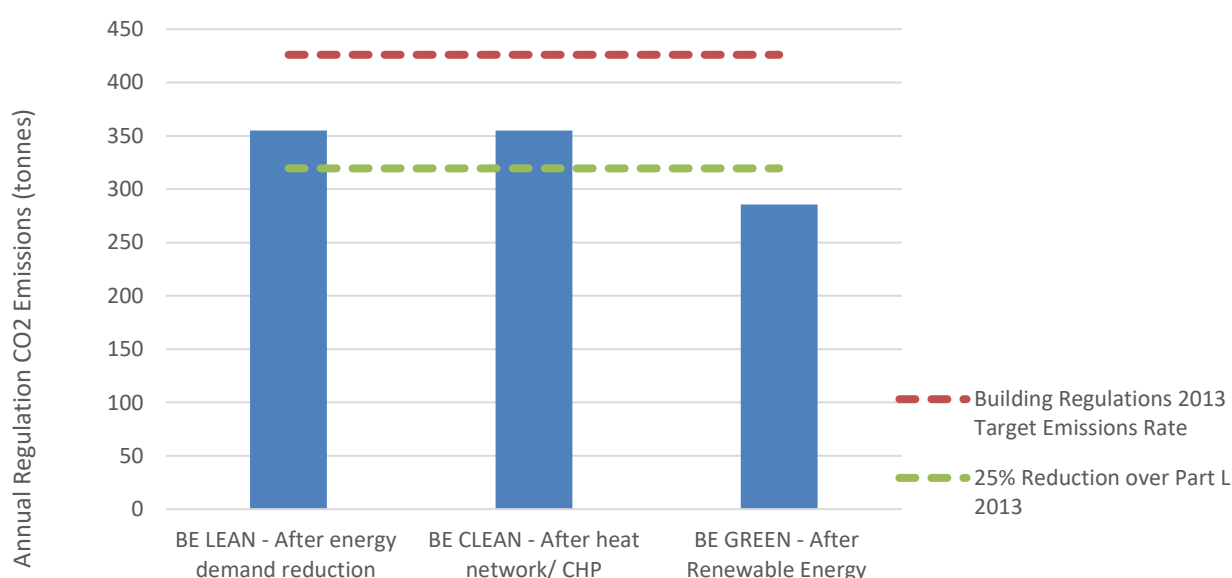


Figure 1 Carbon emissions in Energy Hierarchy

2. Introduction

This Energy Statement will be included as part of the planning application that addresses the environmental impact of the development. This report focuses on the energy strategy for the proposed scheme and how energy consumption and carbon emissions will be minimised and to meet the targeted carbon emissions in accordance with the London Plan and Local planning policy.

This development is to be located in the London Borough of Camden and it is in close proximity to Tottenham Court Road station (approx. 120m to South). The proposal is **change of use from the existing basement car park to a hotel consisting of 208 rooms at 112a Great Russell Street, London, WC1B 3NP.**



The Government approved software, i.e. IES 2019 has been utilised to carry out energy calculations. Syntegra received the architectural drawings and relevant documents, and they were used to undertake the energy assessments. The document references are listed in table below.

No.	Document Name	Format	Received Date
1	200417-001-Planning documents-Sheet - 0101 - Proposed GA Plan Basement 5 Planning	dwg	17-04-2020
2	200417-001-Planning documents-Sheet - 0102 - Proposed GA Plan Basement 4 Planning	dwg	17-04-2020
4	200417-001-Planning documents-Sheet - 0103 - Proposed Plan Ground Floor Planning	dwg	17-04-2020
5	200417-001-Planning documents-Sheet - 0152 - Section A-A Planning	dwg	17-04-2020
6	200417-001-Planning documents-Sheet - 0153 - Section B-B Planning	dwg	17-04-2020
7	200417-001-Planning documents-Sheet - 0154 - Section C-C Planning	dwg	17-04-2020

Table 5 The document list

3. Assessment Methodology

3.1. Mayor's Energy Hierarchy

The energy hierarchy is a classification of different methods to improve energy performance in a parallel sequence. This includes primarily a focus on reducing energy use by avoiding unnecessary use, to then improving the efficiency of energy systems to minimise loss, this is followed by exploiting renewable energy sources and then low carbon energy solutions for energy needs and finally, any remaining demand can be catered for by conventional fuel sources.

The Mayor's Energy Strategy adopts a set of principles to guide design development and decisions regarding energy, balanced with the need to optimise environmental and economic benefits. These guiding principles have been reordered since the publication of the Mayor's Energy Strategy in Feb 2004 and the adopted replacement London Plan 2011 with further alterations in 2015 stating that the following hierarchy should be used to assess applications:

- **BE LEAN** – By using less energy and taking into account the further energy efficiency measure in comparison to the baseline building.
- **BE CLEAN** – By supplying energy efficiently. The clean building looks at further carbon dioxide emission savings over the lean building by taking into consideration the use of decentralise energy via CHP.
- **BE GREEN** – By integrating renewable energy into the scheme which can further reduce the carbon dioxide emission rate.

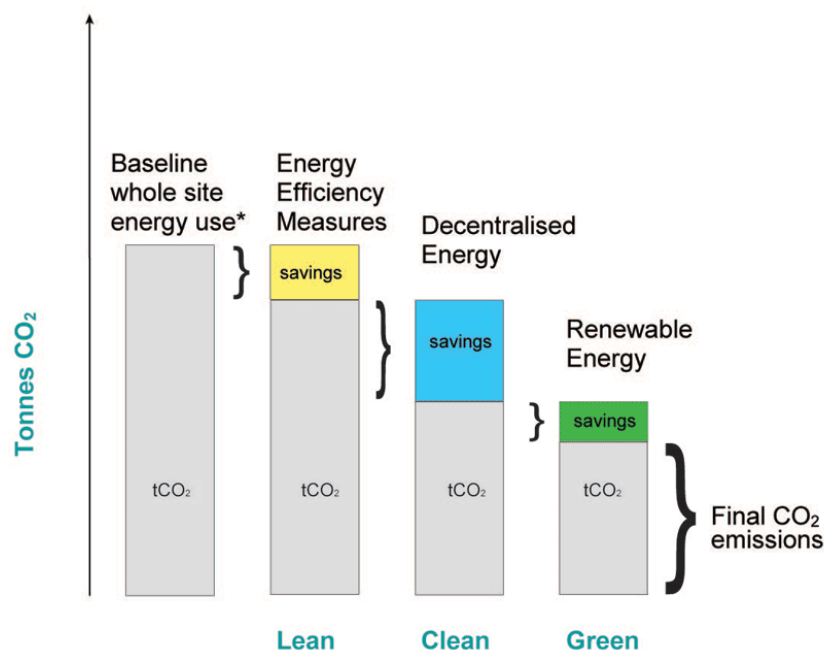


Figure 2 The Energy Hierarchy

4. Baseline – Target Emission Rate

The baseline (known as Target Emission Rate), as calculated in line with the Building Regulation 2013, is the maximum amount of carbon dioxide a dwelling or non-residential unit is allowed to emit. The Target Emission Rate (TER) includes carbon dioxide emissions which are covered by Part L of the Building Regulations, known as regulated emissions (space and water heating, ventilation, lighting, pumps, fans & controls). The baseline energy uses and resulting CO₂ emissions rates of the development have been assessed using the Government approved software.

In regard to the conversion/ refurbishment, the baseline energy use and CO₂ emissions for the development are calculated based on the notional existing building conditions in accordance with GLA Guidance on preparing energy assessments. The inputs were gathered during the site survey or assumed by the Reduced Data SAP (RdSAP) or Non-domestic EPC conventions when the data was not available. The existing building conditions are summarised in the table below.

		Existing Specifications (Built in 1977, Age band F set by SAP 2012 Appendix S)
U-value (W/m ² K)	Wall	1.0 (solid brick as built)
	Window	N/A
	Floor	1.2 (insulation unknown or as built)
	Roof	0.68 (flat roof)
	Solid Door	N/A
Air Permeability (m ³ /h.m ² at 50 Pa)		35
Heating System		No heating system (for energy assessment, a gas boiler has been used as per the GLA guidance)
Hot Water System		No heating system (for energy assessment, a gas boiler has been used as per the GLA guidance)
Lighting		Fluorescent
Ventilation		Extract fans with SFP 1.5 W/l/s

Table 6 Existing Specifications used for energy assessment

The baseline regulated CO₂ emissions from the different development types are presented in the table below.

BASELINE

BASELINE	Regulated CO ₂ Emissions (Tonnes CO ₂ /yr)
Basement Hotel	425.97

Table 7 Regulated Carbon Emissions at Baseline

5. BE LEAN – Energy Efficient Design

This section outlines the energy efficient measures taken in order to minimise the building's energy demand and therefore reduce energy use and CO₂ emissions further than the Baseline requirements (Building Regulations 2013 Part L compliance).

5.1. Passive Design Measures

- Enhanced Building Elements**

At the 'BE LEAN' stage of the energy hierarchy, energy efficient building elements have been incorporated into the build. The heat loss of different building element is dependent upon their U-value and air tightness. Therefore, better U-values and air permeability than the minimum values set in the Part L 2013 have been suggested in this development. Please see below more specifically.

		Part L2B 2013 min. required values		Proposed building values
		New	Upgrade	
U-value (W/m ² K)	Wall	0.28	0.3 - .55	0.2
	Window	1.6		-
	Floor	0.22	0.25	0.22
	Roof	0.16 - 0.18		0.18
	Door	1.8		-
Air Permeability (m ³ /h.m ² at 50 Pa)		-		3

Table 8 Proposed building elements

- Mechanical Ventilation with Heat Recovery**

The mechanical ventilation will include heat recovery to improve its efficiency and reduce any heat loss from the building. For the Design Stage calculation, the specifications below have been used. However, this should be reviewed with the mechanical engineers during the design development and can be substituted with other products having similar or better performance.

Ventilation Type	Centralised balanced system with heat recovery
Heat Recovery Type	Plate heat exchanger (recuperator)
Specific Fan Power	AHU 1.7 W/l/s
Heat Exchanger Efficiency	68 %

Table 9 Design Stage ventilation Specifications

5.2. Active Design Measures

• Heating, Cooling and Hot Water System

At the 'BE LEAN' stage, a gas boiler has been examined for space heating and hot water, and the active cooling is provided by electrically powered equipment. Detailed specifications used at BE LEAN stage are in the table below.

Please note that the heating system below has been used only for carbon emissions calculation at BE LEAN stage as per GLA Guidance on energy assessment. The suggested system will be mentioned at BE GREEN stage as renewable technology (ASHP) has been suggested – Section 8.2.

Systems	General Specification	Controls/ Other inputs
Heating	Gas boiler (efficiency of 91%) with fan coil units (SFP 0.3 W/l/s)	Controls – central time, local time and local temperature
Cooling	Air Source Heat Pump (SEER 2.6) with fan coil units (SFP 0.3 W/l/s)	
Hot-water	From the gas boiler	- Cylinder – 6000 litres - Storage losses – 0.0047 kWh/l/day

Table 10 Heating and Hot water systems

• High Efficiency Lighting

The proposed light fittings will be low energy efficient fittings. **100lm/W has been used for all spaces.** The suggested specifications should be reviewed at detailed design stage with electric engineers.

The following table demonstrates the reduction in CO₂ emissions from the energy efficiency measures mentioned above. As shown in the table below, the carbon reduction of **16.65%** can be achieved on the site at BE LEAN stage against the Baseline set by Building Regulations Part L 2013.

BE LEAN STAGE

	Regulated CO ₂ Emissions (Tonnes CO ₂ /yr)		Carbon Reduction (%)
	BASELINE	BE LEAN	
Basement Hotel	425.97	355.06	16.65 %

Table 11 Regulated Carbon Emissions at Be Lean Stage

6. BE CLEAN – CHP & Decentralised Energy Networks

The Energy Hierarchy encourages the use of a CHP system and the connection to District Heating system to reduce CO₂ emissions further.

6.1. Decentralised Energy Network

The Mayor's Energy Strategy favours community heating systems because they offer:

- Potential economies of scale in respect of efficiency and therefore reduced carbon emissions; and
- Greater potential for future replacement with Low or Zero Carbon (LZC) technologies.

The feasibility of connecting into an existing heating network or providing the building with its own combined heat and power plant has been assessed alongside the **London Heat Map Study for the London Borough of Camden** as part of this assessment. The study identifies that the site is not located near the existing/ potential district heating networks. This is demonstrated clearly from the London Heat Map (<http://www.londonheatmap.org.uk>) snapshot below.

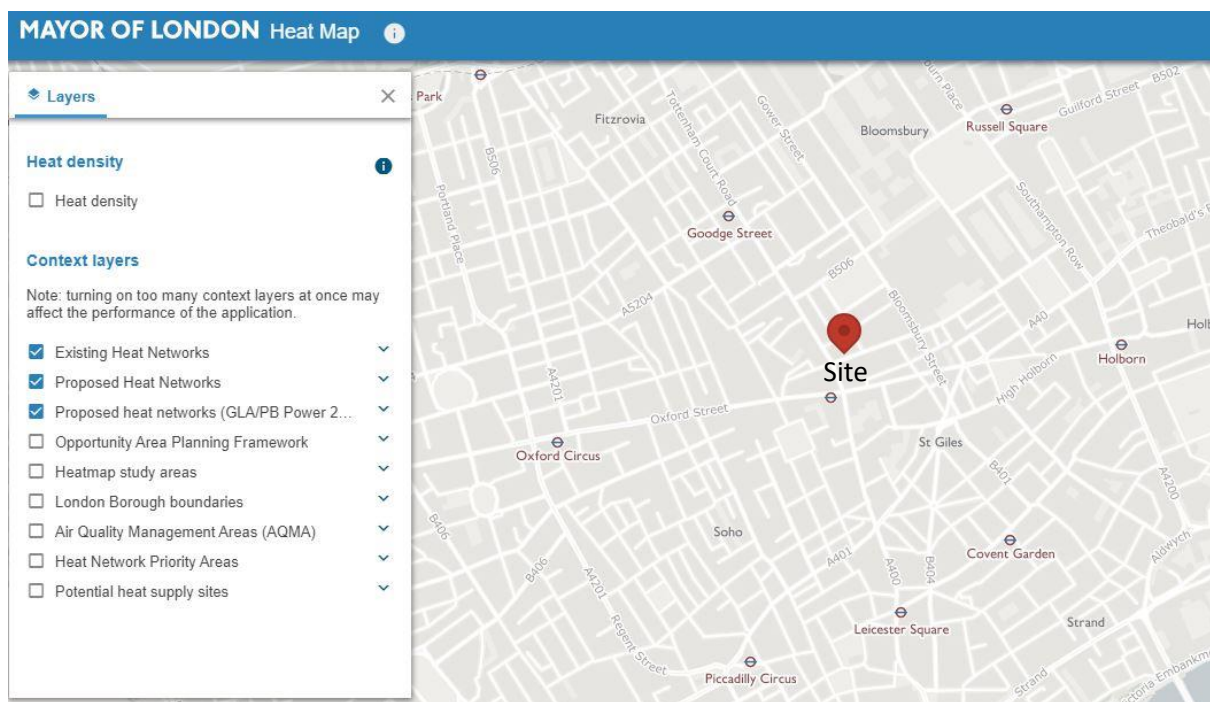


Figure 3 London Heat Map near the site

Moreover, the London heat map below identifies existing DH networks in more broaden area, and it could not find any existing DH networks within 1Km radius from the property. The costs involved in extending the existing DH network would outweigh the advantages in this small development. **Therefore, utilisation of the DH network has not been a feasible option for this development.**

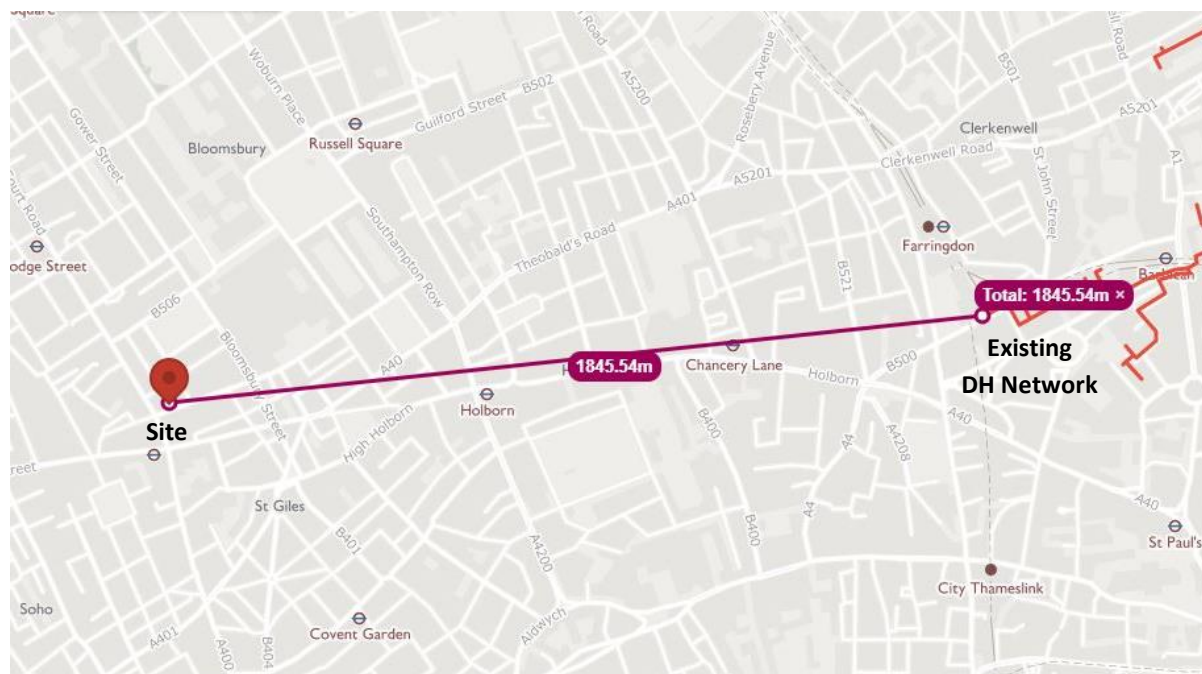


Figure 4 Existing DH Network near the site

6.2. CHP

The Energy Hierarchy identifies the combined heat and power (CHP) as a method of producing heat and electricity with much lower emissions than separate heat and power. Also, it encourages the creation of district heating systems supplied by CHP. The implementation of a CHP strategy should be decided according to good practice design. Key factors for the efficient implementation of the CHP system are:

- Development with high heating load for the majority of the year.
- CHP operation based on maximum heat load for minimum 10 hours per day.
- CHP operation at maximum capacity of 90% of its operating period.

To ensure that CHP is financially viable it is essential that the unit is selected to meet the base heat load and that this load is maintained over a large proportion of the day (a figure of 14 – 17 hours per day is often quoted subject to the load profiles and gas and electricity prices) to ensure that the additional costs (maintenance) associated with running a CHP unit can be recovered. This need to run the CHP plant, as far as possible continuously makes the building load profile of prime importance when reviewing the viability of such solutions and in particular the summer time heat load profile. To enable the CHP plant to run continuously when it is operating, a thermal store is often used so that excess CHP capacity can be used to generate hot water for use at a later time.

Since the planning permission was granted based on Air Source Heat Pumps (as per the previous report), this report has not consider the CHP system for heating and hot water demand. Hence the CHP system has not been considered at BE CLEAN stage.

7. BE GREEN – Renewable Energy

In this section the viable renewable energy technologies that could reduce the development's CO₂ emissions are examined. In determining the appropriate renewable technology for the site, the following factors were considered;

- Renewable energy resource or fuel availability of the LZC technology on the site.
- Space limitations due to building design and urban location of the site.
- Capital, operating and maintenance cost.
- Planning Permission
- Implementation with regards the overall M&E design strategy for building type
- Available Grants

The table below summarises the various low zero carbon technologies considered for the projects, and we have identified that **Air Source Heat Pumps (ASHP)** would be the most appropriate option in this development.

Technology	Local Planning Requirements	Carbon Payback	Grants/ Funding	Feasibility
Air Source Heat Pumps (ASHP)	Noise Issues from External units	High	Renewable Heat Incentive (RHI)	HIGH
Photovoltaic (PV)	Spatial and Shadowing	High	-	ZERO
Solar Thermal	Spatial and Shadowing	Low	Renewable Heat Incentive (RHI)	ZERO
Ground Source Heat Pumps (GSHP)	Spatial issues for boring holes and noise	Medium	Renewable Heat Incentive (RHI)	MEDIUM
Biomass	Spatial requirement for fuel storage and biomass odour	High	Renewable Heat Incentive (RHI)	LOW
Wind Power	Extensive planning requirements for noise and local biodiversity	Low	-	LOW
Hydro Power	Extensive planning requirements for noise and water quality	None	-	ZERO

Table 12 Feasibility Study of LZC Technologies

7.1. Non-feasible Technology

- **Photovoltaic (PV) and Solar Thermal**

The proposed development is a basement hotel (Basement Level 4 and 5), hence the PV panel or Solar Thermal panel are not applicable to this development.

- **Ground Source Heat Pumps (GSHP)**

Ground source heat pump would be a feasible option to meet the space heating requirements, however, it requires to bore ground holes to extract the ground heat to be utilised for space heating requirements. The costs involved in installing GSHP would outweigh the advantages in this development. Therefore, utilization of the GSHP has not been a feasible option for this development.

- **Hydro power**

Although River Thames is close to the site, there is no river or lake within the development site boundaries. Therefore, small scale hydro-electric will not be studied any further because of the location and the spatial limitations of the development.

- **Wind Power**

Wind turbines need extensive planning requirements and they are only feasible at consistent wind speed. Moreover, since the development is located in an urban area, the site does not have sufficient wind speed to operate wind turbine at the height of 10 meters as shown below (<http://www.renew-reuse-recycle.com/noabl.pl?n=503>). Hence this option has been discounted.

Estimated average windspeeds around WC1B 3..

Wind speed at 10m above ground level (m/s)			Wind speed at 25m above ground level (m/s)			Wind speed at 45m above ground level (m/s)		
4.9	4.8	4.8	5.7	5.6	5.6	6.2	6.1	6.1
5	4.9	4.8	5.7	5.6	5.5	6.2	6.1	6
4.8	4.7	4.6	5.6	5.5	5.4	6	6	5.9

Squares surrounding the central square correspond to wind speeds for surrounding grid squares. Power generated is related to windspeed by a cubic ratio. That means if you halve the windspeed, the power goes down by a factor of 8 (which is $2 \times 2 \times 2$). A quarter of the windspeed gives you a 64th of the power ($4 \times 4 \times 4$). As a rough guide, if your turbine is rated at producing 1KW at 12m/s then it will produce 125W at 6m/s and 15W at 3m/s.

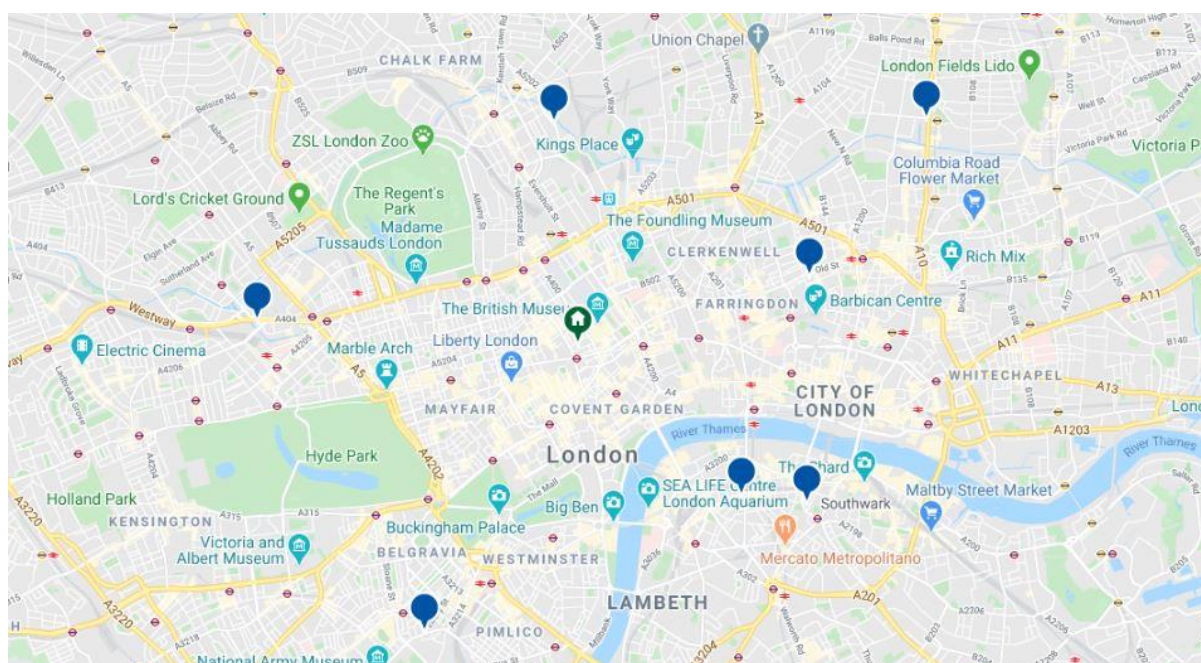
Please note that bear in mind that the NOABL windspeed dataset used here is a model of windspeeds across the country, assuming completely flat terrain. It isn't a database of measured windspeeds. Other factors such as hills, houses, trees and other obstructions in your vicinity need to be considered as well as they can have a significant effect. If you're thinking about installing a wind turbine, you should perform your own windspeed measurements using an anemometer to determine what the actual figures are.

- Biomass

A biomass system designed for this development would be fueled by wood pellets which have a high energy content. However, a biomass system would not be an appropriate technology for the site for the following reasons:

- The burning of wood pellets releases substantially more NOx emissions when compared to similar gas boilers. As the development is situated within an urban area, the installation of a biomass boiler would further impact on the air quality in this area.
- the lack of spaces for pellet boiler and storage on the site.
- Pellets would need to be transported from local pellet suppliers, which causes carbon emissions to the air.

However, if the biomass system is considered at detailed design stage, local suppliers can be found near the site as shown in the map below (<http://biomass-suppliers-list.service.gov.uk>).



Company name	Postcode	Contact	Fuel Supplied	Telephone
Travis Perkins Trading Co. Ltd	NW1 0PT	www.travisperkins.co.uk sean.mahon@travisperkins.co.uk	Pellets	0207 380 6480
Travis Perkins Trading Co. Ltd	SE1 8HA	www.travisperkins.co.uk lee.thompson@travisperkins.co.uk	Pellets	020 7928 1891
Travis Perkins Trading Co. Ltd	EC1Y 0TY	www.travisperkins.co.uk keith.gittins@travisperkins.co.uk	Pellets	020 7251 6999
Travis Perkins Trading Co. Ltd	EC1Y 0TY	www.travisperkins.co.uk kenneth.walker@travisperkins.co.uk	Pellets	08705 005500
Travis Perkins Trading Co. Ltd	SE1 1HA	www.travisperkins.co.uk paula.harvey@travisperkins.co.uk	Pellets	020 7407 3511
Travis Perkins Trading Co. Ltd	W2 6NA	www.travisperkins.co.uk liam.clancy@travisperkins.co.uk	Pellets	020 7262 6602
Travis Perkins Trading Co. Ltd	SW1W 8NF	www.travisperkins.co.uk ron.adams@travisperkins.co.uk	Pellets	020 7730 6622
Travis Perkins Trading Co. Ltd	SW8 1RJ	www.travisperkins.co.uk jonathan.hannaby@travisperkins.co.uk	Pellets	020 7582 4255
Travis Perkins Trading Co. Ltd	E8 4DL	www.travisperkins.co.uk daniel.marsden@travisperkins.co.uk	Pellets	020 7254 1442
Travis Perkins Trading Co. Ltd	N19 5UN	www.travisperkins.co.uk toby.duncan@travisperkins.co.uk	Pellets	0207 561 0516

7.2. Proposed Technology

• Air Source Heat Pumps (ASHP)

ASHPs can meet the space heating demands on site efficiently in comparison with gas boilers. Although this low carbon technology consumes electricity to operate, due to higher efficiency the heat output is much greater. Therefore, the ASHP has been suggested for the space heating, cooling and hot water. However, the mechanical engineer should be reviewed the specification during the design development.

Systems	General Specification	Controls/ Other inputs
Heating	100% ASHP (SCOP 4.71) with fan coil units (SFP 0.3 W/l/s)	Controls – central time, local time and local temperature
Cooling	100% ASHP (SEER 5.16 and EER 4.64) with fan coil units (SFP 0.3 W/l/s)	
Hot water	70% from ASHP (SCOP 4.71) + 30% from electric boiler	- Cylinder – 6000 litres - Uninsulated cylinder

Table 13 Be Green Stage Heating and cooling systems

Given the proposed LZC technologies on the site (**ASHP**), the overall CO₂ reduction at BE GREEN stage can be calculated as shown below. And, it can be seen that the overall CO₂ reduction via on-site renewables is **19.53%** against the BE LEAN stage.

BE GREEN stage

	Regulated CO ₂ Emissions (Tonnes CO ₂ /yr)		Carbon Reduction (%)
	BE LEAN	BE GREEN	
Basement Hotel	355.06	285.73	19.53 %

Table 14 Regulated Energy Use and Carbon Reduction at Be Green Stage

8. Conclusion

This report assesses the predicted energy performance and carbon dioxide emissions of the proposed development at **112a Great Russell Street, London, WC1B 3NP**, based on the information provided by the design team.

In line with the local Council's three step energy hierarchy, the regulated CO₂ emissions for the development have been reduced by **32.92%** over Building Regulation Part L 2013, once all measures in the table below are taken into account.

Stages	Strategies
BE LEAN Energy efficient design	- U-values and air permeability better than Building Regulations Part L2B. - Mechanical Ventilation with Heat Recovery system. - Low water consumption - Low energy lights
BE CLEAN District heat networks or CHP	Not feasible on the site. Details are in Section 7.
BE GREEN On-site renewable technologies	Air Source Heat Pumps for space heating, cooling and hot water. Details are in Section 8.2.

Table 15 Energy Hierarchy and suggested strategies

The table below clearly shows that the development meets the 25% targeted carbon reduction.

Energy Hierarchy		Regulated Carbon Savings	
		Tonnes CO ₂ /yr	%
BE LEAN	After energy demand reduction	70.91	16.65 %
BE CLEAN	After heat network/ CHP	0	0 %
BE GREEN	After renewable energy	69.33	19.53 %
Total Cumulative Savings		140.24	32.92 %
Total Target Savings		136.43	25 %

Table 16 Carbon dioxide Emissions after each stage of the Energy Hierarchy

9. Appendix A – Brukl Reports

Project name

BASELINE (existing)

As designed

Date: Mon Apr 06 18:30:29 2020

Administrative information

Building Details

Address: 112a Great Russell Street, London, WC1B 3NP

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.12

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.12

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

Owner Details

Name:

Telephone number:

Address: , ,

Certifier details

Name:

Telephone number:

Address: , ,

Criterion 1: The calculated CO₂ emission rate for the building must not exceed the target

The building does not comply with England Building Regulations Part L 2013

CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	55.8
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	55.8
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	81.1
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	1	1	B4000016:Surf[0]
Floor	0.25	1.2	1.2	B4000016:Surf[15]
Roof	0.25	0.68	0.68	B500002D:Surf[3]
Windows***, roof windows, and rooflights	2.2	-	-	No windows or rooflights in building
Personnel doors	2.2	-	-	No Personnel doors in building
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	35

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- Baseline - gas boiler

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	-	0	0	-
Standard value	0.91*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.					

"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		
Standard value		0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	Zone	Standard
B4. Admin Office and CCTV Room		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. AHU Vent Room		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. BOH Storage		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Comms Room 01		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Comms Room 02		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Core 01		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Core 02		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor		-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor		-	-	1.5	-	-	-	-	-	-	-	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
B4. Corridor	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Corridor	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Fire Lobby	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Hotel Lobby	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Lift	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Luggage Storage	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. LV Room 01	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Plant	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Staff Changing Area	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Core 03	-	-	1.5	-	-	-	-	-	-	-	N/A
B4. Stair Hall	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.001 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.002 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.003 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.004 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.005 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.006 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.007 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.008 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.009 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.010 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.011 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.012 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.013 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.014 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.015 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.016 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.017 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.018 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.019 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.020 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.021 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.022 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.023 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B4.024 Twin Room	-	-	1.5	-	-	-	-	-	-	-	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	
B4.025 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.026 DDA Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.027 Single Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.028 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.029 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.030 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.031 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.032 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.033 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.034 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.035 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.036 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.037 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.038 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.039 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.040 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.041 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.042 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.043 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.044 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.045 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.046 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.047 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.048 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.049 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.050 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.051 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.052 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.053 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.054 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.055 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.056 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.057 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.058 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.059 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.060 Double Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.061 Double Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.062 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.063 DDA Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.064 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.065 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.066 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.067 Twin Room	-	-	1.5	-	-	-	-	-	-	-	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	
B4.068 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.069 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.070 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.071 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.072 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.073 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.074 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.075 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.076 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.077 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.078 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.079 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.080 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.081 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.082 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.083 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.084 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.085 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.086 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.087 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.088 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.089 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.090 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.091 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.092 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.093 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.094 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.095 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.096 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.097 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B4.098 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A	
B5. Cold Water Storage Room	-	-	1.5	-	-	-	-	-	-	-	N/A	
B5. Comms room 03	-	-	1.5	-	-	-	-	-	-	-	N/A	
B5. Comms Room 04	-	-	1.5	-	-	-	-	-	-	-	N/A	
B5. Core 01	-	-	1.5	-	-	-	-	-	-	-	N/A	
B5. Core 01 Stair	-	-	1.5	-	-	-	-	-	-	-	N/A	
B5. Core 02	-	-	1.5	-	-	-	-	-	-	-	N/A	
B5. Core 03	-	-	1.5	-	-	-	-	-	-	-	N/A	
B5. Core 03 Protected Lobby	-	-	1.5	-	-	-	-	-	-	-	N/A	
B5. Corridor	-	-	1.5	-	-	-	-	-	-	-	N/A	
B5. Corridor	-	-	1.5	-	-	-	-	-	-	-	N/A	
B5. Corridor	-	-	1.5	-	-	-	-	-	-	-	N/A	
B5. Corridor	-	-	1.5	-	-	-	-	-	-	-	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
B5.011 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.012 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.013 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.014 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.015 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.016 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.017 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.018 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.019 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.020 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.021 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.022 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.023 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.024 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.025 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.026 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.027 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.028 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.029 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.030 DDA Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.031 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.032 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.033 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.034 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.035 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.036 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.037 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.038 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.039 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.040 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.041 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.042 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.043 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.044 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.045 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.046 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.047 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.048 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.049 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.050 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.051 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.052 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.053 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	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
B5.054 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.055 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.056 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.057 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.058 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.059 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.060 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.061 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.062 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.063 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.064 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.065 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.066 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.067 Double Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.068 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.069 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.070 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.071 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.072 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.073 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.074 Double Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.075 Double Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.076 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.077 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.078 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.079 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.080 DDA Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.081 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.082 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.083 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.084 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.085 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.086 DDA Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.087 DDA Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.088 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.089 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.090 Single Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.091 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.092 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.093 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.094 DDA Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.095 DDA Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.096 Family Room	-	-	1.5	-	-	-	-	-	-	-	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
B5.097 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.098 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.099 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.100 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.101 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.102 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.103 Family Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.104 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.105 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.106 Twin Room	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.107 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.108 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.109 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B5.110 Double Bedroom	-	-	1.5	-	-	-	-	-	-	-	N/A
B3. Core 01	-	-	1.5	-	-	-	-	-	-	-	N/A
B3. Core 02	-	-	1.5	-	-	-	-	-	-	-	N/A
B3. Core 03	-	-	1.5	-	-	-	-	-	-	-	N/A
B2. Core 01	-	-	1.5	-	-	-	-	-	-	-	N/A
B2. Core 02	-	-	1.5	-	-	-	-	-	-	-	N/A
B2. Core 03	-	-	1.5	-	-	-	-	-	-	-	N/A
B1. Core 01	-	-	1.5	-	-	-	-	-	-	-	N/A
B1. Core 02	-	-	1.5	-	-	-	-	-	-	-	N/A
B1. Core 03	-	-	1.5	-	-	-	-	-	-	-	N/A
GF. Core 02	-	-	1.5	-	-	-	-	-	-	-	N/A
GF. Core 03	-	-	1.5	-	-	-	-	-	-	-	N/A
GF. Core 01 - Unknown	-	-	1.5	-	-	-	-	-	-	-	N/A
GF. Core 01 - Lift	-	-	1.5	-	-	-	-	-	-	-	N/A
GF. Core 01 - Hall and Stair	-	-	1.5	-	-	-	-	-	-	-	N/A
GF. Core 01 - Cupboard	-	-	1.5	-	-	-	-	-	-	-	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	
B4. Admin Office and CCTV Room		23	-	-	959
B4. AHU Vent Room		23	-	-	206
B4. BOH Storage		23	-	-	35
B4. Comms Room 01		23	-	-	31
B4. Comms Room 02		23	-	-	30
B4. Core 01		-	45	-	169
B4. Core 02		-	45	-	219
B4. Corridor		-	45	-	654
B4. Corridor		-	45	-	253
B4. Corridor		-	45	-	192

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B4. Corridor		-	45	-	177
B4. Corridor		-	45	-	525
B4. Corridor		-	45	-	97
B4. Corridor		-	45	-	391
B4. Corridor		-	45	-	309
B4. Corridor		-	45	-	132
B4. Corridor		-	45	-	142
B4. Corridor		-	45	-	249
B4. Corridor		-	45	-	149
B4. Corridor		-	45	-	377
B4. Corridor		-	45	-	314
B4. Corridor		-	45	-	274
B4. Corridor		-	45	-	290
B4. Corridor		-	45	-	97
B4. Corridor		-	45	-	163
B4. Corridor		-	45	-	90
B4. Corridor		-	45	-	266
B4. Corridor		-	45	-	242
B4. Fire Lobby		-	45	-	259
B4. Hotel Lobby		-	45	-	1297
B4. Lift		-	45	-	55
B4. Luggage Storage		23	-	-	80
B4. LV Room 01		23	-	-	39
B4. Plant		23	-	-	55
B4. Staff Changing Area		-	45	-	125
B4. Core 03		-	45	-	161
B4. Stair Hall		-	45	-	111
B4.001 Double Bedroom		-	45	-	99
B4.002 Double Bedroom		-	45	-	88
B4.003 Family Room		-	45	-	177
B4.004 Double Bedroom		-	45	-	94
B4.005 Double Bedroom		-	45	-	94
B4.006 Double Bedroom		-	45	-	105
B4.007 Double Bedroom		-	45	-	102
B4.008 Family Room		-	45	-	161
B4.009 Family Room		-	45	-	120
B4.010 Twin Room		-	45	-	94
B4.011 Twin Room		-	45	-	93
B4.012 Twin Room		-	45	-	93
B4.013 Twin Room		-	45	-	93
B4.014 Twin Room		-	45	-	93
B4.015 Twin Room		-	45	-	88
B4.016 Twin Room		-	45	-	92

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B4.017 Twin Room		-	45	-	94
B4.018 Twin Room		-	45	-	93
B4.019 Twin Room		-	45	-	93
B4.020 Double Bedroom		-	45	-	93
B4.021 Double Bedroom		-	45	-	108
B4.022 Twin Room		-	45	-	109
B4.023 Twin Room		-	45	-	107
B4.024 Twin Room		-	45	-	108
B4.025 Twin Room		-	45	-	108
B4.026 DDA Room		-	45	-	137
B4.027 Single Bedroom		-	45	-	76
B4.028 Double Bedroom		-	45	-	90
B4.029 Double Bedroom		-	45	-	90
B4.030 Double Bedroom		-	45	-	89
B4.031 Double Bedroom		-	45	-	87
B4.032 Double Bedroom		-	45	-	102
B4.033 Family Room		-	45	-	145
B4.034 Double Bedroom		-	45	-	89
B4.035 Family Room		-	45	-	158
B4.036 Family Room		-	45	-	168
B4.037 Double Bedroom		-	45	-	98
B4.038 Double Bedroom		-	45	-	98
B4.039 Double Bedroom		-	45	-	115
B4.040 Double Bedroom		-	45	-	115
B4.041 Double Bedroom		-	45	-	117
B4.042 Double Bedroom		-	45	-	103
B4.043 Double Bedroom		-	45	-	107
B4.044 Double Bedroom		-	45	-	101
B4.045 Double Bedroom		-	45	-	108
B4.046 Double Bedroom		-	45	-	103
B4.047 Double Bedroom		-	45	-	105
B4.048 Double Bedroom		-	45	-	94
B4.049 Double Bedroom		-	45	-	89
B4.050 Double Bedroom		-	45	-	94
B4.051 Double Bedroom		-	45	-	94
B4.052 Double Bedroom		-	45	-	111
B4.053 Double Bedroom		-	45	-	111
B4.054 Double Bedroom		-	45	-	110
B4.055 Double Bedroom		-	45	-	94
B4.056 Double Bedroom		-	45	-	94
B4.057 Double Bedroom		-	45	-	89
B4.058 Double Bedroom		-	45	-	91
B4.059 Double Bedroom		-	45	-	92

General lighting and display lighting		Luminous efficacy [lm/W]			
Zone name		Luminaire	Lamp	Display lamp	General lighting [W]
	Standard value	60	60	22	
B4.060 Double Room		-	45	-	123
B4.061 Double Room		-	45	-	94
B4.062 Twin Room		-	45	-	109
B4.063 DDA Room		-	45	-	136
B4.064 Double Bedroom		-	45	-	95
B4.065 Double Bedroom		-	45	-	95
B4.066 Twin Room		-	45	-	143
B4.067 Twin Room		-	45	-	115
B4.068 Twin Room		-	45	-	115
B4.069 Double Bedroom		-	45	-	137
B4.070 Double Bedroom		-	45	-	88
B4.071 Double Bedroom		-	45	-	103
B4.072 Family Room		-	45	-	146
B4.073 Family Room		-	45	-	139
B4.074 Twin Room		-	45	-	110
B4.075 Double Bedroom		-	45	-	100
B4.076 Double Bedroom		-	45	-	105
B4.077 Double Bedroom		-	45	-	105
B4.078 Double Bedroom		-	45	-	105
B4.079 Double Bedroom		-	45	-	105
B4.080 Double Bedroom		-	45	-	109
B4.081 Double Bedroom		-	45	-	103
B4.082 Double Bedroom		-	45	-	88
B4.083 Double Bedroom		-	45	-	88
B4.084 Family Room		-	45	-	128
B4.085 Double Bedroom		-	45	-	102
B4.086 Double Bedroom		-	45	-	101
B4.087 Family Room		-	45	-	130
B4.088 Family Room		-	45	-	171
B4.089 Double Bedroom		-	45	-	115
B4.090 Double Bedroom		-	45	-	122
B4.091 Double Bedroom		-	45	-	122
B4.092 Double Bedroom		-	45	-	122
B4.093 Double Bedroom		-	45	-	113
B4.094 Twin Room		-	45	-	106
B4.095 Twin Room		-	45	-	107
B4.096 Twin Room		-	45	-	106
B4.097 Double Bedroom		-	45	-	111
B4.098 Double Bedroom		-	45	-	102
B5. Cold Water Storage Room		23	-	-	90
B5. Comms room 03		23	-	-	63
B5. Comms Room 04		23	-	-	44
B5. Core 01		-	45	-	269

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B5. Core 01 Stair		-	45	-	165
B5. Core 02		-	45	-	140
B5. Core 03		-	45	-	173
B5. Core 03 Protected Lobby		-	45	-	111
B5. Corridor		-	45	-	357
B5. Corridor		-	45	-	499
B5. Corridor		-	45	-	276
B5. Corridor		-	45	-	179
B5. Corridor		-	45	-	158
B5. Corridor		-	45	-	154
B5. Corridor		-	45	-	178
B5. Corridor		-	45	-	473
B5. Corridor		-	45	-	246
B5. Corridor		-	45	-	183
B5. Corridor		-	45	-	118
B5. Corridor		-	45	-	284
B5. Corridor		-	45	-	114
B5. Corridor		-	45	-	62
B5. Corridor		-	45	-	168
B5. Corridor		-	45	-	250
B5. Corridor		-	45	-	86
B5. Corridor		-	45	-	217
B5. Corridor		-	45	-	356
B5. Corridor		-	45	-	332
B5. Corridor		-	45	-	78
B5. Corridor		-	45	-	295
B5. Corridor		-	45	-	296
B5. Corridor		-	45	-	151
B5. Corridor		-	45	-	81
B5. Corridor		-	45	-	266
B5. Corridor		-	45	-	108
B5. Corridor		-	45	-	292
B5. Corridor		-	45	-	170
B5. Electrical room		23	-	-	198
B5. Heating and Pumps Plant		23	-	-	142
B5. Lift		-	45	-	63
B5. Plant		23	-	-	59
B5. Plant		23	-	-	72
B5. Plant		23	-	-	43
B5. Refuse Storage and Local Drainage Pump		23	-	-	93
B5. Tanks Room		23	-	-	90
B5. UPS Pump Room		23	-	-	42
B5.002 Double Bedroom		-	45	-	114

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B5.003 Double Bedroom		-	45	-	100
B5.004 Family Room		-	45	-	195
B5.005 Double Bedroom		-	45	-	106
B5.006 Double Bedroom		-	45	-	106
B5.007 Double Bedroom		-	45	-	119
B5.008 Double Bedroom		-	45	-	117
B5.009 Family Room		-	45	-	175
B5.010 Twin Room		-	45	-	130
B5.011 Twin Room		-	45	-	104
B5.012 Twin Room		-	45	-	101
B5.013 Twin Room		-	45	-	102
B5.014 Twin Room		-	45	-	102
B5.015 Twin Room		-	45	-	102
B5.016 Twin Room		-	45	-	103
B5.017 Twin Room		-	45	-	101
B5.018 Twin Room		-	45	-	101
B5.019 Twin Room		-	45	-	100
B5.020 Twin Room		-	45	-	102
B5.021 Twin Room		-	45	-	101
B5.022 Twin Room		-	45	-	101
B5.023 Twin Room		-	45	-	101
B5.024 Double Bedroom		-	45	-	116
B5.025 Twin Room		-	45	-	117
B5.026 Twin Room		-	45	-	115
B5.027 Twin Room		-	45	-	116
B5.028 Twin Room		-	45	-	116
B5.029 Twin Room		-	45	-	116
B5.030 DDA Room		-	45	-	165
B5.031 Family Room		-	45	-	146
B5.032 Double Bedroom		-	45	-	98
B5.033 Double Bedroom		-	45	-	98
B5.034 Double Bedroom		-	45	-	97
B5.035 Double Bedroom		-	45	-	95
B5.036 Double Bedroom		-	45	-	121
B5.037 Double Bedroom		-	45	-	119
B5.038 Double Bedroom		-	45	-	97
B5.039 Family Room		-	45	-	166
B5.040 Family Room		-	45	-	175
B5.041 Double Bedroom		-	45	-	105
B5.042 Double Bedroom		-	45	-	105
B5.043 Double Bedroom		-	45	-	121
B5.044 Double Bedroom		-	45	-	123
B5.045 Double Bedroom		-	45	-	105

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B5.046 Double Bedroom		-	45	-	131
B5.047 Family Room		-	45	-	143
B5.048 Double Bedroom		-	45	-	127
B5.049 Double Bedroom		-	45	-	110
B5.050 Double Bedroom		-	45	-	115
B5.051 Double Bedroom		-	45	-	109
B5.052 Double Bedroom		-	45	-	117
B5.053 Double Bedroom		-	45	-	104
B5.054 Double Bedroom		-	45	-	106
B5.055 Double Bedroom		-	45	-	100
B5.056 Double Bedroom		-	45	-	97
B5.057 Double Bedroom		-	45	-	102
B5.058 Double Bedroom		-	45	-	102
B5.059 Double Bedroom		-	45	-	99
B5.060 Double Bedroom		-	45	-	97
B5.061 Double Bedroom		-	45	-	98
B5.062 Double Bedroom		-	45	-	103
B5.063 Double Bedroom		-	45	-	102
B5.064 Double Bedroom		-	45	-	144
B5.065 Family Room		-	45	-	136
B5.066 Family Room		-	45	-	135
B5.067 Double Room		-	45	-	105
B5.068 Double Bedroom		-	45	-	106
B5.069 Double Bedroom		-	45	-	97
B5.070 Double Bedroom		-	45	-	100
B5.071 Twin Room		-	45	-	115
B5.072 Double Bedroom		-	45	-	101
B5.073 Double Bedroom		-	45	-	116
B5.074 Double Room		-	45	-	146
B5.075 Double Room		-	45	-	121
B5.076 Double Bedroom		-	45	-	107
B5.077 Family Room		-	45	-	182
B5.078 Family Room		-	45	-	147
B5.079 Double Bedroom		-	45	-	146
B5.080 DDA Room		-	45	-	137
B5.081 Double Bedroom		-	45	-	111
B5.082 Double Bedroom		-	45	-	96
B5.083 Double Bedroom		-	45	-	103
B5.084 Double Bedroom		-	45	-	103
B5.085 Double Bedroom		-	45	-	101
B5.086 DDA Room		-	45	-	166
B5.087 DDA Room		-	45	-	152
B5.088 Double Bedroom		-	45	-	102

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B5.089 Double Bedroom		-	45	-	103
B5.090 Single Bedroom		-	45	-	112
B5.091 Double Bedroom		-	45	-	108
B5.092 Double Bedroom		-	45	-	104
B5.093 Double Bedroom		-	45	-	106
B5.094 DDA Room		-	45	-	152
B5.095 DDA Room		-	45	-	164
B5.096 Family Room		-	45	-	172
B5.097 Family Room		-	45	-	141
B5.098 Double Bedroom		-	45	-	112
B5.099 Double Bedroom		-	45	-	107
B5.100 Double Bedroom		-	45	-	108
B5.101 Double Bedroom		-	45	-	108
B5.102 Double Bedroom		-	45	-	108
B5.103 Family Room		-	45	-	136
B5.104 Double Bedroom		-	45	-	96
B5.105 Double Bedroom		-	45	-	90
B5.106 Twin Room		-	45	-	112
B5.107 Double Bedroom		-	45	-	122
B5.108 Double Bedroom		-	45	-	122
B5.109 Double Bedroom		-	45	-	122
B5.110 Double Bedroom		-	45	-	127
B3. Core 01		-	45	-	184
B3. Core 02		-	45	-	232
B3. Core 03		-	45	-	175
B2. Core 01		-	45	-	184
B2. Core 02		-	45	-	233
B2. Core 03		-	45	-	175
B1. Core 01		-	45	-	222
B1. Core 02		-	45	-	266
B1. Core 03		-	45	-	211
GF. Core 02		-	45	-	164
GF. Core 03		-	45	-	152
GF. Core 01 - Unknown		23	-	-	51
GF. Core 01 - Lift		-	45	-	59
GF. Core 01 - Hall and Stair		-	45	-	407
GF. Core 01 - Cupboard		23	-	-	23

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?
B4. Admin Office and CCTV Room	N/A	N/A
B4.001 Double Bedroom	N/A	N/A
B4.002 Double Bedroom	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B4.003 Family Room	N/A	N/A
B4.004 Double Bedroom	N/A	N/A
B4.005 Double Bedroom	N/A	N/A
B4.006 Double Bedroom	N/A	N/A
B4.007 Double Bedroom	N/A	N/A
B4.008 Family Room	N/A	N/A
B4.009 Family Room	N/A	N/A
B4.010 Twin Room	N/A	N/A
B4.011 Twin Room	N/A	N/A
B4.012 Twin Room	N/A	N/A
B4.013 Twin Room	N/A	N/A
B4.014 Twin Room	N/A	N/A
B4.015 Twin Room	N/A	N/A
B4.016 Twin Room	N/A	N/A
B4.017 Twin Room	N/A	N/A
B4.018 Twin Room	N/A	N/A
B4.019 Twin Room	N/A	N/A
B4.020 Double Bedroom	N/A	N/A
B4.021 Double Bedroom	N/A	N/A
B4.022 Twin Room	N/A	N/A
B4.023 Twin Room	N/A	N/A
B4.024 Twin Room	N/A	N/A
B4.025 Twin Room	N/A	N/A
B4.026 DDA Room	N/A	N/A
B4.027 Single Bedroom	N/A	N/A
B4.028 Double Bedroom	N/A	N/A
B4.029 Double Bedroom	N/A	N/A
B4.030 Double Bedroom	N/A	N/A
B4.031 Double Bedroom	N/A	N/A
B4.032 Double Bedroom	N/A	N/A
B4.033 Family Room	N/A	N/A
B4.034 Double Bedroom	N/A	N/A
B4.035 Family Room	N/A	N/A
B4.036 Family Room	N/A	N/A
B4.037 Double Bedroom	N/A	N/A
B4.038 Double Bedroom	N/A	N/A
B4.039 Double Bedroom	N/A	N/A
B4.040 Double Bedroom	N/A	N/A
B4.041 Double Bedroom	N/A	N/A
B4.042 Double Bedroom	N/A	N/A
B4.043 Double Bedroom	N/A	N/A
B4.044 Double Bedroom	N/A	N/A
B4.045 Double Bedroom	N/A	N/A
B4.046 Double Bedroom	N/A	N/A
B4.047 Double Bedroom	N/A	N/A
B4.048 Double Bedroom	N/A	N/A
B4.049 Double Bedroom	N/A	N/A
B4.050 Double Bedroom	N/A	N/A
B4.051 Double Bedroom	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B4.052 Double Bedroom	N/A	N/A
B4.053 Double Bedroom	N/A	N/A
B4.054 Double Bedroom	N/A	N/A
B4.055 Double Bedroom	N/A	N/A
B4.056 Double Bedroom	N/A	N/A
B4.057 Double Bedroom	N/A	N/A
B4.058 Double Bedroom	N/A	N/A
B4.059 Double Bedroom	N/A	N/A
B4.060 Double Room	N/A	N/A
B4.061 Double Room	N/A	N/A
B4.062 Twin Room	N/A	N/A
B4.063 DDA Room	N/A	N/A
B4.064 Double Bedroom	N/A	N/A
B4.065 Double Bedroom	N/A	N/A
B4.066 Twin Room	N/A	N/A
B4.067 Twin Room	N/A	N/A
B4.068 Twin Room	N/A	N/A
B4.069 Double Bedroom	N/A	N/A
B4.070 Double Bedroom	N/A	N/A
B4.071 Double Bedroom	N/A	N/A
B4.072 Family Room	N/A	N/A
B4.073 Family Room	N/A	N/A
B4.074 Twin Room	N/A	N/A
B4.075 Double Bedroom	N/A	N/A
B4.076 Double Bedroom	N/A	N/A
B4.077 Double Bedroom	N/A	N/A
B4.078 Double Bedroom	N/A	N/A
B4.079 Double Bedroom	N/A	N/A
B4.080 Double Bedroom	N/A	N/A
B4.081 Double Bedroom	N/A	N/A
B4.082 Double Bedroom	N/A	N/A
B4.083 Double Bedroom	N/A	N/A
B4.084 Family Room	N/A	N/A
B4.085 Double Bedroom	N/A	N/A
B4.086 Double Bedroom	N/A	N/A
B4.087 Family Room	N/A	N/A
B4.088 Family Room	N/A	N/A
B4.089 Double Bedroom	N/A	N/A
B4.090 Double Bedroom	N/A	N/A
B4.091 Double Bedroom	N/A	N/A
B4.092 Double Bedroom	N/A	N/A
B4.093 Double Bedroom	N/A	N/A
B4.094 Twin Room	N/A	N/A
B4.095 Twin Room	N/A	N/A
B4.096 Twin Room	N/A	N/A
B4.097 Double Bedroom	N/A	N/A
B4.098 Double Bedroom	N/A	N/A
B5.002 Double Bedroom	N/A	N/A
B5.003 Double Bedroom	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B5.004 Family Room	N/A	N/A
B5.005 Double Bedroom	N/A	N/A
B5.006 Double Bedroom	N/A	N/A
B5.007 Double Bedroom	N/A	N/A
B5.008 Double Bedroom	N/A	N/A
B5.009 Family Room	N/A	N/A
B5.010 Twin Room	N/A	N/A
B5.011 Twin Room	N/A	N/A
B5.012 Twin Room	N/A	N/A
B5.013 Twin Room	N/A	N/A
B5.014 Twin Room	N/A	N/A
B5.015 Twin Room	N/A	N/A
B5.016 Twin Room	N/A	N/A
B5.017 Twin Room	N/A	N/A
B5.018 Twin Room	N/A	N/A
B5.019 Twin Room	N/A	N/A
B5.020 Twin Room	N/A	N/A
B5.021 Twin Room	N/A	N/A
B5.022 Twin Room	N/A	N/A
B5.023 Twin Room	N/A	N/A
B5.024 Double Bedroom	N/A	N/A
B5.025 Twin Room	N/A	N/A
B5.026 Twin Room	N/A	N/A
B5.027 Twin Room	N/A	N/A
B5.028 Twin Room	N/A	N/A
B5.029 Twin Room	N/A	N/A
B5.030 DDA Room	N/A	N/A
B5.031 Family Room	N/A	N/A
B5.032 Double Bedroom	N/A	N/A
B5.033 Double Bedroom	N/A	N/A
B5.034 Double Bedroom	N/A	N/A
B5.035 Double Bedroom	N/A	N/A
B5.036 Double Bedroom	N/A	N/A
B5.037 Double Bedroom	N/A	N/A
B5.038 Double Bedroom	N/A	N/A
B5.039 Family Room	N/A	N/A
B5.040 Family Room	N/A	N/A
B5.041 Double Bedroom	N/A	N/A
B5.042 Double Bedroom	N/A	N/A
B5.043 Double Bedroom	N/A	N/A
B5.044 Double Bedroom	N/A	N/A
B5.045 Double Bedroom	N/A	N/A
B5.046 Double Bedroom	N/A	N/A
B5.047 Family Room	N/A	N/A
B5.048 Double Bedroom	N/A	N/A
B5.049 Double Bedroom	N/A	N/A
B5.050 Double Bedroom	N/A	N/A
B5.051 Double Bedroom	N/A	N/A
B5.052 Double Bedroom	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B5.053 Double Bedroom	N/A	N/A
B5.054 Double Bedroom	N/A	N/A
B5.055 Double Bedroom	N/A	N/A
B5.056 Double Bedroom	N/A	N/A
B5.057 Double Bedroom	N/A	N/A
B5.058 Double Bedroom	N/A	N/A
B5.059 Double Bedroom	N/A	N/A
B5.060 Double Bedroom	N/A	N/A
B5.061 Double Bedroom	N/A	N/A
B5.062 Double Bedroom	N/A	N/A
B5.063 Double Bedroom	N/A	N/A
B5.064 Double Bedroom	N/A	N/A
B5.065 Family Room	N/A	N/A
B5.066 Family Room	N/A	N/A
B5.067 Double Room	N/A	N/A
B5.068 Double Bedroom	N/A	N/A
B5.069 Double Bedroom	N/A	N/A
B5.070 Double Bedroom	N/A	N/A
B5.071 Twin Room	N/A	N/A
B5.072 Double Bedroom	N/A	N/A
B5.073 Double Bedroom	N/A	N/A
B5.074 Double Room	N/A	N/A
B5.075 Double Room	N/A	N/A
B5.076 Double Bedroom	N/A	N/A
B5.077 Family Room	N/A	N/A
B5.078 Family Room	N/A	N/A
B5.079 Double Bedroom	N/A	N/A
B5.080 DDA Room	N/A	N/A
B5.081 Double Bedroom	N/A	N/A
B5.082 Double Bedroom	N/A	N/A
B5.083 Double Bedroom	N/A	N/A
B5.084 Double Bedroom	N/A	N/A
B5.085 Double Bedroom	N/A	N/A
B5.086 DDA Room	N/A	N/A
B5.087 DDA Room	N/A	N/A
B5.088 Double Bedroom	N/A	N/A
B5.089 Double Bedroom	N/A	N/A
B5.090 Single Bedroom	N/A	N/A
B5.091 Double Bedroom	N/A	N/A
B5.092 Double Bedroom	N/A	N/A
B5.093 Double Bedroom	N/A	N/A
B5.094 DDA Room	N/A	N/A
B5.095 DDA Room	N/A	N/A
B5.096 Family Room	N/A	N/A
B5.097 Family Room	N/A	N/A
B5.098 Double Bedroom	N/A	N/A
B5.099 Double Bedroom	N/A	N/A
B5.100 Double Bedroom	N/A	N/A
B5.101 Double Bedroom	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B5.102 Double Bedroom	N/A	N/A
B5.103 Family Room	N/A	N/A
B5.104 Double Bedroom	N/A	N/A
B5.105 Double Bedroom	N/A	N/A
B5.106 Twin Room	N/A	N/A
B5.107 Double Bedroom	N/A	N/A
B5.108 Double Bedroom	N/A	N/A
B5.109 Double Bedroom	N/A	N/A
B5.110 Double Bedroom	N/A	N/A

Criterion 4: The performance of the building, as built, should be consistent with the calculated BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

EPBD (Recast): Consideration of alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	5252.4	5252.4
External area [m ²]	4620.8	4620.8
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	35	3
Average conductance [W/K]	5220.18	1097.4
Average U-value [W/m ² K]	1.13	0.24
Alpha value* [%]	10.38	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

100 C1 Hotels

C2 Residential Institutions: Hospitals and Care Homes
C2 Residential Institutions: Residential schools
C2 Residential Institutions: Universities and colleges
C2A Secure Residential Institutions
Residential spaces
D1 Non-residential Institutions: Community/Day Centre
D1 Non-residential Institutions: Libraries, Museums, and Galleries
D1 Non-residential Institutions: Education
D1 Non-residential Institutions: Primary Health Care Building
D1 Non-residential Institutions: Crown and County Courts
D2 General Assembly and Leisure, Night Clubs, and Theatres
Others: Passenger terminals
Others: Emergency services
Others: Miscellaneous 24hr activities
Others: Car Parks 24 hrs
Others: Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	93.5	41.41
Cooling	0	0
Auxiliary	16.78	8.37
Lighting	29.51	11.33
Hot water	170.72	170.72
Equipment*	10.94	10.94
TOTAL **	310.51	231.83

* 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]	273.32	128.52
Primary energy* [kWh/m ²]	464.43	317.76
Total emissions [kg/m ²]	81.1	55.8

* 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] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	273.3	0	93.5	0	14.1	0.81	0	0.91	0
	Notional	128.5	0	41.4	0	5.8	0.86	0	----	----
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0	0	0	0	0
	Notional	0	0	0	0	0	0	0	----	----

Key to terms

Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

Building fabric

Element	U _{i-Typ}	U _{i-Min}	Surface where the minimum value occurs*
Wall	0.23	1	B4000016:Surf[0]
Floor	0.2	1.2	B4000016:Surf[15]
Roof	0.15	0.68	B500002D:Surf[3]
Windows, roof windows, and rooflights	1.5	-	No windows or rooflights in building
Personnel doors	1.5	-	No Personnel doors in building
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	35

Project name

BE LEAN - RevA

As designed

Date: Mon Apr 06 18:59:26 2020

Administrative information

Building Details

Address: 112a Great Russell Street, London, WC1B 3NP

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.12

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.12

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

Owner Details

Name:

Telephone number:

Address: , ,

Certifier details

Name:

Telephone number:

Address: , ,

Criterion 1: The calculated CO₂ emission rate for the building must not exceed the target

The building does not comply with England Building Regulations Part L 2013

CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	54.4
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	54.4
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	67.6
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	0.2	0.2	B4000016:Surf[0]
Floor	0.25	0.22	0.22	B4000016:Surf[15]
Roof	0.25	0.18	0.18	B500002D:Surf[3]
Windows***, roof windows, and rooflights	2.2	-	-	No windows or rooflights in building
Personnel doors	2.2	-	-	No Personnel doors in building
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	3

Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

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

1- FCU - Gas Boilers for heating and ASHP for cooling

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	2.6	0	1.7	0.68
Standard value	0.91*	3.2	N/A	1.6^	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for gas single boiler systems <=2 MW output. For single boiler systems >2 MW or multi-boiler systems, (overall) limiting efficiency is 0.86. For any individual boiler in a multi-boiler system, limiting efficiency is 0.82.					
^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.					

"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		
B4. Admin Office and CCTV Room		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. AHU Vent Room		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. BOH Storage		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Comms Room 01		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Comms Room 02		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Core 01		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Core 02		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	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		
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Fire Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Hotel Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Lift	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Luggage Storage	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. LV Room 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Plant	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Staff Changing Area	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Core 03	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Stair Hall	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.001 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.002 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.003 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.004 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.005 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.006 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.007 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.008 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.009 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.010 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.011 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.012 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.013 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.014 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.015 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.016 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.017 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.018 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.019 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.020 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.021 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.022 Twin Room	-	-	-	-	-	-	-	0.3	-	-	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		
B4.023 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.024 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.025 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.026 DDA Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.027 Single Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.028 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.029 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.030 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.031 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.032 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.033 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.034 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.035 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.036 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.037 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.038 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.039 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.040 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.041 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.042 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.043 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.044 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.045 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.046 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.047 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.048 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.049 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.050 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.051 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.052 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.053 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.054 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.055 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.056 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.057 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.058 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.059 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.060 Double Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.061 Double Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.062 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.063 DDA Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.064 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.065 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	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		
B4.066 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.067 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.068 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.069 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.070 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.071 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.072 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.073 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.074 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.075 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.076 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.077 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.078 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.079 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.080 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.081 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.082 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.083 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.084 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.085 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.086 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.087 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.088 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.089 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.090 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.091 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.092 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.093 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.094 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.095 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.096 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.097 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.098 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Cold Water Storage Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Comms room 03	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Comms Room 04	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Core 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Core 01 Stair	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Core 02	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Core 03	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Core 03 Protected Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Corridor	-	-	-	-	-	-	-	0.3	-	-	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
B5.009 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.010 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.011 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.012 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.013 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.014 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.015 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.016 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.017 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.018 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.019 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.020 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.021 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.022 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.023 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.024 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.025 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.026 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.027 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.028 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.029 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.030 DDA Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.031 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.032 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.033 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.034 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.035 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.036 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.037 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.038 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.039 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.040 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.041 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.042 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.043 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.044 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.045 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.046 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.047 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.048 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.049 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.050 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.051 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	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
B5.052 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.053 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.054 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.055 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.056 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.057 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.058 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.059 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.060 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.061 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.062 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.063 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.064 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.065 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.066 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.067 Double Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.068 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.069 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.070 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.071 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.072 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.073 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.074 Double Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.075 Double Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.076 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.077 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.078 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.079 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.080 DDA Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.081 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.082 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.083 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.084 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.085 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.086 DDA Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.087 DDA Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.088 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.089 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.090 Single Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.091 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.092 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.093 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.094 DDA Room	-	-	-	-	-	-	-	0.3	-	-	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
B5.095 DDA Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.096 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.097 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.098 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.099 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.100 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.101 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.102 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.103 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.104 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.105 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.106 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.107 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.108 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.109 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.110 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B3. Core 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B3. Core 02	-	-	-	-	-	-	-	0.3	-	-	N/A
B3. Core 03	-	-	-	-	-	-	-	0.3	-	-	N/A
B2. Core 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B2. Core 02	-	-	-	-	-	-	-	0.3	-	-	N/A
B2. Core 03	-	-	-	-	-	-	-	0.3	-	-	N/A
B1. Core 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B1. Core 02	-	-	-	-	-	-	-	0.3	-	-	N/A
B1. Core 03	-	-	-	-	-	-	-	0.3	-	-	N/A
GF. Core 02	-	-	-	-	-	-	-	0.3	-	-	N/A
GF. Core 03	-	-	-	-	-	-	-	0.3	-	-	N/A
GF. Core 01 - Unknown	-	-	-	-	-	-	-	0.3	-	-	N/A
GF. Core 01 - Lift	-	-	-	-	-	-	-	0.3	-	-	N/A
GF. Core 01 - Hall and Stair	-	-	-	-	-	-	-	0.3	-	-	N/A
GF. Core 01 - Cupboard	-	-	-	-	-	-	-	0.3	-	-	N/A

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name	Standard value	Luminaire	Lamp	Display lamp	
B4. Admin Office and CCTV Room	60	100	-	-	216
B4. AHU Vent Room	60	100	-	-	93
B4. BOH Storage	60	100	-	-	16
B4. Comms Room 01	60	100	-	-	14
B4. Comms Room 02	60	100	-	-	13
B4. Core 01	60	-	100	-	38
B4. Core 02	60	-	100	-	49
B4. Corridor	60	-	100	-	147

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B4. Corridor		-	100	-	57
B4. Corridor		-	100	-	43
B4. Corridor		-	100	-	40
B4. Corridor		-	100	-	118
B4. Corridor		-	100	-	22
B4. Corridor		-	100	-	88
B4. Corridor		-	100	-	70
B4. Corridor		-	100	-	30
B4. Corridor		-	100	-	32
B4. Corridor		-	100	-	56
B4. Corridor		-	100	-	34
B4. Corridor		-	100	-	85
B4. Corridor		-	100	-	71
B4. Corridor		-	100	-	62
B4. Corridor		-	100	-	65
B4. Corridor		-	100	-	22
B4. Corridor		-	100	-	37
B4. Corridor		-	100	-	20
B4. Corridor		-	100	-	60
B4. Corridor		-	100	-	54
B4. Fire Lobby		-	100	-	58
B4. Hotel Lobby		-	100	-	292
B4. Lift		-	100	-	12
B4. Luggage Storage		100	-	-	36
B4. LV Room 01		100	-	-	18
B4. Plant		100	-	-	25
B4. Staff Changing Area		-	100	-	28
B4. Core 03		-	100	-	36
B4. Stair Hall		-	100	-	25
B4.001 Double Bedroom		-	100	-	22
B4.002 Double Bedroom		-	100	-	20
B4.003 Family Room		-	100	-	40
B4.004 Double Bedroom		-	100	-	21
B4.005 Double Bedroom		-	100	-	21
B4.006 Double Bedroom		-	100	-	24
B4.007 Double Bedroom		-	100	-	23
B4.008 Family Room		-	100	-	36
B4.009 Family Room		-	100	-	27
B4.010 Twin Room		-	100	-	21
B4.011 Twin Room		-	100	-	21
B4.012 Twin Room		-	100	-	21
B4.013 Twin Room		-	100	-	21
B4.014 Twin Room		-	100	-	21

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B4.015 Twin Room		-	100	-	20
B4.016 Twin Room		-	100	-	21
B4.017 Twin Room		-	100	-	21
B4.018 Twin Room		-	100	-	21
B4.019 Twin Room		-	100	-	21
B4.020 Double Bedroom		-	100	-	21
B4.021 Double Bedroom		-	100	-	24
B4.022 Twin Room		-	100	-	25
B4.023 Twin Room		-	100	-	24
B4.024 Twin Room		-	100	-	24
B4.025 Twin Room		-	100	-	24
B4.026 DDA Room		-	100	-	31
B4.027 Single Bedroom		-	100	-	17
B4.028 Double Bedroom		-	100	-	20
B4.029 Double Bedroom		-	100	-	20
B4.030 Double Bedroom		-	100	-	20
B4.031 Double Bedroom		-	100	-	20
B4.032 Double Bedroom		-	100	-	23
B4.033 Family Room		-	100	-	33
B4.034 Double Bedroom		-	100	-	20
B4.035 Family Room		-	100	-	36
B4.036 Family Room		-	100	-	38
B4.037 Double Bedroom		-	100	-	22
B4.038 Double Bedroom		-	100	-	22
B4.039 Double Bedroom		-	100	-	26
B4.040 Double Bedroom		-	100	-	26
B4.041 Double Bedroom		-	100	-	26
B4.042 Double Bedroom		-	100	-	23
B4.043 Double Bedroom		-	100	-	24
B4.044 Double Bedroom		-	100	-	23
B4.045 Double Bedroom		-	100	-	24
B4.046 Double Bedroom		-	100	-	23
B4.047 Double Bedroom		-	100	-	24
B4.048 Double Bedroom		-	100	-	21
B4.049 Double Bedroom		-	100	-	20
B4.050 Double Bedroom		-	100	-	21
B4.051 Double Bedroom		-	100	-	21
B4.052 Double Bedroom		-	100	-	25
B4.053 Double Bedroom		-	100	-	25
B4.054 Double Bedroom		-	100	-	25
B4.055 Double Bedroom		-	100	-	21
B4.056 Double Bedroom		-	100	-	21
B4.057 Double Bedroom		-	100	-	20

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B4.058 Double Bedroom		-	100	-	21
B4.059 Double Bedroom		-	100	-	21
B4.060 Double Room		-	100	-	28
B4.061 Double Room		-	100	-	21
B4.062 Twin Room		-	100	-	25
B4.063 DDA Room		-	100	-	31
B4.064 Double Bedroom		-	100	-	21
B4.065 Double Bedroom		-	100	-	21
B4.066 Twin Room		-	100	-	32
B4.067 Twin Room		-	100	-	26
B4.068 Twin Room		-	100	-	26
B4.069 Double Bedroom		-	100	-	31
B4.070 Double Bedroom		-	100	-	20
B4.071 Double Bedroom		-	100	-	23
B4.072 Family Room		-	100	-	33
B4.073 Family Room		-	100	-	31
B4.074 Twin Room		-	100	-	25
B4.075 Double Bedroom		-	100	-	23
B4.076 Double Bedroom		-	100	-	24
B4.077 Double Bedroom		-	100	-	24
B4.078 Double Bedroom		-	100	-	24
B4.079 Double Bedroom		-	100	-	24
B4.080 Double Bedroom		-	100	-	24
B4.081 Double Bedroom		-	100	-	23
B4.082 Double Bedroom		-	100	-	20
B4.083 Double Bedroom		-	100	-	20
B4.084 Family Room		-	100	-	29
B4.085 Double Bedroom		-	100	-	23
B4.086 Double Bedroom		-	100	-	23
B4.087 Family Room		-	100	-	29
B4.088 Family Room		-	100	-	39
B4.089 Double Bedroom		-	100	-	26
B4.090 Double Bedroom		-	100	-	28
B4.091 Double Bedroom		-	100	-	28
B4.092 Double Bedroom		-	100	-	28
B4.093 Double Bedroom		-	100	-	25
B4.094 Twin Room		-	100	-	24
B4.095 Twin Room		-	100	-	24
B4.096 Twin Room		-	100	-	24
B4.097 Double Bedroom		-	100	-	25
B4.098 Double Bedroom		-	100	-	23
B5. Cold Water Storage Room		100	-	-	40
B5. Comms room 03		100	-	-	28

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B5. Comms Room 04		100	-	-	20
B5. Core 01		-	100	-	61
B5. Core 01 Stair		-	100	-	37
B5. Core 02		-	100	-	32
B5. Core 03		-	100	-	39
B5. Core 03 Protected Lobby		-	100	-	25
B5. Corridor		-	100	-	80
B5. Corridor		-	100	-	112
B5. Corridor		-	100	-	62
B5. Corridor		-	100	-	40
B5. Corridor		-	100	-	35
B5. Corridor		-	100	-	35
B5. Corridor		-	100	-	40
B5. Corridor		-	100	-	106
B5. Corridor		-	100	-	55
B5. Corridor		-	100	-	41
B5. Corridor		-	100	-	27
B5. Corridor		-	100	-	64
B5. Corridor		-	100	-	26
B5. Corridor		-	100	-	14
B5. Corridor		-	100	-	38
B5. Corridor		-	100	-	56
B5. Corridor		-	100	-	19
B5. Corridor		-	100	-	49
B5. Corridor		-	100	-	80
B5. Corridor		-	100	-	75
B5. Corridor		-	100	-	18
B5. Corridor		-	100	-	66
B5. Corridor		-	100	-	67
B5. Corridor		-	100	-	34
B5. Corridor		-	100	-	18
B5. Corridor		-	100	-	60
B5. Corridor		-	100	-	24
B5. Corridor		-	100	-	66
B5. Corridor		-	100	-	38
B5. Electrical room		100	-	-	45
B5. Heating and Pumps Plant		100	-	-	64
B5. Lift		-	100	-	14
B5. Plant		100	-	-	26
B5. Plant		100	-	-	33
B5. Plant		100	-	-	19
B5. Refuse Storage and Local Drainage Pump		100	-	-	42
B5. Tanks Room		100	-	-	41

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B5. UPS Pump Room		100	-	-	19
B5.002 Double Bedroom		-	100	-	26
B5.003 Double Bedroom		-	100	-	23
B5.004 Family Room		-	100	-	44
B5.005 Double Bedroom		-	100	-	24
B5.006 Double Bedroom		-	100	-	24
B5.007 Double Bedroom		-	100	-	27
B5.008 Double Bedroom		-	100	-	26
B5.009 Family Room		-	100	-	39
B5.010 Twin Room		-	100	-	29
B5.011 Twin Room		-	100	-	24
B5.012 Twin Room		-	100	-	23
B5.013 Twin Room		-	100	-	23
B5.014 Twin Room		-	100	-	23
B5.015 Twin Room		-	100	-	23
B5.016 Twin Room		-	100	-	23
B5.017 Twin Room		-	100	-	23
B5.018 Twin Room		-	100	-	23
B5.019 Twin Room		-	100	-	23
B5.020 Twin Room		-	100	-	23
B5.021 Twin Room		-	100	-	23
B5.022 Twin Room		-	100	-	23
B5.023 Twin Room		-	100	-	23
B5.024 Double Bedroom		-	100	-	26
B5.025 Twin Room		-	100	-	26
B5.026 Twin Room		-	100	-	26
B5.027 Twin Room		-	100	-	26
B5.028 Twin Room		-	100	-	26
B5.029 Twin Room		-	100	-	26
B5.030 DDA Room		-	100	-	37
B5.031 Family Room		-	100	-	33
B5.032 Double Bedroom		-	100	-	22
B5.033 Double Bedroom		-	100	-	22
B5.034 Double Bedroom		-	100	-	22
B5.035 Double Bedroom		-	100	-	21
B5.036 Double Bedroom		-	100	-	27
B5.037 Double Bedroom		-	100	-	27
B5.038 Double Bedroom		-	100	-	22
B5.039 Family Room		-	100	-	37
B5.040 Family Room		-	100	-	39
B5.041 Double Bedroom		-	100	-	24
B5.042 Double Bedroom		-	100	-	24
B5.043 Double Bedroom		-	100	-	27

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B5.044 Double Bedroom		-	100	-	28
B5.045 Double Bedroom		-	100	-	24
B5.046 Double Bedroom		-	100	-	30
B5.047 Family Room		-	100	-	32
B5.048 Double Bedroom		-	100	-	29
B5.049 Double Bedroom		-	100	-	25
B5.050 Double Bedroom		-	100	-	26
B5.051 Double Bedroom		-	100	-	25
B5.052 Double Bedroom		-	100	-	26
B5.053 Double Bedroom		-	100	-	23
B5.054 Double Bedroom		-	100	-	24
B5.055 Double Bedroom		-	100	-	22
B5.056 Double Bedroom		-	100	-	22
B5.057 Double Bedroom		-	100	-	23
B5.058 Double Bedroom		-	100	-	23
B5.059 Double Bedroom		-	100	-	22
B5.060 Double Bedroom		-	100	-	22
B5.061 Double Bedroom		-	100	-	22
B5.062 Double Bedroom		-	100	-	23
B5.063 Double Bedroom		-	100	-	23
B5.064 Double Bedroom		-	100	-	33
B5.065 Family Room		-	100	-	31
B5.066 Family Room		-	100	-	30
B5.067 Double Room		-	100	-	24
B5.068 Double Bedroom		-	100	-	24
B5.069 Double Bedroom		-	100	-	22
B5.070 Double Bedroom		-	100	-	22
B5.071 Twin Room		-	100	-	26
B5.072 Double Bedroom		-	100	-	23
B5.073 Double Bedroom		-	100	-	26
B5.074 Double Room		-	100	-	33
B5.075 Double Room		-	100	-	27
B5.076 Double Bedroom		-	100	-	24
B5.077 Family Room		-	100	-	41
B5.078 Family Room		-	100	-	33
B5.079 Double Bedroom		-	100	-	33
B5.080 DDA Room		-	100	-	31
B5.081 Double Bedroom		-	100	-	25
B5.082 Double Bedroom		-	100	-	22
B5.083 Double Bedroom		-	100	-	23
B5.084 Double Bedroom		-	100	-	23
B5.085 Double Bedroom		-	100	-	23
B5.086 DDA Room		-	100	-	37

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B5.087 DDA Room		-	100	-	34
B5.088 Double Bedroom		-	100	-	23
B5.089 Double Bedroom		-	100	-	23
B5.090 Single Bedroom		-	100	-	25
B5.091 Double Bedroom		-	100	-	24
B5.092 Double Bedroom		-	100	-	23
B5.093 Double Bedroom		-	100	-	24
B5.094 DDA Room		-	100	-	34
B5.095 DDA Room		-	100	-	37
B5.096 Family Room		-	100	-	39
B5.097 Family Room		-	100	-	32
B5.098 Double Bedroom		-	100	-	25
B5.099 Double Bedroom		-	100	-	24
B5.100 Double Bedroom		-	100	-	24
B5.101 Double Bedroom		-	100	-	24
B5.102 Double Bedroom		-	100	-	24
B5.103 Family Room		-	100	-	31
B5.104 Double Bedroom		-	100	-	22
B5.105 Double Bedroom		-	100	-	20
B5.106 Twin Room		-	100	-	25
B5.107 Double Bedroom		-	100	-	28
B5.108 Double Bedroom		-	100	-	28
B5.109 Double Bedroom		-	100	-	28
B5.110 Double Bedroom		-	100	-	29
B3. Core 01		-	100	-	41
B3. Core 02		-	100	-	52
B3. Core 03		-	100	-	39
B2. Core 01		-	100	-	41
B2. Core 02		-	100	-	52
B2. Core 03		-	100	-	39
B1. Core 01		-	100	-	50
B1. Core 02		-	100	-	60
B1. Core 03		-	100	-	48
GF. Core 02		-	100	-	37
GF. Core 03		-	100	-	34
GF. Core 01 - Unknown		100	-	-	23
GF. Core 01 - Lift		-	100	-	13
GF. Core 01 - Hall and Stair		-	100	-	92
GF. Core 01 - Cupboard		100	-	-	10

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?
B4. Admin Office and CCTV Room	N/A	N/A
B4. AHU Vent Room	N/A	N/A
B4. BOH Storage	N/A	N/A
B4. Comms Room 01	N/A	N/A
B4. Comms Room 02	N/A	N/A
B4. Core 01	N/A	N/A
B4. Core 02	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Corridor	N/A	N/A
B4. Fire Lobby	N/A	N/A
B4. Hotel Lobby	N/A	N/A
B4. Lift	N/A	N/A
B4. Luggage Storage	N/A	N/A
B4. LV Room 01	N/A	N/A
B4. Plant	N/A	N/A
B4. Staff Changing Area	N/A	N/A
B4. Core 03	N/A	N/A
B4. Stair Hall	N/A	N/A
B4.001 Double Bedroom	N/A	N/A
B4.002 Double Bedroom	N/A	N/A
B4.003 Family Room	N/A	N/A
B4.004 Double Bedroom	N/A	N/A
B4.005 Double Bedroom	N/A	N/A
B4.006 Double Bedroom	N/A	N/A
B4.007 Double Bedroom	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B4.008 Family Room	N/A	N/A
B4.009 Family Room	N/A	N/A
B4.010 Twin Room	N/A	N/A
B4.011 Twin Room	N/A	N/A
B4.012 Twin Room	N/A	N/A
B4.013 Twin Room	N/A	N/A
B4.014 Twin Room	N/A	N/A
B4.015 Twin Room	N/A	N/A
B4.016 Twin Room	N/A	N/A
B4.017 Twin Room	N/A	N/A
B4.018 Twin Room	N/A	N/A
B4.019 Twin Room	N/A	N/A
B4.020 Double Bedroom	N/A	N/A
B4.021 Double Bedroom	N/A	N/A
B4.022 Twin Room	N/A	N/A
B4.023 Twin Room	N/A	N/A
B4.024 Twin Room	N/A	N/A
B4.025 Twin Room	N/A	N/A
B4.026 DDA Room	N/A	N/A
B4.027 Single Bedroom	N/A	N/A
B4.028 Double Bedroom	N/A	N/A
B4.029 Double Bedroom	N/A	N/A
B4.030 Double Bedroom	N/A	N/A
B4.031 Double Bedroom	N/A	N/A
B4.032 Double Bedroom	N/A	N/A
B4.033 Family Room	N/A	N/A
B4.034 Double Bedroom	N/A	N/A
B4.035 Family Room	N/A	N/A
B4.036 Family Room	N/A	N/A
B4.037 Double Bedroom	N/A	N/A
B4.038 Double Bedroom	N/A	N/A
B4.039 Double Bedroom	N/A	N/A
B4.040 Double Bedroom	N/A	N/A
B4.041 Double Bedroom	N/A	N/A
B4.042 Double Bedroom	N/A	N/A
B4.043 Double Bedroom	N/A	N/A
B4.044 Double Bedroom	N/A	N/A
B4.045 Double Bedroom	N/A	N/A
B4.046 Double Bedroom	N/A	N/A
B4.047 Double Bedroom	N/A	N/A
B4.048 Double Bedroom	N/A	N/A
B4.049 Double Bedroom	N/A	N/A
B4.050 Double Bedroom	N/A	N/A
B4.051 Double Bedroom	N/A	N/A
B4.052 Double Bedroom	N/A	N/A
B4.053 Double Bedroom	N/A	N/A
B4.054 Double Bedroom	N/A	N/A
B4.055 Double Bedroom	N/A	N/A
B4.056 Double Bedroom	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B4.057 Double Bedroom	N/A	N/A
B4.058 Double Bedroom	N/A	N/A
B4.059 Double Bedroom	N/A	N/A
B4.060 Double Room	N/A	N/A
B4.061 Double Room	N/A	N/A
B4.062 Twin Room	N/A	N/A
B4.063 DDA Room	N/A	N/A
B4.064 Double Bedroom	N/A	N/A
B4.065 Double Bedroom	N/A	N/A
B4.066 Twin Room	N/A	N/A
B4.067 Twin Room	N/A	N/A
B4.068 Twin Room	N/A	N/A
B4.069 Double Bedroom	N/A	N/A
B4.070 Double Bedroom	N/A	N/A
B4.071 Double Bedroom	N/A	N/A
B4.072 Family Room	N/A	N/A
B4.073 Family Room	N/A	N/A
B4.074 Twin Room	N/A	N/A
B4.075 Double Bedroom	N/A	N/A
B4.076 Double Bedroom	N/A	N/A
B4.077 Double Bedroom	N/A	N/A
B4.078 Double Bedroom	N/A	N/A
B4.079 Double Bedroom	N/A	N/A
B4.080 Double Bedroom	N/A	N/A
B4.081 Double Bedroom	N/A	N/A
B4.082 Double Bedroom	N/A	N/A
B4.083 Double Bedroom	N/A	N/A
B4.084 Family Room	N/A	N/A
B4.085 Double Bedroom	N/A	N/A
B4.086 Double Bedroom	N/A	N/A
B4.087 Family Room	N/A	N/A
B4.088 Family Room	N/A	N/A
B4.089 Double Bedroom	N/A	N/A
B4.090 Double Bedroom	N/A	N/A
B4.091 Double Bedroom	N/A	N/A
B4.092 Double Bedroom	N/A	N/A
B4.093 Double Bedroom	N/A	N/A
B4.094 Twin Room	N/A	N/A
B4.095 Twin Room	N/A	N/A
B4.096 Twin Room	N/A	N/A
B4.097 Double Bedroom	N/A	N/A
B4.098 Double Bedroom	N/A	N/A
B5. Cold Water Storage Room	N/A	N/A
B5. Comms room 03	N/A	N/A
B5. Comms Room 04	N/A	N/A
B5. Core 01	N/A	N/A
B5. Core 01 Stair	N/A	N/A
B5. Core 02	N/A	N/A
B5. Core 03	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B5.012 Twin Room	N/A	N/A
B5.013 Twin Room	N/A	N/A
B5.014 Twin Room	N/A	N/A
B5.015 Twin Room	N/A	N/A
B5.016 Twin Room	N/A	N/A
B5.017 Twin Room	N/A	N/A
B5.018 Twin Room	N/A	N/A
B5.019 Twin Room	N/A	N/A
B5.020 Twin Room	N/A	N/A
B5.021 Twin Room	N/A	N/A
B5.022 Twin Room	N/A	N/A
B5.023 Twin Room	N/A	N/A
B5.024 Double Bedroom	N/A	N/A
B5.025 Twin Room	N/A	N/A
B5.026 Twin Room	N/A	N/A
B5.027 Twin Room	N/A	N/A
B5.028 Twin Room	N/A	N/A
B5.029 Twin Room	N/A	N/A
B5.030 DDA Room	N/A	N/A
B5.031 Family Room	N/A	N/A
B5.032 Double Bedroom	N/A	N/A
B5.033 Double Bedroom	N/A	N/A
B5.034 Double Bedroom	N/A	N/A
B5.035 Double Bedroom	N/A	N/A
B5.036 Double Bedroom	N/A	N/A
B5.037 Double Bedroom	N/A	N/A
B5.038 Double Bedroom	N/A	N/A
B5.039 Family Room	N/A	N/A
B5.040 Family Room	N/A	N/A
B5.041 Double Bedroom	N/A	N/A
B5.042 Double Bedroom	N/A	N/A
B5.043 Double Bedroom	N/A	N/A
B5.044 Double Bedroom	N/A	N/A
B5.045 Double Bedroom	N/A	N/A
B5.046 Double Bedroom	N/A	N/A
B5.047 Family Room	N/A	N/A
B5.048 Double Bedroom	N/A	N/A
B5.049 Double Bedroom	N/A	N/A
B5.050 Double Bedroom	N/A	N/A
B5.051 Double Bedroom	N/A	N/A
B5.052 Double Bedroom	N/A	N/A
B5.053 Double Bedroom	N/A	N/A
B5.054 Double Bedroom	N/A	N/A
B5.055 Double Bedroom	N/A	N/A
B5.056 Double Bedroom	N/A	N/A
B5.057 Double Bedroom	N/A	N/A
B5.058 Double Bedroom	N/A	N/A
B5.059 Double Bedroom	N/A	N/A
B5.060 Double Bedroom	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B5.061 Double Bedroom	N/A	N/A
B5.062 Double Bedroom	N/A	N/A
B5.063 Double Bedroom	N/A	N/A
B5.064 Double Bedroom	N/A	N/A
B5.065 Family Room	N/A	N/A
B5.066 Family Room	N/A	N/A
B5.067 Double Room	N/A	N/A
B5.068 Double Bedroom	N/A	N/A
B5.069 Double Bedroom	N/A	N/A
B5.070 Double Bedroom	N/A	N/A
B5.071 Twin Room	N/A	N/A
B5.072 Double Bedroom	N/A	N/A
B5.073 Double Bedroom	N/A	N/A
B5.074 Double Room	N/A	N/A
B5.075 Double Room	N/A	N/A
B5.076 Double Bedroom	N/A	N/A
B5.077 Family Room	N/A	N/A
B5.078 Family Room	N/A	N/A
B5.079 Double Bedroom	N/A	N/A
B5.080 DDA Room	N/A	N/A
B5.081 Double Bedroom	N/A	N/A
B5.082 Double Bedroom	N/A	N/A
B5.083 Double Bedroom	N/A	N/A
B5.084 Double Bedroom	N/A	N/A
B5.085 Double Bedroom	N/A	N/A
B5.086 DDA Room	N/A	N/A
B5.087 DDA Room	N/A	N/A
B5.088 Double Bedroom	N/A	N/A
B5.089 Double Bedroom	N/A	N/A
B5.090 Single Bedroom	N/A	N/A
B5.091 Double Bedroom	N/A	N/A
B5.092 Double Bedroom	N/A	N/A
B5.093 Double Bedroom	N/A	N/A
B5.094 DDA Room	N/A	N/A
B5.095 DDA Room	N/A	N/A
B5.096 Family Room	N/A	N/A
B5.097 Family Room	N/A	N/A
B5.098 Double Bedroom	N/A	N/A
B5.099 Double Bedroom	N/A	N/A
B5.100 Double Bedroom	N/A	N/A
B5.101 Double Bedroom	N/A	N/A
B5.102 Double Bedroom	N/A	N/A
B5.103 Family Room	N/A	N/A
B5.104 Double Bedroom	N/A	N/A
B5.105 Double Bedroom	N/A	N/A
B5.106 Twin Room	N/A	N/A
B5.107 Double Bedroom	N/A	N/A
B5.108 Double Bedroom	N/A	N/A
B5.109 Double Bedroom	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B5.110 Double Bedroom	N/A	N/A
B3. Core 01	N/A	N/A
B3. Core 02	N/A	N/A
B3. Core 03	N/A	N/A
B2. Core 01	N/A	N/A
B2. Core 02	N/A	N/A
B2. Core 03	N/A	N/A
B1. Core 01	N/A	N/A
B1. Core 02	N/A	N/A
B1. Core 03	N/A	N/A
GF. Core 02	N/A	N/A
GF. Core 03	N/A	N/A
GF. Core 01 - Unknown	N/A	N/A
GF. Core 01 - Lift	N/A	N/A
GF. Core 01 - Hall and Stair	N/A	N/A
GF. Core 01 - Cupboard	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]	5252.4	5252.4
External area [m ²]	4620.8	4620.8
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	3	3
Average conductance [W/K]	985.53	1097.4
Average U-value [W/m ² K]	0.21	0.24
Alpha value* [%]	10.2	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

100 C1 Hotels

C2 Residential Institutions: Hospitals and Care Homes
C2 Residential Institutions: Residential schools
C2 Residential Institutions: Universities and colleges
C2A Secure Residential Institutions
Residential spaces
D1 Non-residential Institutions: Community/Day Centre
D1 Non-residential Institutions: Libraries, Museums, and Galleries
D1 Non-residential Institutions: Education
D1 Non-residential Institutions: Primary Health Care Building
D1 Non-residential Institutions: Crown and County Courts
D2 General Assembly and Leisure, Night Clubs, and Theatres
Others: Passenger terminals
Others: Emergency services
Others: Miscellaneous 24hr activities
Others: Car Parks 24 hrs
Others: Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	46.01	6.86
Cooling	1.63	1.94
Auxiliary	30.65	18.51
Lighting	6.92	11.33
Hot water	172.87	170.72
Equipment*	10.94	10.94
TOTAL **	258.08	209.37

* 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]	140.68	47.78
Primary energy* [kWh/m ²]	387.37	311.78
Total emissions [kg/m ²]	67.6	54.4

* 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] Fan coil systems, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	129.4	11.3	46	1.6	30.7	0.78	1.92	0.91	2.6
	Notional	21.3	26.5	6.9	1.9	18.5	0.86	3.79	----	----
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0	0	0	0	0
	Notional	0	0	0	0	0	0	0	----	----

Key to terms

Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

Building fabric

Element	U _{i-Typ}	U _{i-Min}	Surface where the minimum value occurs*
Wall	0.23	0.2	B4000016:Surf[0]
Floor	0.2	0.22	B4000016:Surf[15]
Roof	0.15	0.18	B500002D:Surf[3]
Windows, roof windows, and rooflights	1.5	-	No windows or rooflights in building
Personnel doors	1.5	-	No Personnel doors in building
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	3

Project name

BE GREEN - RevA

As designed

Date: Mon Apr 06 17:24:52 2020

Administrative information

Building Details

Address: 112a Great Russell Street, London, WC1B 3NP

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.12

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.12

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

Owner Details

Name:

Telephone number:

Address: , ,

Certifier details

Name:

Telephone number:

Address: , ,

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	64
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	64
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	54.4
Are emissions from the building less than or equal to the target?	BER ≤ TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	U _a -Limit	U _a -Calc	U _i -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.2	0.2	B4000016:Surf[0]
Floor	0.25	0.22	0.22	B4000016:Surf[15]
Roof	0.25	0.18	0.18	B500002D:Surf[3]
Windows***, roof windows, and rooflights	2.2	-	-	No windows or rooflights in building
Personnel doors	2.2	-	-	No Personnel doors in building
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	3

Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

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

1- Heating and Cooling - 100% ASHP with FCU

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.71	4.64	0	1.7	0.68
Standard value	2.5*	3.2	N/A	1.6^	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types ≤12 kW output, refer to EN 14825 for limiting standards.					
^ Limiting SFP may be extended by the amounts specified in the Non-Domestic Building Services Compliance Guide if the system includes additional components as listed in the Guide.					

"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		
B4. Admin Office and CCTV Room		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. AHU Vent Room		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. BOH Storage		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Comms Room 01		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Comms Room 02		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Core 01		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Core 02		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor		-	-	-	-	-	-	-	0.3	-	-	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
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Fire Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Hotel Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Lift	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Luggage Storage	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. LV Room 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Plant	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Staff Changing Area	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Core 03	-	-	-	-	-	-	-	0.3	-	-	N/A
B4. Stair Hall	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.001 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.002 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.003 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.004 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.005 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.006 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.007 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.008 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.009 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.010 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.011 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.012 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.013 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.014 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.015 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.016 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.017 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.018 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.019 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.020 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.021 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.022 Twin Room	-	-	-	-	-	-	-	0.3	-	-	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
B4.023 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.024 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.025 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.026 DDA Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.027 Single Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.028 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.029 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.030 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.031 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.032 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.033 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.034 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.035 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.036 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.037 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.038 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.039 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.040 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.041 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.042 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.043 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.044 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.045 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.046 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.047 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.048 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.049 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.050 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.051 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.052 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.053 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.054 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.055 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.056 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.057 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.058 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.059 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.060 Double Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.061 Double Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.062 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.063 DDA Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.064 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.065 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	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		
B4.066 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.067 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.068 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.069 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.070 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.071 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.072 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.073 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.074 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.075 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.076 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.077 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.078 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.079 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.080 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.081 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.082 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.083 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.084 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.085 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.086 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.087 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.088 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.089 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.090 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.091 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.092 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.093 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.094 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.095 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.096 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.097 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B4.098 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Comms room 03	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Comms Room 04	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Core 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Core 01 Stair	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Core 02	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Core 03	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Core 03 Protected Lobby	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A
B5. Corridor	-	-	-	-	-	-	-	0.3	-	-	N/A

[illegible]

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
B5.011 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.012 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.013 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.014 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.015 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.016 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.017 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.018 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.019 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.020 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.021 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.022 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.023 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.024 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.025 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.026 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.027 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.028 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.029 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.030 DDA Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.031 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.032 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.033 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.034 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.035 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.036 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.037 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.038 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.039 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.040 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.041 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.042 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.043 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.044 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.045 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.046 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.047 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.048 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.049 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.050 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.051 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.052 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.053 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	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
B5.054 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.055 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.056 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.057 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.058 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.059 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.060 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.061 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.062 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.063 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.064 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.065 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.066 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.067 Double Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.068 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.069 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.070 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.071 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.072 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.073 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.074 Double Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.075 Double Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.076 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.077 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.078 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.079 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.080 DDA Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.081 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.082 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.083 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.084 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.085 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.086 DDA Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.087 DDA Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.088 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.089 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.090 Single Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.091 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.092 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.093 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.094 DDA Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.095 DDA Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.096 Family Room	-	-	-	-	-	-	-	0.3	-	-	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
B5.097 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.098 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.099 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.100 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.101 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.102 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.103 Family Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.104 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.105 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.106 Twin Room	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.107 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.108 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.109 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B5.110 Double Bedroom	-	-	-	-	-	-	-	0.3	-	-	N/A
B3. Core 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B3. Core 02	-	-	-	-	-	-	-	0.3	-	-	N/A
B3. Core 03	-	-	-	-	-	-	-	0.3	-	-	N/A
B2. Core 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B2. Core 02	-	-	-	-	-	-	-	0.3	-	-	N/A
B2. Core 03	-	-	-	-	-	-	-	0.3	-	-	N/A
B1. Core 01	-	-	-	-	-	-	-	0.3	-	-	N/A
B1. Core 02	-	-	-	-	-	-	-	0.3	-	-	N/A
B1. Core 03	-	-	-	-	-	-	-	0.3	-	-	N/A
GF. Core 02	-	-	-	-	-	-	-	0.3	-	-	N/A
GF. Core 03	-	-	-	-	-	-	-	0.3	-	-	N/A
GF. Core 01 - Unknown	-	-	-	-	-	-	-	0.3	-	-	N/A
GF. Core 01 - Lift	-	-	-	-	-	-	-	0.3	-	-	N/A
GF. Core 01 - Hall and Stair	-	-	-	-	-	-	-	0.3	-	-	N/A
GF. Core 01 - Cupboard	-	-	-	-	-	-	-	0.3	-	-	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	
B4. Admin Office and CCTV Room		100	-	-	216
B4. AHU Vent Room		100	-	-	93
B4. BOH Storage		100	-	-	16
B4. Comms Room 01		100	-	-	14
B4. Comms Room 02		100	-	-	13
B4. Core 01		-	100	-	38
B4. Core 02		-	100	-	49
B4. Corridor		-	100	-	147
B4. Corridor		-	100	-	57
B4. Corridor		-	100	-	43

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B4. Corridor		-	100	-	40
B4. Corridor		-	100	-	118
B4. Corridor		-	100	-	22
B4. Corridor		-	100	-	88
B4. Corridor		-	100	-	70
B4. Corridor		-	100	-	30
B4. Corridor		-	100	-	32
B4. Corridor		-	100	-	56
B4. Corridor		-	100	-	34
B4. Corridor		-	100	-	85
B4. Corridor		-	100	-	71
B4. Corridor		-	100	-	62
B4. Corridor		-	100	-	65
B4. Corridor		-	100	-	22
B4. Corridor		-	100	-	37
B4. Corridor		-	100	-	20
B4. Corridor		-	100	-	60
B4. Corridor		-	100	-	54
B4. Fire Lobby		-	100	-	58
B4. Hotel Lobby		-	100	-	292
B4. Lift		-	100	-	12
B4. Luggage Storage		100	-	-	36
B4. LV Room 01		100	-	-	18
B4. Plant		100	-	-	25
B4. Staff Changing Area		-	100	-	28
B4. Core 03		-	100	-	36
B4. Stair Hall		-	100	-	25
B4.001 Double Bedroom		-	100	-	22
B4.002 Double Bedroom		-	100	-	20
B4.003 Family Room		-	100	-	40
B4.004 Double Bedroom		-	100	-	21
B4.005 Double Bedroom		-	100	-	21
B4.006 Double Bedroom		-	100	-	24
B4.007 Double Bedroom		-	100	-	23
B4.008 Family Room		-	100	-	36
B4.009 Family Room		-	100	-	27
B4.010 Twin Room		-	100	-	21
B4.011 Twin Room		-	100	-	21
B4.012 Twin Room		-	100	-	21
B4.013 Twin Room		-	100	-	21
B4.014 Twin Room		-	100	-	21
B4.015 Twin Room		-	100	-	20
B4.016 Twin Room		-	100	-	21

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B4.017 Twin Room		-	100	-	21
B4.018 Twin Room		-	100	-	21
B4.019 Twin Room		-	100	-	21
B4.020 Double Bedroom		-	100	-	21
B4.021 Double Bedroom		-	100	-	24
B4.022 Twin Room		-	100	-	25
B4.023 Twin Room		-	100	-	24
B4.024 Twin Room		-	100	-	24
B4.025 Twin Room		-	100	-	24
B4.026 DDA Room		-	100	-	31
B4.027 Single Bedroom		-	100	-	17
B4.028 Double Bedroom		-	100	-	20
B4.029 Double Bedroom		-	100	-	20
B4.030 Double Bedroom		-	100	-	20
B4.031 Double Bedroom		-	100	-	20
B4.032 Double Bedroom		-	100	-	23
B4.033 Family Room		-	100	-	33
B4.034 Double Bedroom		-	100	-	20
B4.035 Family Room		-	100	-	36
B4.036 Family Room		-	100	-	38
B4.037 Double Bedroom		-	100	-	22
B4.038 Double Bedroom		-	100	-	22
B4.039 Double Bedroom		-	100	-	26
B4.040 Double Bedroom		-	100	-	26
B4.041 Double Bedroom		-	100	-	26
B4.042 Double Bedroom		-	100	-	23
B4.043 Double Bedroom		-	100	-	24
B4.044 Double Bedroom		-	100	-	23
B4.045 Double Bedroom		-	100	-	24
B4.046 Double Bedroom		-	100	-	23
B4.047 Double Bedroom		-	100	-	24
B4.048 Double Bedroom		-	100	-	21
B4.049 Double Bedroom		-	100	-	20
B4.050 Double Bedroom		-	100	-	21
B4.051 Double Bedroom		-	100	-	21
B4.052 Double Bedroom		-	100	-	25
B4.053 Double Bedroom		-	100	-	25
B4.054 Double Bedroom		-	100	-	25
B4.055 Double Bedroom		-	100	-	21
B4.056 Double Bedroom		-	100	-	21
B4.057 Double Bedroom		-	100	-	20
B4.058 Double Bedroom		-	100	-	21
B4.059 Double Bedroom		-	100	-	21

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B4.060 Double Room		-	100	-	28
B4.061 Double Room		-	100	-	21
B4.062 Twin Room		-	100	-	25
B4.063 DDA Room		-	100	-	31
B4.064 Double Bedroom		-	100	-	21
B4.065 Double Bedroom		-	100	-	21
B4.066 Twin Room		-	100	-	32
B4.067 Twin Room		-	100	-	26
B4.068 Twin Room		-	100	-	26
B4.069 Double Bedroom		-	100	-	31
B4.070 Double Bedroom		-	100	-	20
B4.071 Double Bedroom		-	100	-	23
B4.072 Family Room		-	100	-	33
B4.073 Family Room		-	100	-	31
B4.074 Twin Room		-	100	-	25
B4.075 Double Bedroom		-	100	-	23
B4.076 Double Bedroom		-	100	-	24
B4.077 Double Bedroom		-	100	-	24
B4.078 Double Bedroom		-	100	-	24
B4.079 Double Bedroom		-	100	-	24
B4.080 Double Bedroom		-	100	-	24
B4.081 Double Bedroom		-	100	-	23
B4.082 Double Bedroom		-	100	-	20
B4.083 Double Bedroom		-	100	-	20
B4.084 Family Room		-	100	-	29
B4.085 Double Bedroom		-	100	-	23
B4.086 Double Bedroom		-	100	-	23
B4.087 Family Room		-	100	-	29
B4.088 Family Room		-	100	-	39
B4.089 Double Bedroom		-	100	-	26
B4.090 Double Bedroom		-	100	-	28
B4.091 Double Bedroom		-	100	-	28
B4.092 Double Bedroom		-	100	-	28
B4.093 Double Bedroom		-	100	-	25
B4.094 Twin Room		-	100	-	24
B4.095 Twin Room		-	100	-	24
B4.096 Twin Room		-	100	-	24
B4.097 Double Bedroom		-	100	-	25
B4.098 Double Bedroom		-	100	-	23
B5. Comms room 03		100	-	-	28
B5. Comms Room 04		100	-	-	20
B5. Core 01		-	100	-	61
B5. Core 01 Stair		-	100	-	37

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B5. Core 02		-	100	-	32
B5. Core 03		-	100	-	39
B5. Core 03 Protected Lobby		-	100	-	25
B5. Corridor		-	100	-	80
B5. Corridor		-	100	-	112
B5. Corridor		-	100	-	62
B5. Corridor		-	100	-	40
B5. Corridor		-	100	-	35
B5. Corridor		-	100	-	35
B5. Corridor		-	100	-	40
B5. Corridor		-	100	-	106
B5. Corridor		-	100	-	55
B5. Corridor		-	100	-	41
B5. Corridor		-	100	-	27
B5. Corridor		-	100	-	64
B5. Corridor		-	100	-	26
B5. Corridor		-	100	-	14
B5. Corridor		-	100	-	38
B5. Corridor		-	100	-	56
B5. Corridor		-	100	-	19
B5. Corridor		-	100	-	49
B5. Corridor		-	100	-	80
B5. Corridor		-	100	-	75
B5. Corridor		-	100	-	18
B5. Corridor		-	100	-	66
B5. Corridor		-	100	-	67
B5. Corridor		-	100	-	34
B5. Corridor		-	100	-	18
B5. Corridor		-	100	-	60
B5. Corridor		-	100	-	24
B5. Corridor		-	100	-	66
B5. Corridor		-	100	-	38
B5. Electrical room		100	-	-	45
B5. Heating and Pumps Plant		100	-	-	64
B5. Lift		-	100	-	14
B5. Plant		100	-	-	26
B5. Plant		100	-	-	33
B5. Plant		100	-	-	19
B5. Refuse Storage and Local Drainage Pump		100	-	-	42
B5. UPS Pump Room		100	-	-	19
B5.002 Double Bedroom		-	100	-	26
B5.003 Double Bedroom		-	100	-	23
B5.004 Family Room		-	100	-	44

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B5.005 Double Bedroom		-	100	-	24
B5.006 Double Bedroom		-	100	-	24
B5.007 Double Bedroom		-	100	-	27
B5.008 Double Bedroom		-	100	-	26
B5.009 Family Room		-	100	-	39
B5.010 Twin Room		-	100	-	29
B5.011 Twin Room		-	100	-	24
B5.012 Twin Room		-	100	-	23
B5.013 Twin Room		-	100	-	23
B5.014 Twin Room		-	100	-	23
B5.015 Twin Room		-	100	-	23
B5.016 Twin Room		-	100	-	23
B5.017 Twin Room		-	100	-	23
B5.018 Twin Room		-	100	-	23
B5.019 Twin Room		-	100	-	23
B5.020 Twin Room		-	100	-	23
B5.021 Twin Room		-	100	-	23
B5.022 Twin Room		-	100	-	23
B5.023 Twin Room		-	100	-	23
B5.024 Double Bedroom		-	100	-	26
B5.025 Twin Room		-	100	-	26
B5.026 Twin Room		-	100	-	26
B5.027 Twin Room		-	100	-	26
B5.028 Twin Room		-	100	-	26
B5.029 Twin Room		-	100	-	26
B5.030 DDA Room		-	100	-	37
B5.031 Family Room		-	100	-	33
B5.032 Double Bedroom		-	100	-	22
B5.033 Double Bedroom		-	100	-	22
B5.034 Double Bedroom		-	100	-	22
B5.035 Double Bedroom		-	100	-	21
B5.036 Double Bedroom		-	100	-	27
B5.037 Double Bedroom		-	100	-	27
B5.038 Double Bedroom		-	100	-	22
B5.039 Family Room		-	100	-	37
B5.040 Family Room		-	100	-	39
B5.041 Double Bedroom		-	100	-	24
B5.042 Double Bedroom		-	100	-	24
B5.043 Double Bedroom		-	100	-	27
B5.044 Double Bedroom		-	100	-	28
B5.045 Double Bedroom		-	100	-	24
B5.046 Double Bedroom		-	100	-	30
B5.047 Family Room		-	100	-	32

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B5.048 Double Bedroom		-	100	-	29
B5.049 Double Bedroom		-	100	-	25
B5.050 Double Bedroom		-	100	-	26
B5.051 Double Bedroom		-	100	-	25
B5.052 Double Bedroom		-	100	-	26
B5.053 Double Bedroom		-	100	-	23
B5.054 Double Bedroom		-	100	-	24
B5.055 Double Bedroom		-	100	-	22
B5.056 Double Bedroom		-	100	-	22
B5.057 Double Bedroom		-	100	-	23
B5.058 Double Bedroom		-	100	-	23
B5.059 Double Bedroom		-	100	-	22
B5.060 Double Bedroom		-	100	-	22
B5.061 Double Bedroom		-	100	-	22
B5.062 Double Bedroom		-	100	-	23
B5.063 Double Bedroom		-	100	-	23
B5.064 Double Bedroom		-	100	-	33
B5.065 Family Room		-	100	-	31
B5.066 Family Room		-	100	-	30
B5.067 Double Room		-	100	-	24
B5.068 Double Bedroom		-	100	-	24
B5.069 Double Bedroom		-	100	-	22
B5.070 Double Bedroom		-	100	-	22
B5.071 Twin Room		-	100	-	26
B5.072 Double Bedroom		-	100	-	23
B5.073 Double Bedroom		-	100	-	26
B5.074 Double Room		-	100	-	33
B5.075 Double Room		-	100	-	27
B5.076 Double Bedroom		-	100	-	24
B5.077 Family Room		-	100	-	41
B5.078 Family Room		-	100	-	33
B5.079 Double Bedroom		-	100	-	33
B5.080 DDA Room		-	100	-	31
B5.081 Double Bedroom		-	100	-	25
B5.082 Double Bedroom		-	100	-	22
B5.083 Double Bedroom		-	100	-	23
B5.084 Double Bedroom		-	100	-	23
B5.085 Double Bedroom		-	100	-	23
B5.086 DDA Room		-	100	-	37
B5.087 DDA Room		-	100	-	34
B5.088 Double Bedroom		-	100	-	23
B5.089 Double Bedroom		-	100	-	23
B5.090 Single Bedroom		-	100	-	25

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
B5.091 Double Bedroom		-	100	-	24
B5.092 Double Bedroom		-	100	-	23
B5.093 Double Bedroom		-	100	-	24
B5.094 DDA Room		-	100	-	34
B5.095 DDA Room		-	100	-	37
B5.096 Family Room		-	100	-	39
B5.097 Family Room		-	100	-	32
B5.098 Double Bedroom		-	100	-	25
B5.099 Double Bedroom		-	100	-	24
B5.100 Double Bedroom		-	100	-	24
B5.101 Double Bedroom		-	100	-	24
B5.102 Double Bedroom		-	100	-	24
B5.103 Family Room		-	100	-	31
B5.104 Double Bedroom		-	100	-	22
B5.105 Double Bedroom		-	100	-	20
B5.106 Twin Room		-	100	-	25
B5.107 Double Bedroom		-	100	-	28
B5.108 Double Bedroom		-	100	-	28
B5.109 Double Bedroom		-	100	-	28
B5.110 Double Bedroom		-	100	-	29
B3. Core 01		-	100	-	41
B3. Core 02		-	100	-	52
B3. Core 03		-	100	-	39
B2. Core 01		-	100	-	41
B2. Core 02		-	100	-	52
B2. Core 03		-	100	-	39
B1. Core 01		-	100	-	50
B1. Core 02		-	100	-	60
B1. Core 03		-	100	-	48
GF. Core 02		-	100	-	37
GF. Core 03		-	100	-	34
GF. Core 01 - Unknown		100	-	-	23
GF. Core 01 - Lift		-	100	-	13
GF. Core 01 - Hall and Stair		-	100	-	92
GF. Core 01 - Cupboard		100	-	-	10

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?
B4. Admin Office and CCTV Room	N/A	N/A
B4. AHU Vent Room	N/A	N/A
B4. BOH Storage	N/A	N/A
B4. Comms Room 01	N/A	N/A
B4. Comms Room 02	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B4.018 Twin Room	N/A	N/A
B4.019 Twin Room	N/A	N/A
B4.020 Double Bedroom	N/A	N/A
B4.021 Double Bedroom	N/A	N/A
B4.022 Twin Room	N/A	N/A
B4.023 Twin Room	N/A	N/A
B4.024 Twin Room	N/A	N/A
B4.025 Twin Room	N/A	N/A
B4.026 DDA Room	N/A	N/A
B4.027 Single Bedroom	N/A	N/A
B4.028 Double Bedroom	N/A	N/A
B4.029 Double Bedroom	N/A	N/A
B4.030 Double Bedroom	N/A	N/A
B4.031 Double Bedroom	N/A	N/A
B4.032 Double Bedroom	N/A	N/A
B4.033 Family Room	N/A	N/A
B4.034 Double Bedroom	N/A	N/A
B4.035 Family Room	N/A	N/A
B4.036 Family Room	N/A	N/A
B4.037 Double Bedroom	N/A	N/A
B4.038 Double Bedroom	N/A	N/A
B4.039 Double Bedroom	N/A	N/A
B4.040 Double Bedroom	N/A	N/A
B4.041 Double Bedroom	N/A	N/A
B4.042 Double Bedroom	N/A	N/A
B4.043 Double Bedroom	N/A	N/A
B4.044 Double Bedroom	N/A	N/A
B4.045 Double Bedroom	N/A	N/A
B4.046 Double Bedroom	N/A	N/A
B4.047 Double Bedroom	N/A	N/A
B4.048 Double Bedroom	N/A	N/A
B4.049 Double Bedroom	N/A	N/A
B4.050 Double Bedroom	N/A	N/A
B4.051 Double Bedroom	N/A	N/A
B4.052 Double Bedroom	N/A	N/A
B4.053 Double Bedroom	N/A	N/A
B4.054 Double Bedroom	N/A	N/A
B4.055 Double Bedroom	N/A	N/A
B4.056 Double Bedroom	N/A	N/A
B4.057 Double Bedroom	N/A	N/A
B4.058 Double Bedroom	N/A	N/A
B4.059 Double Bedroom	N/A	N/A
B4.060 Double Room	N/A	N/A
B4.061 Double Room	N/A	N/A
B4.062 Twin Room	N/A	N/A
B4.063 DDA Room	N/A	N/A
B4.064 Double Bedroom	N/A	N/A
B4.065 Double Bedroom	N/A	N/A
B4.066 Twin Room	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B4.067 Twin Room	N/A	N/A
B4.068 Twin Room	N/A	N/A
B4.069 Double Bedroom	N/A	N/A
B4.070 Double Bedroom	N/A	N/A
B4.071 Double Bedroom	N/A	N/A
B4.072 Family Room	N/A	N/A
B4.073 Family Room	N/A	N/A
B4.074 Twin Room	N/A	N/A
B4.075 Double Bedroom	N/A	N/A
B4.076 Double Bedroom	N/A	N/A
B4.077 Double Bedroom	N/A	N/A
B4.078 Double Bedroom	N/A	N/A
B4.079 Double Bedroom	N/A	N/A
B4.080 Double Bedroom	N/A	N/A
B4.081 Double Bedroom	N/A	N/A
B4.082 Double Bedroom	N/A	N/A
B4.083 Double Bedroom	N/A	N/A
B4.084 Family Room	N/A	N/A
B4.085 Double Bedroom	N/A	N/A
B4.086 Double Bedroom	N/A	N/A
B4.087 Family Room	N/A	N/A
B4.088 Family Room	N/A	N/A
B4.089 Double Bedroom	N/A	N/A
B4.090 Double Bedroom	N/A	N/A
B4.091 Double Bedroom	N/A	N/A
B4.092 Double Bedroom	N/A	N/A
B4.093 Double Bedroom	N/A	N/A
B4.094 Twin Room	N/A	N/A
B4.095 Twin Room	N/A	N/A
B4.096 Twin Room	N/A	N/A
B4.097 Double Bedroom	N/A	N/A
B4.098 Double Bedroom	N/A	N/A
B5. Comms room 03	N/A	N/A
B5. Comms Room 04	N/A	N/A
B5. Core 01	N/A	N/A
B5. Core 01 Stair	N/A	N/A
B5. Core 02	N/A	N/A
B5. Core 03	N/A	N/A
B5. Core 03 Protected Lobby	N/A	N/A
B5. Corridor	N/A	N/A
B5. Corridor	N/A	N/A
B5. Corridor	N/A	N/A
B5. Corridor	N/A	N/A
B5. Corridor	N/A	N/A
B5. Corridor	N/A	N/A
B5. Corridor	N/A	N/A
B5. Corridor	N/A	N/A
B5. Corridor	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B5.024 Double Bedroom	N/A	N/A
B5.025 Twin Room	N/A	N/A
B5.026 Twin Room	N/A	N/A
B5.027 Twin Room	N/A	N/A
B5.028 Twin Room	N/A	N/A
B5.029 Twin Room	N/A	N/A
B5.030 DDA Room	N/A	N/A
B5.031 Family Room	N/A	N/A
B5.032 Double Bedroom	N/A	N/A
B5.033 Double Bedroom	N/A	N/A
B5.034 Double Bedroom	N/A	N/A
B5.035 Double Bedroom	N/A	N/A
B5.036 Double Bedroom	N/A	N/A
B5.037 Double Bedroom	N/A	N/A
B5.038 Double Bedroom	N/A	N/A
B5.039 Family Room	N/A	N/A
B5.040 Family Room	N/A	N/A
B5.041 Double Bedroom	N/A	N/A
B5.042 Double Bedroom	N/A	N/A
B5.043 Double Bedroom	N/A	N/A
B5.044 Double Bedroom	N/A	N/A
B5.045 Double Bedroom	N/A	N/A
B5.046 Double Bedroom	N/A	N/A
B5.047 Family Room	N/A	N/A
B5.048 Double Bedroom	N/A	N/A
B5.049 Double Bedroom	N/A	N/A
B5.050 Double Bedroom	N/A	N/A
B5.051 Double Bedroom	N/A	N/A
B5.052 Double Bedroom	N/A	N/A
B5.053 Double Bedroom	N/A	N/A
B5.054 Double Bedroom	N/A	N/A
B5.055 Double Bedroom	N/A	N/A
B5.056 Double Bedroom	N/A	N/A
B5.057 Double Bedroom	N/A	N/A
B5.058 Double Bedroom	N/A	N/A
B5.059 Double Bedroom	N/A	N/A
B5.060 Double Bedroom	N/A	N/A
B5.061 Double Bedroom	N/A	N/A
B5.062 Double Bedroom	N/A	N/A
B5.063 Double Bedroom	N/A	N/A
B5.064 Double Bedroom	N/A	N/A
B5.065 Family Room	N/A	N/A
B5.066 Family Room	N/A	N/A
B5.067 Double Room	N/A	N/A
B5.068 Double Bedroom	N/A	N/A
B5.069 Double Bedroom	N/A	N/A
B5.070 Double Bedroom	N/A	N/A
B5.071 Twin Room	N/A	N/A
B5.072 Double Bedroom	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
B5.073 Double Bedroom	N/A	N/A
B5.074 Double Room	N/A	N/A
B5.075 Double Room	N/A	N/A
B5.076 Double Bedroom	N/A	N/A
B5.077 Family Room	N/A	N/A
B5.078 Family Room	N/A	N/A
B5.079 Double Bedroom	N/A	N/A
B5.080 DDA Room	N/A	N/A
B5.081 Double Bedroom	N/A	N/A
B5.082 Double Bedroom	N/A	N/A
B5.083 Double Bedroom	N/A	N/A
B5.084 Double Bedroom	N/A	N/A
B5.085 Double Bedroom	N/A	N/A
B5.086 DDA Room	N/A	N/A
B5.087 DDA Room	N/A	N/A
B5.088 Double Bedroom	N/A	N/A
B5.089 Double Bedroom	N/A	N/A
B5.090 Single Bedroom	N/A	N/A
B5.091 Double Bedroom	N/A	N/A
B5.092 Double Bedroom	N/A	N/A
B5.093 Double Bedroom	N/A	N/A
B5.094 DDA Room	N/A	N/A
B5.095 DDA Room	N/A	N/A
B5.096 Family Room	N/A	N/A
B5.097 Family Room	N/A	N/A
B5.098 Double Bedroom	N/A	N/A
B5.099 Double Bedroom	N/A	N/A
B5.100 Double Bedroom	N/A	N/A
B5.101 Double Bedroom	N/A	N/A
B5.102 Double Bedroom	N/A	N/A
B5.103 Family Room	N/A	N/A
B5.104 Double Bedroom	N/A	N/A
B5.105 Double Bedroom	N/A	N/A
B5.106 Twin Room	N/A	N/A
B5.107 Double Bedroom	N/A	N/A
B5.108 Double Bedroom	N/A	N/A
B5.109 Double Bedroom	N/A	N/A
B5.110 Double Bedroom	N/A	N/A
B3. Core 01	N/A	N/A
B3. Core 02	N/A	N/A
B3. Core 03	N/A	N/A
B2. Core 01	N/A	N/A
B2. Core 02	N/A	N/A
B2. Core 03	N/A	N/A
B1. Core 01	N/A	N/A
B1. Core 02	N/A	N/A
B1. Core 03	N/A	N/A
GF. Core 02	N/A	N/A
GF. Core 03	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
GF. Core 01 - Unknown	N/A	N/A
GF. Core 01 - Lift	N/A	N/A
GF. Core 01 - Hall and Stair	N/A	N/A
GF. Core 01 - Cupboard	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]	5207.7	5207.7
External area [m ²]	4620.8	4620.8
Weather	LON	LON
Infiltration [m ³ /hm ² @ 50Pa]	3	3
Average conductance [W/K]	985.53	1097.4
Average U-value [W/m ² K]	0.21	0.24
Alpha value* [%]	10.2	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

100 C1 Hotels

C2 Residential Institutions: Hospitals and Care Homes
C2 Residential Institutions: Residential schools
C2 Residential Institutions: Universities and colleges
C2A Secure Residential Institutions
Residential spaces
D1 Non-residential Institutions: Community/Day Centre
D1 Non-residential Institutions: Libraries, Museums, and Galleries
D1 Non-residential Institutions: Education
D1 Non-residential Institutions: Primary Health Care Building
D1 Non-residential Institutions: Crown and County Courts
D2 General Assembly and Leisure, Night Clubs, and Theatres
Others: Passenger terminals
Others: Emergency services
Others: Miscellaneous 24hr activities
Others: Car Parks 24 hrs
Others: Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	7.67	2.34
Cooling	0.82	1.94
Auxiliary	30.72	18.53
Lighting	6.9	11.36
Hot water	58.71	92.28
Equipment*	11.03	11.03
TOTAL **	104.81	126.44

* 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]	141.2	48.02
Primary energy* [kWh/m ²]	525.56	675.83
Total emissions [kg/m ²]	54.4	64

* 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] Fan coil systems, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
	Actual	130	11.2	7.7	0.8	30.7	4.71	3.82	4.71	5.16
	Notional	21.5	26.5	2.3	1.9	18.5	2.56	3.79	----	----
[ST] No Heating or Cooling										
	Actual	0	0	0	0	0	0	0	0	0
	Notional	0	0	0	0	0	0	0	----	----

Key to terms

Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

Building fabric

Element	U _{i-Typ}	U _{i-Min}	Surface where the minimum value occurs*
Wall	0.23	0.2	B4000016:Surf[0]
Floor	0.2	0.22	B4000016:Surf[15]
Roof	0.15	0.18	B500002D:Surf[3]
Windows, roof windows, and rooflights	1.5	-	No windows or rooflights in building
Personnel doors	1.5	-	No Personnel doors in building
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	3

10. Appendix B - BREEAM Pre-assessment

BREEAM UK Refurbishment & Fit-out 2014 - Pre-assessment

Great Russell Street

Pre-assessment

Great Russell Street

17 April 2020

Assessment Report



PwC's BREEAM Outstanding rated One Embankment Place in London. Image: Hofton + Crow.

Assessment details

Assessment references

Registration number:	BREEAM-19-5217	Date created:	17/3/2019
Created by:	Umer Uzair		
Architect name:	Proun Architects		
Developer name:	Criterion		
Property owner			

Site details

Site name:	Great Russel Street
Address:	112a
	Great Russel Street, Bloomsbury
Town:	London
County:	Camden
Post code:	WC1 B3NP
Country:	United Kingdom

Certificate details

The certificate will have the name of the architect (if entered above) and the name of the developer (from above).

Any other names to appear on the certificate are listed below:

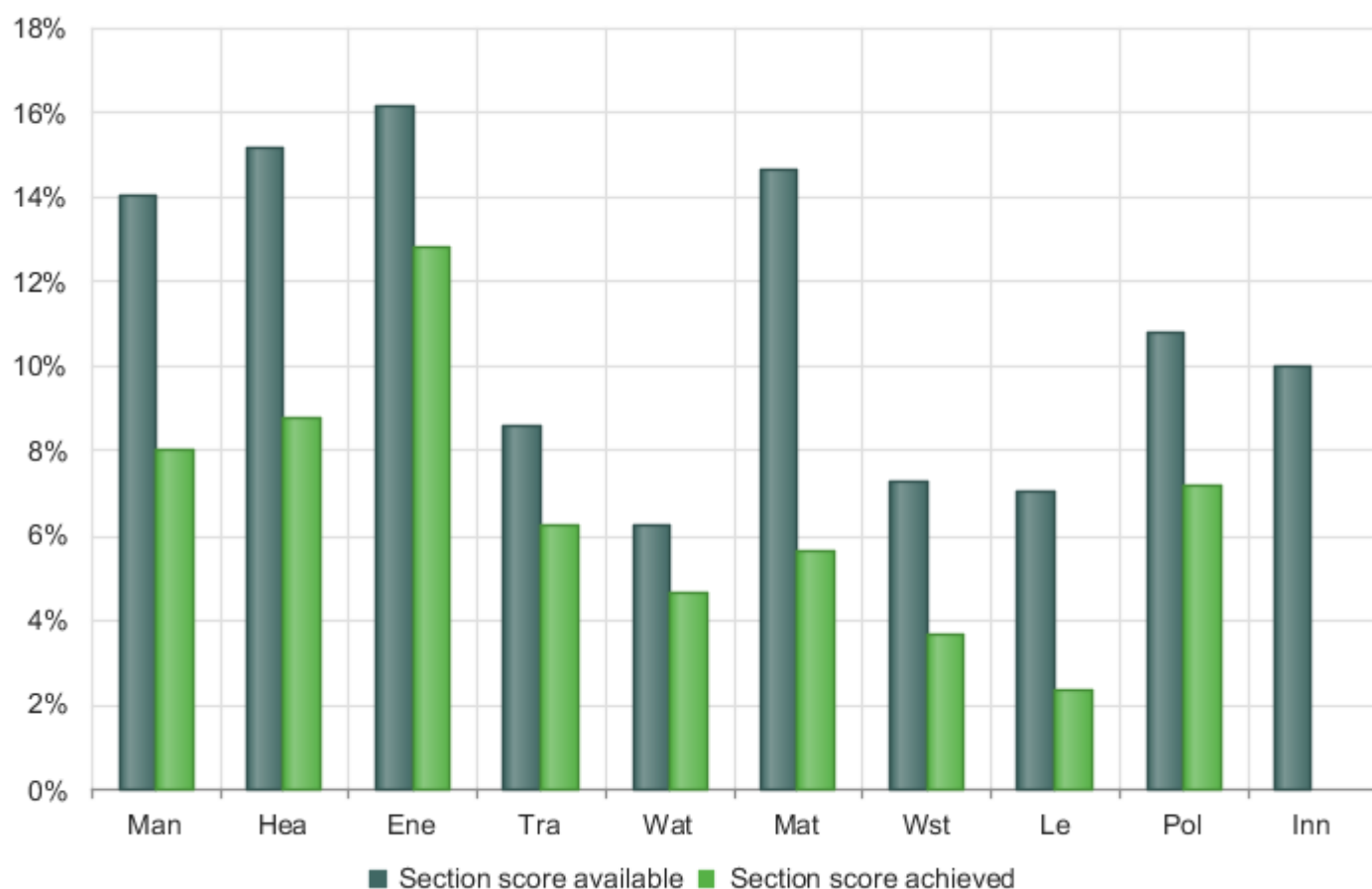
Name	Label
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BREEAM rating

BREEAM Rating

	Credits available	Credits achieved	% Credits achieved	Weighting	Category score
Man	21.0	12.0	57.14%	14.05%	8.02%
Hea	19.0	11.0	57.89%	15.17%	8.78%
Ene	24.0	19.0	79.17%	16.18%	12.80%
Tra	11.0	8.0	72.73%	8.59%	6.24%
Wat	8.0	6.0	75.00%	6.24%	4.68%
Mat	13.0	5.0	38.46%	14.63%	5.62%
Wst	10.0	5.0	50.00%	7.32%	3.65%
Le	3.0	1.0	33.33%	7.02%	2.34%
Pol	12.0	8.0	66.67%	10.81%	7.20%
Inn	10.0	0.0	0.00%	10.00%	0.00%
Total	131.0	75.0	57.25%	-	59.37%
Rating	-	-	-	-	Very Good

Performance by environmental category



Issue scores

Please Note: X means the exemplary credit for the relevant issue

Management

Man 01	Man 02	Man 03	Man 03X	Man 04	Man 05	Man 05X
1	0	4	0	4	3	0

Health and Wellbeing

Hea 01	Hea 01X	Hea 02	Hea 02X	Hea 03	Hea 04	Hea 05	Hea 06
1	0	4	0	N/A	2	3	1

Energy

Ene 01	Ene 01X	Ene 02	Ene 03	Ene 04	Ene 05	Ene 06	Ene 07	Ene 08	Ene 09
15	0	1	0	0	N/A	3	N/A	N/A	N/A

Transport

Tra 01	Tra 02	Tra 03	Tra 04	Tra 05
2	1	2	2	1

Water

Wat 01	Wat 01X	Wat 02	Wat 03	Wat 04
3	0	1	2	N/A

Materials

Mat 01	Mat 01X	Mat 03	Mat 03X	Mat 04	Mat 05	Mat 06
3	0	0	0	1	1	0

Waste

Wst 01	Wst 01X	Wst 02	Wst 03	Wst 04	Wst 05	Wst 05X	Wst 06
4	0	N/A	1	N/A	0	0	0

Land use and ecology

Le 2	Le 4	Le 5
N/A	1	0

Pollution

Pol 01	Pol 02	Pol 03	Pol 03X	Pol 04	Pol 05
3	0	4	0	1	N/A
Innovation					
Inn 01	N/A		Inn 01X	0	

Initial details

112a

Stage 1 filtering: Scope of the assessment

Part 1 : Fabric and structure : Yes

Part 2 : Core services : Yes

Part 3 : Local services : Yes

Part 4 : Interior design : Yes

Stage 2 filtering: Project specific filtering

Is the project a change of use? (e.g. change from office to a hotel) : Yes

Are transportation systems specified or present within the refurbishment or fit-out zone? (lifts, escalators, moving walks) : Yes, newly specified transportation systems

Are there laboratories present and if so what % of total building area do they represent : No laboratories present

Project Type : Major, whole building refurbishment

Laboratory containment area : No laboratories present

Is cold storage specified or present within the refurbishment or fit-out zone? : No

Are there new or existing landscaping areas within the refurbishment or fit-out zone and within developer control? : No

Are there any external areas within the refurbishment or fit-out zone and within developer control that can feasibly be enhanced in line with LE 04 : Yes

If the asset undergoing refurbishment or fit-out is part of a larger building, are the building services plant centralised or localised? :

If the asset undergoing refurbishment or fit-out is part of a larger building, is the cooling generation plant centralised or localised? : Local

If the asset undergoing refurbishment or fit-out is part of a larger building, is the heating generation plant centralised or localised? : Local

Is Wat01 within the scope of the assessment in accordance with Table 42? : Yes

What is the building type? : Other building transport type 2

Is this a speculative refurbishment? : No

If Industrial, does the building have office areas? : N/A

Does the building have or mitigate any unregulated water demand? e.g. irrigation or soft-landscaped areas requiring no irrigation, car washing, other significant process related : No

Does the building have unregulated energy demands from significantly contributing systems? : No

Is the project a simple building? : No

Does the building have external lighting within the scope of works? : Yes

Does the building have any existing or newly specified externally mounted plant? : No

If undertaking a Part 4 assessment, is there any equipment specified that requires commissioning (see Man04 CN13) : Yes

Historic building (listed building or building in a conservation area) : No

Is any new insulation specified? : Yes

Are high grade aggregates to be used in the refurbishment scheme? : No

Category assessment

Management | Man

Man Management

Site : 112a

MAN 01 PROJECT BRIEF AND DESIGN

Stakeholder consultation (project delivery) :	0
Stakeholder consultation (third party) :	1
Sustainability champion (design) :	0
Sustainability champion (monitoring progress) :	0

MAN 02 LIFECYCLE COST AND SERVICE LIFE PLANNING

Elemental lifecycle cost :	0
Component level LCC plan :	0
Capital cost reporting :	0

MAN 03 RESPONSIBLE CONSTRUCTION PRACTICES

Is all timber used in the project 'legally harvested and traded timber'? :	Yes
Environmental management :	0
Construction stage sustainability champion :	0
Considerate construction :	2
Exemplary level criteria :	No
Has the project achieve the minimum standard for an Excellent or Outstanding rating? :	No
Monitoring of refurbishment or fit-out site impacts :	2
Utility consumption :	Yes
Transport of construction materials and waste :	Yes

MAN 04 COMMISSIONING AND HANDOVER

Commissioning and testing schedule and responsibilities :	1
Commissioning building services :	1
Testing and inspecting building fabric :	1
Handover :	1
Has criterion 9 been met? :	Yes

MAN 05 AFTERCARE

Aftercare support :	1
Exemplary level criteria :	No
Seasonal commissioning :	1
Post occupancy evaluation :	1

Credits awarded : 12.0

Health and Wellbeing | Hea

Hea Health & Wellbeing

Site : 112a

HEA 01 VISUAL COMFORT

Glare control :	0
Daylighting :	0
Exemplary level criteria :	No
View out :	0
Internal and external lighting :	1

HEA 02 INDOOR AIR QUALITY

Indoor air quality plan :	1
Ventilation :	1
Volatile organic compounds :	2
Exemplary level criteria :	0
Potential for natural ventilation :	0

HEA 03 SAFE CONTAINMENT IN LABORATORIES - NA

HEA 04 THERMAL COMFORT

Thermal modelling :	1
Adaptation - for a projected climate change scenario :	0
Thermal zoning and controls :	1

HEA 05 ACOUSTIC PERFORMANCE

Acoustic performance :	3
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HEA 06 SAFETY AND SECURITY

Security of site and building :	1
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Credits awarded : 11.0

Energy | Ene

Ene Energy

Site : 112a

ENE 01 ASSESSMENT OPTION

Which option is being followed : Option 1: Whole building energy model

ENE 01 - OPTION 1

Country :	England
Credits :	15.0
Actual (existing) building energy demand (DemEx) :	268.8 kWh/m2
Reference building energy demand (DemRef) :	131.69 kWh/m2
Actual (proposed) building energy demand (DemProp) :	140.3 kWh/m2
Actual (existing) building primary energy consumption (PEEx) :	496.9 kWh/m2
Reference building primary energy consumption (PERef) :	496.79 kWh/m2
Actual (proposed) building primary energy consumption (PEProp) :	135.77 kWh/m2
Actual (existing) building CO2 emissions (BEREx) :	97.28 KgCO2/m2
Reference building CO2 emissions (SER) :	74.25 KgCO2/m2
Actual (proposed) building CO2 emissions (BERProp) :	32.51 kgCO2/m2
Building energy demand individual parameter EPR (Energy performance Ratio) :	0.89
Primary energy consumption individual parameter EPR (Energy performance Ratio) :	1.0
Building CO2 emissions individual parameter EPR (Energy performance Ratio) :	0.93
EPRNDR (Energy Performance Ratio Non Domestic Refurbishment) :	0.94
Additional assessment criteria :	
Zero regulated carbon :	No
Equivalent % of the building's 'regulated' energy consumption generated by carbon neutral sources and used to meet energy demand from 'unregulated' building systems or processes? :	
Is the building designed to be carbon negative? :	No
If the building is defined as 'carbon negative' what is the total (modelled) renewable/carbon neutral energy generated and exported? :	
Exemplary credits scored :	0

ENE 02 ENERGY MONITORING

Sub-metering of major energy consuming systems :	1
Sub-metering of high energy load and tenancy areas :	0

ENE 03 EXTERNAL LIGHTING

External lighting :	0
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ENE 04 LOW CARBON DESIGN

Passive design analysis :	0
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Free cooling :	0
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Low and zero carbon technologies :	0
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ENE 05 ENERGY EFFICIENT COLD STORAGE - NA

ENE 06 ENERGY EFFICIENT TRANSPORTATION SYSTEMS
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Energy consumption :	1
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Energy efficient measures :	2
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ENE 07 ENERGY EFFICIENT LABORATORY SYSTEMS - NOTAPPLICABLE
--

ENE 08 ENERGY EFFICIENT EQUIPMENT

ENE 09 DRYING SPACE

Credits awarded : 19.0

Transport | Tra

Tra Transport

Site : 112a

TRA 01 SUSTAINABLE TRANSPORT SOLUTIONS

Sustainable transport options : 2

TRA 02 PROXIMITY TO AMENITIES

Proximity to amenities : 1

TRA 03 CYCLIST FACILITIES

Cycle storage : 1

Cyclist facilities : 1

TRA 04 MAXIMUM CAR PARKING CAPACITY

Car parking capacity : 2

TRA 05 TRAVEL PLAN

Travel plan : 1

Credits awarded : 8.0

Water | Wat

Wat Water

Site : 112a

WAT 01 WATER CONSUMPTION

Water consumption :	3
Exemplary level criteria :	No

WAT 02 WATER MONITORING

Water monitoring :	1
Has criterion 1 been met? :	Yes

WAT 03 LEAK DETECTION

Leak detection system :	1
Flow control devices :	1

WAT 04 WATER EFFICIENT EQUIPMENT - NA

Credits awarded : 6.0

Materials | Mat

Mat Materials

Site : 112a

MAT 01 ENVIRONMENTAL IMPACT OF MATERIALS

Options :	Option 2
Environmental impact of materials :	3
Exemplary level criteria :	

MAT 03 RESPONSIBLE SOURCING OF MATERIALS

Sustainable procurement plan :	0
Has criterion 1 been met? :	Yes
Responsible sourcing of materials :	0
Exemplary level criteria :	

MAT 04 INSULATION

Insulation :	1
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MAT 05 DESIGNING FOR DURABILITY AND RESILIENCE

Designing for durability and resilience :	1
---	---

MAT 06 MATERIAL EFFICIENCY

Material efficiency :	0
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Credits awarded : 5.0

Waste | Wst

Wst Waste

Site : 112a

WST 01 CONSTRUCTION WASTE MANAGEMENT

Pre-refurbishment audit :	0
Re-use and direct recycling of materials :	0
Resource efficiency :	3
Diversion of waste from landfill :	1
Exemplary level criteria :	

WST 02 RECYCLED AGGREGATES - NA

WST 03 OPERATIONAL WASTE

Operational waste :	1
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WST 04 SPECULATIVE FINISHES

WST 05 ADAPTATION TO CLIMATE CHANGE

Adaptation to climate change - structural and fabric resilience :	0
Exemplary criteria: Responding to adaptation to climate change :	

WST 06 FUNCTIONAL ADAPTABILITY

Functional adaptability :	0
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Credits awarded : 5.0

Land use and ecology | Le**Le Land use and ecology****Site : 112a****LE 02 PROTECTION OF ECOLOGICAL FEATURES - NA****LE 04 ECOLOGICAL ENHANCEMENT**

Ecological enhancement : 1

LE 05 LONG TERM IMPACT ON BIODIVERSITY

Long term impact on biodiversity : 0

Credits awarded : 1.0

Pollution | Pol

Pol Pollution

Site : 112a

POL 01 IMPACT OF REFRIGERANTS

Impact of refrigerants :	2
Leak detection :	1

POL 02 NOX EMISSIONS

NOx emissions :	0
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POL 03 FLOOD RISK AND REDUCING SURFACE WATER RUN-OFF

Flood risk management :	2
Exemplary level criteria :	No
Surface water run-off :	1
Minimising watercourse pollution :	1

POL 04 REDUCTION OF NIGHT TIME LIGHT POLLUTION

Reduction of night time light pollution :	1
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POL 05 NOISE ATTENUATION

Credits awarded : 8.0

Innovation | Inn

Inn Innovation

Site : 112a

INN 01 APPROVED INNOVATIONS

Approved innovations :

0

Credits awarded : 0.0