RIDGE

Property and Construction Consultants

Holiday Inn, Kings Cross - Extension

Sustainability Statement
London

May 2014

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Contents

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Section 1 – Executive Summary

In accordance with the London Borough of Camden Core Strategy and the Development polices, Ridge and Partners LLP has produced a Sustainability Statement to accompany the planning application for the new proposed first floor extension of the King's Cross Holiday Inn, in London.

The proposed extension consists on a new build, 26 bedrooms 4 star hotel together with circulation spaces and communal spaces.

The aim of this report is to present the assessments undertaken to demonstrate the sustainable design and construction approach for the proposed extension. Figure 2 below illustrates the works proposed for the first floor extension of the Holiday Inn, Kings Cross.

The report focuses on the following:

1. Energy assessment: In order to estimate the expected annual energy consumption for the proposed development a thermal modelling exercise using Integrated Environmental Solutions Virtual Environment (IES Ve 2013) dynamic simulation was undertaken.
   "Lean, Clean and Green" measures were investigated and modelled to estimate an annual energy consumption profile of the extension.

2. Sustainable use of materials: This section highlights the proposed building materials selection and procurement. Responsible sourcing of material has been considered as part of the design of the proposed development.

3. Water use: A water consumption assessment was carried out to set out the design philosophy to be implemented at the detailed design stages.

And

4. Sustainability assessment tool; A BREEAM New Construction Pre-assessment exercise was undertaken to assess the design of the proposed extension. This assessment was carried out to highlight the potential achievable ratings. The assessment indentifies early actions for the design team to consider to follow a sustainable design and construction process.

Key findings:

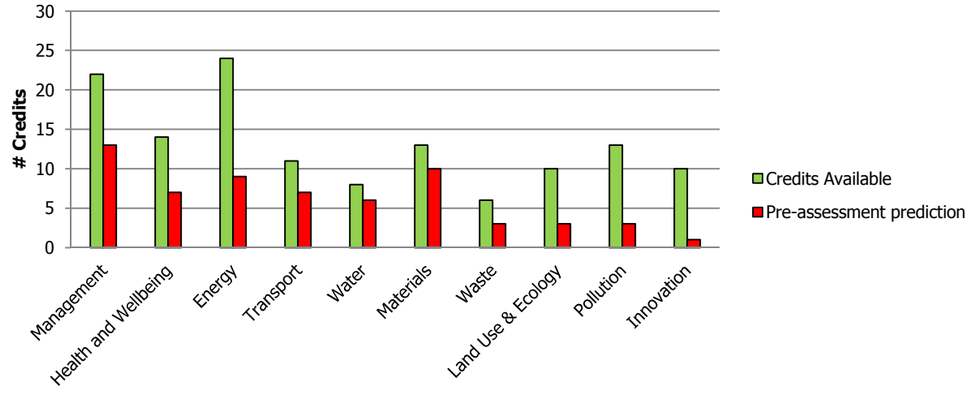
The energy assessment carried out concluded that the passive (lean) and active (clean) measures proposed for the development have a potential of reducing the annual energy consumption by approximately 9% with a 10% reduction in CO_2 emissions.

It has to be noted that the complete works proposed for the Kings Cross Holiday Inn include the complete replacement of the mechanical ventilation and cooling plant serving the ground floor areas of the existing building. These upgrades and replacement have been proposed to further reduce the operational annual energy of the building.

Note: The proposed replacement of the mechanical ventilation and cooling systems were not taken into account in the thermal model. The thermal model was used to simulate the performance of the proposed extension.

The BREEAM Pre-assessment carried out indentified the credits that can be targeted to achieve a rating of "Good". The reports have indentified limitations due to the nature of the project to achieve further credits.

The following graph shows the BREEAM Pre-assessment credit summary. A 50.98% was deemed achievable at this stage.



Section 2 – Introduction

2.1 General

Firoka Ltd appointed Ridge and Partners LLP to prepare a sustainability statement in support of the planning application for their proposed 26 room first floor extension to their Holiday Inn King Cross Hotel in London.

The proposed extension consists on a new build, 26 bedrooms 4 star hotel together with circulation spaces and communal spaces.

The proposed site is located in 1 King's Cross Rd, London WC1X 9HX:

Figure 1 below shows the location, orientation and sun-path for the proposed extension.

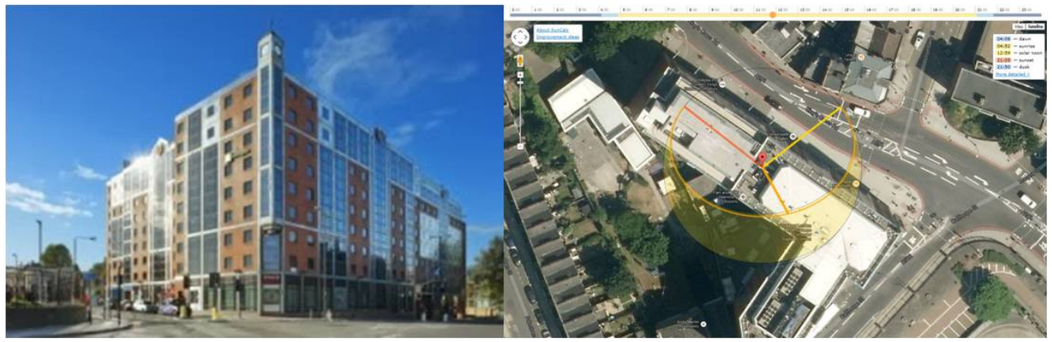


Figure 1, King's Cross Holiday Inn location (source: google and suncalc.net)

The aim of this report is to present the assessments undertaken to demonstrate the sustainable design and construction approach for the proposed extension. Figure 2 below illustrates the works proposed for the first floor extension of the Holiday Inn, Kings Cross.

The report focuses on the following:

5. Energy assessment
6. Sustainable use of materials
7. Water use

And

8. Sustainability assessment tools

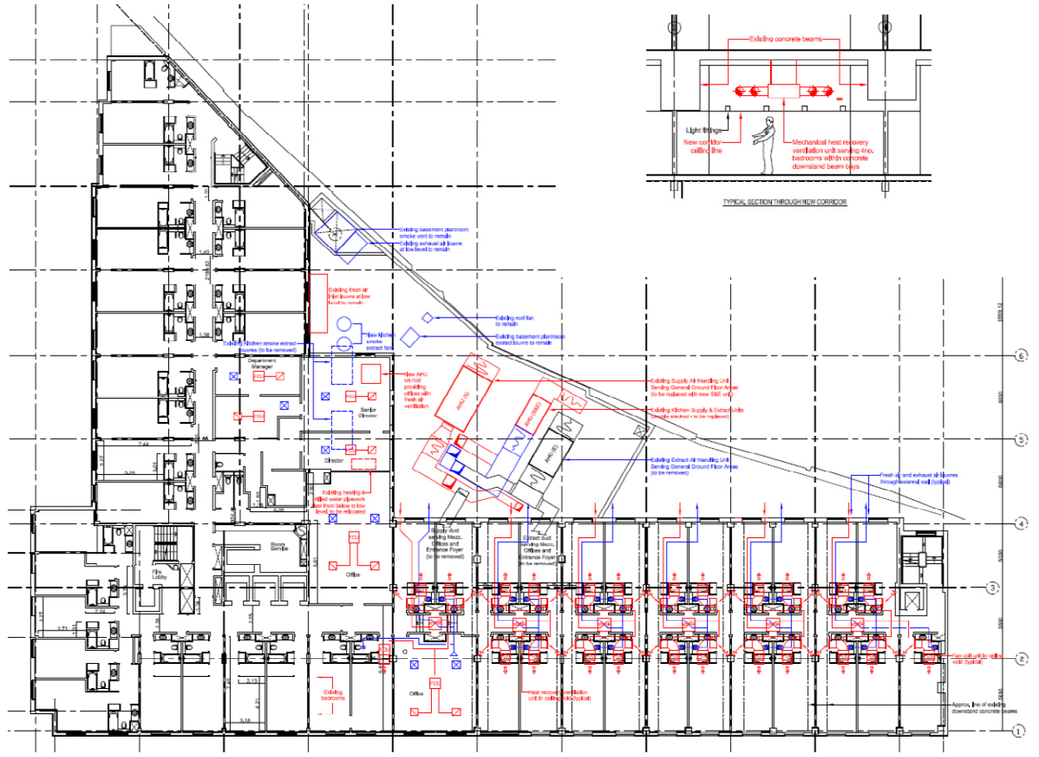


Figure 2; Holiday Inn, Kings Cross proposed extension

Section 3 – Energy Assessment

In order to estimate the expected annual energy consumption for the proposed development a thermal modelling exercise using Integrated Environmental Solutions Virtual Environment (IES Ve 2013) dynamic simulation) was undertaken. Figure 3 below shows the IES Ve 3D model built. This thermal modelling package was used to estimate the energy consumption profile of the building through Simplified Building Energy Model (SBEM, DSM) calculations. These calculations generally are used to demonstrate compliance with Part L2A of the Building Regulations.

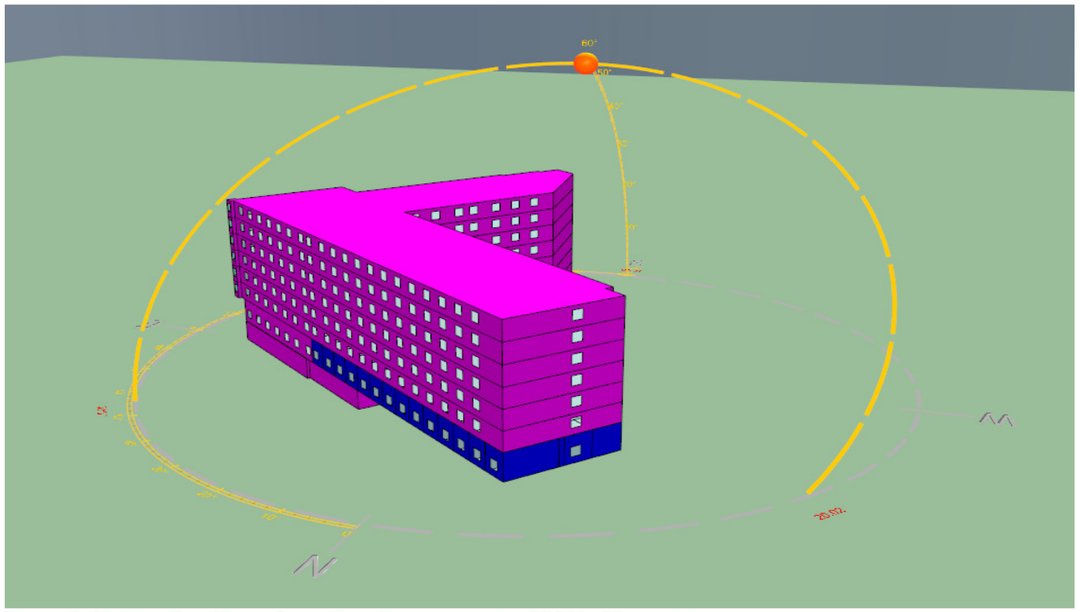


Figure 3, Holiday Inn Kings Cross first floor extension IES Ve 3D model

To achieve a truly low-carbon building the most effective approach to reduce operational energy use should follow the low carbon design principles as described in Chartered Institution of Building Services Engineers (CIBSE) Guide L Sustainability 2007. The following steps describe CIBSEs principles:

I. Focus on understating the energy use of the building
II. Evaluate the buildings location, orientation, fabric thermal performance and operation to determine measures to reduce the energy requirements of the building (Passive design measures: Lean).
III. Improve the efficiency of fixed building services (Boiler plant, light fittings etc) to meet the energy demand in the most effective way possible (Active design measures: Clean).
IV. Study the feasibility of implementing Low Zero Carbon (LZC) technologies to further reduce the CO_2 emissions associated with the energy use of the building studied (Green).

The Energy Hierarchy diagram in Figure 4 below illustrates the "Lean, Clean and Green" methodology.

Note: Part L2A calculations require the use of NCM templates. These set a large proportion of the design criteria (Occupancy profiles, heating and cooling set points and mechanical ventilation rates). Therefore the predicted annual energy consumption and carbon dioxide emissions in these calculations may vary from the actual energy consumption of the proposed building.

The IES Ve thermal model built for the proposed building takes into account the following:

1. Building geometry, location and orientation
2. Buildings fabric thermal performance
3. Building services strategy
4. Environmental conditions (this includes solar irradiation, wind, and external temperatures)
5. Internal heat gains (occupants, computers, lighting and miscellaneous small power (NCM templates used)
6. Domestic Hot water DHW consumption

3.1 Methodology

The following steps describe the method used to assess the energy reduction potential the "Lean, Clean and Green" methodology offer and evaluate the potential impact energy efficiency measures could have if implemented in the proposed first floor extension.

a) Construction of a base model to determine a base point from which to assess potential energy efficiency measures
b) Construction of a model implementing "Lean and Clean" measures (Energy Efficiency) to quantify the energy reduction potential of these measures.
c) Assessment of the technical suitability of LZC technologies
d) Energy iterations to investigate which strategies offer the best suitable possible solution

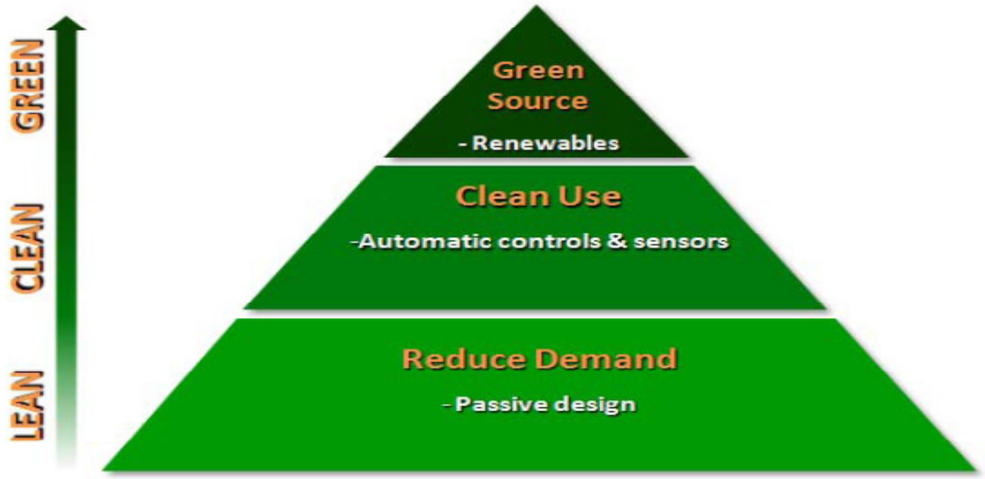


Figure 4, Energy Hierarchy

3.2 Base Model

A 3D model for the proposed first floor extension of the King's Cross Holiday Inn was built in IESVe 2013 (see Figure 3 above). The model built was based on the following architectural layout and elevation drawings developed by Michael Gallagher Architects.

Ground Floor Plan as Existing	- 21013 GA - 01
First Floor Plan as Existing	- 21013 GA - 02
Typical Floor Plan as Existing	- 21013 GA - 03
Section A as Existing	- 21013 GA - 04
Option 2 / First Floor Plan	- 21013 GA - 12
Section B as Proposed	- 21013 GA - 14
Section C as Existing & Proposed	- 21013 GA - 15
Existing and Proposed front elevations	- 21013 GA - 16
Existing and Proposed rear elevations	- 21013 GA - 17

Thermal and energy profiles were then developed implementing minimum efficiency performance standards in line with Building Regulations Part L 2014, the Non-domestic building services compliance guide 2014 Edition and National Calculation Methodology (NCM) templates and systems. These profiles where assigned to the IES Ve 3D model built.

It has to be noted that the proposed building services strategy will use the existing gas fired boiler and chillers systems to serve the space heating, domestic hot water and cooling requirements for the proposed extension. This has been included in the thermal modelling analysis carried out.

The efficiency of the existing natural gas fired boiler was based on the following:

Heating Nominal efficiency of 80% based on 3 No Kayanson Fire tube Boilers 1106kW

The efficiency of the existing chillers was based on the following:

Cooling nominal efficiency of 2.88 based on 2 No York Chillers model YCIV0770PA50

Part L2A compliance calculations (DSM Simulations) where then carried out to determine the annual energy consumption of the building. The results estimate a Base annual energy consumption profile for comparison.

The following are the main energy performance standards modelled:

Assumed Efficiencies:

Applicable external fabric thermal efficiency and air permeability

Building Fabric Element	**U-value (W/m^2.K)**
Walls	0.35
Floors	0.25
Windows/Doors	2.2
Air Permeability	10 m^3/m^2.hr

Table 1, Base Model Fabric Efficiency

Space Heating
NCM System: Fan Coil Unit System
Fuel: Natural Gas
Heat Source: Low Temperature Hot Water (LTHW) Boiler
Efficiency: 80%
Pump type: Constant Speed

Comfort Cooling
NCM System: Fan Coil Unit System
Fuel: Electricity
Cooling Source: Chilled Water
System: Package Air Cooled Chillers
Energy Efficiency Ratio: 2.88
Pump type: Constant Speed

Ventilation in bedrooms and office spaces
Centralised Balanced Mechanical Ventilation with Heat recovery
Heat recovery efficiency: Plate Heat exchanger 50%

Power Correction factor
Power correction factor: <0.9

Lighting
General lighting: 55 Lumens per circuit watt
Display lighting lamp efficacy: 22 lumens per circuit watt

Lighting Controls
Switches (for bedrooms, stores, meeting rooms, offices and staff rooms)
Automatic on and off controls (all communal areas)

Metering provided with no "out of range" values (No facility to warn when consumption falls out normal consumption values).

3.3 Energy Efficiency

In order to reduce the energy demand in the proposed development the following options have been identified as potential energy efficiency measures:

a) Improve fabric thermal performance
b) Increase level of air tightness to better the air permeability rate in the building
c) Improved heat recovery efficiency
d) Incorporate variable speed drives
e) Improve lighting design efficiency
f) Include natural daylight photoelectric sensing controls
g) Occupant sensing for extract ventilation systems
h) Incorporate improved system efficiencies for the space heating, comfort cooling and domestic hot water services

Energy efficiency measures shown below were studied to calculate the resulting reduction in annual energy consumption. Thermal and energy profiles where created in IES Ve. These were then assigned to the thermal model and Part L2A dynamic simulations were carried out to test the effectiveness of the potential energy efficiency measures.

Efficiency measures:

External fabric thermal efficiency and air permeability

Building Fabric Element	**U-value ($W/m^2.K$)**
Walls	0.20
Floors	0.20
Windows	1.61
Air Permeability	5 $m^3/m^2.hr$

Table 2, Energy efficiency fabric efficiency

Space Heating
NCM System: Fan Coil Unit System
Fuel: Natural Gas
Heat Source: Low Temperature Hot Water (LTHW) Boiler
Efficiency: 80%
Pump type: Constant Speed

Comfort Cooling
NCM System: Fan Coil Unit System
Fuel: Electricity
Cooling Source: Chilled Water
System: Package Air Cooled Chillers
Energy Efficiency Ratio: 2.88
Pump type: Constant Speed

Ventilation in bedrooms and office spaces
Centralised Balanced Mechanical Ventilation with Heat recovery
Heat recovery efficiency: Plate Heat exchanger 65%

Power Correction factor
Power correction factor: < 0.9

Lighting
General lighting: 65 Lumens per circuit watt
Display lighting lamp efficacy: 22 lumens per circuit watt

Lighting Controls
Switches with absence detection (for bedrooms, stores, meeting rooms, offices and staff rooms).

Metering provided with "out of range" values

3.4 Energy consumption assessment

The compliance energy modelling carried out calculated annual energy consumption based on building areas, energy efficiency ratios of building services and type of building through the UK government NCM and SBEM methodologies. This calculation methodology evaluates the Carbon Dioxide (CO_2) emissions of the proposed building taking into account regulated energy only.

Graph 1 below show the energy consumption results modelled. The implementation of the Energy Efficiency measures suggested an annual energy use reduction of around 33MWh which represents a 9% improvement of the overall energy consumption.

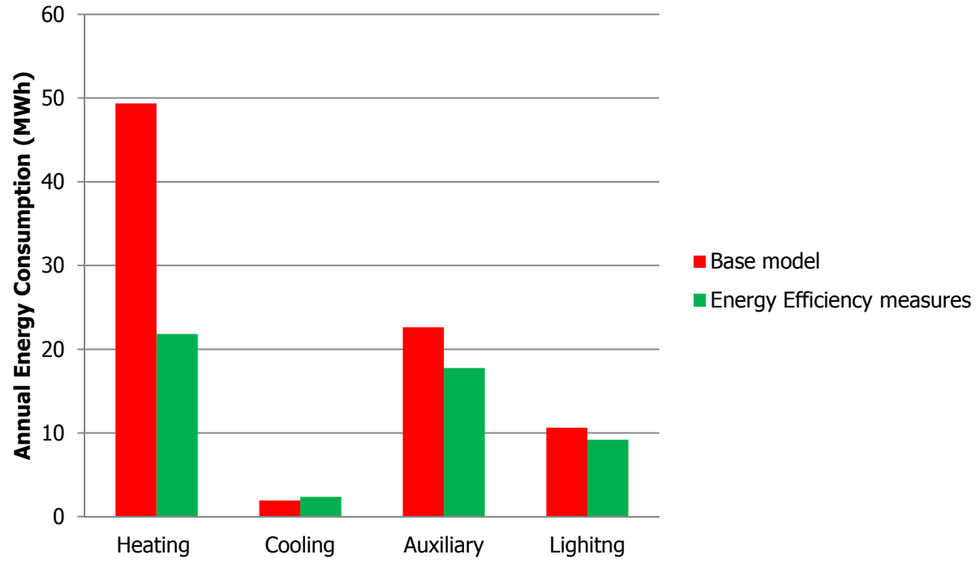
The compliance documents for both cases are attached in appendix 2. Please note that the results of this simulation are based on a set of assumptions and information provided by others as detailed in the previous section.

Energy Consumption by end use			
	kWh/m²	**kWh**	**MWh**
Heating	57.71	49,371	49
Cooling	2.25	1,925	2
Auxiliary	26.44	22,619	23
Lighting	12.4	10,608	11
DHW	339.32	290,288	290
Equipment	17.65	15,100	15
	$kgCO_2/m^2$	**$kgCO_2$**	**tCO_2**
CO2 emissions BER	99.9	85,464	85

Table 3, annual energy consumption by end use (base model)

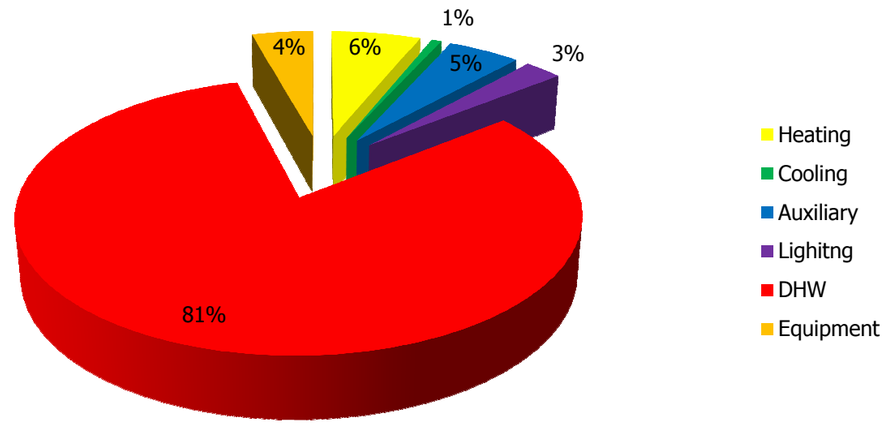
Energy Consumption by end use			
	kWh/m²	**kWh**	**MWh**
Heating	25.51	21,824	22
Cooling	2.78	2,378	2
Auxiliary	20.76	17,760	18
Lighting	10.75	9,197	9
DHW	339.32	290,288	290
Equipment	17.65	15,100	15
	$kgCO_2/m^2$	**$kgCO_2$**	**tCO_2**
CO2 emissions BER	90	76,995	77

Table 4, annual energy consumption by end use (energy efficiency model)

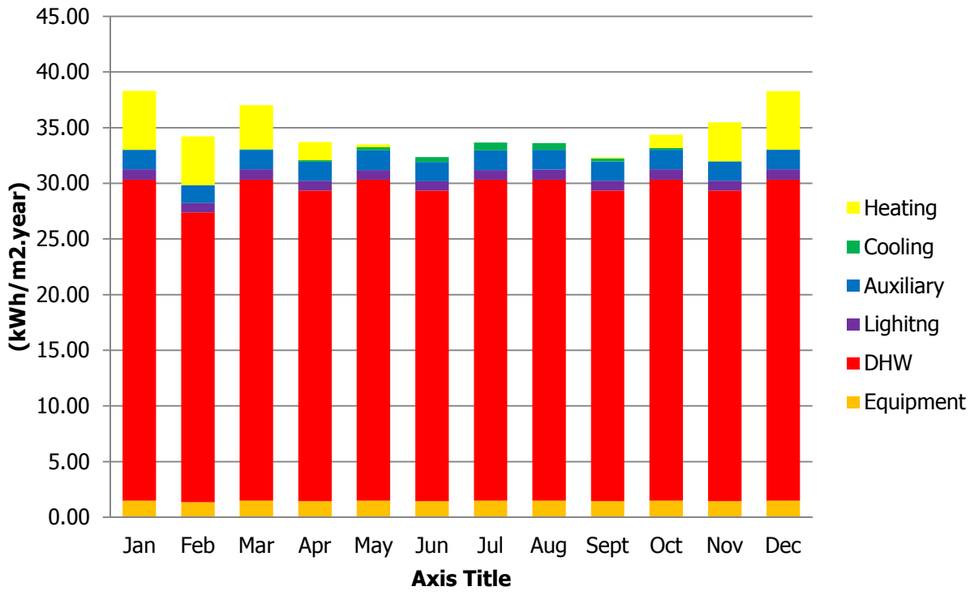


Graph 1, annual energy performance

Energy Consumption by end use



Graph 2, modelled energy consumption for the proposed extension



Graph 3, annual energy breakdown for the proposed extension

The NCM methodology dictates most of the buildings demand and consumption profiles taken into account on the DHW calculation therefore these results cannot be modify to suit a proposed/designed occupancy or demand strategy.

Graph 2 and Graph 3 above show the DHW annual consumption to be the highest among all other services throughout the year.

The building services strategy proposed for the first floor extension of the King's Cross Holiday Inn has been selected to minimize the use of energy. The heating and comfort cooling requirements are to be served by the existing boiler and chiller systems. The energy and CO2 reduction potential savings will come through the improvement of efficiencies of the proposed kit to distribute the space heating, DHW, cooling and lighting.

As part of the energy strategy for the proposed extension, the design will include a total replacement of cooling and ventilation equipment serving the ground floor of the King's Cross Holiday Inn. The main aim of these works is to improve the annual operational energy consumption of the building.

Section 4 – Sustainable use of Materials

4.1 Material Specification

Specification, where possible, will prioritise the use of natural materials or materials with high recycled content. All products and systems will achieve a 'Green guide to Specification' A+ to A rating. Within the Green Guide, materials and components are assessed in terms of their environmental impacts, within comparable specifications, across their entire life cycles. Specification will make a preference for materials that are manufactured to proven environmental standards – ISO 14001 or similar equivalents.

4.2 Indoor comfort

Natural day-lighting and the indoor air quality are important internal factors in the success of this development. Where possible the use of breathable/hygroscopic materials will be used to help maintain a high quality internal environment. A whole building heat recovery ventilation system will be installed to ventilate the internal occupied spaces..

4.3 Timber procurement

All timbers used as primary structural elements will be required to Forest Stewardship Council (FSC) certified. All sheathing/lining boards and timber doors will also be specified to be FSC certified.

Specification of Hardwoods for use in the internal furnishings will pay careful attention to avoid the use of threatened/exotic imported species where these are most likely to be taken from un-managed forests and unsustainable sources.

4.4 Environmental Management Systems

It is proposed that the principal contractor demonstrate their Environmental Management Record. This will form part of the selection criteria. Use of the Green Guide to Specification in the development of the works specification will ensure that suppliers are suitable as this is factored into the assessment of the systems.

4.5 Demolition

The re-use of the existing buildings that are proposed to be demolished has been considered. The waste generated from the demolition of the existing buildings will where possible be retained and re-used on site. Any waste that cannot be recycled will be removed in accordance with a site waste management plan.

4.6 Construction Waste Management

Construction works will require a Site Waste Management Plan to be in place. This will be required to cover any site clearance works on the site. An audit of any enabling works will be required to be carried out to identify the materials to be released and their potential future uses and form the basis of a strategy for the handling of waste.

The construction specification will place preference, when options are available, on the use materials with a high recycled content. As previously described, specification of concretes for example will be required to use high content of recycled aggregates and where possible include GGBS in place of cement. Metals used in the construction will also be sought based on optimum recycled content – steel frames, window frames etc.

Sustainability Statement

Whilst the regulation requiring projects of this size to have a Site Waste Management Plan (SWMP) in place throughout the works was scrapped in Dec 2013, any contractor constructing these works will be required to implement a SWMP. Contractors will be required to record on the plan the identity of the person removing the waste, the waste carrier registration number of the waste carrier and a copy of, or reference to, the written description of the waste.

The plan will be regularly updated and record the types and quantities of waste that are:

I. re-used (and whether on or off-site)
II. re-cycled (and whether on or off-site)
III. sent for another form of recovery (and whether on or off-site)
IV. sent to landfill
V. otherwise disposed of

Figures on the amount of re-use and recycling, and whether this takes place on or off-site, should be provided wherever possible.

Section 5 – Water use

5.1 Assessment

An assessment has been carried out to estimate a potential water use reduction by specifying low flush, low flow rate sanitary fittings. The BREEAM NC 2011 Wat 01 – Water Efficiency calculation methodology for Hotel Buildings was used to calculate the percentage improvement that the implementation of water efficient sanitary fittings could have. This was carried out in support of the planning application for the first floor extension to the Holiday Inn Kings Cross in London, UK.

At this stage we have not allowed for rainwater harvesting and grey water recycling.

The following assumptions have been taken into account to carry out the water efficiency calculation.

The number of sanitary fittings has been extracted from the following GA drawings of the proposed development (table 1 below shows a summary of the sanitary fittings):

Drawings reference:
Option 2 / First Floor Plan 21013/GA-12

Sanitary Component	No
WC	26
WHB	26
Urinals	0
Baths	26
Sinks	0

Table 5, Summary of sanitary fittings

Table 2 below shows the flush volumes and flow rate limits proposed to achieve approximately 40% reduction in water use, in line with BREEAM Wat01 calculator.

Component	Unit	
WC	3.75	Effective Flush volume
WHB	3.75	litres/min
Showers	4	litres/min
Baths	120	litres

Table 6, Sanitary fittings: Flush volume and flow rate summary

Table 3 below shows the current benchmark for water use for new hotel building is described in the figure below (Business or Holiday) = 25m^3per year/m^2.

	Luxury Hotel			Business or Holiday			Smaller		
	Existing	New build	Improve-ment	Existing	New build	Improve-ment	Existing	New build	Improve-ment
Energy (annual kWh/m^2 floor area)	E >150 *A	E <130*A	E >38%[1] *A						
E (electricity), G (gas)	E >200	E <90	E >40%[1]	E >140	E<80	E >42%[1]	E >120	E <80	E >33%[1]
*A (air conditioned)	G >460	G <300	G >34%[1]	G>400	G<260	G >35%[1]	G>360	G <240	G >33%[1]
Water (m^3 per annum/m^2 net area)	200-150 *P	120-65 *P	20-67%[1] *P	180-80 *P	60-25 *P	25-86%[1] *P			
**P (hotels with pools)	70-40	30-15	25-78%[1]	50-30	20-10	33-80%[1]	15-10	8-4	20-73%[1]
Material Efficiency % recycled content by value	Not available	10-20%[2]	Not available	Not available	10-20%[2]	Not available	Not available	10-20%[2]	Not available
Biodiversity	Benchmark figures not available								

Table 7, OGC Watermark project Water efficiency benchmarks

5.2 Recommendations

The specification of water efficient sanitary fittings as described above has the potential of reducing water use by approximately 25%.

The proposed development should aim to consume no more than the 25m^3 per year /m^2 of potable water. This can be achieved by good management and specification of water efficient sanitary fittings and appliances.

It is also recommended that all cold water services are metered and a linked leak detection meter is specified to determine any faults that may arise.

At this stage no rainwater harvesting or grey-water recycling has been considered.

Section 6 – Sustainability assessment tools

Camden Planning guidance states that for any 500m^2 or more non-residential development an environmental assessment is carried out using the BREEAM methodology. The following sections details the BREEAM pre-assessment for the proposed extension of the Holiday Inn in Kings Cross.

6.1 BREEAM Overview

The Building Research Establishment Environmental Assessment Method (BREEAM) is a performance based assessment method and certification scheme for new buildings. The primary aim of the BREEAM process is to mitigate the life cycle impacts of new buildings on the environment in a robust and cost effective manner. This is achieved through integration and use of the scheme by clients and their project teams at key stages in the design and procurement process. This enables the client, through the BREEAM Assessor and the BRE Global certification process, to measure, evaluate and reflect the performance of their building against best practice in an independent and robust manner. This performance is quantified by a number of individual measures and associated criteria stretching across a range of environmental issues which is ultimately expressed as a single certified BREEAM rating.

The potential BREEAM ratings for a building are as shown below:-

Rating	Percentage Score	Equivalent performance
Outstanding	>85	Less than 1% of UK new non-domestic buildings
Excellent	>70	Top 10% of UK new non-domestic buildings
Very Good	>55	Top 25% of UK new non-domestic buildings
Good	>45	Top 50% of UK new non-domestic buildings
Pass	>30	Top 75% of UK new non-domestic buildings
Unclassified	<30	Failed to met minimum BREEAM criteria

Table 8, BREEAM ratings Benchmarks

In order to achieve a BREEAM rating for a building, the client must appoint an independent person, accredited by the BRE, to act as an assessor. The assessor will work with the client to:-

1. Provide a Pre-assessment of the rating which is likely to be achieved by the building.
2. Register the project with the Building Research Establishment (BRE) who administers the scheme.
3. Collate information provided by the client and the contractor and prepare a design stage report for submission to the BRE.
4. Visit the completed site and collate photographic and other evidence to show that the building has been built to incorporate those features that were agreed as part of the design stage assessment. The evidence is compiled into a final report for submission to the BRE who will issue a certificate to confirm the building's final rating.

Both the design stage and the completion reports are assessed by the BRE in order to confirm that the evidence has been provided in the format and to the level of detail required by the BRE.
The table below provides a useful comparison of the RIBA outline plan of work with the BREEAM assessment stages. The columns shown gold are the stages within which information is gained and collated, those shown green are the stages wherein the project reports are issued to the BRE for approval.
It should be noted that typically approximately 6 weeks are required for the BRE to consider the evidence provided in both the Design stage and the Post Construction reports.

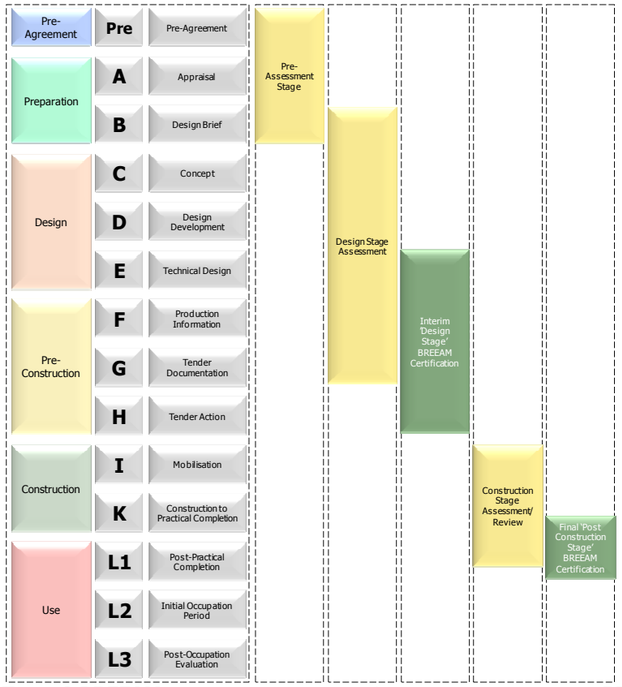


Table 9 BREEAM assessment and certification stages and the RIBA Outline Plan of Works

On completion of a compliant Post Construction report, the BRE will issue to the client a certificate confirming the BRREAM rating for the building, the details of which will also be listed on GreenBook Live (www.greenbooklive.com).

6.2 BREEAM NC 2011 Scheme Classification

The proposed development consists of the following buildings:

26 bedroom extension to an existing hotel in central london.

The project will be classed as: New Construction (Fully fitted) Residential Institution – Hotel.

Note: A new version of BREEAM is due to be launch in late spring 2014. Please note that the assessment will have some change but will still follow the same process as described above. Appendix 4 shows the proposed new sections and describes key differences between the assessments.

6.3 Credit assessment

A preliminary BREEAM New Construction (NC) 2011 Pre-assessment was carried out using the BREEAM Pre-assessment calculator V2.61 to evaluate the proposed Retail Unit buildings environmental performance.

The following information was used to start the BREEAM NC 2011 Pre-assessment
Building Name: First Floor Extension Holiday Inn, Kings Cross
Building type: Hotel
Project type: New Construction (fully fitted)

The same pre-assessment exercise can be carried out for the proposed first floor extension for the Holiday Inn, Kings Cross. This report will look at one building only but will highlight the actions that can be followed for the procurement, design and construction of all the proposed development. The BREEAM NC 2011 Pre-assessment calculator is attached in Appendix 3.

Please note that it is not a formal Design Stage assessment which will follow during detailed design stage of the project. This report provides guidance to achieve a Very Good rating, and in particular on:

1. The mandatory credits that are required to achieve a BREEAM Good rating.
2. The early action credits that should be considered at the earliest possible stage of the project.
3. The requirements for specialist consultants.
4. The actions and responsibilities required from the main contractor.
5. Design Team responsibilities

The BREEAM New Construction reference manual (version 3.4) should be referred to for full guidance on compliance with each credit and the items of evidence required by the Assessor.

Note: The score is currently an accurate estimate; the final score may change if the design or processes are amended by others in a way that prevents the award of the currently identified credits.

6.4 BREEAM NC 2011 Pre-assessment

The credits identified to allow the project to achieve a BREEAM Very Good rating are shown in Table 10 below

BREEAM SECTION CREDIT REFERENCE	Credits Available	Pre-assessment prediction
Management		
Man 1 - Sustainable Procurement	8	5
Man 2 - Responsible Construction Practices	2	2
Man 3 - Construction Site Impacts	5	4
Man 4 - Stakeholder Participation	4	2
Man 5 - Life cycle cost and Service life plan	3	0
Total Section	22	13
Health and Wellbeing		
Hea 1 - Visual Comfort	3	3
Hea 2 - Indoor Air Quality	4	1
Hea 3 - Thermal Comfort	2	2
Hea 4 - Water Quality	1	0
Hea 5 - Acoustic Performance	2	1
Hea 6 - Safety and security	2	0
Total Section	14	7
Energy		
Ene 1 - Reduction of CO_2 emissions	15	4
Ene 2 - Energy Monitoring	1	1
Ene 3 - External Lighting	1	1
Ene 4 - Low or Zero Carbon Technologies	5	1
Ene 8 - Energy Efficient Equipment	2	2
Total Section	24	9
Transport		
Tra 1 - Public Transport Accessibility	5	5
Tra 2 - Proximity to amenities	1	1
Tra 3 - Cyclist Facilities	2	0
Tra 4 - Maximum Car Parking Capacity	2	0
Tra 5 - Travel Plan	1	1
Total Section	11	7
Water		
Wat 1 - Water Consumption	5	3
Wat 2 - Water Monitoring	1	1
Wat 3 - Water leak detection and prevention	2	2
Wat 4 - Water Efficient equipment	0	0
Total Section	8	6
Materials		
Mat 1 - Life cycle impacts	6	5
Mat 2 - Hard Landscape & Boundary Protect	1	0
Mat 3 - Responsible Sourcing of Materials	3	2
Mat 4 - Insulation	2	2
Mat 5 - Designing for Robustness	1	1
Total Section	13	10

Waste		
Wst 1 - Construction Waste Management	4	3
Wst 2 - Recycled Aggregates	1	0
Wst 3 - Operational Waste	1	0
Total Section	6	3
Land Use & Ecology		
LE 1 - Site selection	2	1
LE 2 - Ecological value of site	1	0
LE 3 - Mitigating Ecological Impact	2	2
LE 4 - Enhancing Site Ecology	3	0
LE 5 - Long term impact on Biodiversity	2	0
Total Section	10	3
Pollution		
Pol 1 - Impact of Refrigerants	3	0
Pol 2 - NO_x Emissions from Heating Source	3	1
Pol 3 - Surface water run off	5	0
Pol 4 - Reduction of Night Time Light Pollut'n	1	1
Pol 5 - Noise Attenuation	1	1
Total Section	13	3
Innovation		
Inn 1 - Innovation (Man 1)	10	1
Total Section	10	1

Table 10, Pre-assessment credit prediction (Mandatory Criteria highlighted in green)

BREEAM Section	Credits Available	Pre-assessment prediction	% of Credits Achieved	Section Weighting	Section Score
Management	22	13	59.09%	0.12	7.09%
Health and Wellbeing	14	7	50.00%	0.15	7.50%
Energy	24	9	37.50%	0.19	7.13%
Transport	11	7	63.64%	0.08	5.09%
Water	8	6	75.00%	0.06	4.50%
Materials	13	10	76.92%	0.125	9.62%
Waste	6	3	50.00%	0.075	3.75%
Land Use & Ecology	10	3	30.00%	0.1	3.00%
Pollution	13	3	23.08%	0.1	2.31%
Innovation	10	1	10.00%	0.1	1.00%
BREEAM Pre-Assessment total Score		**50.98%**			

Table 11, First Floor Extension Holiday Inn, Kings Cross; BREEAM NC 2011 pre assessment summary rating

6.5 Mandatory Criteria

Whilst most BREEAM credits are tradable and can be targeted in various configurations to achieve the required overall score, some credits are mandatory to achieve certain BREEAM ratings. To achieve a BREEAM Good rating the following credits must be achieved, in addition to achieving a score of >45% overall. Table 5 below highlights the mandatory requirements to achieve a "Good" rating.

Man 01 Sustainable Procurement: One credit under this section must to be achieved. Generally the main contractor, the mechanical design engineer and stakeholders are responsible for the issues cover under Man 01.

Hea 01 Visual Comfort: Criteria 1 (*All fluorescent and compact fluorescent lamps are fitted with high frequency ballasts*) needs to be achieved. Generally the electrical/lighting design engineer is responsible for the specification of all light fittings.

Hea 04 Water Quality: Criteria 1 (*1. All water systems in the building are designed in compliance with the measures outlined in the Health and Safety Executive's "Legionnaires' disease – The control of legionella bacteria in water systems". Approved Code of Practice and Guidance, 2000 and where relevant, other industry/sector best practice guidance*) needs to be achieved. Generally the mechanical design engineer is responsible for this issue.

Wat 01 Water consumption: One credit under this section must be achieved. Generally the client, architect and contractor are responsible for the specification of "domestic scale" sanitary fittings.

Wat 02 Water monitoring: Criteria 1(*The specification of a water meter on the mains water supply to each building; this includes instances where water is supplied via a borehole or other private source.*) must be achieved. Generally the mechanical design engineer is responsible for specifying the monitoring/metering of all water systems.

Mat 03 Responsible Sourcing: Criteria 3(Confirmation that all timber used on the project is sourced in accordance with the UK Government's Timber Procurement Policy.) must be achieved. Generally the architect and main contractor are responsible for specifying the materials used.

BREEAM Issue	PASS	GOOD	VERY GOOD	EXCELLENT	OUTSTANDING
Man 01: Sustainable procurement	One Credit	One Credit	One Credit	One Credit	Two Credits
Man 02: Responsible construction practices	None	None	None	One Credit	Two Credits
Man 04: Stakeholder participation	None	None	None	One Credit (Building user information)	One Credit (Building user information)
Hea 01: Visual comfort	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only
Hea 04: Water quality	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only
Ene 01: Reduction of CO2 emissions	None	None	None		Ten Credits
Ene 02: Energy monitoring	None	None	One Credit (First Sub-metering Credit)	Six credits	One Credit (First Sub-metering Credit)
Ene 04: Low or zero carbon technologies	None	None	None	One Credit	One Credit
Wat 01: Water consumption	None	One Credit	One Credit	One Credit	Two Credits
Wat 02: Water monitoring	None	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only
Mat 03: Responsible Sourcing	Criterion 3 only	Criterion 3 only	Criterion 3 only	Criterion 3 only	Criterion 3 only
Wst 01: Construction waste management	None	None	None	None	One Credit
Wst 03: Operational waste	None	None	None	One Credit	One Credit
LE 03: Mitigating ecological impact	None	None	One Credit	One Credit	One Credit

Table 12, BREEAM New Construction 2011 Minimum Standards (Table 3-2: BREEAM New Construction Technical Manual)

6.6 Early Action Credits

It is recommended that the client and design team review the following credits as early as possible in the project, as they can become difficult or indeed impossible to achieve if considered later in the design stages of the development. Evidence is required by the BREEAM Assessor that the following considerations were completed at a suitable stage in the design process.

Management 01 – Sustainable Procurement

From around RIBA stage B (Design Brief) or equivalent the client, building occupier, design team and contractor are involved in contributing to the decision making process for the project. As a minimum this includes meeting to identify and define their roles, responsibilities and contributions during the Design, Construction, Commissioning & handover, and Occupation stages.

An appropriate project team member(s) is appointed to monitor and programme pre-commissioning, commissioning and, where necessary, re-commissioning on behalf of the client.

A specialist commissioning manager is appointed during the design stage (by either client or contractor) for complex systems and the scope of their responsibility includes:
Design input: commission ability design reviews
Commissioning management input to construction programming
Commissioning management input during installation stages
Management of commissioning, performance testing and handover/post handover stages

Management 04 – Stakeholder Participation

During the preparation of the brief, all relevant parties and relevant bodies are identified and consulted with by the design team. The findings of the consultation must influence the design and therefore must have been held before key and final design decisions were made. *The stakeholders that should be consulted and topics that must be discussed are:*

- Actual/intended building users including facilities manager staff/those responsible for the day to day operation of the building and grounds.
- Representative consultation group from the existing community (if the building is a new development in an existing community) or for a community still under construction.
- Existing partnerships and networks that have knowledge and experience from existing buildings of the same type
- Potential users of any shared facilities e.g. operators of clubs and community groups
- Specialist service and maintenance contractors/representatives where the building function has particular technical requirements in complex environments.

6.7 Requirements for Specialist Consultants

There are particular credits under BREEAM that require a suitably qualified consultant to report on certain aspects of the design of the building and surrounding area. This report identifies the consultants that should be appointed in order to ascertain key credits targeted to achieve a BREEAM Very Good rating. The following are the specialist consultants required. (Find the definition of the 'Suitably Qualified' consultants in appendix 3.)

6.8 Suitably qualified acoustician:

The appointment of an acoustician will allow 1 credit from a possible 2 for item HEA05 and 1 credit from a possible 1 for POL05.

The main responsibility of an acoustician is to provide early design advice on:

- External sources of noise impacting the chosen site
- Site layout and zoning of the building for good acoustics
- Acoustic requirements for users with special hearing and communication needs and acoustic treatment of different zones and facades.

In addition the acoustician will generate a report that covers the following:

- A noise impact assessment in compliance with BS 7445:1991
- The following noise levels measured/determined: Existing background noise levels at the nearest or most exposed noise-sensitive development to the proposed development or at a location where background conditions can be argued to be similar and the rating noise level resulting from the new noise-source.

6.9 Requirements of the Main Contractor

Because there are a number of credits that the main contractor is either solely or part responsible for, the following matters shall be included within the tender documentation. This will ensure that the main contractor is both aware of and obliged to support the client and the project's BREEAM aspirations.

Management 01 – Sustainable Procurement

The main contractor shall carry out a thermographic survey within the project budget and programme of works. Once construction is complete a thermographic survey of the building fabric shall be undertaken in accordance with the appropriate standard and by a professional holding a valid Level 2 certificate in thermography (as defined by the UKTA).

Management 02 - Responsible Construction Practices

The main contractor shall achieve a Considerate Contractors Scheme score of between 35 -39 (for 2 BREEAM credits) or >40 for an additional 'innovation' credit.

Management 03 - Construction Site Impacts

The main contractor shall ensure that that responsibility has been assigned to an individual(s) for monitoring, recording and reporting energy, water and transport consumption data resulting from all construction processes.

The main contractor for the project must operate an Environmental Management System (EMS) covering their main operations. The EMS must be either:
Third party certified, to ISO14001/EMAS or equivalent standard, or
The structure of the EMS is in compliance with BS8555 200312 and has reached phase four of the implementation stage, 'implementation and operation of the environmental management system', and completed phase audits one to four, as defined in BS8555.

Waste 01 - Construction Waste Management

The main contractor shall ensure that non-hazardous construction waste (excluding demolition and excavation waste) generated by the building's design and construction meets or exceeds the resource efficiency benchmarks set out by BREEAM.

The main contractor shall ensure that there is a compliant Site Waste Management Plan (SWMP).

Waste 02 – Recycled Aggregates

The main contractor shall ensure that the total amount of recycled and/or secondary aggregate specified is greater than 25% (by weight or volume) of the total high-grade aggregate specified for the development. To contribute to the total amount, the percentage of high-grade aggregate specified per application (where present) that is recycled and/or secondary aggregate, must meet the minimum levels set out by BREEAM.

6.10 Design Team Responsibilities

The table below identifies those parties responsible for completing and recording the actions that are required to achieve the credits and for submitting information to the BREEAM assessor in the agreed format. It is recommended that where action from more than one party is required, the first named party is responsible for co-ordinating actions from each of the named parties. For example, for MAN01, the Main Contractor will be responsible for collating, recording and submitting information to the BREEAM assessor.

Management

MAN 01	Sustainable Procurement	Main Contractor/Client/Project Manager
MAN 02	Responsible construction practices	Main Contractor
MAN 03	Construction site impacts	Main Contractor
MAN 04	Stakeholder participation	Client/Design Team/Main Contractor
MAN 05	Life cycle cost and service life planning	Cost Consultant/Client/Design team/Main Contractor

Health and Wellbeing

HEA 01	Visual comfort	Architect/Sustainability Consultant
HEA 02	Indoor air quality	M&E Consultant
HEA 03	Thermal comfort	M&E Consultant
HEA 04	Water quality	M&E Consultant
HEA 05	Acoustic performance	Acoustic Consultant
HEA 06	Safety and security	Architect/Client/Main Contractor

Energy

ENE 01	Reduction of CO2 emissions	M&E Consultant
ENE 02	Energy monitoring	M&E Consultant
ENE 03	External lighting	M&E Consultant
ENE 04	Low and zero carbon technologies	M&E Consultant
ENE 08	Energy efficient equipment	Main Contractor/Client

Transport

TRA 01	Public transport accessibility	Client / Architect
TRA 02	Proximity to amenities	Client / Architect
TRA 03	Cyclist facilities	Client / Architect
TRA 04	Maximum car parking capacity	Client / Architect
TRA 05	Travel plan	Client / Architect/Transport Consultant

Water

WAT 01	Water consumption	Architect / M&E Consultant
WAT 02	Water monitoring	M&E Consultant
WAT 03	Water leak detection and prevention	M&E Consultant
WAT 04	Water efficient equipment	M&E Consultant

Materials

MAT 01	Life cycle impacts	Architect
MAT 02	Hard landscaping and boundary protection	Architect
MAT 03	Responsible sourcing of materials	Architect
MAT 04	Insulation	Architect
MAT 05	Designing for robustness	Architect

Waste

WST 01	Construction waste management	Main Contractor
WST 02	Recycled aggregates	Main Contractor / Structural or Civil Engineer
WST 03	Operational waste	Main Contractor / Client / Architect

Land Use & Ecology

LE 01	Site selection	Main Contractor/Client/Ecologist
LE 02	Ecological value of site and protection of ecological features	Main Contractor/Client/Ecologist
LE 03	Mitigating ecological impact	Main Contractor/Client/Ecologist
LE 04	Enhancing site ecology	Main Contractor/Client/Ecologist
LE 05	Long term impact on biodiversity	Main Contractor/Client/Ecologist

Pollution

POL 01	Impact of refrigerants	M&E Consultant
POL 02	NOx emissions	M&E Consultant
POL 03	Surface water run off	Main Contractor/Civil Engineer/Client
POL 04	Reduction of night time light pollution	M&E Consultant
POL 05	Noise attenuation	Acoustic Consultant

Section 7 – Conclusion

This report has identified the proposed measures for the first floor extension at the King's Cross Holiday Inn, London covering the following issues in accordance of the London Borough of Camden Core Strategy and Development Policies:

- Energy use
- Sustainable use of materials
- Water use
- The use of a sustainability assessment tool

The design team has given consideration on energy conservation and on maximising feasible and productive sustainable credentials. With this in mind the design intention is to construct a facility targeting a favourable annual energy performance and a "Good" (BREEAM) rating due to the site constrains related to this project.

7.1 Energy assessment conclusions

The designers have considered the use of passive measures to minimise energy usage within the building where possible. Heat recovery ventilation will be provided within the office and bedroom areas to provide ventilation. Occupancy sensors will be provided for all luminaries where available to reduce energy consumption. This strategy has been developed to reduce the energy requirements of the proposed extension.

The energy assessment was based on the current strategy being served by the existing boiler and chillers plant.

A full dynamic thermal simulation was carried out in line with the National Calculation Mythology and SBEM/DS to determine the potential energy savings the measures proposed can achieve.

The models suggested a 9% annual energy reduction and a 10% CO_2 emissions reduction with the proposed passive and active measures described in section 3.0 above.

It should be noted that the developer is to include replacement works to all the ventilation and cooling systems for the ground floor areas of the existing building. These proposals are targeting the overall energy performance of the buildings as the updated efficiencies of ventilation and cooling delivery will be improved to current building regulations standards. These changes will improve the annual operational energy of the building.

7.2 Water use conclusions

The design team have considered the specification of efficient sanitary ware fittings to reduce the water consumption in the proposed development.

These improvements were assessed with the BREEAM Wat 01 calculator which allows the designers to work out a water reduction benchmark following the BRE method of calculation.

7.3 BREEAM Pre-assessment conclusion

This section of the report has identified the following:

1. The mandatory credits that are required to achieve a BREEAM Good rating.
2. The early action credits that should be considered at the earliest possible stage of the project.
3. The requirements for specialist consultants.
4. The actions and responsibilities required from the main contractor.
5. Design Team responsibilities

The credit assessment undertaken as part of this analysis concluded a predicted BREEAM rating for the First floor extension for the Holiday Inn, Kings Cross of 50.98% which would achieve a BREEAM "Good" rating.

During the initial pre-assessment the initial conservative approach resulted in an early score of 50.98% which would achieve a "Good" rating (45-55%). At the concept stage of design, it is recommended to target a score around 5% greater than the required rating, i.e. 50% for a "Good" rating. This buffer would allow for credits to be lost as the project progresses through the design and construction stages but still achieve the 45% requirement upon certification at project completion.

It has to be noted that at this stage most of the Land Use and Ecology and some of the Energy credits have not been targeted due to the nature of the proposed development. These assumptions have reduced the potential BREEAM rating (London Borough of Camden CPG 3 states that all proposed non-domestic developments over 500m^2 should achieve a BREEAM Rating of Very Good).

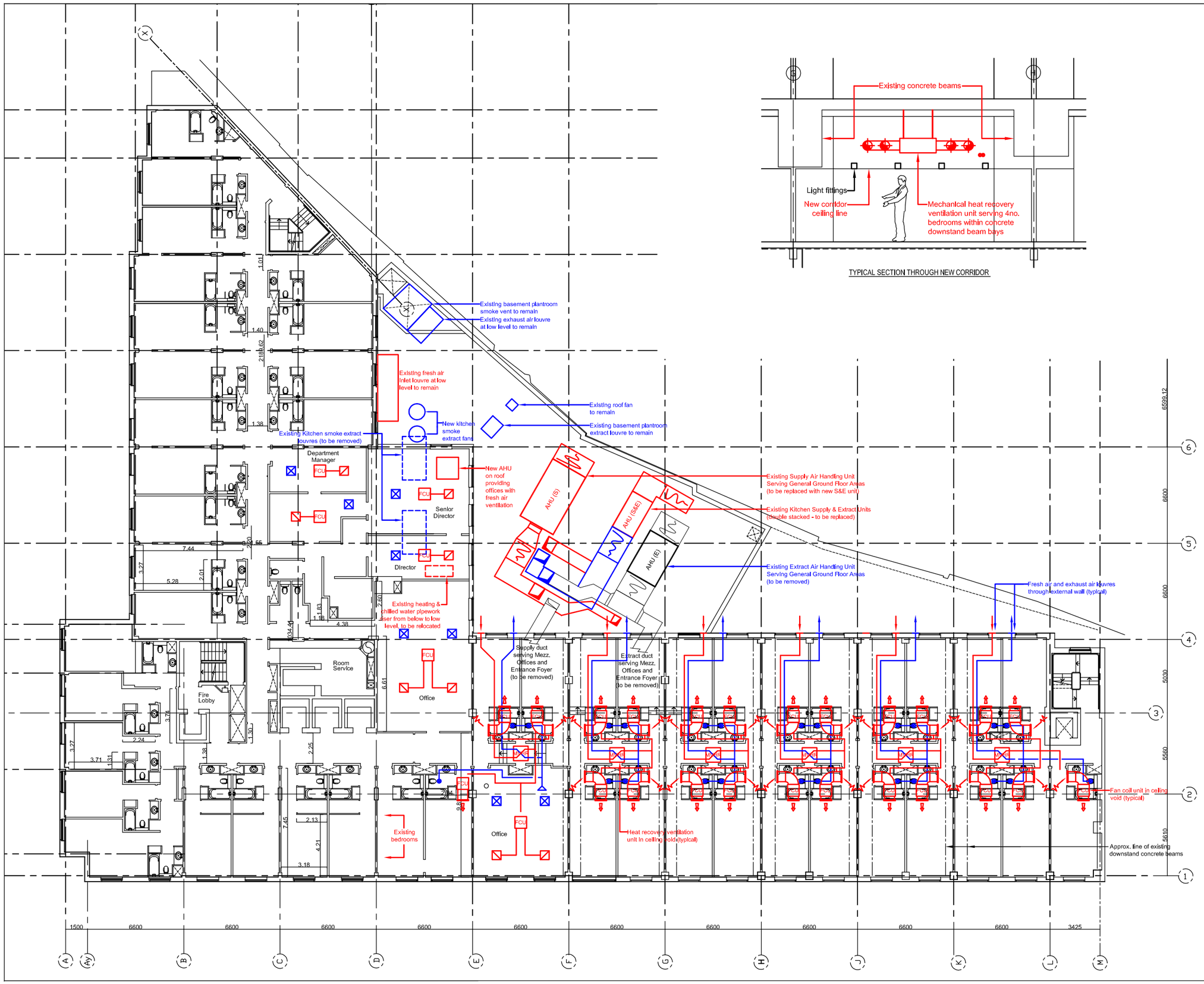
The requirements to achieve at least 60% of the Energy section credits have been set the Core Strategy of London Borough of Camden have been proven to be not financially viable as the current building services strategy is served by the existing boiler and chiller plant. The energy assessment has indentified that the building services strategy does not require an update or replace of the main heating and cooling plant.

Appendix 1 – Proposed Extension

NOTES:

1. DO NOT SCALE
2. DRAWINGS TO BE READ IN CONJUNCTION WITH ALL SERVICES AND STRUCTURAL ENGINEERS DRAWINGS & SPECIFICATIONS.
3.

TYPICAL SECTION THROUGH NEW CORRIDOR



FEASIBILITY

REF	DATE	REVISION	DRN	CHK
-	-	-	-	-

SCALE @A3	DATE	DRAWN BY	CHECKED BY
1:250	02.14	JMEG	PB

DRAWING

FIRST FLOOR
PROPOSED MECHANICAL SERVICES
SKETCH DESIGN

PROJECT

FIRST FLOOR EXTENSION
HOLIDAY INN, KINGS CROSS

CLIENT

FIROKA

RIDGE

THE COWYARDS
BLENHEIM PARK
OXFORD ROAD
WOODSTOCK
OX20 1QR

TEL: 01993 815000
FAX: 01993 815001
www.ridge.co.uk

DRG NO	REV
140369 - SKM02	-

FILE REFERENCE:

XREF FILE REFERENCE:

Appendix 2 – SBEM/DSM Results

BRUKL Output Document

HM Government

Compliance with England and Wales Building Regulations Part L 2010

Project name

Kings Cross Holiday Inn Extension (Base Model)

As designed

Date: Thu May 29 15:05:48 2014

Administrative information

Building Details

Address: 1 Kings Cross Rd, London, WC1X 9HX

Certification tool

Calculation engine: Apache

Calculation engine version: 6.4.0.12

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 6.4.0.12

BRUKL compliance check version: v4.1.e.5

Owner Details

Name: Firoka Ltd

Telephone number:

Address: , ,

Certifier details

Name: Ridge and Partners LLP

Telephone number: 01993815204

Address: The Cowyards, Blenheim Park, Oxford Road,, Woodstock, OX20 1QR

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

The building does not comply with England and Wales Building Regulations Part L 2010

1.1	CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	79.5
1.2	Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	79.5
1.3	Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	99
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

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	0.23	0.35	CRRD0000:Surf[2]
Floor	0.25	0.25	0.25	CRRD0000:Surf[0]
Roof	0.25	0.25	0.25	DPRT0000:Surf[0]
Windows***, roof windows, and rooflights	2.2	2.2	2.2	CRRD0000:Surf[1]
Personnel doors	2.2	-	-	No Personnel doors in building
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building

$U_{a\text{-}Limit}$ = 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	10

2.b Building services

The building services parameters listed below are expected to be checked by the BCO against guidance. No automatic checking is performed by the tool.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	<0.9

1- Kings Cross Hotel Heating+Cooling

Heating seasonal efficiency	**Cooling nominal efficiency**	**SFP [W/(l/s)]**	**HR seasonal efficiency**
0.8	2.88	0.5	0.5
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system			NO

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

Local mechanical ventilation and exhaust

Zone	**Supply/extract SFP [W/(l/s)]**	**HR seasonal efficiency**	**Exhaust SFP [W/(l/s)]**
DEPARTMENTMANAGER	-	-	1
DIRECTOR	-	-	1
OFFICE	-	-	1
ROOM1	-	-	1
ROOM10	-	-	1
ROOM11	-	-	1
ROOM12	-	-	1
ROOM13	-	-	1
ROOM14	-	-	1
ROOM15	-	-	1
ROOM16	-	-	1
ROOM17	-	-	1
ROOM18	-	-	1
ROOM19	-	-	1
ROOM2	-	-	1
ROOM20	-	-	1
ROOM21	-	-	1
ROOM22	-	-	1
ROOM23	-	-	1
ROOM24	-	-	1
ROOM25	-	-	1
ROOM26	-	-	1
ROOM3	-	-	1
ROOM4	-	-	1
ROOM5	-	-	1
ROOM6	-	-	1
ROOM7	-	-	1
ROOM8	-	-	1
ROOM9	-	-	1
SENIORDIRECTOR	-	-	1

General lighting and display lighting

Zone	**General lighting [W]**	**Display lamps efficacy [lm/W]**
CORRIDOR	250	-
DEPARTMENTMANAGER	180	-
DIRECTOR	280	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
OFFICE	740	-
ROOM1	60	-
ROOM10	60	-
ROOM11	60	-
ROOM12	60	-
ROOM13	60	-
ROOM14	60	-
ROOM15	60	-
ROOM16	60	-
ROOM17	60	-
ROOM18	60	-
ROOM19	60	-
ROOM2	60	-
ROOM20	60	-
ROOM21	60	-
ROOM22	60	-
ROOM23	60	-
ROOM24	60	-
ROOM25	70	-
ROOM26	80	-
ROOM3	60	-
ROOM4	60	-
ROOM5	60	-
ROOM6	60	-
ROOM7	60	-
ROOM8	60	-
ROOM9	60	-
SENIORDIRECTOR	250	-
STAIRS	40	-

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?
DEPARTMENTMANAGER	NO (-47.1%)	NO
DIRECTOR	NO (-45.1%)	NO
OFFICE	NO (-57.5%)	NO
ROOM1	NO (-65.4%)	NO
ROOM10	NO (-65.4%)	NO
ROOM11	NO (-65.4%)	NO
ROOM12	NO (-65.4%)	NO
ROOM13	NO (-65.4%)	NO
ROOM14	NO (-89.1%)	NO
ROOM15	NO (-65.7%)	NO
ROOM16	NO (-54.8%)	NO
ROOM17	NO (-54.8%)	NO
ROOM18	NO (-54.8%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
ROOM19	NO (-54.8%)	NO
ROOM2	NO (-65.4%)	NO
ROOM20	NO (-54.8%)	NO
ROOM21	NO (-54.8%)	NO
ROOM22	NO (-54.8%)	NO
ROOM23	NO (-54.8%)	NO
ROOM24	NO (-54.8%)	NO
ROOM25	NO (-62.7%)	NO
ROOM26	NO (-59.5%)	NO
ROOM3	NO (-65.4%)	NO
ROOM4	NO (-65.4%)	NO
ROOM5	NO (-65.4%)	NO
ROOM6	NO (-65.4%)	NO
ROOM7	NO (-65.4%)	NO
ROOM8	NO (-65.4%)	NO
ROOM9	NO (-65.4%)	NO
SENIORDIRECTOR	NO (-44.4%)	NO

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 [m²]	855.5	855.5
External area [m²]	1064.4	1064.4
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	10	5
Average conductance [W/K]	420.79	476.35
Average U-value [W/m²K]	0.4	0.45
Alpha value* [%]	10.06	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/m²]

	Actual	Notional
Heating	61.39	78.67
Cooling	2.02	2.24
Auxiliary	25.32	21.5
Lighting	10.67	9.78
Hot water	339.32	235.15
Equipment*	17.65	17.65
TOTAL**	**438.73**	**347.34**

* 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/m²]

	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	Indicative Target
Heating + cooling demand [MJ/m²]	166.81	267.5
Primary energy* [kWh/m²]	519.74	417.96
Total emissions [kg/m²]	99	79.5

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

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Fan coil systems, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	159.7	26.1	68.4	2.3	28.2	0.65	3.22	0.8	3.95
	Notional	263	34.9	87.6	2.5	23.9	0.83	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	0.01	CRRD0000:Surf[41]
Floor	0.2	0.25	CRRD0000:Surf[0]
Roof	0.15	0.25	DPRT0000:Surf[0]
Windows, roof windows, and rooflights	1.5	2.2	CRRD0000:Surf[1]
Personnel doors	1.5	-	No Personnel doors in building
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building

$U_{i\text{-}Typ}$ = 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	10

BRUKL Output Document

HM Government

Compliance with England and Wales Building Regulations Part L 2010

Project name

Kings Cross Holiday Inn Extension (Energy Efficiency Modell)

As designed

Date: Thu May 29 15:54:10 2014

Administrative information

Building Details

Address: 1 Kings Cross Rd, London, WC1X 9HX

Certification tool

Calculation engine: Apache

Calculation engine version: 6.4.0.12

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 6.4.0.12

BRUKL compliance check version: v4.1.e.5

Owner Details

Name: Firoka Ltd

Telephone number:

Address: , ,

Certifier details

Name: Ridge and Partners LLP

Telephone number: 01993815204

Address: The Cowyards, Blenheim Park, Oxford Road,, Woodstock, OX20 1QR

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

The building does not comply with England and Wales Building Regulations Part L 2010

1.1	CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	79.7
1.2	Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	79.7
1.3	Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	90
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

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	0.13	0.2	CRRD0000:Surf[2]
Floor	0.25	0.2	0.2	CRRD0000:Surf[0]
Roof	0.25	0.25	0.25	DPRT0000:Surf[0]
Windows***, roof windows, and rooflights	2.2	1.62	1.62	CRRD0000:Surf[1]
Personnel doors	2.2	-	-	No Personnel doors in building
Vehicle access & similar large doors	1.5	-	-	No Vehicle access doors in building
High usage entrance doors	3.5	-	-	No High usage entrance doors in building

$U_{a\text{-}Limit}$ = 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 building services parameters listed below are expected to be checked by the BCO against guidance. No automatic checking is performed by the tool.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	<0.9

1- Kings Cross Hotel Heating+Cooling

Heating seasonal efficiency	**Cooling nominal efficiency**	**SFP [W/(l/s)]**	**HR seasonal efficiency**
0.8	2.88	0.5	0.65
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system			YES

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

Local mechanical ventilation and exhaust

Zone	**Supply/extract SFP [W/(l/s)]**	**HR seasonal efficiency**	**Exhaust SFP [W/(l/s)]**
DEPARTMENTMANAGER	-	-	0.6
DIRECTOR	-	-	0.6
OFFICE	-	-	0.6
ROOM1	-	-	0.6
ROOM10	-	-	0.6
ROOM11	-	-	0.6
ROOM12	-	-	0.6
ROOM13	-	-	0.6
ROOM14	-	-	0.6
ROOM15	-	-	0.6
ROOM16	-	-	0.6
ROOM17	-	-	0.6
ROOM18	-	-	0.6
ROOM19	-	-	0.6
ROOM2	-	-	0.6
ROOM20	-	-	0.6
ROOM21	-	-	0.6
ROOM22	-	-	0.6
ROOM23	-	-	0.6
ROOM24	-	-	0.6
ROOM25	-	-	0.6
ROOM26	-	-	0.6
ROOM3	-	-	0.6
ROOM4	-	-	0.6
ROOM5	-	-	0.6
ROOM6	-	-	0.6
ROOM7	-	-	0.6
ROOM8	-	-	0.6
ROOM9	-	-	0.6
SENIORDIRECTOR	-	-	0.6

General lighting and display lighting

Zone	**General lighting [W]**	**Display lamps efficacy [lm/W]**
CORRIDOR	250	-
DEPARTMENTMANAGER	160	-
DIRECTOR	240	-

General lighting and display lighting

Zone	General lighting [W]	Display lamps efficacy [lm/W]
OFFICE	630	-
ROOM1	60	-
ROOM10	60	-
ROOM11	60	-
ROOM12	60	-
ROOM13	60	-
ROOM14	60	-
ROOM15	60	-
ROOM16	60	-
ROOM17	60	-
ROOM18	60	-
ROOM19	60	-
ROOM2	60	-
ROOM20	60	-
ROOM21	60	-
ROOM22	60	-
ROOM23	60	-
ROOM24	60	-
ROOM25	70	-
ROOM26	80	-
ROOM3	60	-
ROOM4	60	-
ROOM5	60	-
ROOM6	60	-
ROOM7	60	-
ROOM8	60	-
ROOM9	60	-
SENIORDIRECTOR	210	-
STAIRS	40	-

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?
DEPARTMENTMANAGER	NO (-40.4%)	NO
DIRECTOR	NO (-38.1%)	NO
OFFICE	NO (-52.1%)	NO
ROOM1	NO (-61.1%)	NO
ROOM10	NO (-61.1%)	NO
ROOM11	NO (-61.1%)	NO
ROOM12	NO (-61.1%)	NO
ROOM13	NO (-61.1%)	NO
ROOM14	NO (-87.7%)	NO
ROOM15	NO (-61.1%)	NO
ROOM16	NO (-48.8%)	NO
ROOM17	NO (-48.8%)	NO
ROOM18	NO (-48.8%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
ROOM19	NO (-48.8%)	NO
ROOM2	NO (-61.1%)	NO
ROOM20	NO (-48.8%)	NO
ROOM21	NO (-48.8%)	NO
ROOM22	NO (-48.8%)	NO
ROOM23	NO (-48.8%)	NO
ROOM24	NO (-48.8%)	NO
ROOM25	NO (-57.9%)	NO
ROOM26	NO (-54.2%)	NO
ROOM3	NO (-61.1%)	NO
ROOM4	NO (-61.1%)	NO
ROOM5	NO (-61.1%)	NO
ROOM6	NO (-61.1%)	NO
ROOM7	NO (-61.1%)	NO
ROOM8	NO (-61.1%)	NO
ROOM9	NO (-61.1%)	NO
SENIORDIRECTOR	NO (-37.3%)	NO

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 [m²]	855.5	855.5
External area [m²]	1064.4	1064.4
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	5	5
Average conductance [W/K]	300.19	476.34
Average U-value [W/m²K]	0.28	0.45
Alpha value* [%]	10.05	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/m²]

	Actual	Notional
Heating	25.51	79.4
Cooling	2.78	2.34
Auxiliary	20.76	21.5
Lighting	10.75	9.78
Hot water	339.32	235.15
Equipment*	17.65	17.65
TOTAL**	**399.11**	**348.16**

* 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/m²]

	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	Indicative Target
Heating + cooling demand [MJ/m²]	97.62	271.09
Primary energy* [kWh/m²]	472.25	418.99
Total emissions [kg/m²]	90	79.7

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

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Fan coil systems, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity										
	Actual	70.7	38.1	28.4	3.1	23.1	0.69	3.41	0.8	3.95
	Notional	265.4	36.5	88.4	2.6	23.9	0.83	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	0.01	CRRD0000:Surf[41]
Floor	0.2	0.2	CRRD0000:Surf[0]
Roof	0.15	0.25	DPRT0000:Surf[0]
Windows, roof windows, and rooflights	1.5	1.62	CRRD0000:Surf[1]
Personnel doors	1.5	-	No Personnel doors in building
Vehicle access & similar large doors	1.5	-	No Vehicle access doors in building
High usage entrance doors	1.5	-	No High usage entrance doors in building

$U_{i\text{-}Typ}$ = 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 – Wat 01 BREEAM NC Water Calculator

BREEAM 2011 Wat 01 Water Consumption: Other building type calculator

BREEAM®

Please select the option that best defines the building type being assessed	Residential Institution - Hotel

Water Consumption - Building Microcomponents

		WC	Urinals	Wash hand basin taps	Showers	Baths	Kitchen taps (staff/residents kitchen)	Domestic sized washing machines	Domestic sized dishwashers	Kitchen taps: restaurant (pre-rinse nozzles only)	Waste disposal unit (commercial kitchens only)	Commercial sized dishwashers	Commercial sized washing machines
	Component assessed for building type (if specified)	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
	Please confirm if this component type is specified in the building and will be installed	Specified	Not Specified	Specified	Not Specified	Specified	Not Specified		Not Specified	Not Specified	Not Specified	Not Specified	Not Specified
	Please select the number of different types of specification that you wish to enter for this component type?	1		1		1							
Type 1	Please confirm the BREEAM water efficient component level achieved for this component - type 1	4		4		4							
	Please confirm the no. of type 1 components specified												
	Type 1 - aggregate component level	4.00		4.00		4.00							
Type 2	Please confirm the BREEAM water efficient component level achieved for this component - type 2												
	Please confirm the no. of type 1 components specified												
	Type 2 - aggregate component level												
Type 3	Please confirm the BREEAM water efficient component level achieved for this component - type 3												
	Please confirm the no. of type 1 components specified												
	Type 3 - aggregate component level												
Type 4	Please confirm the BREEAM water efficient component level achieved for this component - type 4												
	Please confirm the no. of type 1 components specified												
	Type 4 - aggregate component level												
Type 5	Please confirm the BREEAM water efficient component level achieved for this component - type 5												
	Please confirm the no. of type 1 components specified												
	Type 5 - aggregate component level												
Type 6	Please confirm the BREEAM water efficient component level achieved for this component - type 6												
	Please confirm the no. of type 1 components specified												
	Type 6 - aggregate component level												
Type 7	Please confirm the BREEAM water efficient component level achieved for this component - type 7												
	Please confirm the no. of type 1 components specified												
	Type 7 - aggregate component level												
Type 8	Please confirm the BREEAM water efficient component level achieved for this component - type 8												
	Please confirm the no. of type 1 components specified												
	Type 8 - aggregate component level												
	Total number of fittings for component												
	Level achieved for component type	4.00		4.00		4.00							
	Component weighting factor for building type	41.42%		17.57%		41.02%							
	Contribution to overall component level achieved	1.66		0.70		1.64							
	Overall component level achieved	4.00											

Note: for the purpose of awarding credits this figure is rounded down to the nearest whole component level, e.g. if the total from the individual component levels is 0.7, then the component level achieved is 'Baseline

Non-Potable Water Yield - Water Recycling

Greywater system specified and installed in compliance with BS8525-1:2010 Greywater Systems - Part 1 Code of Practice	Yes

Rainwater system specified and installed in compliance with BS8515:2009 Rainwater Harvesting Systems - Code of practice	No

Other permissible source of non potable recycled water	No
Please give a brief description of source/system	

Please select from the drop down list below how you would like to assess performance of the specified system(s) and then enter the relevant % opposite:		
Please select		*Note: input figure to two decimal places only.*
BREEAM component level achieved for water recycling	Baseline	*Note: credits only available for achieving BREEAM component level 4 or 5 in the elemental method.*

Wat01 Results

Total Wat01 BREEAM credits achieved	3

Total Wat01 BREEAM Innovation credits achieved	0

Appendix 4 – BREEAM Pre-assessment Calculator

BREEAM 2011 New Construction Assessment Report: Rating & Key Performance Indicators

This assessment and indicative BREEAM rating is not a formal certified BREEAM assessment or rating and must not be communicated as such. The score presented is indicative of a buildings potential performance and is based on a simplified pre-formal BREEAM assessment and unverified commitments given at an early stage in the design process.

Overall Indicative Building Performance

Building name	Holiday inn Hotel Kings Cross
Indicative building score (%)	50.98%
Indicative BREEAM rating	Pre-Assessment result indicates potential for BREEAM Good rating
Indicative minimum standards level achieved	Pre-Assessment result indicates the minimum standards for Very Good level

Summary of Indicative Building Performance by Environmental Section and Assessment Issue

Management	Indicative no. credits available	Indicative no. credits Achieved	Indicative contribution to score	Minimum standards level achieved
Man01 Sustainable Procurement	8.0	5.0	2.73%	Pre-Assessment result indicates the minimum standards for Outstanding level
Man02 Responsible Construction Practices	2.0	2.0	1.09%	Pre-Assessment result indicates the minimum standards for Outstanding level
Man03 Construction Site Impacts	5.0	4.0	2.18%	N/A
Man04 Stakeholder Participation	4.0	2.0	1.09%	Pre-Assessment result indicates the minimum standards for Outstanding level
Man05 Life cycle cost and service life planning	3.0	0.0	0.00%	N/A
Total indicative environmental section performance	**22.0**	**13.0**	**7.09%**	
Health & Wellbeing				
Hea01 Visual Comfort	3.0	3.0	3.21%	Pre-Assessment result indicates the minimum standards for Outstanding level
Hea02 Indoor Air Quality	4.0	1.0	1.07%	N/A
Hea03 Thermal Comfort	2.0	2.0	2.14%	N/A
Hea04 Water Quality	1.0	0.0	0.00%	Pre-Assessment result indicates the minimum standards for Outstanding level
Hea05 Acoustic Performance	2.0	1.0	1.07%	N/A
Hea06 Safety and Security	2.0	0.0	0.00%	N/A
Total indicative environmental section performance	**14.0**	**7.0**	**7.50%**	
Energy				
Ene01 Reduction of CO2 Emissions	15.0	4.0	3.17%	Pre-Assessment result indicates the minimum standards for Very Good level
Ene02 Energy Monitoring	1.0	1.0	0.79%	Pre-Assessment result indicates the minimum standards for Outstanding level
Ene03 External Lighting	1.0	1.0	0.79%	N/A
Ene04 Low and Zero Carbon Technology	5.0	1.0	0.79%	Pre-Assessment result indicates the minimum standards for Outstanding level
Ene05 Energy Efficient Cold Storage	N/A	N/A	N/A	N/A
Ene06 Energy Efficient Transportation Systems	N/A	N/A	N/A	N/A
Ene07 Energy Efficient Laboratory Systems	N/A	N/A	N/A	N/A
Ene08 Energy Efficient Equipment	2.0	2.0	1.58%	N/A
Ene09 Drying Space	N/A	N/A	N/A	N/A
Total indicative environmental section performance	**24.0**	**9.00**	**7.13%**	
Transport				
Tra01 Public Transport Accessibility	5.0	5.0	3.64%	N/A
Tra02 Proximity to Amenities	1.0	1.0	0.73%	N/A
Tra03 Cyclist facilities	2.0	0.0	0.00%	N/A
Tra04 Maximum Car Parking Capacity	2.0	0.0	0.00%	N/A
Tra05 Travel Plan	1.0	1.0	0.73%	N/A
Total indicative environmental section performance	**11.0**	**7.0**	**5.09%**	
Water				
Wat01 Water Consumption	5.0	3.0	2.25%	Pre-Assessment result indicates the minimum standards for Outstanding level
Wat02 Water Monitoring	1.0	1.0	0.75%	Pre-Assessment result indicates the minimum standards for Outstanding level
Wat03 Water Leak Detection and Prevention	2.0	2.0	1.50%	N/A
Wat04 Water Efficient Equipment	N/A	N/A	N/A	N/A
Total indicative environmental section performance	**8.0**	**6.0**	**4.50%**	
Materials				
Mat01 Life Cycle Impacts	6.0	5.0	4.81%	N/A
Mat02 Hard Landscaping and Boundary Protection	1.0	0.0	0.00%	N/A
Mat03 Responsible Sourcing	3.0	2.0	1.92%	Pre-Assessment result indicates the minimum standards for Outstanding level
Mat04 Insulation	2.0	2.0	1.92%	N/A
Mat05 Designing for Robustness	1.0	1.0	0.96%	N/A
Total indicative environmental section performance	**13.0**	**10.00**	**9.62%**	
Waste				
Wst01 Construction Waste Management	4.0	3.0	3.75%	Pre-Assessment result indicates the minimum standards for Outstanding level
Wst02 Recycled Aggregates	1.0	0.0	0.00%	N/A
Wst03 Operational Waste	1.0	0.0	0.00%	Pre-Assessment result indicates the minimum standards for Very Good level
Wst04 Speculative Floor and Ceiling Finishes	N/A	N/A	N/A	N/A
Total indicative environmental section performance	**6.0**	**3.00**	**3.75%**	
Land Use and Ecology				
LE01 Site Selection	2.0	1.0	1.00%	N/A
LE02 Ecological Value of Site and Protection of Ecological Features	1.0	0.0	0.00%	N/A
LE03 Mitigating Ecological Impact	2.0	2.0	2.00%	Pre-Assessment result indicates the minimum standards for Outstanding level
LE04 Enhancing Site Ecology	3.0	0.0	0.00%	N/A
LE05 Long Term Impact on Biodiversity	2.0	0.0	0.00%	N/A
Total indicative environmental section performance	**10.0**	**3.00**	**3.00%**	
Pollution				
Pol01 Impact of Refrigerants	3.0	0.0	0.00%	N/A
Pol02 NOx Emissions	3.0	1.0	0.77%	N/A
Pol03 Surface Water Run off	5.0	0.0	0.00%	N/A
Pol04 Reduction of Night Time Light Pollution	1.0	1.0	0.77%	N/A
Pol05 Noise Attenuation	1.0	1.0	0.77%	N/A
Total indicative environmental section performance	**13.0**	**3.00**	**2.31%**	
Innovation				
Inn01 Innovation	10.0	1.0	1.00%	N/A
Total indicative environmental section performance	**10.0**	**1.00**	**1.00%**	

Appendix 5 – BREEAM UK NC 2014 Summary of Changes

Draft BREEAM UK New Construction 2014 Scheme: Summary of changes between 2011 and 2014 versions

This document summarises the key differences and changes between BREEAM UK New Construction 2011 and 2014. It does not outline in detail every change and for the majority of BREEAM issues minor clarifications and additions have been made. In reviewing this document the reader should also refer to the BREEAM UK New Construction scheme documents for the full detail.

Key:

New issue for 2014
Issue removed for 2014
SB Simple buildings

BREEAM 2011 Issue List									BREEAM 2014 Issue List									Summary of key changes and new requirements
		No. credits available	Minimum BREEAM standards (i.e. min. BREEAM credits)					Exemplary level req.				No. credits available	Minimum BREEAM standards (i.e. min. BREEAM credits)					Exemplary level req.	
			P	G	VG	E	O						P	G	VG	E	O		
MANAGEMENT									**MANAGEMENT**										
Man 01	**Sustainable procurement**	8	1	1	1	1	2	Y	Man 01	**Project brief and design**		4	-	-	1	1	1	Y (SB)	1) 'Construction and handover' and 'Aftercare' criteria moved to other issues in Management to align with the construction process 2) Recognition of the BREEAM Accredited Professional qualification now adressed within criteria relating to a 'Sustainability Champion' 3) Stakeholder consultation criteria moved to this issue from Man 04 Stakeholder Participation in NC 2011
Man 02	**Responsible construction practices**	2	-	-	-	1	2	Y	Man 02	**Lifecycle cost and service life planning**		4	-	-	-	-	-	-	1) Previously Man 05 in NC 2011 2) New credit for reporting predicted capital cost 3) Restrucure and review of criteria 4) 'Elemental level life cycle costing (LCC)' and 'Component level LCC' terminology introduced
Man 03	**Construction site impacts**	5	-	-	-	-	-	-	Man 03	**Responsible construction practices**		6	Criterion 2	Criterion 2	Criterion 2	Criterion 2 1 credit	Criterion 2 2 credits	Y	1) Previously Man 02 in NC 2011 2) Criteria from 'Man 03 Construction site impacts' moved to this issue 3) Criteria relating to the Sustainability Champion (and therefore BREEAM AP) introduced
Man 04	**Stakeholder participation**	4	-	-	-	1	1	-	Man 04	**Commissioning and handover**		4	-	-	-	Criterion 9	Criterion 9	-	1) Previously Man 04 'Stakeholder participation', now 'Commissioning and handover' 2) Criteria from Man 01 in NC 2011 moved to this issue 3) Thermographic survey criteria updated 4) Building User Guide criteria and criteria from Man 01 (NC 2011) combined to form 'Handover' criteria
Man 05	**Life cycle cost and service life planning**	3	-	-	-	-	-	-	Man 05	**Aftercare**		3	-	-	-	1	1	Y	1) Previously Man 05 Life cycle cost and service life planning 2) 'Seasonal commissioning' criteria and 'Aftercare' criteria from Man 01 (NC 2011) and 'POE' criteria from Man 04 (NC 2011) combined to form this issue
	Total credits	22								**Total credits**		21							
HEALTH & WELLBEING									**HEALTH & WELLBEING**										
Hea 01	**Visual comfort**	Max. 5 (building type dependent)	Criterion 1	Criterion 1	Criterion 1	Criterion 1	Criterion 1	Y	Hea 01	**Visual comfort**		Max. 6 (building type dependent)	-	-	-	-	-	Y	1) 'Minimum standard' requirement no longer applies to this issue 2) Issue layout updated 3) Average daylight illuminance and minimum daylight illuminance benchmarks introduced as an optional alternative to the average daylight factor benchmark 4) 'View out' criteria made independent from the glare control criteria and the percentage compliant floor area adjusted from 100% to 95% 5) 'Visual arts' criteria removed
Hea 02	**Indoor air quality**	Max. 6 (building type dependent)	-	-	-	-	-	-	Hea 02	**Indoor air quality**		Max. 5 (building type dependent)	-	-	-	-	-	Y	1) Laboratory criteria moved to a separate issue, now Hea 03 2) BS EN 13779:2007 criteria added with reference to air intakes and exhausts 3) Table of VOC (Volatile Organic Compound) criteria re-structured and updated 4) Exemplary level performance criteria added
Hea 03	**Thermal comfort**	2	-	-	-	-	-	-	Hea 03	**Safe containment in laboratories**		Max. 2 (building type dependent)	-	-	-	-	-	-	1) Laboratory criteria moved to this issue from Hea 02 Indoor air quality 2) Risk assessment criteria added 3) Criteria relating to clean air hoods and articulated extension arms added 4) HSE guidance document referenced 5) 'Emergency button' criteria removed
Hea 04	**Water quality**	1	Criterion 1	Criterion 1	Criterion 1	Criterion 1	Criterion 1	-	Hea 04	**Thermal comfort**		3	-	-	-	-	-	-	1) Reference to CIBSE TM52 added to criteria for free-running buildings 2) Criteria relating to 'time out of range' metric replaced with criteria relating to ISO 7730: 2005 3) 'Adaptability to climate change' criteria added
Hea 05	**Acoustic performance**	Max. 4 (building type dependent)	-	-	-	-	-	-	Hea 05	**Acoustic performance**		Max. 4 (building type dependent)	-	-	-	-	-	-	1) Issue layout updated 2) Pre-requisite for suitably qualified acoustician to be appointed at an appropriate stage removed 3) Criteria for all building types amended 4) Education buildings: 'Acoustic Performance Standard for the Priority School Building Programme' replaces Building Bulletin 93 5) Education buildings: the same acoustic criteria now apply to all education buildings (no longer separate criteria for further and higher education) 6) Office and Court building type criteria differentiated from Industrial, Retail, Prisons and Other building type criteria.
Hea 06	**Safety and security**	2	-	-	-	-	-	-	Hea 06	**Safety and security**		2	-	-	-	-	-	-	1) Dedicated pedestrian crossing criteria updated 2) Crime Impact Assessment criteria added
	Total credits	20	(building type dependent)							**Total credits**		22	(building type dependent)						

BREEAM 2011 Issue List										BREEAM 2014 Issue List										Summary of key changes and new requirements
			No. credits available	Minimum BREEAM standards (i.e. min. BREEAM credits)					Exemplary level req.				No. credits available	Minimum BREEAM standards (i.e. min. BREEAM credits)					Exemplary level req.	
ENERGY										**ENERGY**										
Ene	01	**Reduction of emissions**	15	-	-	-	6	10	Y	Ene	01	**Reduction of energy use and carbon emissions**	12	-	-	-	5	8	Y	1) Credits are calculated based on the building regulations of the country where the building is located, i.e. Wales, Scotland, Northern Ireland or England 2) The minimum standards for Excellent and Outstanding are based solely on the Energy Performance Ratio (EPR) achieved. The requirement for a % reduction in regulated CO_2 emissions has been removed. 3) The performance translators used in the calculation method have been updated to better reflect different servicing strategies
Ene	02	**Energy monitoring**	Max. 2 (building type dependent)	-	-	1	1	1	-	Ene	02	**Energy monitoring**	Max. 2 (building type dependent)	-	-	1	1	1	-	1) Sub-metering of over 90% of energy consuming systems 2) Criteria amended to recognise use of an appropriate energy monitoring and management system
Ene	03	**External lighting**	1	-	-	-	-	-	-	Ene	03	**External lighting**	1	-	-	-	-	-	-	1) External lighting criteria simplified
Ene	04	**Low and zero carbon technologies**	5	-	-	-	1	1	Y	Ene	04	**Low carbon design**	3	-	-	-	-	-	-	1) Passive design analysis and implementation added. 2) Free cooling retained as an extension to passive design analysis. 3) Low and zero carbon technologies analysis and implementation retained but credits for a % reduction in regulated CO_2 emissions have been removed
Ene	05	**Energy efficient cold storage**	2	-	-	-	-	-	Y	Ene	05	**Energy efficient cold storage**	Max. 2 (building type dependent)	-	-	-	-	-	-	1) Criteria amended to include BS EN 378:2008 2) Exemplary credit removed
Ene	06	**Energy efficient transportation systems**	2	-	-	-	-	-	-	Ene	06	**Energy efficient transportation systems**	Max. 3 (building type dependent)	-	-	-	-	-	-	1) Energy consumption estimation to use new BS EN ISO 25745 Parts 2 and 3. 2) Separate credit for regenerative drives
Ene	07	**Energy efficient laboratory systems**	Max. 5 (building type dependent)	-	-	-	-	-	-	Ene	07	**Energy efficient laboratory systems**	Max. 5 (building type dependent)	-	-	-	-	-	-	1) This issue is no longer applicable to schools 2) New criteria on engaging clients to define laboratory performance criteria added
Ene	08	**Energy efficient equipment**	1	-	-	-	-	-	-	Ene	08	**Energy efficient equipment**	2	-	-	-	-	-	-	1) Criteria added on demonstrating a meaningful reduction in total unregulated energy consumption 2) Domestic scale appliances for both residential and non-residential buildings to have at least specified ratings under the EU Energy Efficiency Labelling Scheme 3) Healthcare criteria amended
Ene	09	**Drying space**	1	-	-	-	-	-	-	Ene	09	**Drying space**	1	-	-	-	-	-	-	1) No major changes to this issue
		Total credits	34	(building type dependent)								**Total credits**	31	(building type dependent)						
TRANSPORT										**TRANSPORT**										
Tra	01	**Public transport accessibility**	Max. 5 (building type dependent)	-	-	-	-	-	-	Tra	01	**Public transport accessibility**	Max. 5 (building type dependent)	-	-	-	-	-	-	1) No major changes to this issue
Tra	02	**Proximity to amenities**	Max. 2 (building type dependent)	-	-	-	-	-	-	Tra	02	**Proximity to amenities**	Max. 2 (building type dependent)	-	-	-	-	-	-	1) Amenities have been adjusted to give greater choice in routes to achieving compliance 2) Amenities have been split into two tiers; Core and Additonal amenities
Tra	03	**Cyclist facilities**	Max. 2 (building type dependent)	-	-	-	-	-	-	Tra	03	**Cyclist facilities**	Max. 3 (building type dependent)	-	-	-	-	-	-	1) Issue layout updated 2) Adjusted the sliding scale of compliance to further reduce the number of cyclist facilities required for populated buildings 3) Guidance added to take into account remotely located buildings
Tra	04	**Maximum car parking capacity**	Max. 2 (building type dependent)	-	-	-	-	-	-	Tra	04	**Maximum car parking capacity**	Max. 2 (building type dependent)	-	-	-	-	-	-	1) No major changes to this issue
Tra	05	**Travel plan**	1	-	-	-	-	-	-	Tra	05	**Travel plan**	1	-	-	-	-	-	-	1) The issue has been adjusted to align with best practice guidance
		Total credits	12	(building type dependent)								**Total credits**	13	(building type dependent)						
WATER										**WATER**										
Wat	01	**Water consumption**	5	-	1	1	1	2	Y	Wat	01	**Water consumption**	5	-	1	1	1	2	Y	1) No major changes to this issue
Wat	02	**Water monitoring**	1	-	Criterion 1	Criterion 1	Criterion 1	Criterion 1	-	Wat	02	**Water monitoring**	1	-	Criterion 1	Criterion 1	Criterion 1	Criterion 1	-	1) No major changes to this issue
Wat	03	**Water leak detection and**	2	-	-	-	-	-	-	Wat	03	**Water leak detection**	2	-	-	-	-	-	-	1) Prescriptive requirements for flow control devices have been removed
Wat	04	**Water efficient equipment**	1	-	-	-	-	-	-	Wat	04	**Water efficient equipment**	1	-	-	-	-	-	-	1) The scope of this issue has been wided to include all types of unregulated water consumption and no longer focuses solely on irregation systems
		Total credits	9									**Total credits**	9							

BREEAM 2011 Issue List										BREEAM 2014 Issue List										Summary of key changes and new requirements
		No. credits available	Minimum BREEAM standards (i.e. min. BREEAM credits)					Exemplary level req.				No. credits available	Minimum BREEAM standards (i.e. min. BREEAM credits)					Exemplary level req.		
MATERIALS										**MATERIALS**										
Mat 01	**Life cycle impacts**	Max. 6 (building type dependent)	-	-	-	-	-	Y		Mat 01	**Life cycle impacts**	Max. 6 (building type dependent)	-	-	-	-	-	Y		1) No major changes to this issue
Mat 02	**Hard landscaping and boundary protection**	1	-	-	-	-	-	-		Mat 02	**Hard landscaping and boundary protection**	1	-	-	-	-	-	-		1) No major changes to this issue
Mat 03	**Responsible sourcing of materials**	3	Criterion 3	Criterion 3	Criterion 3	Criterion 3	Criterion 3	Y		Mat 03	**Responsible sourcing of materials**	4	TBC	TBC	TBC	TBC	TBC	Y		1) Issue layout updated 2) New criteria for developing and implementing sustainable procurement policy added 3)Methodology revised to remove the need for the calculation of material volumes
Mat 04	**Insulation**	2	-	-	-	-	-	-		Mat 04	**Insulation**	1	-	-	-	-	-	-		1) Criteria relating to responsible sourcing of insulation have been removed and added under Mat 03 issue
Mat 05	**Designing for robustness**	1						-		Mat 05	**Designing for durability and resilience**	1	-	-	-	-	-	-		1) New criteria relating to protection of the building from environmental degradation has been added
Mat 06	**N/A**	N/A	-	-	-	-	-	-		Mat 06	**Material efficiency**	1	-	-	-	-	-	-		1) Assessment criteria lays down requirements to identify,investigate and implement measures to optimise material use at all stages of the project
	Total credits	13	(building type dependent)								**Total credits**	14	(building type dependent)							
WASTE										**WASTE**										
Wst 01	**Construction waste management**	4	-	-	-	-	1	Y		Wst 01	**Construction waste management**	4	-	-	-	-	1	Y		1) Reference to Site Waste Management Plan has been changed to Construction Resource Management Plan 2) Exemplary level criterion for diverting excavation waste from landfill added
Wst 02	**Recycled aggregates**	1	-	-	-	-	-	Y		Wst 02	**Recycled aggregates**	1	-	-	-	-	-	Y		1) Minimum levels of high grade aggregate use updated 2) Construction, demolition and excavation waste sourcing distance criterion has been moved to exemplary level criteria 3) Exemplary level criteria have been amended
Wst 03	**Operational waste**	1	-	-	-	1	1	-		Wst 03	**Operational waste**	1	-	-	-	1	1	-		1) Additional criterion for pre-schools, schools and sixth form colleges has been removed
Wst 04	**Speculative floor and ceiling finishes**	1	-	-	-	-	-	-		Wst 04	**Speculative floor and ceiling finishes**	1	-	-	-	-	-	-		1) No major changes to this issue
Wst 05	**N/A**	N/A	-	-	-	-	-	-		Wst 05	**Adaptation to climate change**	1	-	-	-	-	-	Y		1) New issue for 2014
Wst 06	**N/A**	N/A	-	-	-	-	-	-		Wst 06	**Functional adaptability**	1	-	-	-	-	-	-		1) New issue for 2014
	Total credits	7									**Total credits**	9								
LAND USE & ECOLOGY										**LAND USE & ECOLOGY**										
LE 01	**Site selection**	2	-	-	-	-	-	-		LE 01	**Site selection**	2	-	-	-	-	-	-		1) 'Previously developed land' now referred to as 'previously occupied land' 2) Definition of 'contaminated land specialist' added 3) Definition of 'previously occupied land' amended
LE 02	**Ecological value of site and protection of ecological features**	1	-	-	-	-	-	-		LE 02	**Ecological value of site and protection of ecological features**	2	-	-	-	-	-	-		1) Two credits available rather than one 2) Reference to BS 42020:2013 now included in criteria 3) Definition of 'features of ecological value' amended
LE 03	**Mitigating ecological impact**	2	-	-	1	1	1	-		LE 03	**Minimising impact on existing site ecology**	2	-	-	1	1	1	-		1) Issue name amended 2) Compliance Note regarding green walls added
LE 04	**Enhancing site ecology**	Max. 3 (building type dependent)	-	-	-	-	-	-		LE 04	**Enhancing site ecology**	Max. 2 (building type dependent)	-	-	-	-	-	-		1) Two credits available rather than three 2) 'Simple buildings' criteria added 3) Compliance note added on calculating the increase in ecological value
LE 05	**Long term impact on biodiversity**	Max. 3 (building type dependent)	-	-	-	-	-	-		LE 05	**Long term impact on biodiversity**	2	-	-	-	-	-	-		1) Issue structure updated 2) Prison building types now follow the same credit structure as all other building types 3) BS 42020: 2013 now referred to for the landscape and habitat management plan criteria
	Total credits	11	(building type dependent)								**Total credits**	10	(building type dependent)							
POLLUTION										**POLLUTION**										
Pol 01	**Impact of refrigerants**	3	-	-	-	-	-	-		Pol 01	**Impact of refrigerants**	3	-	-	-	-	-	-		1) Additional default values have been provided for the DELC calculation 2) Leak detection criteria simplified
Pol 02	**NO_x emissions**	Max. 3 (building type dependent)	-	-	-	-	-	-		Pol 02	**NO_x emissions**	Max. 3 (building type dependent)	-	-	-	-	-	-		1) All buildings (except Industrial) are required to assess the NO_x emissions associated with both hot water and space heating, where water heating uses 10% or greater of the total heating demand 2) NO_x emissions associated with grid electricity have been updated 3) Conversion factors have been amended
Pol 03	**Surface water run off**	5	-	-	-	-	-	-		Pol 03	**Surface water run off**	5	-	-	-	-	-	Y (SB)		1) Criteria for developments in medium/high flood risk zones now includes the option to apply BS 8533:2011with reference to flood resilience/resistance 2) Minimising water course pollution criteria simplified
Pol 04	**Reduction of night time light pollution**	1	-	-	-	-	-	-		Pol 04	**Reduction of night time light pollution**	1	-	-	-	-	-	-		1) No major changes to this issue
Pol 05	**Noise attenuation**	1	-	-	-	-	-	-		Pol 05	**Reduction of noise pollution**	1	-	-	-	-	-	-		1) Issue name changed 2) No major changes to this issue
	Total credits	13	(building type dependent)								**Total credits**	13	(building type dependent)							

BREEAM 2011 Issue List				BREEAM 2014 Issue List				Summary of key changes and new requirements
	No. credits available	Minimum BREEAM standards (i.e. min. BREEAM credits)	Exemplary level req.		No. credits available	Minimum BREEAM standards (i.e. min. BREEAM credits)	Exemplary level req.	
CHANGES AFFECTING ON ALL SECTIONS								
	BREEAM 2011			**BREEAM 2014**				
Shell and core	The four options available to clients using BREEAM to assess a new shell and core building include; Option 1 - Use of a lease agreement between the developer and tenants Option 2 - A green building guide for tenant fit-outs Option 3 - Developer/tenant collaboration Option 4 - No evidence provided for tenant(s) fit-out specification Further information can be found in Appendix D of the scheme document.			New shell and core projects are categorised into one of the following types; Option 1: Shell only Option 2: Shell and core Shell and core compliance notes have been added to each assessment issue to confirm whether or not it applied to a shell and core project and, where it does apply, how to assess it for the two shell and core project types. Further information can be found in Appendix D of the scheme document and the compliance notes for each issue.				
Appendices	Appendix A – BREEAM New Construction scope and healthcare building types			Appendix A – BREEAM UK New Construction scope and Healthcare building types				
	Appendix B – BREEAM New Construction scope and education buildings			Appendix B - BREEAM UK New Construction scope and Education buildings				
	Appendix C – BREEAM New Construction scope and multi-residential buildings			Appendix C - BREEAM UK New Construction scope and Multi-residential buildings				
	Appendix D – BREEAM New Construction and shell and core/speculative assessments			Appendix D - BREEAM UK New Construction and shell and core project assessments The guidance on shell and core assessments has been updated. See row 89 above for further information.				
	Appendix E – Organisational, Local or National Considerate Constructor Scheme requirements: guidance for scheme administrators			Appendix E 'Applicability of BREEAM New Construction for simple building assessments' has been added for BREEAM UK New Construction 2014. A guidance note on organisational, local and national considerate constructor schemes will be provided on the BREEAM website in due course.				
	Appendix F – Guidance for relating ecologist's report to BREEAM			A guidance note on relating the ecologist's reports to BREEAM will be provided on the BREEAM website in due course. New Appendice in development.				
	Appendix G – The BREEAM evidential requirements			See 'The BREEAM evidential requirements' prior to the technical sections at the front of the manual. The evidential requirements have been updated. See row 98 below for further information. New Appendice in development.				
	Appendix H – BREEAM assessment issues by building type and their percentage contribution to BREEAM performance			Appendix H 'Examples of BREEAM New Construction certificates' has been added for BREEAM UK New Construction 2014. Information on BREEAM assessment issues according to building type and their percentage contribution to BREEAM performance is no longer available within the scheme document.				
Evidence	The 'Schedule of Evidence' section within each BREEAM issue lists the evidence required to demonstrate compliance. Appendix G 'The BREEAM evidential requirements' provides further information.			The Evidence section (formerly the 'Schedule of Evidence') within each issue has been updated in line with guidance found in 'The BREEAM evidential requirements' prior to the technical sections at the front of the manual. Three evidence types have been introduced; 1. General evidence, 2. Specific evidence, and 3. Other evidence. The Evidence section for each issue lists the 'specific evidence' required only. BREEAM Assessors should refer to the table of 'Evidence types' found in 'The BREEAM evidential requirements' section for guidance on the types of 'general evidence' that can be used in combination with 'specific evidence' to demonstrate that all criteria have been complied with.				
Weightings	The weighting applied to each BREEAM section is as follows;			The weighting applied to each BREEAM section has been reviewed and updated as follows;				
	Management	12%		**Management**	12%	12.5%	11%	
	Health & wellbeing	15%		**Health & wellbeing**	15%	10%	10.50%	
	Energy	19%		**Energy**	15%	14.5%	15%	
	Transport	8%		**Transport**	9%	11.5%	10%	
	Water	6%		**Water**	7%	4%	7.50%	
	Materials	12.5%		**Materials**	13.5%	17.5%	14.50%	
	Waste	7.5%		**Waste**	8.5%	11%	9.50%	
	Land use & ecology	10%		**Land use & ecology**	10%	13%	11%	
	Pollution	10%		**Pollution**	10%	6%	11%	
	Innovation	10%		**Innovation**	10%	10%	10%	
					Fully fitted out	**Shell only**	**Shell and core only**	