Energy Statement

Chalton Street

July 2015

REPORT REF: ES/CS/072015 - RJT

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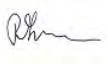
-	For Initial Comment	Alex Timperley		Ryan Thrower		17/07/2015

1. EXECUTIVE SUMMARY

1.1 NRG Consulting have been appointed by Rangepay Ltd to undertake an Energy Statement on a proposed development in the London Borough of Camden.

1.2 The scheme comprises of a 56 room hotel.

1.3 This document has been produced to satisfy:

- Policy 5.2 of the London Plan by providing a 35% improvement in regulated CO_2 over Part L of the Building Regulations 2013.

- London Borough of Camden Core Strategy Policy CS13, Camden Local Development Framework - Policy DP22 – Promoting sustainable design and construction and Camden Planning Guidance – Sustainability – CPG 3.

1.4 A BREEAM Pre-Assessment under the "Other - Residential institutions (short term stay)" scheme can be found in Appendix 3 showing how a "Very Good" rating will be achieved.

1.5 This document has been written in adherence to the GLA Guide to Energy Statements (April 2015)

2. POLICY FRAMEWORK

2.1 With over 1000m2 of floor area proposed the development falls within the Government's "major" category of planning applications.

NATIONAL POLICIES

2.2 On 25 March 2015, the Government confirmed its policy to limit local energy requirements and continue to support low carbon infrastructure. The Mayor has considered the Government's intentions regarding energy performance standards and its support for energy infrastructure and considers his energy targets within his energy hierarchy to be in line with this approach. It encourages developers to make carbon savings on-site, firstly through demand reduction. These reductions are in line with the Government's preferred maximum energy requirement (19 per cent reduction beyond Part L 2013 (Code 4) equivalent). The remaining energy savings are met through low carbon infrastructure, either on-site or off-site.

2.3 The Mayor has also commissioned a viability study as part of his Minor Alterations to the London Plan6 which confirms that current and future London Plan targets are viable for development in London. The targets in the London Plan will therefore continue to be applied in line with the energy hierarchy, across both residential and non-domestic development until the implementation of zero carbon policies in 2016.

(Source: Pg.11 *GLA Guide to Energy Statements* – April 2015)

REGIONAL POLICIES

2.4 The London Plan was updated in March 2015. A link to the new version can be found here:

https://www.london.gov.uk/priorities/planning/london-plan/further-alterations-to-the-london-plan

2.5

A Development proposals should make the fullest contribution to minimising carbon dioxide emissions in accordance with the following energy hierarchy:

1. Be lean: use less energy.
2. Be clean: supply energy efficiently.
3. Be green: use renewable energy.

B The Mayor will work with boroughs and developers to ensure that major developments meet the following targets for carbon dioxide emissions reduction in buildings. These targets are expressed as minimum improvements over the Target Emission Rate (TER) outlined in the national Building Regulations leading to zero carbon residential buildings from 2016: Improvement on 2013 Building Regulations: 2013 - 2016 - **35 percent** (as of 6th April 2014).

C Development proposals should include a detailed energy assessment to demonstrate how the targets for carbon dioxide emissions reduction outlined above are to be met within the framework of the energy hierarchy.

D As a minimum, Energy Assessments should include the following details:

i. Calculation of the energy demand and carbon dioxide emissions covered by the Building Regulations and, separately, the energy demand and carbon dioxide emissions from any other part of the development, including plant or equipment, that are not covered by the Building Regulations.

ii. Proposals to reduce carbon dioxide emissions through the energy efficient design of the site, buildings and services.

iii. Proposals to further reduce carbon dioxide emissions through the use of decentralised energy where feasible, such as district heating and cooling and combined heat and power (CHP).

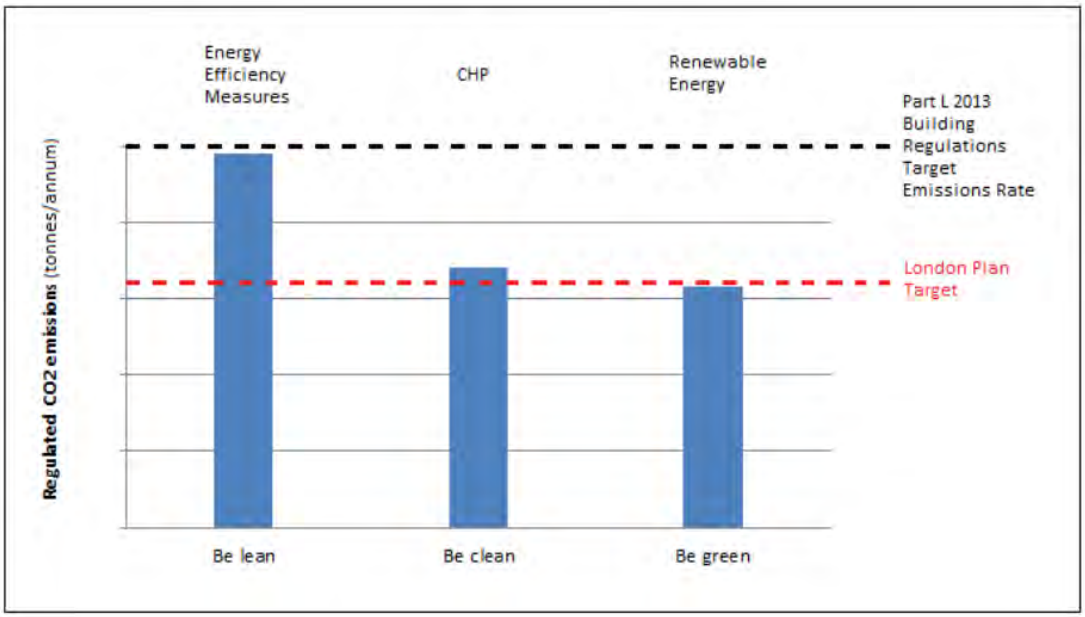
iv. Proposals to further reduce carbon dioxide emissions through the use of on-site renewable energy technologies.

2.6 As of 6th April 2014, The London Plan changed the targets required for major developments from 40% reduction in CO_2 emissions over the Part L 2010 baseline to 35% reduction in CO_2 emissions over the Part L 2013 baseline. Text from the GLA Website confirms this:

The GLA provides guidance for developers and their advisers on preparing energy assessments to accompany strategic planning applications. Each assessment is required to demonstrate how the targets for regulated CO_2 emission reductions over and above 2013 Building Regulations will be met using the Mayor's energy hierarchy. As outlined in the Sustainable Design and Construction SPG, since 6 April 2014, the Mayor has applied a 35 per cent carbon reduction target beyond Part L 2013 of the Building Regulations - this is deemed to be broadly equivalent to the 40 per cent target beyond Part L 2010 of the Building Regulations, as set out in London Plan Policy 5.2 for 2013-2016.

(Source: GLA. 2015. *Energy Planning - GLA Guidance on preparing energy assessments*. [ONLINE] Available at: https://www.london.gov.uk/priorities/planning/strategic-planning-applications/preplanning-application-meeting-service/energy-planning-gla-guidance-on-preparing-energy-assessments) [Accessed April 15].

2.7 A visual representation of the GLA Target in relation to Building Regulations where feasible is:



(Source GLA. 2015. Pg.13 *ENERGY PLANNING Greater London Authority guidance on preparing energy assessments (April 2015)*. [ONLINE] Available at: https://www.london.gov.uk/sites/default/files/GLA%20guidance%20on%20preparing%20energy%20assessments%20April%202015.pdf. [Accessed April 15].

LOCAL POLICIES

2.8 London Borough of Camden Policy Policy DP22 - *Promoting sustainable design and construction* states:

Policy DP22 - Promoting sustainable design and construction

The Council will require development to incorporate sustainable design and construction measures. Schemes must:

a) demonstrate how sustainable development principles, including the relevant measures set out in paragraph 22.5 below, have been incorporated into the design and proposed implementation; and
b) incorporate green or brown roofs and green walls wherever suitable.

The Council will promote and measure sustainable design and construction by:

c) expecting new build housing to meet Code for Sustainable Homes Level 3 by 2010 and Code Level 4 by 2013 and encouraging Code Level 6 (zero carbon) by 2016.
d) expecting developments (except new build) of 500 sq m of residential floorspace or above or 5 or more dwellings to achieve "very good" in EcoHomes assessments prior to 2013 and encouraging "excellent" from 2013;
e) expecting non-domestic developments of 500sqm of floorspace or above to achieve "very good" in BREEAM assessments and "excellent" from 2016 and encouraging zero carbon from 2019.

The Council will require development to be resilient to climate change by ensuring schemes include appropriate climate change adaptation measures, such as:

f) summer shading and planting;
g) limiting run-off;
h) reducing water consumption;
i) reducing air pollution; and
j) not locating vulnerable uses in basements in flood-prone areas.

3. BASELINE

3.1 A full SBEM Calculation has been carried out using IES Version 7.0.2 to gain the regulated emissions for the site. A licensed and accredited NDEA (SBEM Assessor) has carried out the calculations.

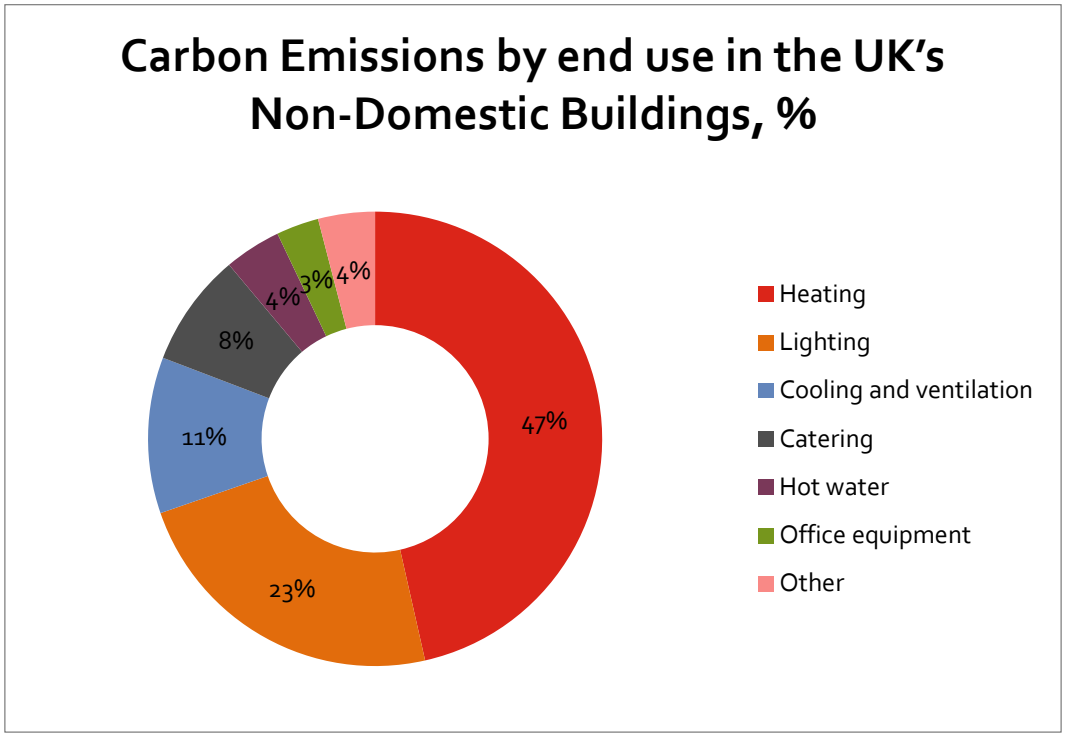
3.2 For unregulated emissions, CIBSE Guide F has been used along with BREDEM 12. Due to the residential style usage of the building, emissions have been calculated for:

a) Appliances

b) Commercial Laundry

c) Restaurant/Catering

3.3 Typical CO_2 emissions for non-domestic developments are broken down as follows:



3.4 In accordance with potential planning requirements, compliance is to be achieved with BREEAM "Very Good".

3.5 Based upon the TER as set out in the "Be Lean" BRUKL in Appendix 2, with a total gross internal floor area of **1,578m²,** the development has a baseline production of **107.8 tonnes CO_2/year.**

3.6

	CO_2 Emissions - (Tonnes per Annum)	
	Regulated	**Un-Regulated**
Part L 2010 Baseline (TER)	**107.8**	**85**
Proposed Development (BER)		
After Decentralised/CHP Feasibility		
After Renewable Energy		

4. BE LEAN

4.1 Construction Details have been selected to ensure that all fabric U-Values exceed the requirements of Part L of the Building Regulations (2013) and all Heating, Hot Water and Ventilation elements are in compliance with the Domestic Building Services Compliance Guide (2013). The proposed construction details for the development are as follows:

Elements	U Value
External Walls	**0.20 w/m^2/k**
Semi-Exposed Walls	**0.20 w/m^2/k**
Ground Floor	**0.18 w/m^2/k**
Roof	**0.16 w/m^2/k**
Windows	**1.7 w/m^2/k**
Air Permeability	**5m^3/hm^2@50Pa**

4.2 The basic principle for the development is:

- Enhanced U-Values
- Renewable Energy in the form of ASHPs
- Highly efficient HVAC
- Accredited Details for Thermal Bridging
- Highly efficient Internal Lighting

Please see Appendix 1 for a full specification for the proposed unit.

4.3 The U-Values of all glazed elements will exceed Building Regulations standards, and incorporate low emissivity coating, resulting in an efficient balance between passive solar gain and the thermal losses from each room.

Daylight levels are high throughout and are supplemented with low energy light bulbs. The orientation of the building reduces peak solar gain while ensuring optimum levels of daylight both morning and evening.

4.4 When taking into account energy efficiency measures such as U-Values and efficient HVAC systems, but excluding the imposition of low carbon/renewable technologies this gives the development emissions of **90.1 tonnes CO_2/year**; a **16.4% decrease** in CO_2 emissions over the Part L 2013 baseline.

4.5

	CO_2 Emissions - (Tonnes per Annum)	
	Regulated	**Unregulated**
Part L 2010 Baseline (TER)	**107.8**	**85**
Proposed Development (BER)	**90.1**	**85**
After Decentralised/CHP Feasibility		
After Renewable Energy		

5. BE CLEAN

5.1 Policy 5.6B of the London Plan advises the following:

Major development proposals should select energy systems in accordance with the following hierarchy:

1. Connection to existing heating or cooling networks;

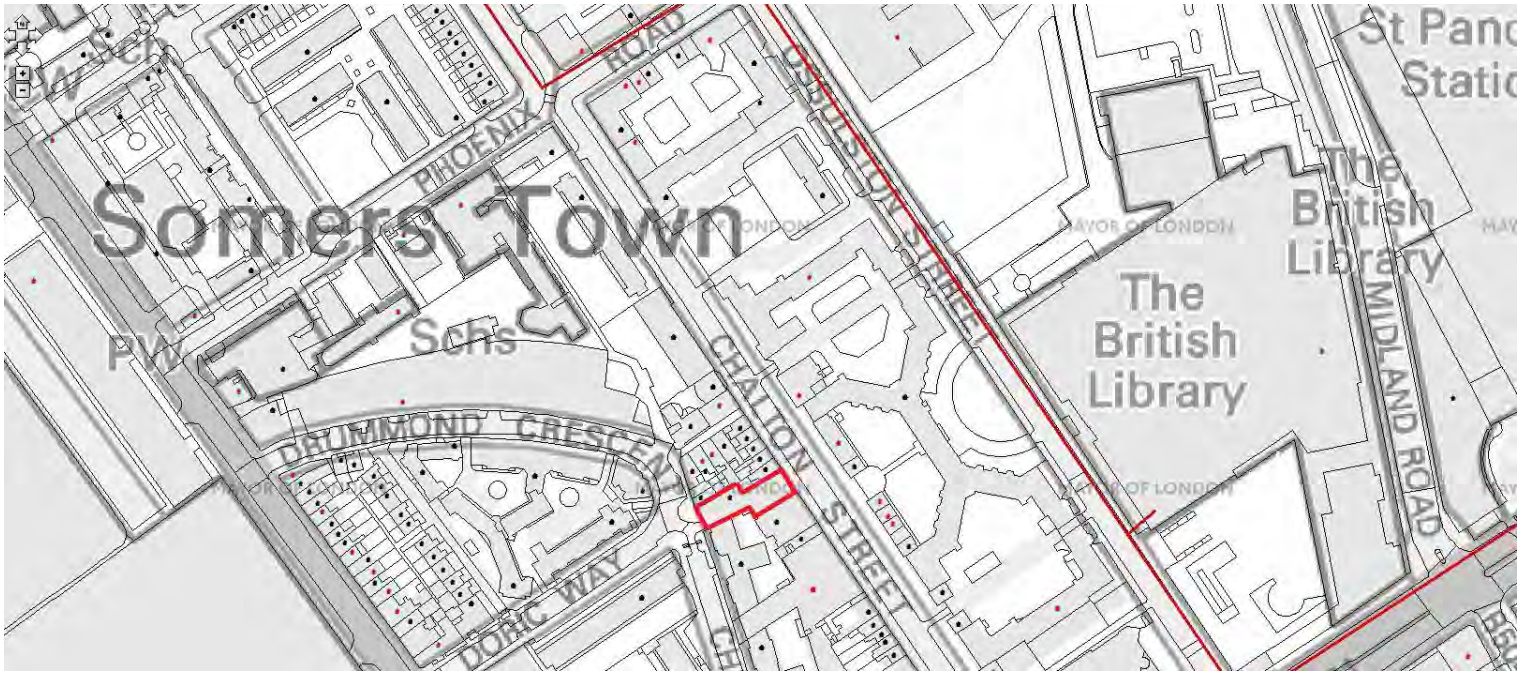
2. Site wide CHP network;

3. Communal heating and cooling.

4. Individual heating

(Source: Mayor of London. 2015. Pg. 197, *The London Plan March 2015*. [ONLINE] Available at: https://www.london.gov.uk/sites/default/files/London%20Plan%20March%202015%20%28FALP%29.pdf) [Accessed April 15].

HEAT MAP



Heat Network Parameters	Details
Name	**Somers Town Heat Network**
Distance from Site to Network	**<1km**
Size	**Unknown**

FEASIBILITY OF UTILISING EXISTING AREA WIDE CONNECTION

5.3 Infeasible due to heat network not being currently operational and having been designed for a specific use (4 residential blocks and Medical institute) - not for the connecting of new developments.

DECENTRALISED ENERGY – ON-SITE CHP

5.4 CHP is a feasible technology for the development. This has been decided for the following reasons:

a) High Hot Water Demand
b) Constant Demand for 365 days per year.
c) High Load elements present such as:
    a. Commercial Laundry
    b. Commercial Kitchen

Element	Details	Further Information
CHP	ENERGIMIZER EM 16NG Natural Gas CHP	Total efficiency: 96% Electric efficiency: 29% Thermal efficiency: 67% **Performance at rated output:** Thermal efficiency: 67% Heat output: 37.50 kW Power efficiency: 29% **Performance at minimum output:** Fraction of rated heat output: 50% Thermal efficiency: 57% Power efficiency: 20%

5.5 A manufacturer datasheet for the proposed CHP Unit can be found in the Appendices.

5.6 To achieve the reduction required to achieve a 35% reduction over Part L 2013, we need to offset a further 20 tonnes of CO_2 per annum. The proposed CHP model offsets 20.4 tonnes of CO_2 per annum.

5.7 Development emissions at this stage of the hierarchy are as follows:

	CO_2 Emissions - (Tonnes per Annum)		
	Regulated	% improvement on TER	Unregulated
Baseline: Part L 2013 of the Building Regulations Compliant Development (TER)	**107.8**		**85**
After energy demand reduction *'Be Lean'*	**90.1**	**16.4%**	**85**
After CHP *'Be Clean'*	**69.7**	**35.34%**	
After renewable energy *'Be Green'*			

6. BE GREEN

6.1 As the development achieves the 35% CO_2 emission reduction over the baseline on-site via Energy Efficiency and CHP, there is no need for any renewable technologies.

7. COOLING AND OVERHEATING

THE COOLING HIERARCHY

7.1 Pursuant with Policy 5.9 of the London Plan the following measures have been investigated:

Cooling Hierarchy	Measures Undertaken
1. Minimising internal heat generation through energy efficient design	• Heat distribution infrastructure within buildings should be designed to minimise pipe lengths, particularly lateral pipework in corridors of apartment blocks. • Adopting pipe configurations which minimise heat loss e.g. twin pipes.
2. Reducing the amount of heat entering the building in summer	• Carefully designed shading measures have been considered, including: i. Specification of Internal blinds
3. Use of thermal mass and high ceilings to manage the heat within the building	• Level of exposed thermal mass has been maximised to help to absorb excess heat within the building.
4. Passive Ventilation	• The use of: i. Openable windows,, ii. Designing in the 'stack effect.
5. Mechanical Ventilation	• An Air Handling Unit with heat recovery Supply SFP - 0.80 W/l/s Heat recovery seasonal efficiency – 90% Supply Rates: - Rooms – 25 l/s - Circulations – 60 l/s

OVERHEATING RISK ANALYSIS

7.2 Criterion 3 of Part L 2013 of the Building Regulations relates to limiting the effects of heat gains in summer.

All dwellings pass this Criterion with the following specification:

Room	U value (W/m2K) including frame	G-value	LT Value	Internal blinds required?
1F_B2.4	1.70	<0.60	>0.72	YES
ROOFLIGHT 1F_B1.2	1.70	<0.35	>0.70	NO
ALL OTHER ROOMS	1.70	<0.60	>0.72	NO

7.3 CIBSE Guide A – Environmental Design (2015) is the reference standard for overheating in the GLA SPG on Sustainability and the current industry standard amongst other CIBSE guides such as CIBSE TM52 "The Limits of Thermal Comfort: Avoiding Overheating in European Buildings" (2013). These set out guidelines on the number of hours a dwelling should not exceed a certain temperature.

ACTIVE COOLING

7.4 Active Cooling in the form of Air Conditioning is being installed for the benefit of the potential guests. The CO_2 emissions associated with this have been included within the Energy Calculations. The specification of the Cooling is:

COOLING	Split or Multi-Split System	**Cooling system type**: Heat Pump **Chiller Fuel Type:** Electricity **Generator Seasonal EER Value:** 6.04 **Generator Nominal EER Value:** 3.51 **Heat Recovery Seasonal Efficiency**: 90% **Pumps:** Variable speed with differential sensor across the pump.

8. CARBON OFFSETTING

8.1 As the development achieves the 35% CO_2 emission reduction over the baseline on-site via Energy Efficient Design Measures and Low Carbon Technology, there is no need for any Carbon Offsetting payments on this project.

9. CONCLUSION

9.1 This document is written in accordance with the guidelines and requirements of:

i. GLA Guide to Energy Statements (April 2015)

ii. The London Plan (March 2015) – Section 5

iii. The Core Strategy of the Local Borough.

9.2 Following energy efficiency measures (Be Lean) a **16.4% decrease** in CO_2 emissions over the Part L 2013 baseline is achieved.

9.3 Further to this a Mini-CHP is being installed to achieve the required 35% reduction in CO2 emissions. The CHP achieves a 20.4 tonnes/CO_2 per annum carbon reduction for a total site reduction of 35.34% in CO_2 emissions over that of the Part L 2013 baseline.

9.4 BREEAM "Very Good" as per the Pre-Assessment in the Appendices has been achieved on the development.

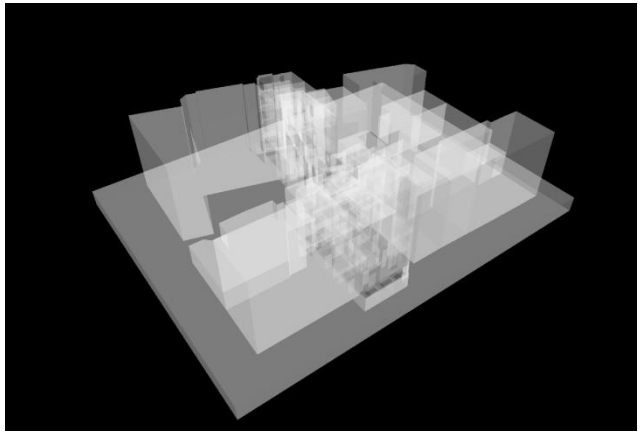
Appendix 1

SBEM COMPLIANCE SPECIFICATIONS REPORT

APPROVED DOCUMENT PART L2A BUILDING REGULATIONS 2013

53-55 CHALTON STREET

LONDON NW1 1HY



FIRST ISSUE: 17TH JULY 2015

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ACCREDITED ASSESSOR: XAVIER VALLADARES
ACCREDITATION NUMBER: BREC400198 / QUID300047

1.0 MODELLING & DATA INPUTS
TABLE 01- PART L2A SBEM SPECIFICATIONS

ELEMENT	PROPOSED / CALCULATED U-VALUES	FURTHER INFORMATION
EXTERNAL WALLS	0.20 W/m^{2}K	-
INTERNAL PARTITIONS	-	-
SEMI EXPOSED WALLS	0.20 W/m^{2}K	TO LIFTS As the lifts are unheated areas, the internal walls adjacent to these rooms will need to be insulated and treated as heat loss walls.
GROUND FLOOR	0.18 W/m^{2}K	-
INTERNAL FLOORS	-	-
ROOF	0.16 W/m^{2}K	-
GLAZED DOORS	1.7 W/m^{2}K	Glazing specifications in Table 02 below
WINDOWS / ROOFLIGHTS	1.7 W/m^{2}K	Glazing specifications in Table 02 below
DOORS	1.80 W/m^{2}K	
AIR PERMEABILITY	5.0 m3/hm2@50Pa	-

***NOTE: All items highlighted in red are to be confirmed by the client / design team to achieve compliance against Criterion 1**

TABLE 02 - GLAZING SPECIFICATIONS TO ACHIEVE CRITERION 3 COMPLIANCE & REDUCE THE RISK OF OVERHEATING

ROOM	U value (W/m2K) including frame	G-value	LT Value	Internal blinds required?
1F_B2.4	1.70	<0.60	>0.72	YES
ROOFLIGHT 1F_B1.2	1.70	<0.35	>0.70	NO
ALL OTHER ROOMS	1.70	<0.60	>0.72	NO

***NOTE: All items highlighted in red are to be confirmed by the client / design team to achieve compliance against Criterion 1**

TABLE 03- PART L2A SBEM SPECIFICATIONS- BUILDING SERVICES

ELEMENT	DETAILS	FURTHER INFORMATION
ELECTRIC POWER FACTOR	>0.95	
HEATING ALL ROOMS	Mitsubishi variable refrigerant flow (VRF)	BE LEAN Supplied via LTHW boilers Seasonal efficiency 96%. Delivery Efficiency 95% Pumps: Variable speed with differential sensor across the pump. BE CLEAN Supplied via LTHW boilers and combined heat and power unit Seasonal efficiency 96%. Delivery Efficiency 95% Pumps: Variable speed with differential sensor across the pump.
CHP	ENERGIMIZAER EM 16NG Natural Gas CHP	Total efficiency: 96% Electric efficiency: 29% Thermal efficiency: 67% **Performance at rated output:** Thermal efficiency: 67% Heat output: 37.50 kW Power efficiency: 29% **Performance at minimum output:** Fraction of rated heat output: 50% Thermal efficiency: 57% Power efficiency: 20%
CONTROLS HEATING	Yes	Keycard system, if the room is unoccupied the FCU will switch off. All FCU will be controllable from reception
SUB METERING HVAC	Yes	Yes, but no alarm for out of range values.
HEAT EMITTERS	-	Fan and coil units
COOLING ALL AREAS	Split or multi-split system	Cooling system type: Heat pump Chiller fuel type: Electricity Generator seasonal EER value 6.04 Generator nominal EER value 3.51 Heat Recovery seasonal efficiency 90% Pumps: Variable speed with differential sensor across the pump.

TABLE 03- PART L2A SBEM SPECIFICATIONS- BUILDING SERVICES (CONTINUED)

ELEMENT	DETAILS	FURTHER INFORMATION
DOMESTIC HOT WATER	Instantaneous hot water	Supplied via Heat Interface Units (HIU) DHW delivery efficiency 0.95% No Secondary Circulation, no storage tank.
MECHANICAL VENTILATION BATHROOMS AND STORES	Mechanical Extract	Exhaust SFP – 0.61 W/l/s Exhaust fan rates - Bathrooms - 12 l/s -Stores - 5 l/s
MECHANICAL VENTILATION BEDROOMS AND CIRCULATIONS	Air Handling Unit AHU	AHU with heat recovery Supply SFP - 0.80 W/l/s Heat recovery seasonal efficiency 0.90 Supply rates: -Rooms – 25 l/s - Circulations – 60 l/s
LIGHTING		Lamps luminous efficacy to be better than 75 lumens / circuit watt Light Output Ratio (LOR) 100% ILLUMINANCE LEVELS MODELLED: Stores and reception 200 lux Bedrooms and circulations 100 lux Bathrooms and breakfast room 150 lux Office 400 lux Kitchen 500 lux
LIGHTING SUB-METERING	Yes	Yes, but no alarm for out of range values.
LIGHTING CONTROLS		PIR: Stores, Circulations, Breakfast room and Reception Photoelectric control: None Manual Switching: Bedrooms, Bathrooms, Office and Kitchen
RENEWABLES/LOW CARBON TECHNOLOGY		ENERGIMIZAER EM 16NG Natural Gas CHP Total efficiency: 96% Electric efficiency: 29% Thermal efficiency: 67%

TABLE 04- SBEM RESULTS – CRITERION 1, FOLLOWING THE LONDON PLAN ENERGY HIERARCHY

BE LEAN COMPLIES WITH Part L2A CRITERION 1?	YES	BER : 57.10 kgCO2/m2/year TER : 68.30 kgCO2/m2/year
BE CLEAN COMPLIES WITH Part L2A CRITERION 1?	YES	BER : 44.20 kgCO2/m2/year TER : 68.30 kgCO2/m2/year
BE GREEN COMPLIES WITH Part L2A CRITERION 1?	YES	BER: 44.20 kgCO2/m2/year TER: 68.30 kgCO2/m2/year

TABLE 05- SBEM RESULTS – CRITERION 2,3,4 AND 5

COMPLIES WITH Part L2A CRITERION 2?	YES	THE PERFORMANCE OF THE BUILDING FABRIC AND THE BUILDING SERVICES COMPLY WITH REASONABLE OVERALL STANDARDS OF ENERGY EFFICIENCY.
COMPLIES WITH Part L2A CRITERION 3?	*WITH CONDITIONS	PASSIVE MEASURES WILL NEED TO BE INCORPORATED TO THE DESIGN TO COMPLY AGAINST CRITERION 3 PART L2A AS PER TABLE 2 ABOVE.
CAN COMPLY WITH Part L2A CRITERION 4?	SEPARATE SUBMISSION	THE PERFORMANCE OF THE BUILDING, AS BUILT, SHOULD BE CONSISTENT WITH THE BER.
CAN COMPLY WITH Part L2A CRITERION 5?	SEPARATE SUBMISSION	THE NECESSARY PROVISION FOR ENABLING ENERGY-EFFICIENT OPERATION OF THE BUILDING SHOULD BE IN PLACE.

FIGURE 01- BASEMENT FLOOR PLAN AS PROPOSED-ZONES SHOWN IN BLUE OUTLINE

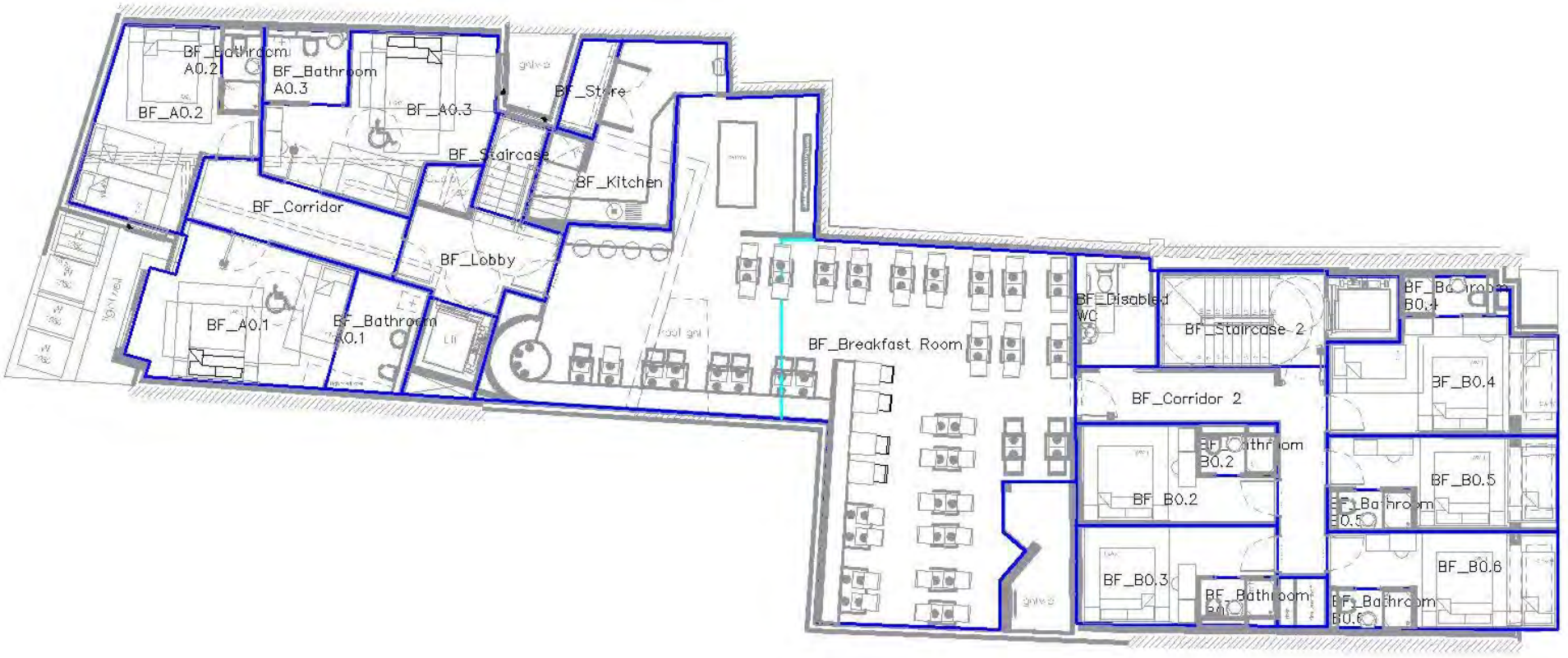


FIGURE 02- GROUND FLOOR PLAN AS PROPOSED-ZONES SHOWN IN BLUE OUTLINE

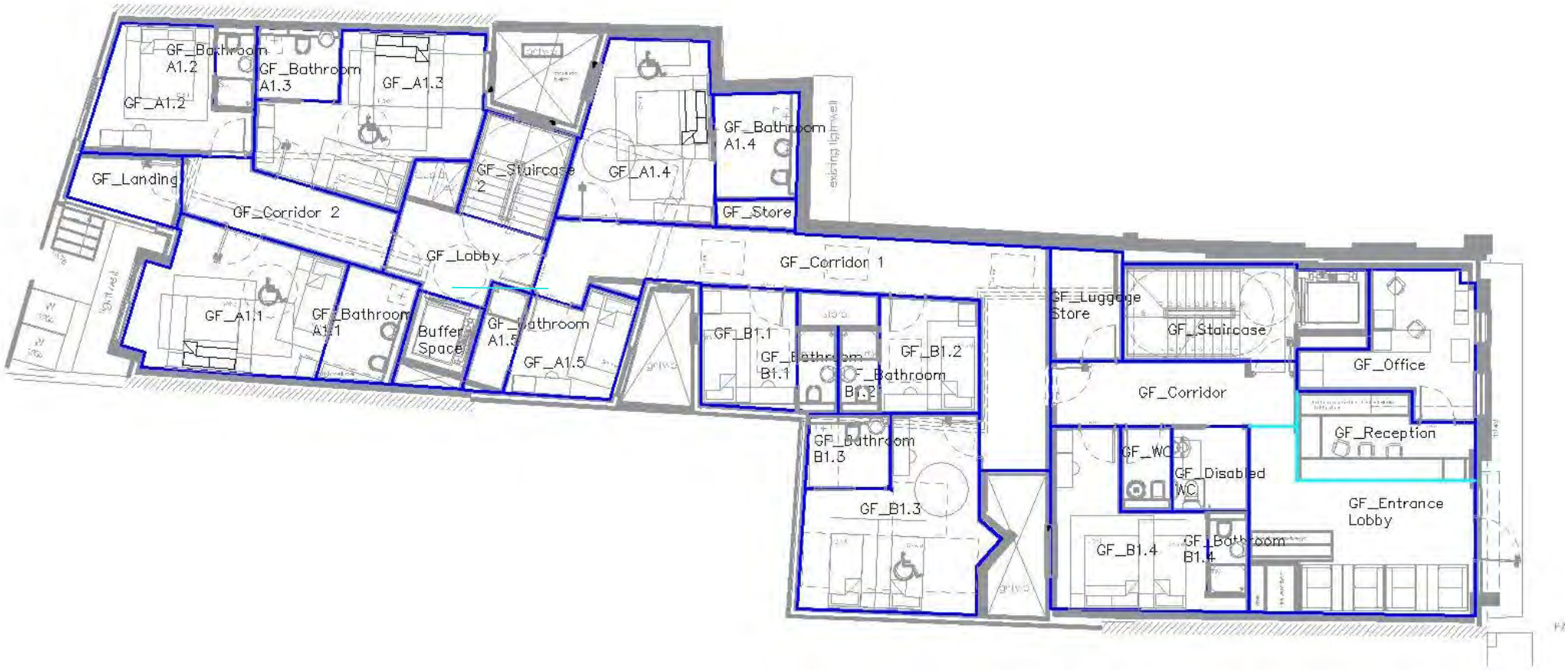


FIGURE 03- FIRST FLOOR PLAN AS PROPOSED-ZONES SHOWN IN BLUE OUTLINE

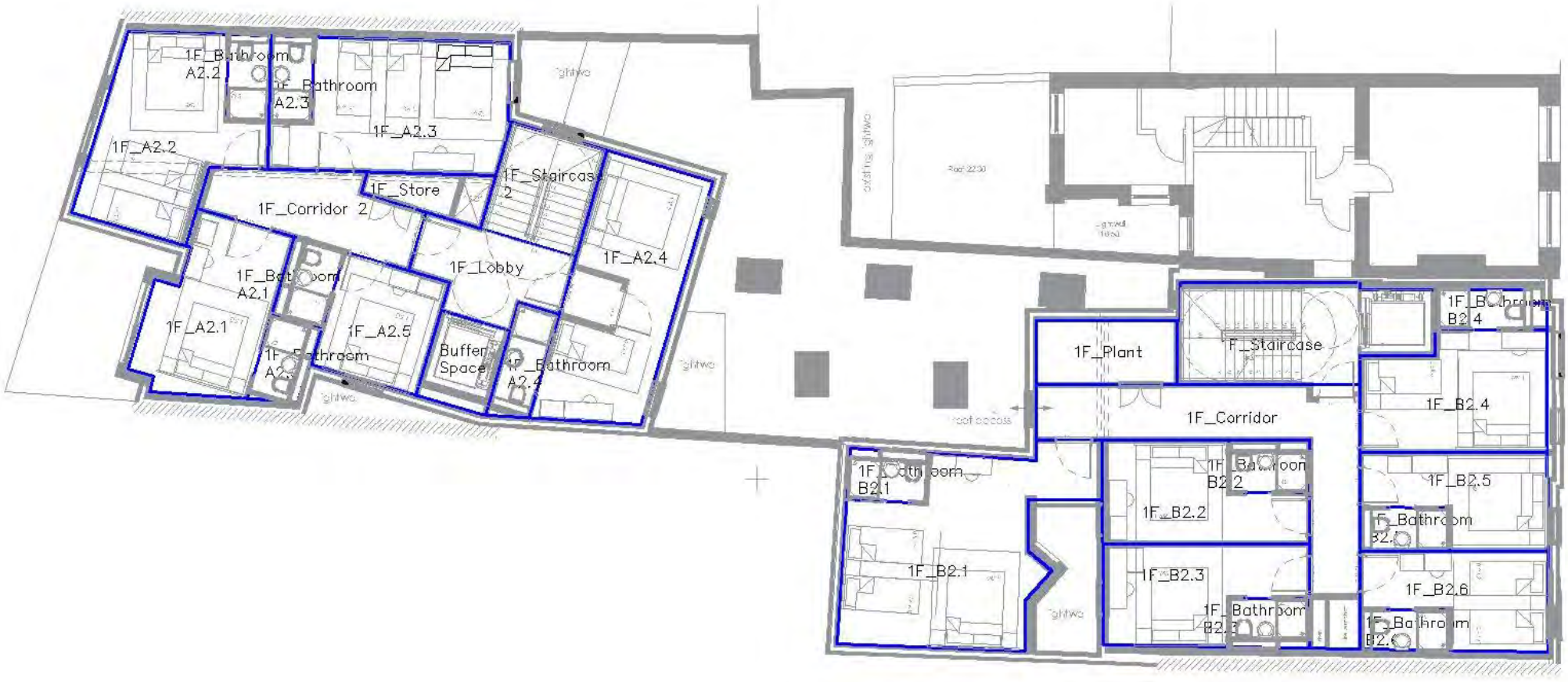


FIGURE 04- SECOND FLOOR PLAN AS PROPOSED-ZONES SHOWN IN BLUE OUTLINE

FIGURE 05- THIRD FLOOR PLAN AS PROPOSED-ZONES SHOWN IN BLUE OUTLINE

FIGURE 06- FOURTH FLOOR PLAN AS PROPOSED-ZONES SHOWN IN BLUE OUTLINE

FIGURE 07 – 3D VIEWS OF THE ASSESSED BUILDING SHOWN IN BLUE (SOUTH-WEST VIEW)

(ADJOINING BUILDINGS SHOWN IN SOLID PINK)

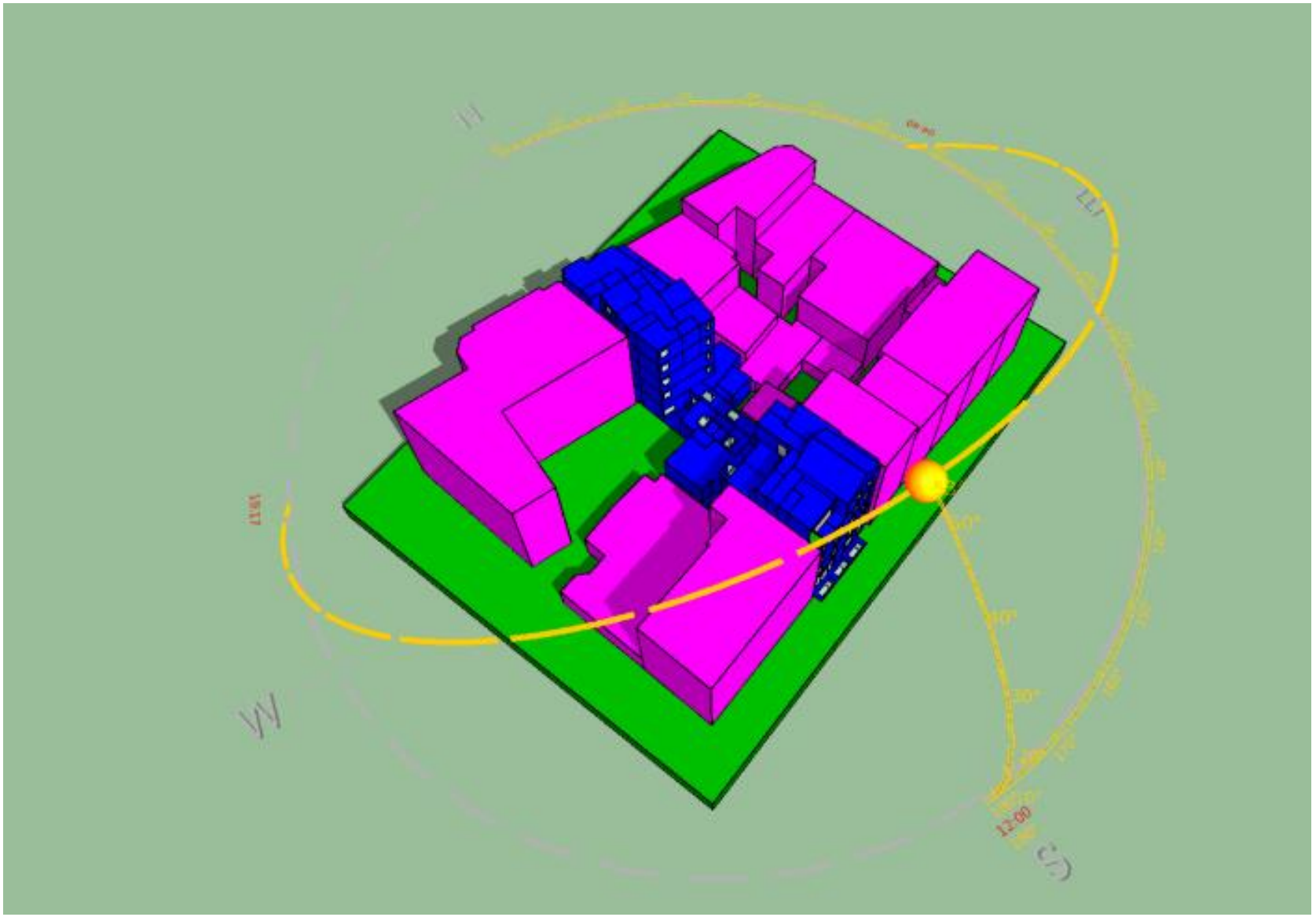
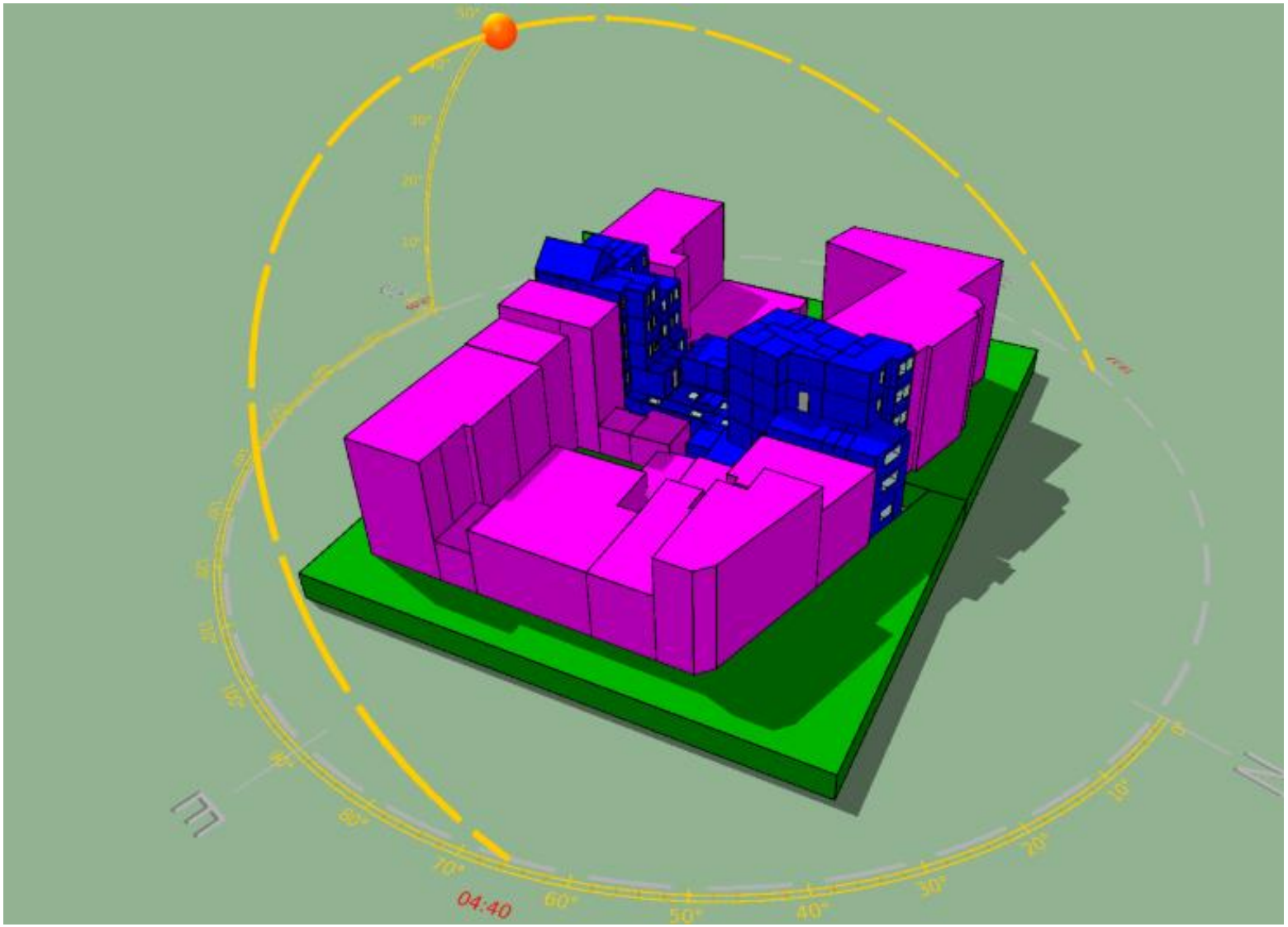


FIGURE 08 – 3D VIEWS OF THE ASSESSED BUILDING SHOWN IN BLUE (NORTH-EAST VIEW)

(ADJOINING BUILDINGS SHOWN IN SOLID PINK)



Appendix 2

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2013

Project name

377 Chalton Street BE LEAN

As designed

Date: Thu Jul 16 22:54:43 2015

Administrative information

Building Details

Address: 53-55 Chalton Street, London, NW1 1HY

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.2

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.2

BRUKL compliance check version: v5.2.b.1

Owner Details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certifier details

Name: Xavier Valladares

Telephone number: 01245 500 566

Address: NRG Consulting, Studio 7 3rd Floor, 138-148 Cambridge, Heath Road, London, E1 5QJ

Criterion 1: The calculated CO_2 emission rate for the building should not exceed the target

1.1	CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	68.3
1.2	Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	68.3
1.3	Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	57.1
1.4	Are emissions from the building less than or equal to the target?	BER =< TER
1.5	Are as built details the same as used in the BER calculations?	Separate submission

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

Values which do not meet standards in the 2013 Non-Domestic Building Services Compliance Guide are displayed in red.

2.a Building fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.2	0.2	BF000001:Surf[2]
Floor	0.25	0.18	0.18	BF000001:Surf[0]
Roof	0.25	0.16	0.16	BF00000B:Surf[1]
Windows***, roof windows, and rooflights	2.2	1.71	1.74	BF000001:Surf[1]
Personnel doors	2.2	1.8	1.8	1F00000B:Surf[2]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [$W/(m^2K)$]
$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [$W/(m^2K)$]
$U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [$W/(m^2K)$]

* There might be more than one surface where the maximum U-value occurs.
** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
*** Display windows and similar glazing are excluded from the U-value check.
N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
$m^3/(h.m^2)$ at 50 Pa	10	5

2.b 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	>0.95

1- Split or Multisplit system

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.96	3.51	0	0	0.9
Standard value	0.91*	3.2	N/A	N/A	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.					

2- Split or Multisplit system Bathrooms / Stores

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.96	3.51	0	0	0.9
Standard value	0.91*	3.2	N/A	N/A	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.					

1- DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	0.96	-
Standard value	0.9*	N/A
* Standard shown is for gas boilers >30 kW output. For boilers <=30 kW output, limiting efficiency is 0.73.		

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

General lighting and display lighting	**Luminous efficacy [lm/W]**			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
BF_A0.2	-	75	-	45
BF_Bathroom A0.2	-	75	-	21
BF_Bathroom A0.3	-	75	-	26
BF_A0.3	-	75	-	53
BF_Corridor	-	75	-	32
BF_A0.1	-	75	-	48
BF_Bathroom A0.1	-	75	-	32
BUFFER SPACE	-	75	-	18
BF_Lobby	-	75	-	33
BF_Staircase	-	75	-	16
BF_Store	75	-	-	31
BF_Kitchen	-	75	-	221
BF_Breakfast Room	-	75	22	368
BF_Disabled WC	-	75	-	32
BF_Staircase 2	-	75	-	41
BF_Bathroom B0.4	-	75	-	25

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
BF_B0.4	-	75	-	46
BF_B0.5	-	75	-	38
BF_Bathroom B0.5	-	75	-	22
BF_B0.6	-	75	-	39
BF_Corridor 2	-	75	-	51
BF_Bathroom B0.2	-	75	-	21
BF_B0.2	-	75	-	35
BF_B0.3	-	75	-	35
BF_Bathroom B0.3	-	75	-	21
BF_Bathroom B0.6	-	75	-	22
BUFFER SPACE	-	75	-	11
GF_A1.2	-	75	-	41
GF_Landing	75	-	-	47
GF_Bathroom A1.2	-	75	-	23
GF_Bathroom A1.3	-	75	-	33
GF_A1.3	-	75	-	59
GF_Corridor 2	-	75	-	39
GF_A1.1	-	75	-	54
GF_Bathroom A1.1	-	75	-	39
GF_Staircase 2	-	75	-	28
GF_A1.4	-	75	-	49
GF_Lobby	-	75	-	39
BUFFER SPACE	-	75	-	22
GF_Bathroom A1.5	-	75	-	30
GF_A1.5	-	75	-	31
GF_Bathroom A1.4	-	75	-	39
GF_Store	75	-	-	22
GF_B1.1	-	75	-	30
GF_Store 1	75	-	-	27
GF_Bathroom B1.1	-	75	-	24
GF_Bathroom B1.2	-	75	-	25
GF_Bathroom B1.3	-	75	-	33
GF_B1.3	-	75	-	60
GF_B1.2	-	75	-	30
GF_Corridor 1	-	75	-	107
GF_Luggage Store	75	-	-	51
GF_Staircase	-	75	-	50
GF_Office	75	-	-	183
GF_B1.4	-	75	-	54
GF_WC	-	75	-	30
GF_Bathroom B1.4	-	75	-	24
GF_Disabled WC	-	75	-	34
GF_Reception	-	75	22	50

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
GF_Corridor	-	75	-	39
GF_Entrance Lobby	-	75	-	56
1F_A2.2	-	75	-	45
1F_Bathroom A2.2	-	75	-	21
1F_Bathroom A2.5	-	75	-	22
1F_A2.1	-	75	-	37
1F_Bathroom A2.3	-	75	-	21
1F_Corridor 2	-	75	-	31
1F_A2.3	-	75	-	48
1F_Store	75	-	-	36
1F_Bathroom A2.1	-	75	-	21
1F_A2.5	-	75	-	26
BUFFER SPACE	-	75	-	17
1F_Lobby	-	75	-	26
1F_Staircase	-	75	-	23
1F_Bathroom A2.4	-	75	-	25
1F_A2.4	-	75	-	50
1F_Bathroom B2.1	-	75	-	21
1F_B2.1	-	75	-	63
1F_Plant	75	-	-	44
1F_B2.3	-	75	-	35
1F_Bathroom B2.3	-	75	-	21
1F_B2.2	-	75	-	35
1F_Bathroom B2.2	-	75	-	21
1F_Corridor	-	75	-	63
1F_Staircase	-	75	-	43
1F_Bathroom B2.6	-	75	-	22
1F_B2.6	-	75	-	32
1F_Bathroom B2.5	-	75	-	22
1F_B2.5	-	75	-	31
2F_A3.2	-	75	-	45
2F_Bathroom A3.2	-	75	-	21
2F_Bathroom A3.1	-	75	-	22
2F_A3.1	-	75	-	37
2F_Bathroom A3.3	-	75	-	21
2F_Corridor 2	-	75	-	31
2F_A3.3	-	75	-	48
2F_Store	75	-	-	36
2F_Bathroom A3.5	-	75	-	21
2F_A3.5	-	75	-	26
BUFFER SPACE	-	75	-	17
2F_Lobby	-	75	-	26
2F_Staircase 2	-	75	-	23

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
2F_Bathroom A3.4	-	75	-	25
2F_A3.4	-	75	-	50
2F_B3.3	-	75	-	31
2F_Bathroom B3.3	-	75	-	21
2F_B3.2	-	75	-	31
2F_Bathroom B3.2	-	75	-	21
2F_B3.1	-	75	-	29
2F_Bathroom B3.1	-	75	-	21
2F_B3.6	-	75	-	32
2F_Bathroom B3.6	-	75	-	22
2F_Bathroom B3.5	-	75	-	22
2F_B3.5	-	75	-	31
2F_B3.4	-	75	-	38
2F_Bathroom B3.4	-	75	-	25
2F_Staircase	-	75	-	42
2F_Corridor	-	75	-	33
3F_B4.3	-	75	-	31
3F_Bathroom B4.3	-	75	-	21
3F_B4.2	-	75	-	31
3F_Bathroom B4.2	-	75	-	21
3F_B4.1	-	75	-	29
3F_Bathroom B4.1	-	75	-	21
3F_B4.6	-	75	-	32
3F_Bathroom B4.6	-	75	-	22
3F_Bathroom B4.5	-	75	-	22
3F_B4.5	-	75	-	31
3F_B4.4	-	75	-	38
3F_Bathroom B4.4	-	75	-	25
3F_Staircase	-	75	-	42
3F_Corridor	-	75	-	33
3F_A4.1	-	75	-	53
3F_Bathroom A4.1	-	75	-	22
3F_Bathroom A4.2	-	75	-	21
3F_4.2	-	75	-	26
3F_Lobby 2	-	75	-	14
3F_Store	75	-	-	36
3F_Staircase 2	-	75	-	23
BUFFER SPACE	-	75	-	17
3F_Bathroom A4.3	-	75	-	25
3F_A4.3	-	75	-	25
3F_Stair Lobby	-	75	-	33
3F_A4.4	-	75	-	25
3F_Bathroom A4.4	-	75	-	21

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
4F_A5.1	-	75	-	53
4F_Bathroom A5.1	-	75	-	22
4F_Bathroom A5.2	-	75	-	21
4F_A5.2	-	75	-	26
4F_Lobby 2	-	75	-	14
4F_Store	75	-	-	36
4F_Staircase 2	-	75	-	23
BUFFER SPACE	-	75	-	17
4F_Bathroom A5.3	-	75	-	25
4F_A5.3	-	75	-	25
4F_Stair Lobby	-	75	-	33
4F_A5.4	-	75	-	25
4F_Bathroom A5.4	-	75	-	21
4F_B5.5	-	75	-	32
4F_Bathroom B5.5	-	75	-	23
4F_Store 3	75	-	-	34
4F_Store 2	75	-	-	34
4F_B5.4	-	75	-	55
4F_Bathroom B5.4	-	75	-	26
4F_Corridor	-	75	-	35
4F_B5.1	-	75	-	30
4F_Bathroom B5.1	-	75	-	22
4F_Staircase	-	75	-	44
1F_Bathroom B2.4	-	75	-	25
1F_B2.4	-	75	-	38

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?
BF_A0.2	NO (-89.6%)	NO
BF_Bathroom A0.2	N/A	N/A
BF_Bathroom A0.3	N/A	N/A
BF_A0.3	NO (-81.7%)	NO
BF_Corridor	N/A	N/A
BF_A0.1	NO (-85.6%)	NO
BF_Bathroom A0.1	N/A	N/A
BUFFER SPACE	N/A	N/A
BF_Lobby	N/A	N/A
BF_Staircase	NO (-19.3%)	NO
BF_Store	N/A	N/A
BF_Kitchen	N/A	N/A
BF_Breakfast Room	NO (-74.4%)	NO
BF_Disabled WC	N/A	N/A
BF_Staircase 2	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
BF_Bathroom B0.4	N/A	N/A
BF_B0.4	NO (-67.8%)	NO
BF_B0.5	NO (-43.3%)	NO
BF_Bathroom B0.5	N/A	N/A
BF_B0.6	NO (-77.7%)	NO
BF_Corridor 2	N/A	N/A
BF_Bathroom B0.2	N/A	N/A
BF_B0.2	NO (-45.5%)	NO
BF_B0.3	NO (-89.3%)	NO
BF_Bathroom B0.3	N/A	N/A
BF_Bathroom B0.6	N/A	N/A
BUFFER SPACE	N/A	N/A
GF_A1.2	NO (-81.1%)	NO
GF_Landing	N/A	N/A
GF_Bathroom A1.2	N/A	N/A
GF_Bathroom A1.3	N/A	N/A
GF_A1.3	NO (-81.7%)	NO
GF_Corridor 2	N/A	N/A
GF_A1.1	NO (-85.6%)	NO
GF_Bathroom A1.1	N/A	N/A
GF_Staircase 2	NO (-56.1%)	NO
GF_A1.4	NO (-89.8%)	NO
GF_Lobby	N/A	N/A
BUFFER SPACE	N/A	N/A
GF_Bathroom A1.5	N/A	N/A
GF_A1.5	NO (-76.2%)	NO
GF_Bathroom A1.4	N/A	N/A
GF_Store	N/A	N/A
GF_B1.1	NO (-69%)	NO
GF_Store 1	N/A	N/A
GF_Bathroom B1.1	N/A	N/A
GF_Bathroom B1.2	N/A	N/A
GF_Bathroom B1.3	N/A	N/A
GF_B1.3	NO (-93%)	NO
GF_B1.2	NO (-33.8%)	NO
GF_Corridor 1	NO (-7.9%)	NO
GF_Luggage Store	N/A	N/A
GF_Staircase	N/A	N/A
GF_Office	NO (-45.3%)	NO
GF_B1.4	NO (-89.4%)	NO
GF_WC	N/A	N/A
GF_Bathroom B1.4	N/A	N/A
GF_Disabled WC	N/A	N/A
GF_Reception	NO (-49.5%)	NO
GF_Corridor	NO (-77.3%)	NO
GF_Entrance Lobby	NO (-64.5%)	NO
1F_A2.2	NO (-84.7%)	NO
1F_Bathroom A2.2	N/A	N/A
1F_Bathroom A2.5	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
1F_A2.1	NO (-81.7%)	NO
1F_Bathroom A2.3	N/A	N/A
1F_Corridor 2	N/A	N/A
1F_A2.3	NO (-84.7%)	NO
1F_Store	N/A	N/A
1F_Bathroom A2.1	N/A	N/A
1F_A2.5	NO (-61.2%)	NO
BUFFER SPACE	N/A	N/A
1F_Lobby	N/A	N/A
1F_Staircase	NO (-56.2%)	NO
1F_Bathroom A2.4	N/A	N/A
1F_A2.4	NO (-88.7%)	NO
1F_Bathroom B2.1	N/A	N/A
1F_B2.1	NO (-71.3%)	NO
1F_Plant	N/A	N/A
1F_B2.3	NO (-89.3%)	NO
1F_Bathroom B2.3	N/A	N/A
1F_B2.2	NO (-45.2%)	NO
1F_Bathroom B2.2	N/A	N/A
1F_Corridor	N/A	N/A
1F_Staircase	NO (-96%)	NO
1F_Bathroom B2.6	N/A	N/A
1F_B2.6	NO (-73.4%)	NO
1F_Bathroom B2.5	N/A	N/A
1F_B2.5	NO (-46.2%)	NO
2F_A3.2	NO (-84.7%)	NO
2F_Bathroom A3.2	N/A	N/A
2F_Bathroom A3.1	N/A	N/A
2F_A3.1	NO (-81.7%)	NO
2F_Bathroom A3.3	N/A	N/A
2F_Corridor 2	N/A	N/A
2F_A3.3	NO (-84.7%)	NO
2F_Store	N/A	N/A
2F_Bathroom A3.5	N/A	N/A
2F_A3.5	NO (-61.2%)	NO
BUFFER SPACE	N/A	N/A
2F_Lobby	N/A	N/A
2F_Staircase 2	N/A	N/A
2F_Bathroom A3.4	N/A	N/A
2F_A3.4	NO (-88.8%)	NO
2F_B3.3	NO (-81.6%)	NO
2F_Bathroom B3.3	N/A	N/A
2F_B3.2	NO (-64.4%)	NO
2F_Bathroom B3.2	N/A	N/A
2F_B3.1	NO (-72.7%)	NO
2F_Bathroom B3.1	NO (-89.2%)	NO
2F_B3.6	NO (-81.9%)	NO
2F_Bathroom B3.6	N/A	N/A
2F_Bathroom B3.5	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
2F_B3.5	NO (-63.4%)	NO
2F_B3.4	NO (-41.5%)	NO
2F_Bathroom B3.4	N/A	N/A
2F_Staircase	NO (-96%)	NO
2F_Corridor	N/A	N/A
3F_B4.3	NO (-81.6%)	NO
3F_Bathroom B4.3	N/A	N/A
3F_B4.2	NO (-64.4%)	NO
3F_Bathroom B4.2	N/A	N/A
3F_B4.1	NO (-72.7%)	NO
3F_Bathroom B4.1	NO (-89.2%)	NO
3F_B4.6	NO (-81.9%)	NO
3F_Bathroom B4.6	N/A	N/A
3F_Bathroom B4.5	N/A	N/A
3F_B4.5	NO (-63.4%)	NO
3F_B4.4	NO (-41.5%)	NO
3F_Bathroom B4.4	N/A	N/A
3F_Staircase	NO (-96%)	NO
3F_Corridor	N/A	N/A
3F_A4.1	NO (-86.1%)	NO
3F_Bathroom A4.1	N/A	N/A
3F_Bathroom A4.2	N/A	N/A
3F_4.2	NO (-61.2%)	NO
3F_Lobby 2	N/A	N/A
3F_Store	N/A	N/A
3F_Staircase 2	N/A	N/A
BUFFER SPACE	N/A	N/A
3F_Bathroom A4.3	N/A	N/A
3F_A4.3	NO (-84.4%)	NO
3F_Stair Lobby	N/A	N/A
3F_A4.4	NO (-89%)	NO
3F_Bathroom A4.4	N/A	N/A
4F_A5.1	NO (-86.2%)	NO
4F_Bathroom A5.1	N/A	N/A
4F_Bathroom A5.2	N/A	N/A
4F_A5.2	NO (-61.2%)	NO
4F_Lobby 2	N/A	N/A
4F_Store	N/A	N/A
4F_Staircase 2	N/A	N/A
BUFFER SPACE	N/A	N/A
4F_Bathroom A5.3	N/A	N/A
4F_A5.3	NO (-84.4%)	NO
4F_Stair Lobby	N/A	N/A
4F_A5.4	NO (-89%)	NO
4F_Bathroom A5.4	N/A	N/A
4F_B5.5	N/A	N/A
4F_Bathroom B5.5	N/A	N/A
4F_Store 3	NO (-91%)	NO
4F_Store 2	NO (-87.3%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
4F_B5.4	NO (-81.3%)	NO
4F_Bathroom B5.4	N/A	N/A
4F_Corridor	N/A	N/A
4F_B5.1	NO (-89.4%)	NO
4F_Bathroom B5.1	NO (-89.2%)	NO
4F_Staircase	NO (-96%)	NO
1F_Bathroom B2.4	N/A	N/A
1F_B2.4	NO (-11%)	YES

Criterion 4: The performance of the building, as built, should be consistent with the 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]	1577.5	1577.5
External area [m^2]	2589	2589
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	5	3
Average conductance [W/K]	747.08	1563.67
Average U-value [W/m^2K]	0.29	0.6
Alpha value* [%]	10	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 Inst.: Hospitals and Care Homes
	C2 Residential Inst.: Residential schools
	C2 Residential Inst.: Universities and colleges
	C2A Secure Residential Inst.
	Residential spaces
	D1 Non-residential Inst.: Community/Day Centre
	D1 Non-residential Inst.: Libraries, Museums, and Galleries
	D1 Non-residential Inst.: Education
	D1 Non-residential Inst.: Primary Health Care Building
	D1 Non-residential Inst.: Crown and County Courts
	D2 General Assembly and Leisure, Night Clubs and Theatres
	Others: Passenger terminals
	Others: Emergency services
	Others: Miscellaneous 24hr activities
	Others: Car Parks 24 hrs
	Others - Stand alone utility block

Energy Consumption by End Use [kWh/m^2]

	Actual	Notional
Heating	35.13	68.84
Cooling	2.72	8.18
Auxiliary	8.25	8.54
Lighting	14.44	16.39
Hot water	169.47	169.85
Equipment*	29.53	29.53
TOTAL**	**230.01**	**271.79**

* Energy used by equipment does not count towards the total for calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m^2]

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

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	157.33	325.19
Primary energy* [kWh/m^2]	325.66	390.27
Total emissions [kg/m^2]	57.1	68.3

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

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	57.6	49.3	17.6	3.2	6.9	0.91	4.29	0.96	6.04
	Notional	102.4	124.2	33	9.1	7.4	0.86	3.79	----	----
[ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	445	0.2	135.5	0	15.8	0.91	4.29	0.96	6.04
	Notional	848.8	39.3	273.5	2.9	15	0.86	3.79	----	----

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 BCO can give particular attention to items with specifications that are better than typically expected.

Building fabric

Element	$U_{i\text{-}Typ}$	$U_{i\text{-}Min}$	Surface where the minimum value occurs*
Wall	0.23	0.2	BF000001:Surf[2]
Floor	0.2	0.18	BF000001:Surf[0]
Roof	0.15	0.16	BF00000B:Surf[1]
Windows, roof windows, and rooflights	1.5	1.27	BF000010:Surf[1]
Personnel doors	1.5	1.8	1F00000B:Surf[2]
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

$U_{i\text{-}Typ}$ = Typical individual element U-values [W/(m²K)] $U_{i\text{-}Min}$ = Minimum individual element U-values [W/(m²K)]

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

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	5

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2013

Project name

377 Chalton Street BE CLEAN

As designed

Date: Thu Jul 16 22:43:38 2015

Administrative information

Building Details

Address: 53-55 Chalton Street, London, NW1 1HY

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.2

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.2

BRUKL compliance check version: v5.2.b.1

Owner Details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certifier details

Name: Xavier Valladares

Telephone number: 01245 500 566

Address: NRG Consulting, Studio 7 3rd Floor, 138-148 Cambridge, Heath Road, London, E1 5QJ

Criterion 1: The calculated CO_2 emission rate for the building should not exceed the target

1.1	CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	68.3
1.2	Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	68.3
1.3	Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	44.2
1.4	Are emissions from the building less than or equal to the target?	BER =< TER
1.5	Are as built details the same as used in the BER calculations?	Separate submission

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

Values which do not meet standards in the 2013 Non-Domestic Building Services Compliance Guide are displayed in red.

2.a Building fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.2	0.2	BF000001:Surf[2]
Floor	0.25	0.18	0.18	BF000001:Surf[0]
Roof	0.25	0.16	0.16	BF00000B:Surf[1]
Windows***, roof windows, and rooflights	2.2	1.71	1.74	BF000001:Surf[1]
Personnel doors	2.2	1.8	1.8	1F00000B:Surf[2]
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [$W/(m^2K)$]
$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [$W/(m^2K)$]
$U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [$W/(m^2K)$]

* There might be more than one surface where the maximum U-value occurs.
** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
*** Display windows and similar glazing are excluded from the U-value check.
N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
$m^3/(h.m^2)$ at 50 Pa	10	5

2.b 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	>0.95

1- Split or Multisplit system

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	0.96	3.51	0	0	0.9
Standard value	0.91*	3.2	N/A	N/A	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.					

2- Split or Multisplit system Bathrooms / Stores

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	0.96	3.51	0	0	0.9
Standard value	0.91*	3.2	N/A	N/A	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.					

1- DHW

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	0.96	-
Standard value	0.9*	N/A
* Standard shown is for gas boilers >30 kW output. For boilers <=30 kW output, limiting efficiency is 0.73.		

1- CHECK2-CHP

	CHPQA quality index	**CHP electrical efficiency**
This building	0	0.29
Standard value	Not provided	N/A

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

General lighting and display lighting	**Luminous efficacy [lm/W]**			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
BF_A0.2	-	75	-	45
BF_Bathroom A0.2	-	75	-	21
BF_Bathroom A0.3	-	75	-	26
BF_A0.3	-	75	-	53
BF_Corridor	-	75	-	32
BF_A0.1	-	75	-	48
BF_Bathroom A0.1	-	75	-	32
BUFFER SPACE	-	75	-	18
BF_Lobby	-	75	-	33
BF_Staircase	-	75	-	16
BF_Store	75	-	-	31

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
BF_Kitchen	-	75	-	221
BF_Breakfast Room	-	75	22	368
BF_Disabled WC	-	75	-	32
BF_Staircase 2	-	75	-	41
BF_Bathroom B0.4	-	75	-	25
BF_B0.4	-	75	-	46
BF_B0.5	-	75	-	38
BF_Bathroom B0.5	-	75	-	22
BF_B0.6	-	75	-	39
BF_Corridor 2	-	75	-	51
BF_Bathroom B0.2	-	75	-	21
BF_B0.2	-	75	-	35
BF_B0.3	-	75	-	35
BF_Bathroom B0.3	-	75	-	21
BF_Bathroom B0.6	-	75	-	22
BUFFER SPACE	-	75	-	11
GF_A1.2	-	75	-	41
GF_Landing	75	-	-	47
GF_Bathroom A1.2	-	75	-	23
GF_Bathroom A1.3	-	75	-	33
GF_A1.3	-	75	-	59
GF_Corridor 2	-	75	-	39
GF_A1.1	-	75	-	54
GF_Bathroom A1.1	-	75	-	39
GF_Staircase 2	-	75	-	28
GF_A1.4	-	75	-	49
GF_Lobby	-	75	-	39
BUFFER SPACE	-	75	-	22
GF_Bathroom A1.5	-	75	-	30
GF_A1.5	-	75	-	31
GF_Bathroom A1.4	-	75	-	39
GF_Store	75	-	-	22
GF_B1.1	-	75	-	30
GF_Store 1	75	-	-	27
GF_Bathroom B1.1	-	75	-	24
GF_Bathroom B1.2	-	75	-	25
GF_Bathroom B1.3	-	75	-	33
GF_B1.3	-	75	-	60
GF_B1.2	-	75	-	30
GF_Corridor 1	-	75	-	107
GF_Luggage Store	75	-	-	51
GF_Staircase	-	75	-	50
GF_Office	75	-	-	183

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
GF_B1.4	-	75	-	54
GF_WC	-	75	-	30
GF_Bathroom B1.4	-	75	-	24
GF_Disabled WC	-	75	-	34
GF_Reception	-	75	22	50
GF_Corridor	-	75	-	39
GF_Entrance Lobby	-	75	-	56
1F_A2.2	-	75	-	45
1F_Bathroom A2.2	-	75	-	21
1F_Bathroom A2.5	-	75	-	22
1F_A2.1	-	75	-	37
1F_Bathroom A2.3	-	75	-	21
1F_Corridor 2	-	75	-	31
1F_A2.3	-	75	-	48
1F_Store	75	-	-	36
1F_Bathroom A2.1	-	75	-	21
1F_A2.5	-	75	-	26
BUFFER SPACE	-	75	-	17
1F_Lobby	-	75	-	26
1F_Staircase	-	75	-	23
1F_Bathroom A2.4	-	75	-	25
1F_A2.4	-	75	-	50
1F_Bathroom B2.1	-	75	-	21
1F_B2.1	-	75	-	63
1F_Plant	75	-	-	44
1F_B2.3	-	75	-	35
1F_Bathroom B2.3	-	75	-	21
1F_B2.2	-	75	-	35
1F_Bathroom B2.2	-	75	-	21
1F_Corridor	-	75	-	63
1F_Staircase	-	75	-	43
1F_Bathroom B2.6	-	75	-	22
1F_B2.6	-	75	-	32
1F_Bathroom B2.5	-	75	-	22
1F_B2.5	-	75	-	31
2F_A3.2	-	75	-	45
2F_Bathroom A3.2	-	75	-	21
2F_Bathroom A3.1	-	75	-	22
2F_A3.1	-	75	-	37
2F_Bathroom A3.3	-	75	-	21
2F_Corridor 2	-	75	-	31
2F_A3.3	-	75	-	48
2F_Store	75	-	-	36

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
2F_Bathroom A3.5	-	75	-	21
2F_A3.5	-	75	-	26
BUFFER SPACE	-	75	-	17
2F_Lobby	-	75	-	26
2F_Staircase 2	-	75	-	23
2F_Bathroom A3.4	-	75	-	25
2F_A3.4	-	75	-	50
2F_B3.3	-	75	-	31
2F_Bathroom B3.3	-	75	-	21
2F_B3.2	-	75	-	31
2F_Bathroom B3.2	-	75	-	21
2F_B3.1	-	75	-	29
2F_Bathroom B3.1	-	75	-	21
2F_B3.6	-	75	-	32
2F_Bathroom B3.6	-	75	-	22
2F_Bathroom B3.5	-	75	-	22
2F_B3.5	-	75	-	31
2F_B3.4	-	75	-	38
2F_Bathroom B3.4	-	75	-	25
2F_Staircase	-	75	-	42
2F_Corridor	-	75	-	33
3F_B4.3	-	75	-	31
3F_Bathroom B4.3	-	75	-	21
3F_B4.2	-	75	-	31
3F_Bathroom B4.2	-	75	-	21
3F_B4.1	-	75	-	29
3F_Bathroom B4.1	-	75	-	21
3F_B4.6	-	75	-	32
3F_Bathroom B4.6	-	75	-	22
3F_Bathroom B4.5	-	75	-	22
3F_B4.5	-	75	-	31
3F_B4.4	-	75	-	38
3F_Bathroom B4.4	-	75	-	25
3F_Staircase	-	75	-	42
3F_Corridor	-	75	-	33
3F_A4.1	-	75	-	53
3F_Bathroom A4.1	-	75	-	22
3F_Bathroom A4.2	-	75	-	21
3F_4.2	-	75	-	26
3F_Lobby 2	-	75	-	14
3F_Store	75	-	-	36
3F_Staircase 2	-	75	-	23
BUFFER SPACE	-	75	-	17

General lighting and display lighting	Luminous efficacy [lm/W]			
Zone name	**Luminaire**	**Lamp**	**Display lamp**	**General lighting [W]**
Standard value	60	60	22	
3F_Bathroom A4.3	-	75	-	25
3F_A4.3	-	75	-	25
3F_Stair Lobby	-	75	-	33
3F_A4.4	-	75	-	25
3F_Bathroom A4.4	-	75	-	21
4F_A5.1	-	75	-	53
4F_Bathroom A5.1	-	75	-	22
4F_Bathroom A5.2	-	75	-	21
4F_A5.2	-	75	-	26
4F_Lobby 2	-	75	-	14
4F_Store	75	-	-	36
4F_Staircase 2	-	75	-	23
BUFFER SPACE	-	75	-	17
4F_Bathroom A5.3	-	75	-	25
4F_A5.3	-	75	-	25
4F_Stair Lobby	-	75	-	33
4F_A5.4	-	75	-	25
4F_Bathroom A5.4	-	75	-	21
4F_B5.5	-	75	-	32
4F_Bathroom B5.5	-	75	-	23
4F_Store 3	75	-	-	34
4F_Store 2	75	-	-	34
4F_B5.4	-	75	-	55
4F_Bathroom B5.4	-	75	-	26
4F_Corridor	-	75	-	35
4F_B5.1	-	75	-	30
4F_Bathroom B5.1	-	75	-	22
4F_Staircase	-	75	-	44
1F_Bathroom B2.4	-	75	-	25
1F_B2.4	-	75	-	38

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?
BF_A0.2	NO (-89.6%)	NO
BF_Bathroom A0.2	N/A	N/A
BF_Bathroom A0.3	N/A	N/A
BF_A0.3	NO (-81.7%)	NO
BF_Corridor	N/A	N/A
BF_A0.1	NO (-85.6%)	NO
BF_Bathroom A0.1	N/A	N/A
BUFFER SPACE	N/A	N/A
BF_Lobby	N/A	N/A
BF_Staircase	NO (-19.3%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
BF_Store	N/A	N/A
BF_Kitchen	N/A	N/A
BF_Breakfast Room	NO (-74.4%)	NO
BF_Disabled WC	N/A	N/A
BF_Staircase 2	N/A	N/A
BF_Bathroom B0.4	N/A	N/A
BF_B0.4	NO (-67.8%)	NO
BF_B0.5	NO (-43.3%)	NO
BF_Bathroom B0.5	N/A	N/A
BF_B0.6	NO (-77.7%)	NO
BF_Corridor 2	N/A	N/A
BF_Bathroom B0.2	N/A	N/A
BF_B0.2	NO (-45.5%)	NO
BF_B0.3	NO (-89.3%)	NO
BF_Bathroom B0.3	N/A	N/A
BF_Bathroom B0.6	N/A	N/A
BUFFER SPACE	N/A	N/A
GF_A1.2	NO (-81.1%)	NO
GF_Landing	N/A	N/A
GF_Bathroom A1.2	N/A	N/A
GF_Bathroom A1.3	N/A	N/A
GF_A1.3	NO (-81.7%)	NO
GF_Corridor 2	N/A	N/A
GF_A1.1	NO (-85.6%)	NO
GF_Bathroom A1.1	N/A	N/A
GF_Staircase 2	NO (-56.1%)	NO
GF_A1.4	NO (-89.8%)	NO
GF_Lobby	N/A	N/A
BUFFER SPACE	N/A	N/A
GF_Bathroom A1.5	N/A	N/A
GF_A1.5	NO (-76.2%)	NO
GF_Bathroom A1.4	N/A	N/A
GF_Store	N/A	N/A
GF_B1.1	NO (-69%)	NO
GF_Store 1	N/A	N/A
GF_Bathroom B1.1	N/A	N/A
GF_Bathroom B1.2	N/A	N/A
GF_Bathroom B1.3	N/A	N/A
GF_B1.3	NO (-93%)	NO
GF_B1.2	NO (-33.8%)	NO
GF_Corridor 1	NO (-7.9%)	NO
GF_Luggage Store	N/A	N/A
GF_Staircase	N/A	N/A
GF_Office	NO (-45.3%)	NO
GF_B1.4	NO (-89.4%)	NO
GF_WC	N/A	N/A
GF_Bathroom B1.4	N/A	N/A
GF_Disabled WC	N/A	N/A
GF_Reception	NO (-49.5%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
GF_Corridor	NO (-77.3%)	NO
GF_Entrance Lobby	NO (-64.5%)	NO
1F_A2.2	NO (-84.7%)	NO
1F_Bathroom A2.2	N/A	N/A
1F_Bathroom A2.5	N/A	N/A
1F_A2.1	NO (-81.7%)	NO
1F_Bathroom A2.3	N/A	N/A
1F_Corridor 2	N/A	N/A
1F_A2.3	NO (-84.7%)	NO
1F_Store	N/A	N/A
1F_Bathroom A2.1	N/A	N/A
1F_A2.5	NO (-61.2%)	NO
BUFFER SPACE	N/A	N/A
1F_Lobby	N/A	N/A
1F_Staircase	NO (-56.2%)	NO
1F_Bathroom A2.4	N/A	N/A
1F_A2.4	NO (-88.7%)	NO
1F_Bathroom B2.1	N/A	N/A
1F_B2.1	NO (-71.3%)	NO
1F_Plant	N/A	N/A
1F_B2.3	NO (-89.3%)	NO
1F_Bathroom B2.3	N/A	N/A
1F_B2.2	NO (-45.2%)	NO
1F_Bathroom B2.2	N/A	N/A
1F_Corridor	N/A	N/A
1F_Staircase	NO (-96%)	NO
1F_Bathroom B2.6	N/A	N/A
1F_B2.6	NO (-73.4%)	NO
1F_Bathroom B2.5	N/A	N/A
1F_B2.5	NO (-46.2%)	NO
2F_A3.2	NO (-84.7%)	NO
2F_Bathroom A3.2	N/A	N/A
2F_Bathroom A3.1	N/A	N/A
2F_A3.1	NO (-81.7%)	NO
2F_Bathroom A3.3	N/A	N/A
2F_Corridor 2	N/A	N/A
2F_A3.3	NO (-84.7%)	NO
2F_Store	N/A	N/A
2F_Bathroom A3.5	N/A	N/A
2F_A3.5	NO (-61.2%)	NO
BUFFER SPACE	N/A	N/A
2F_Lobby	N/A	N/A
2F_Staircase 2	N/A	N/A
2F_Bathroom A3.4	N/A	N/A
2F_A3.4	NO (-88.8%)	NO
2F_B3.3	NO (-81.6%)	NO
2F_Bathroom B3.3	N/A	N/A
2F_B3.2	NO (-64.4%)	NO
2F_Bathroom B3.2	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
2F_B3.1	NO (-72.7%)	NO
2F_Bathroom B3.1	NO (-89.2%)	NO
2F_B3.6	NO (-81.9%)	NO
2F_Bathroom B3.6	N/A	N/A
2F_Bathroom B3.5	N/A	N/A
2F_B3.5	NO (-63.4%)	NO
2F_B3.4	NO (-41.5%)	NO
2F_Bathroom B3.4	N/A	N/A
2F_Staircase	NO (-96%)	NO
2F_Corridor	N/A	N/A
3F_B4.3	NO (-81.6%)	NO
3F_Bathroom B4.3	N/A	N/A
3F_B4.2	NO (-64.4%)	NO
3F_Bathroom B4.2	N/A	N/A
3F_B4.1	NO (-72.7%)	NO
3F_Bathroom B4.1	NO (-89.2%)	NO
3F_B4.6	NO (-81.9%)	NO
3F_Bathroom B4.6	N/A	N/A
3F_Bathroom B4.5	N/A	N/A
3F_B4.5	NO (-63.4%)	NO
3F_B4.4	NO (-41.5%)	NO
3F_Bathroom B4.4	N/A	N/A
3F_Staircase	NO (-96%)	NO
3F_Corridor	N/A	N/A
3F_A4.1	NO (-86.1%)	NO
3F_Bathroom A4.1	N/A	N/A
3F_Bathroom A4.2	N/A	N/A
3F_4.2	NO (-61.2%)	NO
3F_Lobby 2	N/A	N/A
3F_Store	N/A	N/A
3F_Staircase 2	N/A	N/A
BUFFER SPACE	N/A	N/A
3F_Bathroom A4.3	N/A	N/A
3F_A4.3	NO (-84.4%)	NO
3F_Stair Lobby	N/A	N/A
3F_A4.4	NO (-89%)	NO
3F_Bathroom A4.4	N/A	N/A
4F_A5.1	NO (-86.2%)	NO
4F_Bathroom A5.1	N/A	N/A
4F_Bathroom A5.2	N/A	N/A
4F_A5.2	NO (-61.2%)	NO
4F_Lobby 2	N/A	N/A
4F_Store	N/A	N/A
4F_Staircase 2	N/A	N/A
BUFFER SPACE	N/A	N/A
4F_Bathroom A5.3	N/A	N/A
4F_A5.3	NO (-84.4%)	NO
4F_Stair Lobby	N/A	N/A
4F_A5.4	NO (-89%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
4F_Bathroom A5.4	N/A	N/A
4F_B5.5	N/A	N/A
4F_Bathroom B5.5	N/A	N/A
4F_Store 3	NO (-91%)	NO
4F_Store 2	NO (-87.3%)	NO
4F_B5.4	NO (-81.3%)	NO
4F_Bathroom B5.4	N/A	N/A
4F_Corridor	N/A	N/A
4F_B5.1	NO (-89.4%)	NO
4F_Bathroom B5.1	NO (-89.2%)	NO
4F_Staircase	NO (-96%)	NO
1F_Bathroom B2.4	N/A	N/A
1F_B2.4	NO (-11%)	YES

Criterion 4: The performance of the building, as built, should be consistent with the 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]	1577.5	1577.5
External area [m^2]	2589	2589
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	5	3
Average conductance [W/K]	747.08	1563.67
Average U-value [W/m^2K]	0.29	0.6
Alpha value* [%]	10	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 Inst.: Hospitals and Care Homes
	C2 Residential Inst.: Residential schools
	C2 Residential Inst.: Universities and colleges
	C2A Secure Residential Inst.
	Residential spaces
	D1 Non-residential Inst.: Community/Day Centre
	D1 Non-residential Inst.: Libraries, Museums, and Galleries
	D1 Non-residential Inst.: Education
	D1 Non-residential Inst.: Primary Health Care Building
	D1 Non-residential Inst.: Crown and County Courts
	D2 General Assembly and Leisure, Night Clubs and Theatres
	Others: Passenger terminals
	Others: Emergency services
	Others: Miscellaneous 24hr activities
	Others: Car Parks 24 hrs
	Others - Stand alone utility block

Energy Consumption by End Use [kWh/m^2]

	Actual	Notional
Heating	43.52	68.84
Cooling	2.72	8.18
Auxiliary	8.25	8.54
Lighting	14.44	16.39
Hot water	210.54	169.85
Equipment*	29.53	29.53
TOTAL**	**234.17**	**271.79**

* Energy used by equipment does not count towards the total for calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	45.3	0
Solar thermal systems	0	0

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	157.33	325.19
Primary energy* [kWh/m^2]	246.94	390.27
Total emissions [kg/m^2]	44.2	68.3

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

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	57.6	49.3	10.3	3.2	6.9	0.91	4.29	0.96	6.04
	Notional	102.4	124.2	33	9.1	7.4	0.86	3.79	----	----
[ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	445	0.2	59.9	0	15.8	0.91	4.29	0.96	6.04
	Notional	848.8	39.3	273.5	2.9	15	0.86	3.79	----	----

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 BCO can give particular attention to items with specifications that are better than typically expected.

Building fabric

Element	$U_{i\text{-}Typ}$	$U_{i\text{-}Min}$	Surface where the minimum value occurs*
Wall	0.23	0.2	BF000001:Surf[2]
Floor	0.2	0.18	BF000001:Surf[0]
Roof	0.15	0.16	BF00000B:Surf[1]
Windows, roof windows, and rooflights	1.5	1.27	BF000010:Surf[1]
Personnel doors	1.5	1.8	1F00000B:Surf[2]
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

$U_{i\text{-}Typ}$ = Typical individual element U-values [W/(m²K)] $U_{i\text{-}Min}$ = Minimum individual element U-values [W/(m²K)]

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

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	5

Appendix 3

NATURAL GAS FIRED EM 16NG

SPECIFICATION DATASHEET

Operational mode:	Mains parallel operation
Fuel:	Natural gas, LPG
Electrical output (P_{el}):	16kW min 8 kW
Thermal output (P_{th}):	37.5 kW min 25.1 kW
Fuel consumption:	51.3 kW[1)]
CHP coefficient:	0.43
Efficiency:	DIN ISO 3046-1
Total efficiency:	96%
Electric efficiency:	29%
Thermal efficiency:	67%
Gas-connection pressure:	20-50 mbar
Gas-flow pressure:	≤16 mbar
Flow rate with natural gas:	5.0 Nm^3/h
Flow temperature:	max. 85 ° C
Return temperature:	max. 65 ° C
Combustion & cooling air requirement:	min. 58 m^3/h (65 kg/h)
Ambient temperature:	5°C to max. 35°C
Exhaust gas emissions:	at 5 Vol% remaining oxygen
CO (carbon monoxide):	< 100 mg/m^3 (50% TA-air)
NOx (nitrogen oxide):	< 100 mg/m^3 (50% TA-air)
Exhaust gas temperature:	~ 50 ° C[2)]
Exhaust gas volume flow:	~ 63 m^3/h
Exhaust gas mass flow dry:	~ 70 kg/h
Exhaust gas back pressure after CS[4)]:	max. 5 mbar
Sound pressure level CHP:	~ 56 dB(A) (1 m distance) :

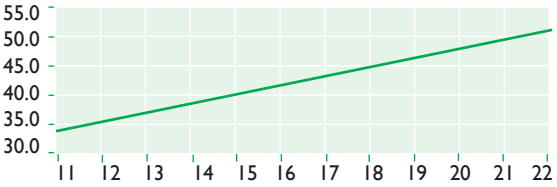
CHP: Dimensions, weights and connections

L x W x H CHP:	1.27 x 0.82 x 0.98 m
Weight CHP: incl. oil and water	740 kg
ϕ x H CS[4)]:	0.30 x 1.52 m (w/o flanges)
Weight CS[4)]:	30 kg
Colour CHP:	Pantone 5517C
Heating connections (VL):	R 3/4" Flow (warm)
	R 3/4" Return (cold)
Exhaust gas connection CS[4)]:	DN100
Gas connection:	R 3/4" NG

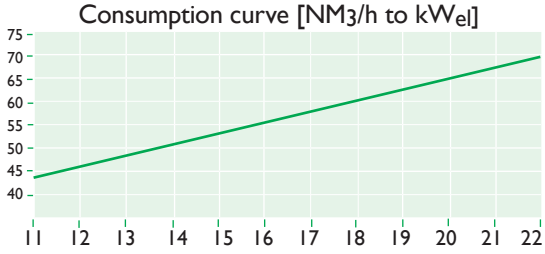
Motor

	K18
Type:	Straight line (Otto)
Operation:	4-stroke
Cylinder:	3
Displacement:	1.8 litres
Nominal engine speed:	1500 1/min

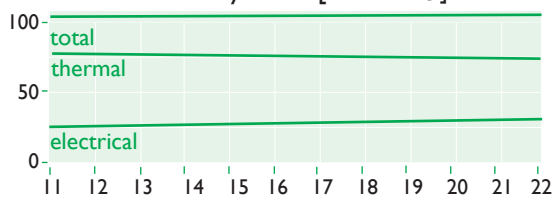
Output curve [kW_{th} to kW_{el}]
Continuous modulation range



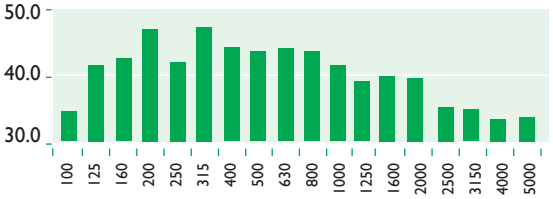
Consumption curve [NM_3/h to kW_{el}]



Efficiency curve [% to kW_{el}]



Sound pressure level curve [dB(A) to Hz][5)]



1) According to DIN ISO 3046-1, tolerance 5%
2) Return temperature 40°
3) According to EU RL 2004/8/EG with 100% internal use
4) Combination silencer
5) Test stand measuring without liability
6) According to EnEVAndV 2009

Environmentally friendly, independent, reliable energy

PRIME MOVER UNIT

ASYNCHRONOUS GENERATOR Weier DKASGM

Cooling:	water cooled
Power:	16 kW
Voltage:	400 V
Nominal current:	29 A
Frequency:	50 Hz
Operating mode:	S1

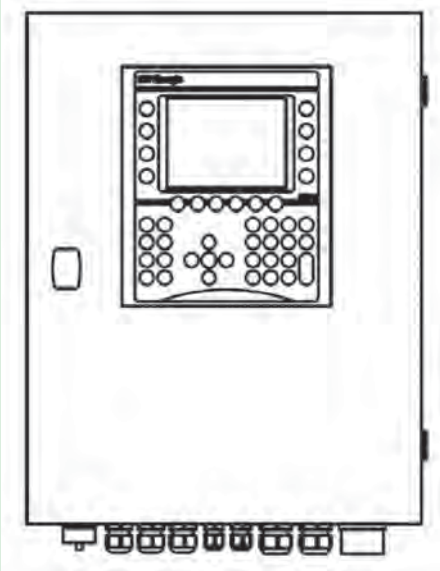
ELECTRICAL DATA ENERGIMISER 16

Max. effective power PA_{max}:	16 kW
Max apparent power SA_{max}:	16.6 kVA
cos □:	0.97
Nominal voltage UN:	400 V
Rated current Ir:	24 A
Grid input:	three phase current
Isolated operation intended?:	No
Motor-driven start intended:	No
Starting current IA:	-
Short circuit current I"K:	0.17 kA
Short circuit stability of the complete system IK:	10 kA
Reactive power compensation:	Existing
Number of compensation steps:	1
Reactive power per step:	7.3 kVArw
Detuning factor respectively resonance frequency:	0
Own requirement:	0.045 kVA

SETTING GRID PROTECTION (VDE-AR-N 41050)

Voltage drop protection U<	0.8 U_n (100 ms)
Voltage increase protection U>	1.1 U_n (100 ms)
Voltage increase protection U>>	1.15 U_n (100 ms)
Frequency drop protection f<	47.5 Hz (100 ms)
Frequency increase protection f>	51.5 Hz (100 ms)

Standard reference conditions according to DIN ISO 3046-1: The technical data are based on natural gas H with a heating value of 10.0 kWh/Nm^3 (total air pressure 100 kPa, air temperature 25°C, relative humidity 30%, 100m above sea level). Power adjustment at ambient conditions according to DIN ISO 3046-1 respectively DIN 6271-3. The tolerance of the specific fuel consumption is +5% at nominal power and the tolerance of the usable thermal output is 7% at nominal power. We reserve the right to change data and characteristics without prior notice in accordance with our business policy and the ongoing development process.



ENERGIMISER 16 CONTROL BR06

Free programmable SPS control system to control, adjust, calculate, measure and display result. The control system is equipped with a full graphics display and all function buttons, required to operate the combined heat and power plant. The 5.7" LCD display shows information about the system and its current status.

The BR06 can optionally be expanded by a heating control system, requirement peak load boiler (up to 2 boilers), data transfer via LAN and Internet with an error notification via email (only with DSL) and an interface connection to external systems (Ethernet UDP, Mod-Bus RTU, RK 512, 3964R).

CABINET: DIMENSIONS AND WEIGHT

(Wall mounting, connections at the bottom, standard cable set 6 m)

W x D x H:	0.40 x 0.19 x 0.52 m
Weight:	21 kg
Colour:	Pantone 5517C

ENERGIMIZER
www.energimizer.co.uk

For information in England and Wales contact Helec Ltd

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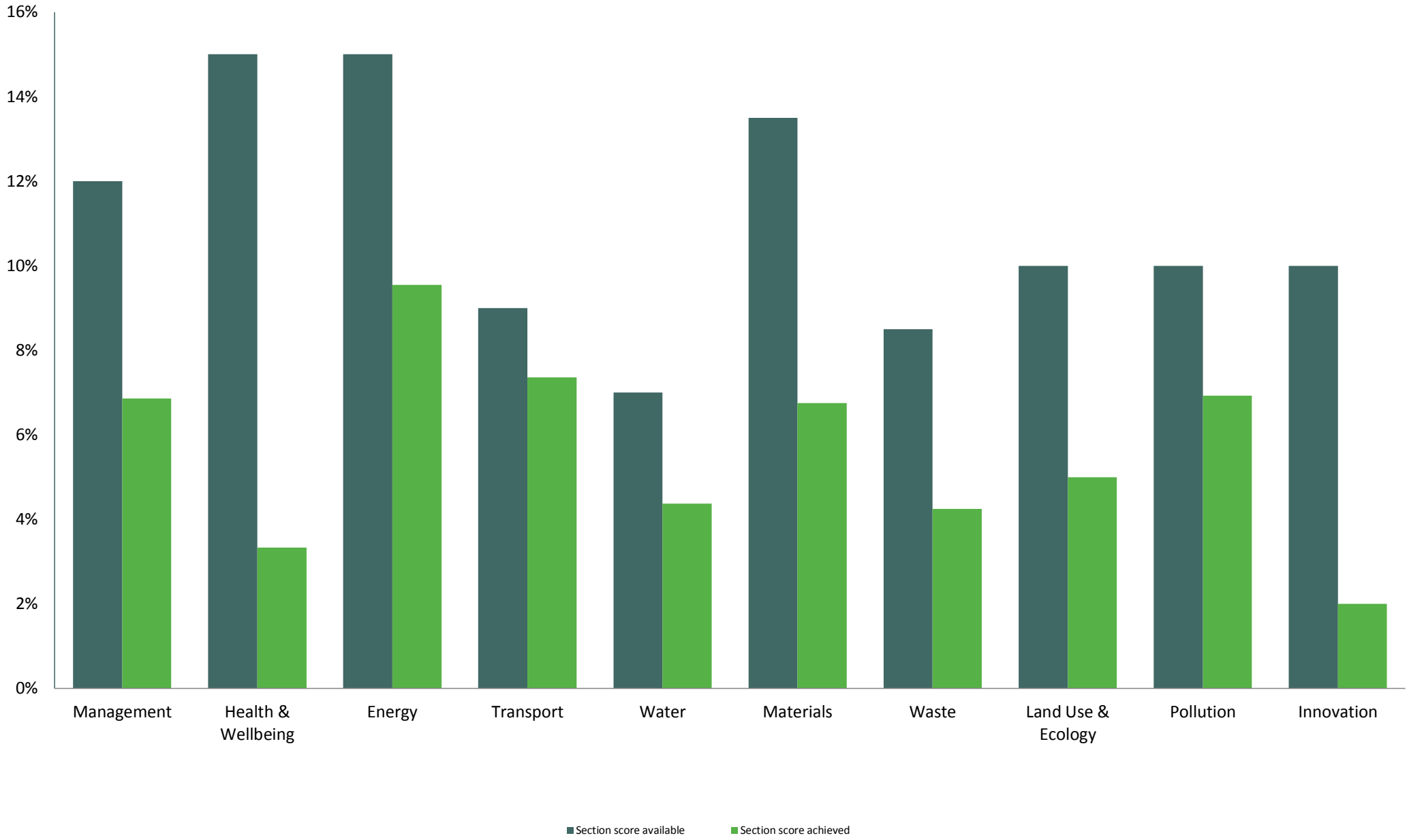
Appendix 4

BREEAM UK New Construction 2014 Pre-Assessment Estimator: Indicative Rating & Building Performance

Overall Building Performance

Building name	53-55 Charlton Street
Indicative BREEAM rating	Very Good
Indicative Total Score	56.4%
Min. standards level achieved	Outstanding level

Building Performance by Environment Section



Environmental Section	No. credits available	Indicative no. credits Achieved	% credits achieved	Section Weighting	Indicative Section Score
Management	21	12	57.1%	12.0%	6.9%
Health & Wellbeing	18	4	22.2%	15.0%	3.3%
Energy	22	14	63.6%	15.0%	9.5%
Transport	11	9	81.8%	9.0%	7.4%
Water	8	5	62.5%	7.0%	4.4%
Materials	14	7	50.0%	13.5%	6.8%
Waste	8	4	50.0%	8.5%	4.3%
Land Use & Ecology	10	5	50.0%	10.0%	5.0%
Pollution	13	9	69.2%	10.0%	6.9%
Innovation	10	2	20.0%	10.0%	2.0%

BREEAM UK New Construction 2014 Pre-Assessment Estimator: Assessment Issue Scoring

Building name	53-55 Charlton Street
Building score (%)	56.40%
Building rating	Very Good
Minimum standards level achieved	Outstanding level

MANAGEMENT

Man 01 Project brief and design

No. of BREEAM credits available	4	Available contribution to overall score	2.29%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will stakeholder consultation (project delivery) take place?	Yes	1	1
Will stakeholder consultation (third party) take place?	Yes	1	1
Will a sustainability champion (design) be assigned?	No	1	0
Will a sustainability champion (monitoring progress) be assigned?	No	1	0

Total BREEAM credits achieved	2
Total contribution to overall building score	1.14%
Total BREEAM innovation credits achieved	0
Minimum standard(s) level	N/A

Comments/notes:

1. Prior to completion of the Concept Design the project delivery stakeholders have met to identify and define their roles, responsibilities and contribution (meeting notes required). The consultation has to cover the minimum consultation content defined in BREEAM manual.

Man 02 Life cycle cost and service life planning

No. of BREEAM credits available	4	Available contribution to overall score	2.29%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will an elemental life cycle cost (LCC)analyses be carried out?	No	2	0
Will a component level LCC plan be developed?	No	1	0
Will the predicted capital cost be reported?	No	1	0
Expected capital cost of the project (if available)		£/m^2	

Total BREEAM credits achieved	0
Total contribution to overall building score	0.00%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

This credit is not sought.

Man 03 Responsible construction practices

No. of BREEAM credits available	6	Available contribution to overall score	3.43%
No. of BREEAM innovation credits available	1	Minimum standards applicable	Yes

Assessment Criteria	Compliant?	Credits available	Credits achieved
Is all site timber used in the project 'legally harvested and traded timber'?	Yes		
Will/does the principal contractor operate a compliant Environmental Management System?	No	1	0
Will a construction stage sustainability champion be assigned?	No	1	0
Will a considerate construction scheme be used by the principal contractor? (One credit where 'compliance' has been achieved. Two credits where 'compliance' is significantly exceeded.)	2	2	2
Will construction site impacts be metered/monitored?	Yes		
Will site utility consumption be metered/monitored?	Yes	1	1
Will transport of construction materials and waste be metered/monitored?	Yes	1	1
Will exemplary level criteria be met?	Yes	1	1

Total BREEAM credits achieved	4
Total contribution to overall building score	2.29%
Total BREEAM innovation credits achieved	1
Minimum standard(s) level	Outstanding level

Comments/notes:

1. All site timber used on the project is sourced in accordance with the UK Government's Timber Procurement Policy.
2. The Contractor has to significantly exceed 'compliance' with the criteria of a compliant scheme (i.e. CCS score between 35 and 39)
3. Energy and water will be metered and monitored during the construction process.
4. Monitor and record data on transport resulting from delivery of the majority of construction materials to site and construction waste from site.
5. There will be operational infrastructure to co-ordinate (in quarterly intervals for the first 3 years): collection of occupant satisfaction, analysis of the data of building performance, setting targets for water and energy reduction, providing feed back any 'lessons learned' to the design team, provision of actual energy annual building energy and water consumption

Man 04 Commisioning and handover

No. of BREEAM credits available	4	Available contribution to overall score	2.29%
No. of BREEAM innovation credits available	0	Minimum standards applicable	Yes

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will commissioning schedule and responsibilities be developed & accounted for?	Yes	1	1
Will a commissioning manager be appointed?	Yes	1	1
Will the building fabric be commissioned?	No	1	0
Will a training schedule for building occupiers/managers at Handover?	Yes	1	1
Will a building user guide be developed prior to handover?	Yes		

Total BREEAM credits achieved	3
Total contribution to overall building score	1.71%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	Outstanding level

Comments/notes:

1. An appropriate project team member has to undertaking design reviews of building services and give advice on suitability for ease of commissioning. He needs to provide commissioning management input to construction programming and during installation stages . In his responsibilities is also to manage the commissioning process, performance testing and handover/post-handover stages.
2. A schedule of commissioning and testing is prepared where all commissioning activities will be carried out in line with BSRIA and CIBSE guidelines. The appropriate team member is appointed to monitor and program commissioning and testing. Commissioning has to be finished prior to handover.
3. Building User Guides are to be provided and are appropriate to all users of the building. The document must describe the facilities to be shared and how access to them will be arranged for potential users.
4. A compliant training schedule will be prepared and implemented.

Man 05 Aftercare

No. of BREEAM credits available	3	Available contribution to overall score	1.71%
No. of BREEAM innovation credits available	1	Minimum standards applicable	Yes

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will aftercare support be provided to building occupiers?	Yes	1	1
Will seasonal commissioning occur over 12months once substantially occupied?	Yes	1	1
Will a post occupancy evaluation be carried out 1 year after occupation?	Yes	1	1
Will exemplary level criteria be met?	Yes	1	1

Total BREEAM credits achieved	3
Total contribution to overall building score	1.71%
Total BREEAM innovation credits achieved	1
Minimum standard(s) level	Outstanding level

Comments/notes:

HEALTH & WELLBEING

Hea 01 Visual Comfort

No. of BREEAM credits available	4	Available contribution to overall score	3.33%
No. of BREEAM innovation credits available	1	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will the design provide adequate glare control for building users?	No	1	0
Will relevant building areas be designed to achieve appropriate daylight factor(s)?	0	1	0
Will the design provide adequate view out for building users?	No	1	0
Will internal/external lighting levels, zoning and controls be specified in accordance with the relevant CIBSE Guides/British Standards?	Yes	1	1
Will exemplary level criteria be met?	No	1	0

Total BREEAM credits achieved	1
Total contribution to overall building score	0.83%
Total BREEAM innovation credits achieved	0
Minimum standard(s) level	N/A

Comments/notes:

1. Electrical Engineer to provide lighting specification and to ensure that the proposed internal and external lighting complies with:
-SLL Code for Lighting 2012
-CIBSE Lighting Guide 7 Sections 3.3, 4.6, 4.7, 4.8 and 4.9.
-BS5489-1:2013 Lighting of roads and public amenity areas
-BS EN 12464-2:2014 Light and lighting - Lighting of work places - Part 2: Outdoor work places.
2. Building light zoning is in line with BREEAM requirements

Hea 02 Indoor Air Quality

No. of BREEAM credits available	5	Available contribution to overall score	4.17%
No. of BREEAM innovation credits available	2	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will an air quality plan be produced and building designed to minimise air pollution?	Yes	1	1
Will building be designed to minimise the concentration and recirculation of pollutants in the building?	No	1	0
Will the relevant products be specified to meet the VOC testing and emission levels required?	No	1	0
Will formaldehyde and total VOC levels be measured post construction?	No	1	0
Will the building be designed to, or have the potential to provide, natural ventilation?	No	1	0
Will exemplary level VOCs (products)criteria be met?	0	2	0

Total BREEAM credits achieved	1
Total contribution to overall building score	0.83%
Total BREEAM innovation credits achieved	0
Minimum standard(s) level	N/A

Comments/notes:

1. BREEAM compliant indoor air quality plan will be prepared by an independent consultant.

Hea 03 Safe containment in laboratories

Assessment issue not applicable

No. of BREEAM credits available	N/A	Available contribution to overall score	N/A
No. of BREEAM innovation credits available	N/A	Minimum standards applicable	N/A

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will an objective risk assessment of proposed laboratory facilities' design be completed?			
Will the manufacture & installation of fume cupboards and containment devices meet best practice standards?			
Will containment level 2 & 3 labs meet best practice safety & performance criteria?			

Total BREEAM credits achieved	N/A
Total contribution to overall building score	N/A
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

Hea 04 Thermal comfort

No. of BREEAM credits available	3	Available contribution to overall score	2.50%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will thermal modelling of the design be carried out?	No	1	0
Will the building design be adapted for a projected climate change scenario?	No	1	0
Will the modelling inform the development of a thermal zoning and control strategy?	No	1	0

Total BREEAM credits achieved	0
Total contribution to overall building score	0.00%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

This credit is not sought.

Hea 05 Acoustic Performance

No. of BREEAM credits available	4	Available contribution to overall score	3.33%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Credits	Credits available	Credits achieved
Will the building meet the appropriate acoustic performance standards and testing requirements for: a. Sound insulation b. Indoor ambient noise level c. Reverberation times?	1	4	1

Total BREEAM credits achieved	1
Total contribution to overall building score	0.83%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1.An Acoustician Airborne sound insulation values are at least 3dB higher and impact sound insulation values are at least 3dB lower than the performance standards in the relevant Building Regulations or Standards.

Hea 06 Safety and Security

No. of BREEAM credits available	2	Available contribution to overall score	1.67%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Where external site areas are present, will safe access be designed for pedestrians and cyclists?	No	1	0
Will a suitably qualified security consultant be appointed and security considerations accounted for?	Yes	1	1

Total BREEAM credits achieved	1
Total contribution to overall building score	0.83%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1. Security by Design certificate is required

ENERGY

Ene 01 Reduction of energy use and carbon emissions

No. of BREEAM credits available	12	Available contribution to overall score	8.18%
No. of BREEAM innovation credits available	5	Minimum standards applicable	Yes

How do you wish to assess the number of BREEAM credits achieved for this issue?	Define a target number of BREEAM credits achieved
Select the target number of BREEAM credits for the Ene01 issue:	8

Ene 01 Calculator

Country of the UK where the building is located		Confirm building regulation and version to be used:	

New Construction (Fully fitted)

Building floor area		m2
Notional building heating and cooling energy demand		MJ/m2yr
Actual building heating and cooling energy demand		MJ/m2yr
Notional building primary energy consumption		kWh/m2yr
Actual building primary energy consumption		kWh/m2yr
Target emission rate (TER)		kgCO2/m2yr
Building emission rate (BER)		kgCO2/m2yr
Building emission rate improvement over TER		
Heating & cooling demand energy performance ratio (EPR_{ED})		
Primary consumption energy performance ratio (EPR_{PC})		
CO_2 Energy performance ratio (EPR_{CO2})		
Overall building energy performance ratio (EPR_{NC})		

Where specified, please confirm the energy production from onsite or near site energy generation technologies	
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' ?	
If the building is defined as 'carbon negative' what is the total (modelled) renewable/carbon neutral energy generated and exported?	

Total BREEAM credits achieved	8
Total contribution to overall building score	5.45%
Total BREEAM innovation credits achieved	0
Minimum standard(s) level	Outstanding level

Comments/notes:

It is anticipated that 8 credits will be achieved.

Ene 02 Energy monitoring

No. of BREEAM credits available	1	Available contribution to overall score	0.68%
No. of BREEAM innovation credits available	0	Minimum standards applicable	Yes

Assessment criteria	Compliant?	Credits available	Credits achieved
Will a BMS or sub-meters be specified to monitor energy use from major building services systems?	Yes	1	1
Will a BMS or sub-meters be specified to monitor energy use by tenant/building function areas?			

Total BREEAM credits achieved	1
Total contribution to overall building score	0.68%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	Outstanding level

Comments/notes:

1. Energy metering systems will be installed to enable at least 90% of the estimated annual energy consumption of each fuel to be assigned to the various end-use categories of energy consuming systems (in line with CIBSE TM39 Building energy metering. 2009).
2. The energy meters needs pulsed output and will be properly labelled.

Ene 03 External lighting

No. of BREEAM credits available	1	Available contribution to overall score	0.68%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment criteria	Compliant?	Credits available	Credits achieved
Will external light fittings and controls be specified in accordance with the BREEAM criteria?	Yes	1	1

Total BREEAM credits achieved	1
Total contribution to overall building score	0.68%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1. The average initial luminous efficiency of the external lighting will be less than 60 lumens per circuit Watt.
2. External lighting will be automatically controlled for prevention of operation during daylight hours
3. In areas where intermittent pedestrians traffic presence detection sensors will be installed.

Ene 04 Low carbon design

No. of BREEAM credits available	3	Available contribution to overall score	2.05%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment criteria	Compliant?	Credits available	Credits achieved
Will passive design measures be used in line with an analysis be carried out during concept design stage (RIBA stage 2 or equivalent)?	No	1	0
Will free cooling measures be implemented in the whole building in line with the passive design analysis?	No	1	0
Will a LZC technology be specified in line with a feasibility study carried out by the completion of the Concept Design stage (RIBA Stage 2 or equivalent)?	Yes	1	1

Total BREEAM credits achieved	1
Total contribution to overall building score	0.68%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1. LZC report has to be carried out before RIBA Stage 2.

Ene 05 Energy efficient cold storage

Assessment issue not applicable

No. of BREEAM credits available	N/A	Available contribution to overall score	N/A
No. of BREEAM innovation credits available	N/A	Minimum standards applicable	N/A

Assessment criteria	Compliant?	Credits available	Credits achieved
Will the refrigeration system be designed, installed & commissioned in accrodance with BREEAM criteria?	No	N/A	N/A
Will the refrigeration system demonstrate a saving in indirect greenhouse gas emissions?	No	N/A	N/A

Total BREEAM credits achieved	N/A
Total contribution to overall building score	N/A
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

Ene 06 Energy efficient transportation systems

No. of BREEAM credits available	3	Available contribution to overall score	2.05%
No. of BREEAM innovation credits available	0	Minimum standards applicable	N/A

Assessment criteria	Compliant?	Credits available	Credits achieved
Will a transportation system analysis be carried out to determine and specify the optimum number, size and type of lifts that is most energy efficient?	Yes	1	1
Will the relevant energy-efficient features criteria be met?	No	2	0

Total BREEAM credits achieved	1
Total contribution to overall building score	0.68%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1. An analysis of the transport demand and usage patterns for the building will be carried out.
2. Energy consumption of the lifts should be calculated in line with BS EN ISO 25745 for: at least two type of systems, an arragement of systems or a system strategy which is 'fit for purpose'
3. Consider the use of regenerative drive in the report
4. Specify the transportation system with the lowest energy consumption.

Ene 07 Energy efficient laboratory systems

Assessment issue not applicable

No. of BREEAM credits available	N/A	Available contribution to overall score	N/A
No. of BREEAM innovation credits available	N/A	Minimum standards applicable	N/A

Assessment criteria	Compliant?	Credits available	Credits achieved
Pre-requisite: Criterion 1 of Hea 03 - risk assessment of laboratory facilities			
Have the occupants' laboratory requirements & performance criteria been confirmed during the preparation of the initial project brief to minimise energy demand?			
Best Practice Energy Practices in Laboratories (table 27)			
Will the laboratory meet criteria item b) Fan power?			
Will the laboratory criteria item c) Fume cupboard volume flow rates?			
Will the lab meet item d) Grouping / isolation of high filtration/ventilation activities?			
Will the laboratory meet criteria item e) Energy recovery - heat?			
Will the laboratory meet criteria item f) Energy recovery - cooling?			
Will the laboratory meet criteria item g) Grouping of cooling loads?			
Will the laboratory meet criteria item h) Free cooling?			
Will the laboratory meet criteria item i) Load responsiveness?			
Will the laboratory meet criteria item j) Cleanrooms?			
Will the laboratory meet criteria item k) Diversity?			
Will the laboratory meet criteria item l) Room air-change rates?			

Total BREEAM credits achieved	N/A
Total contribution to overall building score	N/A
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

Ene 08 Energy efficient equipment

No. of BREEAM credits available	2	Available contribution to overall score	1.36%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment criteria

Which of the following will be present and likely to be a/the major contributor to 'unregulated' energy use?	Present	Major impact
Ref A Small power and plug in equipment?	Yes	Yes
Ref B Swimming pool?	No	
Ref C Communal laundry?	No	
Ref D Data centre?	No	
Ref E IT-intensive operation areas?	No	
Ref F Residential areas?	Yes	Yes
Ref G Healthcare?	No	
Ref H Kitchen and catering facilities?	No	

	Compliant	Credits available	Credits achieved
Will the significant majority contributor(s) to 'unregulated' energy use above meet the BREEAM criteria?	Yes	2	2

Total BREEAM credits achieved	2
Total contribution to overall building score	1.36%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1.Small power plug in equipment will qualify for an Enhanced Capital Allowance scheme or be awarded an Energy Star / Government Buying Standards.
2.Fridges need to be A+ rating

Ene 09 Drying space

Assessment issue not applicable

No. of BREEAM credits available	N/A	Available contribution to overall score	N/A
No. of BREEAM innovation credits available	N/A	Minimum standards applicable	N/A

Assessment criteria	Compliant?	Credits available	Credits achieved
Will internal/external drying space and fixings be provided?			

Total BREEAM credits achieved	N/A
Total contribution to overall building score	N/A
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

TRANSPORT

Tra 01 Public Transport Accessibility

No. of BREEAM credits available	5	Available contribution to overall score	4.09%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Building type category (for purpose of Tra01 issue assessment)	Other Building Type 2

Assessment Criteria	Compliant	Credits available	Credits achieved
Indicative public transport accessibility index (AI):	70.05	5	5
Will the building have a dedicated bus service?			N/A

AI	Indicative Accessibility Index for pre-assessment
0	Poor or no public transport provision
1	A single BREEAM compliant public transport node available
2	Some BREEAM compliant public transport nodes/services available
4	A selection of BREEAM compliant public transport nodes/services available
8	Good provision of public transport i.e. small urban centre / suburban area
10	Very Good provision of public transport i.e. small/medium urban centre
12	Excellent provision of public transport, i.e. medium urban centre
18	Excellent provision of public transport, i.e. large urban/metropolitan city centre

Total BREEAM credits achieved	5
Total contribution to overall building score	4.09%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

The development achieves an AI score of 70.05 (PTAI study) achieving 5 credits.

Tra 02 Proximity to Amenities

No. of BREEAM credits available	1	Available contribution to overall score	0.82%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will the building be in close proximity of and accessible to applicable amenities?	Yes	1	1

Total BREEAM credits achieved	1
Total contribution to overall building score	0.82%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1. It is anticipated that 2 credit is achieved.

Tra 03 Cyclist facilities

No. of BREEAM credits available	2	Available contribution to overall score	1.64%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Building type category (for purpose of Tra03 issue assessment)	Other Building - transport type 2
How many compliant cycle storage spaces will be provided?	0
What cyclist facilities will be provided?	No compliant facilities

Assessment Criteria	Compliant?	Credits available	Credits achieved
Cycle storage spaces	No	2	0
Cyclist facilities	No		

Total BREEAM credits achieved	0
Total contribution to overall building score	0.00%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

This credit is not sought.

Tra 04 Maximum Car Parking Capacity

No. of BREEAM credits available	2	Available contribution to overall score	1.64%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Building type category (for purpose of Tra04 issue)	Other Building - transport type 2
Building's indicative Accessibility Index (sourced from issue Tra01)	70.05

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will BREEAM's maximum parking capacity criteria for the building type/Accessibility Index be met?	Yes	2	2

Total BREEAM credits achieved	2
Total contribution to overall building score	1.64%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1.T here is no parking spaces.

Tra 05 Travel Plan

No. of BREEAM credits available	1	Available contribution to overall score	0.82%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will a transport plan based on site specific travel survey/assessment be developed?	Yes	1	1

Total BREEAM credits achieved	1
Total contribution to overall building score	0.82%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1. Travel Plan has to be prepared for the development.

WATER

Wat 01 Water Consumption

No. of BREEAM credits available	5	Available contribution to overall score	4.38%
No. of BREEAM innovation credits available	1	Minimum standards applicable	Yes

How do you wish to assess the number of BREEAM credits to be achieved for this issue?	Use the Wat01 Calculator to define the number of credits achived

Please select the calculation procedure used	Alternative approach

Standard approach data

Water Consumption from building micro-components	
Water demand met via greywater/rainwater sources	
Total net water consumption	
Improvement on baseline performance	

Key Performance Indicator - use of freshwater resource

Total net Water Consumption		Indicator not assessed
Default building occupancy		Indicator not assessed

Alternative approach data

Overall microcomponent performance level achieved	Level 3
Actual/equivalent % of flushing demand met using recycled non potable water	0.00%

Total BREEAM credits achieved	3
Total contribution to overall building score	2.63%
Total BREEAM innovation credits achieved	0
Minimum standard(s) level	Outstanding level

Comments/notes:

1. Water efficient sanitary fittings shall be supplied throughout the building (BREEAM WAT1 Level 3 fittings)

Wat 02 Water Monitoring

No. of BREEAM credits available	1	Available contribution to overall score	0.88%
No. of BREEAM innovation credits available	0	Minimum standards applicable	Yes

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will there be a water meter on the mains water supply to the building(s)?	Yes	1	1
Will metering/monitoring equipment be specified on the water supply to any relevant	Yes		
Will all specified water meters have a pulsed output?	Yes		
If the site/building has an existing BMS connection, will all pulsed meters be connected to the BMS?	N/A		

Total BREEAM credits achieved	1
Total contribution to overall building score	0.88%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	Outstanding level

Comments/notes:

1. There will be a water meter (with pulsed output) on the mains supply.
2. Every area which use more than 10% of total water usage has to be submetered.

Wat 03 Water Leak Detection and Prevention

No. of BREEAM credits available	2	Available contribution to overall score	1.75%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will a mains water leak detection system be installed on the building's mains water supply?	Yes	1	1
Will flow control devices be installed in each sanitary area/facility?	No	1	0

Total BREEAM credits achieved	1
Total contribution to overall building score	0.88%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1. A water leak detection system will be provided on mains water supply.

Wat 04 Water Efficient Equipment

Assessment issue not applicable

No. of BREEAM credits available	N/A	Available contribution to overall score	N/A
No. of BREEAM innovation credits available	N/A	Minimum standards applicable	N/A

Assessment Criteria	Compliant?	Credits available	Credits achieved
Has a meaningful reduction in unregulated water demand been achieved?			

Total BREEAM credits achieved	N/A
Total contribution to overall building score	N/A
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

MATERIALS

Mat 01 Life Cycle Impacts

No. of BREEAM credits available	6	Available contribution to overall score	5.79%
No. of BREEAM innovation credits available	3	Minimum standards applicable	No

How do you wish to assess the number of BREEAM credits to be achieved for this issue?	Define the number of Mat 01 credits achieved

Assessment Criteria

Predicted total Mat01 credits achieved	2
Predicted total Mat01 points achieved	
Number of building elements assessed	
Green Guide exemplary level compliant?	No
Has IMPACT compliant software been used?	No

Total BREEAM credits achieved	2
Total contribution to overall building score	1.93%
Total BREEAM innovation credits achieved	0
Minimum standard(s) level	N/A

Comments/notes:

1. Full Specification of Construction Elements has to be provided. It is anticipated that 2 credits will be achieved.

Mat 02 Hard Landscaping and Boundary Protection

No. of BREEAM credits available	1	Available contribution to overall score	0.96%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will ≥80% of all external hard landscaping and boundary protection achieve a Green Guide A or A+ rating?	Yes	1	1

Total BREEAM credits achieved	1
Total contribution to overall building score	0.96%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1. Credit to be assessed upon issue of Hard Landscaping and boundary protection drawing showing that 80% of all external and hard landscaping to have a Green guide rating of A or above.

Mat 03 Responsible Sourcing

No. of BREEAM credits available	4	Available contribution to overall score	3.86%
No. of BREEAM innovation credits available	1	Minimum standards applicable	Yes

Assessment Criteria	Compliant	Credits available	Credits achieved
All timber and timber based products are 'Legally harvested and trader timber'	Yes		
Is there a documented sustainable procurement plan?	Yes	1	1
Percentage of available responsible sourcing of materials points achieved	36.00%	3	2

Please confirm the route used to assess Mat03	Route 2: Proportion of materials responsibly sourced

Total BREEAM credits achieved	3
Total contribution to overall building score	2.89%
Total BREEAM innovation credits achieved	0
Minimum standard(s) level	Outstanding level

Comments/notes:

1.All timber used on the project will be sourced in accordance with the UK Government's Timber Procurement Policy.
2. Each of the applicable specified materials will be assigned a responsible sourcing tier and awarded credit. To achieve this credit the client needs to purchase materials from EMS/BES certified manufacturers.
3. The principal contractor will source materials for the project in accordance with a documented sustainable procurement plan

Mat 04 Insulation

No. of BREEAM credits available	1	Available contribution to overall score	0.96%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria		Credits available	Credits achieved	
What is the building's targeted insulating index?	2.50	1	1	Note: An insulatio

Total BREEAM credits achieved	1
Total contribution to overall building score	0.96%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1. The Green Guide rating for the insulation materials will be provided to achieve 1 credit and tge target insulation index will be greater than 2.5.

Mat 05 Designing for durability and resilience

No. of BREEAM credits available	1	Available contribution to overall score	0.96%
No. of BREEAM innovation credits available	0	Minimum standards applicable	N/A

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will suitable durability/protection measures be specified and installed to vulnerable areas of the building?	No	1	0
Will suitable durability/protection measures be specified and installed to exposed parts of the building?	No		

Total BREEAM credits achieved	0
Total contribution to overall building score	0.00%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

This credit is not sought

Mat 06 Material efficiency

No. of BREEAM credits available	1	Available contribution to overall score	0.96%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will material efficiency measures be identified & implemented during all RIBA stages?	No	1	0

Total BREEAM credits achieved	0
Total contribution to overall building score	0.00%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

This credit is not sought

WASTE

Wst 01 Construction Waste Management

No. of BREEAM credits available	4	Available contribution to overall score	4.25%
No. of BREEAM innovation credits available	1	Minimum standards applicable	Yes

How do you wish to assess the number of BREEAM credits to be achieved for this issue?	Define a target number of BREEAM credits

Select the number of BREEAM credits being targeted for issue Wst 01:	3	BREEAM Wst01 Innovation credits:	

Assessment Criteria	Compliant?
Construction resource management plan	
Compliant Pre-demolition audit	
Does the excavation waste meet the exemplary level requirements?	

Key Performance Indicators - Construction Waste

Measure/units for the data being reported		
Non-hazardous construction waste (excluding demolition/excavation)		
Total non-hazardous construction waste generated		Note: At the pre-assessment stage this
Non-hazardous non-demolition const. waste diverted from landfill		Note: At this stage this will be a target l
Total non-hazardous non-demolition const. waste diverted from landfill		Note: At the pre-assessment stage this
Total non-hazardous demolition waste generated		Note: At this stage this will be a target l
Non-hazardous demolition waste diverted from landfill		Note: At this stage this will be a target l
Total non-hazardous demolition waste to disposal		Note: At the pre-assessment stage this
Material for reuse		Note: At this stage this will be a target l
Material for recycling		Note: At this stage this will be a target l
Material for energy recovery		Note: At this stage this will be a target l
Hazardous waste to disposal		Note: At this stage this will be a target l

Total BREEAM credits achieved	3
Total contribution to overall building score	3.19%
Total BREEAM innovation credits achieved	0
Minimum standard(s) level	Outstanding level

Comments/notes:

1. The waste generated by the building's construction phase will not exceed 6.5 tonnes per 100m2 of gross internal floor area and 80% of non-hazardous non-demolition construction waste will be diverted from landfill.
2. Predomolition plan has to be prepared

Wst 02 Recycled Aggregates

No. of BREEAM credits available	1	Available contribution to overall score	1.06%
No. of BREEAM innovation credits available	1	Minimum standards applicable	No

Assessment Criteria	Total
What is the target total % of high-grade aggregate that will be recycled/secondary aggregate?	

% of high-grade aggregate that is recycled/secondary aggregate - by application

Structural frame	
Bitumen/hydraulically bound base, binder and surface courses	
Building foundations	
Concrete road surfaces	
Pipe bedding	
Granular fill and capping	

Total BREEAM credits achieved	0
Total contribution to overall building score	0.00%
Total BREEAM innovation credits achieved	0
Minimum standard(s) level	N/A

Comments/notes:

This credit is not sought.

Wst 03 Operational Waste

No. of BREEAM credits available	1	Available contribution to overall score	1.06%
No. of BREEAM innovation credits available	0	Minimum standards applicable	Yes

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will operational recyclable waste volumes be segregated and stored?	Yes	1	1
Will static waste compactor(s) or baler(s) be specified where appropriate?	Yes		
Will vessel(s) for composting suitable organic waste where appropriate?	Yes		

Total BREEAM credits achieved	1
Total contribution to overall building score	1.06%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	Outstanding level

Comments/notes:

1. One credit will be achieved by providing at least 2m2 per 1000 m2 of net floor area of storage space for recyclable materials. This dedicated space will be clearly labelled and accessible to building occupants.
2. Identify if there will be a consistent generation in volume of the operational waste streams as packaging or compostable waste.

Wst 04 Speculative Floor and Ceiling Finishes

Assessment issue not applicable

No. of BREEAM credits available	N/A	Available contribution to overall score	N/A
No. of BREEAM innovation credits available	N/A	Minimum standards applicable	N/A

Assessment Criteria	Compliant?	Credits available	Credits achieved

Total BREEAM credits achieved	N/A
Total contribution to overall building score	N/A
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

Wst 05 Adaption to climate change

No. of BREEAM credits available	1	Available contribution to overall score	1.06%
No. of BREEAM innovation credits available	1	Minimum standards applicable	N/A

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will a climate change adaptation strategy appraisal for structural and fabric resilience be conducted by the end of Concept Design (RIBA Stage 2 or equivalent)?	No	1	0
Will emexplary level criteria – Responding to adaptation to climate change be met?	No	1	0

Total BREEAM credits achieved	0
Total contribution to overall building score	0.00%
Total BREEAM innovation credits achieved	0
Minimum standard(s) level	N/A

Comments/notes:

This credit is not sought.

Wst 06 Functional adaptability

No. of BREEAM credits available	1	Available contribution to overall score	1.06%
No. of BREEAM innovation credits available	0	Minimum standards applicable	N/A

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will a building specific functional adaptation strategy appraisal be conducted by Concept Design (RIBA Stage 2 or equivalent) and will functional adaptation measures be implemented?	No	1	0

Total BREEAM credits achieved	0
Total contribution to overall building score	0.00%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

This credit is not sought.

LAND USE & ECOLOGY

LE 01 Site Selection

No. of BREEAM credits available	2	Available contribution to overall score	2.00%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will at least 75% of the proposed development's footprint be located on previously occupied land?	Yes	1	1
Is the site deemed to be significantly contaminated?	No	1	0

Total BREEAM credits achieved	1
Total contribution to overall building score	1.00%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1. Development foot print is located on previously developed land (a proper photographic evidence is required)

LE 02 Ecological Value of Site and Protection of Ecological Features

No. of BREEAM credits available	2	Available contribution to overall score	2.00%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Can the land within the construction zone be defined as 'land of low ecological value'?	Yes	1	1
Will all features of ecological value surrounding the construction zone/site boundary be protected?	Yes	1	1

Total BREEAM credits achieved	2
Total contribution to overall building score	2.00%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1. Land within the construction zone will be defined ass 'land of low ecological value'
2. All existing features of ecological value surrounding the construction zone and site boundary area will be adequately protected from damage during clearance, site preparation and construction activities

LE 03 Mitigating Ecological Impact

No. of BREEAM credits available	2	Available contribution to overall score	2.00%
No. of BREEAM innovation credits available	0	Minimum standards applicable	Yes

Assessment Criteria

What is the likely change in ecological value as a result of the sites development?	≥0 species (i.e. no negative change)	Plant species richn

Total BREEAM credits achieved	2
Total contribution to overall building score	2.00%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	Outstanding level

Comments/notes:

1. It is anticipated that ecological value will not change.

LE 04 Enhancing Site Ecology

No. of BREEAM credits available	2	Available contribution to overall score	2.00%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will a suitably qualified ecologist be appointed to report on enhancing and protecting site ecology?	No	2	0
Will the suitably qualified ecologist's general recommendations be implemented?			
What is the targeted/intended improvement in ecological value as a result of enhancement actions?			

Total BREEAM credits achieved	0
Total contribution to overall building score	0.00%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

This credit is not sought

LE 05 Long Term Impact on Biodiversity

No. of BREEAM credits available	2	Available contribution to overall score	2.00%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will a Suitably Qualified Ecologist be appointed to monitor/minimise impacts of site activities on biodiversity?	No	2	0
Will a landscape and habitat management plan be produced covering at least the first five years after project completion in accordance with British Standards?			
Number of applicable measures to improve biodiversity confirmed by SQE:			
Number of applicable measures implemented:			

Total BREEAM credits achieved	0
Total contribution to overall building score	0.00%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

This credit is not sought.

POLLUTION

Pol 01 Impact of Refrigerants

No. of BREEAM credits available	3	Available contribution to overall score	2.31%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria		Credits available	Credits achieved
Refrigerant containing systems installed in the assessed building?	No	3	3
Do all systems (with electric compressors) comply with the requirements of BS EN 378:2008 (parts 2 & 3) & where refrigeration systems containing ammonia are installed, the IoR Ammonia Refrigeration Systems Code of Practice?			
Global Warming Potential of the specified refrigerant(s) 10 or less?			
What is the target range Direct Effect Life Cycle CO2eq. emissions for the system?		kgCO2eq/kW coolth capacity	
Cooling/Heating capacity of the system		kW	
Will a refrigerant leak detection and containment system be specified/installed?		0	0

Total BREEAM credits achieved	3
Total contribution to overall building score	2.31%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1. There will not be any cooling system in the building.

Pol 02 NO_x Emissions

No. of BREEAM credits available	3	Available contribution to overall score	0.00%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria

NO_x emission level - space heating	150.00	mg/kWh
NOx emission level - water heating	150.00	mg/kWh
Does this building meet BREEAM's definition of a highly insulated building?	N/A	
Energy consumption: heating and hot water	N/A	kWh/m2/yr

Total BREEAM credits achieved	0
Total contribution to overall building score	0.00%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

This credit is not sought.

Pol 03 Surface Water Run off

No. of BREEAM credits available	5	Available contribution to overall score	3.85%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
What is the actual/likely annual probability of flooding for the assessed site?	Low	2	2
Will a Flood Risk Assessment be undertaken?	Yes		
Will the site meet the BREEAM criteria for peak rate surface water run off?	Yes	1	1
Will the site meet the criteria for surface water run off volume, attenuation and/or limiting discharge?	Yes	1	1
Will the site be designed to minimise watercourse pollution in accordance with the BREEAM criteria?	No	1	0

Total BREEAM credits achieved	4
Total contribution to overall building score	3.08%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1. According to the FRA the development is located in zone 1 and FRA will be undertaken.
2. A proper consultant to confirm:
-that the peak rate of run-off from the site to the water courses is no greater than pre-development run-off.
-that the post development run-off volume, over the development lifetime, is no greater than it would have been prior to the assessed site's development.

Pol 04 Reduction of Night Time Light Pollution

No. of BREEAM credits available	1	Available contribution to overall score	0.77%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Will the external lighting specification be designed to reduce light pollution?	Yes	1	1

Total BREEAM credits achieved	1
Total contribution to overall building score	0.77%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1. The external lighting strategy has been designed in compliance with Table 2 of the ILP Guidance notes for the reduction of obtrusive light, 2011.
2. All external lighting will be automatically switched off between 23:00 hr and 07:00 hr. This will be achieved by providing a timer.
3. If safety or security lighting is provided and will be used between 23:00 hr and 07:00 hr, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP's Guidance notes.
4. As the external lighting will be specified and installed by the developer and not the future tenant, the Use of a tenancy lease agreement between the developer and tenant/s will not need to cover this issue.

Pol 05 Noise Attenuation

No. of BREEAM credits available	1	Available contribution to overall score	0.77%
No. of BREEAM innovation credits available	0	Minimum standards applicable	No

Assessment Criteria	Compliant	Credits available	Credits achieved
Will there be noise-sensitive areas/buildings within 800m radius of the development?	Yes	1	1
Will a noise impact assessment be carried out and, if applicable, noise attenuation measures specified?	Yes		

Total BREEAM credits achieved	1
Total contribution to overall building score	0.77%
Total BREEAM innovation credits achieved	N/A
Minimum standard(s) level	N/A

Comments/notes:

1. A noise impact assessment will be conducted in compliance with BS 7445. It will cover the following items: Existing background noise levels at the nearest or most exposed noise-sensitive development to the proposed development / The rating noise level resulting from the new noise-source.
2. The noise impact assessment will be carried out by a Suitably Qualified Acoustician consultant holding a recognised acoustic qualification and membership of an appropriate professional body.
3. The noise level from the proposed site/building, as measured in the locality of the nearest or most exposed noise-sensitive development, is a difference no greater than +5dB during the day (07:00 hr to 23:00 hr) and +3dB at night (23:00 hr to 07:00 hr) compared to the background noise level.

OR

Where the noise source(s) from the proposed site/building is greater than +5dB, measures will be installed to attenuate the noise at its source to a level where it will comply with the above criteria.

INNOVATION

Inn 01 Innovation

No. of BREEAM innovation credits available	10	Available contribution to overall score	10.00%
		Minimum standards applicable	No

Assessment Criteria	Compliant?	Credits available	Credits achieved
Man 03 Responsible construction practices	Yes	1	1
Man 05 Aftercare	Yes	1	1
Hea 01 Visual Comfort	No	1	0
Hea 02 Indoor Air Quality	No	2	0
Ene 01 Reduction of energy use and carbon emissions	No	5	0
Wat 01 Water Consumption	No	1	0
Mat01 Life Cycle Impacts	No	3	0
Mat03 Responsible Sourcing of Materials	No	1	0
Wst01 Construction Waste Management	No	1	0
Wst02 Recycled Aggregates	No	1	0
Wst 05 Adaption to climate change	No	1	0

Number of 'approved' innovation credits achieved?	

Total BREEAM innovation credits achieved	2
Total contribution to overall building score	2.00%
Minimum standard(s) level	N/A

Comments/notes: