

BREEAM Pre-assessment report

Land South of Westwells Road,
Neston, Corsham, UK.

Proposed Extension of Spring Park Campus

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1. Executive Summary

This pre-assessment report reviews the opportunities to implement strategies aligned to BREEAM for the site “Land South of Westwells Road, Neston, Corsham”, also known as Proposed Extension of Spring Park Campus.

The pre-assessment is based upon the latest applicable BREEAM methodology for data centre buildings in the UK (Data Centres UK 2010- SD5068 v.1.2). The project has been registered with BRE under Focus ED licence for BREEAM certification (BREEAM-0097-7835).

This report has been developed earlier than Concept Design Stage (RIBA Stage 2) and investigates how the development meets the BREEAM requirements based on building design, location and expected performance.

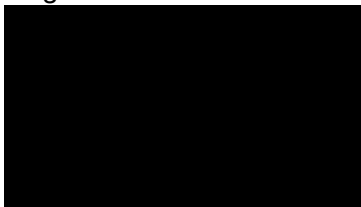
Predicted building performance reveals the building can achieve a BREEAM ‘Very Good’ certificate, with a +55% score (meeting all minimum requirements as summarised in Section 3.1). However, it is essential to consider submitting the assessment with at least a +7% additional score (no less than 62% overall). That is to avoid the impact of missing credits from criteria that cannot be confirmed at post-construction submission for final certification.

To define the achievable target BREEAM rating for the Proposed Extension of Spring Park Campus, the BREEAM criteria have been reviewed against available project documentation and the configuration of other existing Spring Park ARK data centres with similar performance that is expected for the building (such as P3, P4 and P5 buildings, assessed by Focus ED). As a result, this report reveals that a ‘Very Good’ BREEAM rating can be achieved with a **64.20% target score (See Section 3)**. Also, it discloses that the building could reach up to 67.91% as a maximum score for BREEAM (also known as the ‘Potential score’).

This report also explored the feasibility of achieving an ‘Excellent’ rating. Based on this, Section 3.3 reviews the credits that are not targeted and explore what is required to meet this ‘additional’ criteria. Preliminary findings suggest that most of these ‘additional’ credits cannot be awarded due to the requirements of data centre systems and building site/location. Also, credits that impact the lease contracts requiring unfeasible commitments for future tenants are not considered. Therefore, it has been found that targeting a higher rating such as +70% for an ‘Excellent’ certification, seems unfeasible at this stage.

Signed:

Date: 17th April 2024



Dario Arevalo

Focus ED. BREEAM Assessor and BREEAM Advisory Professional (AP)

2. Introduction

The proposed development is the extension of Spring Park Campus- ARK Data Centres in Corsham, Wiltshire, UK.

The proposed extension is projected to hold 28 data halls (at 0.75MW each) for a total 21MW IT load capacity. The data centre building is served by an adjacent ancillary building and energy centre. Total area assessed (estimated GIA): 23,500m².

ARK Data Centres aims to obtain a BREEAM certification achieving a minimum rating of 'Very Good' for the development.

2.1. BREEAM Certification as a rating system for sustainable buildings.

Achieving a BREEAM certification demonstrates the building credentials and commitments for sustainability and efficient building performance.

BREEAM (Building Establishment Environmental Assessment Method) is a certification methodology that measures the performance of the building in line with sustainability and environmental benchmarks and standards. The methodology evaluates how the building performs against the following sustainable design categories and main issues:

Table 1. BREEAM Environmental categories

Management -Commissioning -Construction site impacts -Security	Health & Wellbeing -Daylight -Occupant thermal comfort -Acoustics -Indoor air and water quality -Internal and external lighting	Energy -CO2 emissions -Low/Zero carbon technologies -Energy sub-metering -Energy-efficient building systems
Transport -Public transport -Pedestrian and Cyclist facilities -Access to amenities -Travel plan	Water -Water consumption -Leak detection -Water reuse and recycling	Materials -Embodied life cycle impact of materials -Materials reuse -Responsible sourcing -Robustness
Waste -Construction waste -Recycled aggregates -Recycling facilities	Land Use and Ecology -Site selection -Protection of ecology -Mitigation/enhancement of ecological value	Pollution -Use of refrigerants -Flood risk -NOx emissions -Watercourse pollution -External light and noise pollution

Each issue is a source of environmental impact, which can be assessed against a performance target and awarded one or more credits. In addition to meeting minimum standards, achieving the requirements in each design category scores a number of percentage points. The overall total percentage 'score' then determines the BREEAM rating achieved by the assessed development.

2.2. BREEAM Scoring System

The BREEAM assessment is developed through the applicable BREEAM version to date: BREEAM UK New Construction, Other Buildings with large associated areas (ancillary block) (Data Centres 2010- SD5068: 1.2).

The rating benchmarks for this BREEAM Data Centres assessment are outlined in the table below:

Table 2. BREEAM rating Benchmarks

BREEAM Rating	Performance	% score
UNCLASSIFIED	Does not meet levels of standard good practice	<30
PASS	75% of UK new non-domestic buildings (standard good practice)	≥30
GOOD	50% of UK new non-domestic buildings (intermediate good practice)	≥45
VERY GOOD	Top 25% of UK new non-domestic buildings (advanced good practice)	≥55
EXCELLENT	Top 10% of UK new non-domestic buildings (best practice)	≥70
OUTSTANDING*	Less than top 1% of UK new non-domestic buildings (innovator)	≥85

For this assessment, the environmental weightings for the nine issues are directly related to the impact on sustainability. These are distributed as follows:

Table 3. Assessment score weightings for the Proposed Extension of Spring Park Campus

Section	% weighting per chapter	% score per credit available
Management	12.0	1.0
Health & Wellbeing	10.0	0.77
Energy	37.0	1.61
Transport	5.0	0.50
Water	8.5	1.06
Materials	7.0	0.47
Waste	4.5	0.64
Land Use & Ecology	6.0	0.60
Pollution	10.0	0.91
Innovation (Exceeding performance)	10.0	1.0

3. Proposed Extension Building. BREEAM performance

The proposed development has been assessed against the BREEAM criteria, considering the ARK data centres specifications, expected building performance, management and operations. The assessed building is projected to achieve a 64.20% BREEAM score for a 'Very Good' rating.

Section 3.5- reveals specific requirements for each chapter. Similarly, Appendix A includes a summary matrix with stakeholders' responsibilities and projected target credits. In addition, Appendix B details the applicable BREEAM criteria for this data centre development.

Achieving the target score is subject to meeting minimum standards and early-stage credits, as follows:

3.1. BREEAM Minimum Standards

The following minimum standards should be met to award a BREEAM' **Very Good**' certification (also achieving at least a **55% score**):

- **Man 1 – Commissioning:** (One credit) An appropriate project team member has been appointed to monitor commissioning activities on behalf of the client. Commissioning activities are carried out in line with current standards.
- **Hea 4 - High-frequency lighting:** (One credit) LED lighting features are specified, or instead, high-frequency ballasts are installed on all fluorescent and compact fluorescent lamps (if any).
- **Hea 12 - Microbial contamination:** (One credit) Specifying systems for ambient humidification avoids the risk of waterborne and airborne legionella contamination.
- **Ene 2 - Sub-metering of substantial energy uses:** (One credit) Secure the provision of direct submetering of energy uses within the building.
- **Wat 1 - Water consumption:** (One credit) Specifying water-efficient fittings and demonstrating reduced potable water consumption and low water use.
- **Wat 2 - Water meter:** (One credit) A water meter with a pulsed output is installed on the main supply of the building.
- **LE 4 - Mitigating ecological impact:** (One credit) The appointed Ecologist confirms the change in the site's existing ecological value (no worse than minus nine plant species).

3.2. Design considerations and provisions no later than the Concept stage.

Early design considerations are essential to maximise the BREEAM performance and minimise unexpected additional costs. Based on that, the following chapters for this assessment are recommended to be addressed at early stage (Concept Design RIBA Stage 2):

- **Man 03. Construction Site Impacts:** Arrange monitoring for site activities (Water use, Energy use, CO2 from transport).
- **Man 08. Security:** Design consultation with the Security advisor and local police (Architectural Liaison Officer ALO or Crime Prevention Design Advisor -CPDA) on designing out the opportunity for crime, following the principles and guidance of Secured by Design.
- **Hea 01. Daylighting:** Architects review and confirm that at least 80% of office areas have external views (Required daylight factors will be advised).
- **Hea 02. View Out:** Architects to review the design and confirm offices have window/opening $\geq 20\%$ of the total inside wall area.
- **Hea 13. Acoustic Performance:** Acoustic consultant's early consultation to confirm if additional works/insulation might be required in sensitive admin rooms.
- **Ene 05. Low Zero Carbon (LZC):** A feasibility study confirms the most suitable LZC technology for the development. The selected system is deemed to be installed.
- **Wat 03. Major Water Leak detection:** Include a leak detection device in the main water incomings (Proposed building boundary).
- **Wat 05. Water recycling:** Specialist designer to review the water harvesting design and make it available to meet toilet flushing needs.
- **Wst 02. Recycled Aggregates:** Use crushing aggregates from SQ2 demolition as high-aggregate for the building. (i.e. concrete structure, ground floor, slabs, paved areas or roads)
- **Ecology credits (LE 03, LE 04, LE 05 and LE 06):** Appoint an Ecology consultant at the earliest opportunity to:
 - Review the existing ecology studies and planning requirements (i.e. Ecology reports used for planning and Tree survey).
 - Produce an ecology report and a Landscape Habitat Management Plan (LHMP).
 - Advise the ecology and biodiversity to be protected and enhanced, providing recommendations and highlighting critical actions.
 - Survey the existing and proposed ecology of the site (Proposed building boundary) and calculate the resultant ecology value of the site.

- **Pol 01. Refrigerants:** MEP specialist to review the design and confirm if refrigerants with < 5 GWP content are suitable for the systems.
- **Pol 02. Refrigerant leaks:** MEP specialist implements refrigerant leak detection systems (or refrigerant recovery) are specified.

3.3. Predicted credits not achieved for the development.

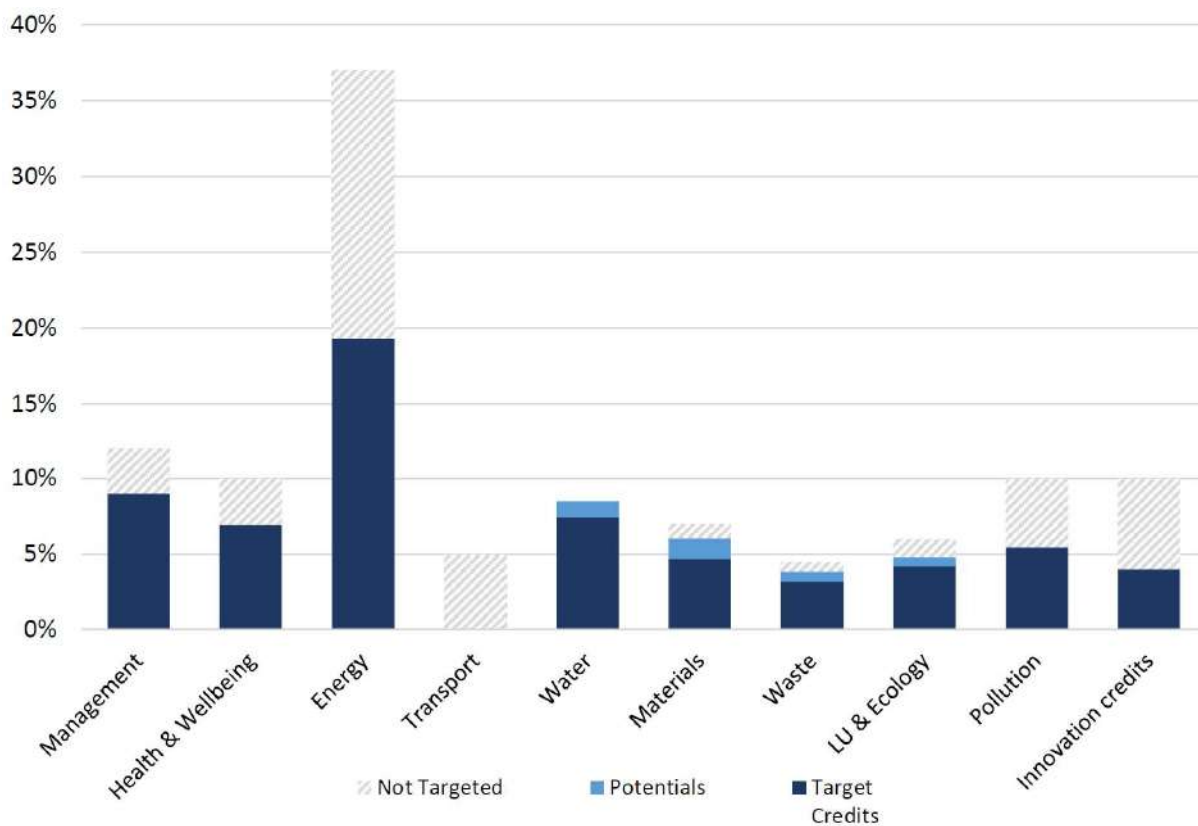
Considering building specifications, expected performance and tenant requirements, further opportunities have been explored to understand the potential to achieve additional credits and higher BREEAM ratings (i.e. 'Excellent' rating). Based on the findings, the following credits are considered not targeted as they are unachievable or financially unviable:

- **Man 01. Seasonal commissioning** (1 credit: 1.0% score):
Resources in place to arrange seasonal commissioning activities after 12 months of the tenant occupation at full capacity.
- **Man 12. Life Cycle Cost Analysis** (2 credits 2.0% score)
Due to the complexity and cost of the data centre modules design, the LCC Study and implementation are financially unavailable.
- **Hea 01. Daylighting** (1 credit 0.77% score)
Current building design cannot guarantee that 80% of office areas have minimum requirements for external views.
- **Hea 02. View Out** (1 credit 0.77% score)
Current building design cannot guarantee offices have window/opening $\geq 20\%$ of the total inside wall area.
- **Hea 07. Potential for Natural ventilation** (1 credit 0.77% score)
The ancillary building design does not allow the minimum requirements for natural ventilation.
- **Hea 08. Indoor air quality** (1 credit 0.77% score)
Due to the building configuration, mechanical systems cannot provide the minimum requirements for distance between air intakes and extracts (+10m apart)
- **Ene 05. Installation of LZC systems** (2 credits 3.22% score)
Integrated zero-carbon technologies cannot guarantee the reduction of the +10% building's energy demand.
- **Ene 22. Sustainable IT Equipment** (2 credits 3.22% score)
The prospective tenant is unknown. The new tenant should confirm that installed IT systems align with EU Code of Conduct.

- **Tra 01. Provision of Public transport** (3 credits 1.5% score)
Due to the building location, occupants do not have a minimum provision of public transport as required by BREEAM.
- **Tra 02. Proximity to Amenities** (1 credit 0.5% score)
Due to the building location, occupants do not have a minimum provision of amenities as required by BREEAM.
- **Tra 03. Cycle storage and cyclist facilities** (2 credits 1.0% score)
Cycle storage location spaces are deemed to be located in the most convenient location giving priority to data centres' security and circulation. The current arrangement shows that cyclist storage spaces cannot be located within 100m of the Proposed building entrance as per BREEAM criteria.
- **Tra 04. Pedestrian and Cycle safety** (1 credit 0.5% score)
The building arrangement cannot meet the BREEAM criteria for segregated cycling paths and pedestrian routes.
- **Tra 05. Travel Plan** (1 credit 0.5% score)
Due to the building location, implementing meaningful strategies through a site-specific travel plan is considered not feasible for BREEAM purposes.
- **Tra 06. Maximum Car Parking Capacity** (2 credits 1.0% score)
The building requirements for parking capacity do not meet the minimum criteria for this chapter.
- **Mat 03. Reuse of Building Facade** (1 credit 0.47% score)
The development does not reuse the façade of any existing buildings.
- **Mat 04. Reuse of Structure** (1 credit 0.47% score)
The development does not reuse any components from the structure of existing buildings.
- **Wst 04. Compactor / Baler** (1 credit 0.64% score)
The installation of a compactor or baler is not suitable for the expected waste of the building.
- **LE 02. Contaminated Land.** (1 credit 0.60% score)
The selected Site does not meet the criteria to be considered 'contaminated land'.
- **Pol 01. Refrigerants.** (1 credit 0.91% score)
Required data centre refrigerants for this development cannot meet the minimum GWP levels to achieve the credit.
- **Pol 04. NOx Emissions.** (2 credits 1.82% score)
Credit is not achievable as the ancillary building's space heating is fuelled by electricity and NOx emissions will overtake minimum levels.

3.4. Preliminary BREEAM Rating. Proposed building.

	Credits available	Weighting Factor	Credit value	Target Credits		Potentials		Not Targeted	
Management	12	12.0%	1.000%	9	9.00%	0	0.00%	3	3.0%
Health & Wellbeing	13	10.0%	0.769%	9	6.92%	0	0.00%	4	3.1%
Energy	23	37.0%	1.609%	12	19.30%	0	0.00%	11	17.7%
Transport	10	5.0%	0.500%	0	0.00%	0	0.00%	10	5.0%
Water	8	8.5%	1.063%	7	7.44%	1	1.06%	0	0.0%
Materials	15	7.0%	0.467%	10	4.67%	3	1.40%	2	0.9%
Waste	7	4.5%	0.643%	5	3.21%	1	0.64%	1	0.6%
LU & Ecology	10	6.0%	0.600%	7	4.20%	1	0.60%	2	1.2%
Pollution	11	10.0%	0.909%	6	5.45%	0	0.00%	5	4.5%
Innovation credits	10	10.0%	1.000%	4	4.00%	0	0.00%	6	6.0%
Totals	119	100.0%		69		6		44	
Minimum Standard Achieved				Very Good		Very Good			
Overall Score %				64.20		67.91		42.1%	
Overall Rating				Very Good		Very Good			



3.5. BREEAM Sections and credits for the proposed building.

Management	Available	Targeted	Potential
Man 1: Commissioning	2	1	0
An appropriate project team member has been appointed to monitor commissioning on behalf of the client, and commissioning activities are carried out in line with current best practice.			
Man 2: Considerate Constructors	2	2	0
The main contractor meets the requirements for the Considerate Constructors Scheme (CCS). It is expected to achieve >36 score in the CCS= 2 credits + 1 extra exemplary credit.			
Man 3: Construction Site Impacts	4	4	0
To ensure best practices and efficiency through construction activities. Monitoring of construction activities on site (CO ₂ , Water and Energy- inc. transport) and EMS procedures and policies in place (including management of materials, air quality and water pollution on site)			
Man 4: Building User Guide	1	1	0
Provision of a building user guide (BUG) that covers information relevant to the tenant/occupants and non-technical building manager on the operation and environmental performance of the building. The BUG is delivered to the occupier on building completion.			
Man 8: Security	1	1	0
EARLY STAGE CREDIT--- Design consultation to the Security advisor and local police (Architectural Liaison Officer ALO or Crime Prevention Design Advisor -CPDA) on designing the opportunity for crime, following the principles and guidance of Secured by Design.			
Man 12: Life cycle Costing	2	0	0
Due to the complexity and cost of the data centre modules design, the LCC Study and implementation are financially unavailable.			
-----Management Section Totals	12	9	0

Health and Wellbeing	Available	Targeted	Potential
Hea 1: Daylighting	1	0	0
Current building design cannot guarantee 80% of office areas have minimum requirements for external views.			
Hea 2: View Out	1	0	0
Current building design cannot guarantee offices have window/opening ≥20% of the total inside wall area.			
Hea 3: Glare Control	1	1	0
Specification of an occupant-controlled shading system in all windows for occupied building areas in ancillary building.			
Hea 4: High Frequency Lighting	1	1	0
Specification of LED lighting features			
Hea 5: Internal and external lighting levels	1	1	0
Lighting calculations in ancillary areas and exterior. Calculations should confirm compliant lux lighting (illuminance) levels.			

Hea 6: Lighting zones and controls	1	1	0
Lighting in ancillary areas is zoned (admin/office rooms). Specifications demonstrate that lighting can be controlled by the occupants of each room.			
Hea 7: Potential for Natural Ventilation	1	0	0
The ancillary building does not meet the minimum requirements for natural ventilation.			
Hea 8: Indoor Air Quality	1	0	0
Mechanical systems cannot provide the minimum requirements for distance between air intakes and extracts (+10m apart)			
Hea 9: Volatile Organic Compounds	1	1	0
Indoor finishes and products are tested and compliant against VOC and Formaldehyde content			
Hea 10: Thermal Comfort	1	1	0
Thermal modelling to demonstrate thermal comfort levels at admin areas. Compliance with CIBSE guidelines is required.			
Hea 11: Thermal Zoning	1	1	0
Mechanical specs confirming Thermal zoning in ancillary areas, including user controls with independent adjustment of heating/cooling systems			
Hea 12: Microbial Contamination	1	1	0
Specification of systems that minimise the risk of waterborne and airborne legionella contamination.			
Hea 13: Acoustic Performance	1	1	0
An acoustic consultant's early consultation is required to confirm if additional works/insulation are required in sensitive admin rooms.			
-----Health and Wellbeing section Totals	13	9	0

Energy	Available	Targeted	Potential
Ene 1: Reduction of CO2 Emissions	15	9	0
Minimum 9 credits are expected for the development.			
Ene 2: Sub-metering of Substantial Energy Uses	2	2	0
Provision of direct submetering of energy uses within the building.			
Ene 4: External Lighting	1	1	0
Luminous efficacy and automated lighting control of external lighting features--(Including roof lighting)			
Ene 5: Low or Zero Carbon Technologies	3	0	0
EARLY STAGE CREDIT--- A feasibility study should confirm the most suitable LZC technology for the building. Preliminary findings suggest that the integrated zero-carbon technologies cannot guarantee the reduction of the +10% building's energy demand.			
Ene 22: Procurement of Sustainable IT Equipment	2	0	0
The tenant is known. The new tenant should confirm that installed IT systems align with EU Code of Conduct.			
-----Energy Section Totals	23	12	0

Transport	Available	Targeted	Potential
Tra 1: Provision of Public Transport	3	0	0
Due to the building location, occupants do not have a minimum provision of public transport as required by BREEAM.			
Tra 2: Proximity to amenities	1	0	0
Due to the building location, occupants do not have a minimum provision of amenities as required by BREEAM.			
Tra 3: Cyclist Facilities	2	0	0
Cyclist storage spaces cannot be located within 100m of the proposed building entrance. Current arrangement shows that cyclist storage spaces cannot be located within 100m of the building entrance as per BREEAM criteria.			
Tra 4: Pedestrian and Cyclist Safety	1	0	0
The development location cannot meet the BREEAM criteria for segregated cycling paths and pedestrian routes.			
Tra 5: Travel Plan	1	0	0
Due to the building location, implementing meaningful strategies through a site-specific travel plan is considered not feasible for BREEAM purposes.			
Tra 6: Maximum Car Parking Capacity	2	0	0
The building requirements for parking capacity do not meet the minimum criteria for this chapter.			
-----Transport Section Totals	10	0	0

Water	Available	Targeted	Potential
Wat 1: Water Consumption	3	3	0
Water-efficient fittings are specified. Reduced consumption of potable water and low water use. Typical ARK data centres demonstrate >50% water reduction in data centre cooling systems.			
Wat 2: Water Meter	1	1	0
A water meter with a pulsed output is installed on the main supply of the building. An exemplary credit is to be achieved as water consumption for cooling is monitored through BMS components.			
Wat 3: Major Leak Detection	1	1	0
A leak detection device is included in the water main incomings (proposed building)			
Wat 4: Sanitary Supply Shut Off	1	1	0
Specification of Solenoid valves in toilet facilities (in case of failure, the system is able to block WC, showers, taps, etc)			
Wat 5: Water recycling	1	0	1
Water harvesting to meet toilet flushing needs (reuse of water or rainwater)			
Wat 6: Irrigation Systems	1	1	0
External landscaping and planting rely solely on precipitation, during all seasons of the year. -Credit awarded by default			
-----Water Section Totals	8	7	1

Materials	Available	Targeted	Potential
Mat 1: Materials Specification (Major Building Elements)	6	4	2
Specification of construction elements and materials with low environmental impact over the life cycle of the building.			
Mat 2: Hard Landscaping and Boundary Protection	1	1	0
Specification of hard landscape and boundary elements with low environmental impact over the life cycle of the project.			
Mat 3: Re-Use of Facade	1	0	0
The development does not reuse the façade of existing buildings.			
Mat 4: Re-Use of Structure	1	0	0
The development does not reuse any structure of existing buildings.			
Mat 5: Responsible Sourcing of Materials	3	3	0
Specifications of materials compliant with responsible sourcing standards. Compliant schemes: BES 6001; CARES; CSC; Eco Reinforcement Responsible Sourcing; FSC; PEFC; SFI; EMS certified (Including Supply chain); EMS certified (Without Supply chain) or Construction Product/Material reused in-situ			
Mat 6: Insulation	2	1	1
Specification of insulation materials with low environmental impact over the life cycle of the building.			
Mat 7: Designing for Robustness	1	1	0
Protection for vulnerable areas to minimise the frequency of use of replacement materials (Exposed parts of the building Internal-External-Landscape)			
-----Materials Section Totals	15	10	3

Waste	Available	Targeted	Potential
Wst 1: Construction Site Waste Management	4	4	0
A Site Waste Management Plan (SWMP) is developed at early stages to define waste targets and procedures during construction. KPIs /monitoring of waste streams on-site will confirm the resulting performance and credits awarded.			
Wst 2: Recycled Aggregates	1	0	1
Crushing aggregates from existing buildings demolition can be used as a high aggregate for the proposed building. (i.e. concrete structure, ground floor, slabs, paved areas or roads)—Recycled aggregates can also be obtained from other sources (at least 25% of total high-aggregates are required to be recycled to meet the criteria).			
Wst 3: Recyclable Waste Storage	1	1	0
Provision of appropriate dedicated Bin storage facilities for recycling during occupation			
Wst 4: Compactor / Baler	1	0	0
The installation of a compactor or baler is not suitable for the expected waste of the development.			
-----Waste Section Totals	7	5	1

Land Use and Ecology	Available	Targeted	Potential
LE 1: Reuse of Land	1	1	0
More than 75% area of the land was previously developed (including hard landscaping) - Pre-construction survey drawings or historical mapping required			
LE 2: Contaminated Land	1	0	0
The selected site does not meet the criteria to be considered as a 'contaminated land'.			
LE 3: Ecological Value of Site and Protection of Ecological Features	1	1	0
Ecology survey should confirm the ecological value of the site and existing ecological features that will be protected during construction			
LE 4: Mitigating Ecological Impact	2	1	1
Change in the ecological value of the site - existing habitats and new species are to be confirmed by the Ecologist. The resulting ecological change will confirm awarded credits.			
LE 5: Enhancing Site Ecology	3	2	0
Ecology survey and report -Ecology protection and enhancement in line with Ecologist's recommendations (including increment of species)			
LE 6: Long Term Impact on Biodiversity	2	2	0
A Landscape Habitat Management Plan (LHMP) is developed. Based on the LHMP, a nominated Biodiversity Champion (BC) will train the personnel on-site to protect ecology and biodiversity. The BC will make sure that environmental policies are in place during all phases of the project. Monitoring records and log-ins are required.			
-----Land Use and Ecology Section Totals	10	7	1

Pollution	Available	Targeted	Potential
Pol 1: Refrigerant GWP Building Services	1	0	0
Data Centre refrigerants for this development cannot meet the minimum GWP required to achieve the credit.			
Pol 2: Preventing Refrigerant Leaks	2	1	0
Criteria are achieved where refrigerant leak detection systems or refrigerant recovery are specified. (data rooms and ancillary building)			
Pol 4: NOx emissions from heating source	2	0	0
Credit not achievable as ancillary building's space heating is fuelled by electricity.			
Pol 5: Flood Risk	3	2	0
Flood Risk Assessment (FRA) and SuDS assessment will confirm the risks within the development			
Pol 6: Minimising Watercourse Pollution	1	1	0
Water pollution control systems are specified to avoid watercourse contamination (Oil-separators)			
Pol 7: Reduction of Night Time Light Pollution	1	1	0
External lighting features reduce uplighting to prevent unnecessary lighting pollution - Automated controls required.			
Pol 8: Noise Attenuation	1	1	0
The acoustician assesses the potential noise coming from the building plant equipment (roofs in ancillary and data hall modules), confirming that noise-sensitive buildings nearby (>800m) are not affected by noise.			
-----Pollution section Totals	11	6	0

Innovation	Available	Targeted	Potential
Inn 1: Innovation	10	2	0
Having a BREEAM AP (Advisory Professional) as part of the project team allows two extra credits under the Innovation category.			
Man 2: Considerate Constructors	1	1	0
It is expected to achieve >36 score in the CCS to achieve this Innovation credit.			
Hea 1: Daylighting	1	0	0
Based on the current design, exemplary criteria is not targeted.			
Ene 1: Reduction of CO2 emissions	2	0	0
Outstanding energy performance is not expected for the development.			
Ene 5: Low or Zero Carbon Technologies	1	0	0
Integrated zero carbon technologies cannot guarantee the reduction of the +15% building's energy demand.			
Wat 1: Water Consumption	1	0	0
The building should demonstrate >50% water reduction in data centre cooling systems.			
Wat 2: Water Meter	1	1	0
Expected water controls and efficiency will award one exemplary/innovation credit for this chapter.			
Mat 1: Materials Specification	1	0	0
Exemplary performance is not expected. Credit not targeted			
Mat 5: Responsible Sourcing of Materials	1	0	0
Exemplary performance is not expected. Credit not targeted			
Wst 1: Construction Site Waste Management	1	0	0
Exemplary performance not expected. Credit not targeted			
Innovation Totals (Up to a maximum of 10 credits)	10	4	0
Overall Totals (Credits)	119	69	6
Overall Score Target	64.20%		
Overall Score Potential	67.91%		

Appendix A – BREEAM Summary Matrix

BREEAM Pre-assessment | Evidence and Responsibilities Schedule

10/02/2023 - Preliminary target score

BREEAM Assessor: Dario Arevalo

Chapter team responsibility. To be confirmed at the kick off meeting

Target score
64.20

The following table has been produced to complement the criteria and actions reflected in the online tracker tool.
Please refer to the tool to review the credits requirements and live score progression.

BREEAM credits			Responsibility					Credits			Evidence	
BREEAM section		Issue name (Sub-sections) * Minimum 1 credit required for Very Good rating * min required for Excellent	ARK - Client	Main Contractor	Architect	MEP Ancillary	Data Centre specialist	Ecology/FRA	DSA			Criteria summary requirements / comments Design Stage
									Available	Targeted	Potential	
Management (1.00% per credit)	Man 01	Commissioning*	•			•	•		1	1		Commissioning activities in systems (Ancillary and Data centre modules)
		Seasonal commissioning							1			Seasonal commissioning is not expected for the development (Commissioning responsibilities over min 12 months after occupied)
	Man 02	Considered constructors*		•					2	2		Score from Considerate Constructors Scheme to be confirmed- Expected min 36 score= 2 credits + 1 extra exemplary credit
	Man 03	Construction Site Impacts (Monitoring and implementation)		•					3	3		Site impact monitoring activities (CO2, Water, Energy and transport). •EMS in place •Env Materials policy •Best practice policy for to air, and water pollution on site
		Responsibly Sourced timber		•					1	1		Chain of Custody certificates (FSC/PEFC)
	Man 04	Building user guide*		•					1	1		Building User Guide (and BUG distribution to occupants after completion)
	Man 08	Security	•						1	1		Early stage ALO/CPDA assessment and recommendations.
Health and Wellbeing (0.77% per credit)	Hea 12	Life Cycle Costing (LCC analysis)							1			Life Cycle Cost (LCC) analysis is not expected for the development
		LCC implementation							1			Life Cycle Cost (LCC) analysis is not expected for the development
	Hea 01	Daylighting							1			Building design cannot guarantee 80% of office areas have external views.
	Hea 02	View Out							1			Building design cannot guarantee offices have window/opening ≥20% of the total inside wall area.
	Hea 03	Glare Control	•						1	1		Specification of occupant-controlled shading system in all windows for occupied building areas in ancillary building.
	Hea 04	High Frequency lighting*				•			1	1		LED lighting specified in ancillary areas
	Hea 05	Internal and External lighting levels				•			1	1		Lighting calculations in ancillary areas and exterior. Calculations should confirm lux lighting (illuminance) levels.
	Hea 06	Lighting Zones and Controls				•			1	1		Lighting in ancillary areas is zoned (admin/office rooms). Lighting can be controlled by the occupants of each room.
	Hea 07	Potential for Natural ventilation							1			Ancillary building does not meet the minimum requirements for natural ventilation.
	Hea 08	Indoor air quality				•			1			Ancillary building does not meet the minimum requirements for distance between air intakes and extracts (+10m apart)
	Hea 09	Volatile Organic Compounds (VOC)			•		•		1	1		Specified materials comply with VOC and Formaldehyde testing.
	Hea 10	Thermal Comfort				•			1	1		Thermal modelling to demonstrate thermal comfort levels at admin areas. Compliance with CIBSE guidelines is required.
	Hea 11	Thermal Zoning				•			1	1		Mechanical specs confirming Thermal zoning in ancillary areas, including user controls with independent adjustment of heating/cooling systems
Energy (1.61% per credit)	Hea 12	Microbial contamination*				•			1	1		Water specs confirming that all installed water systems are compliant with the HSE's ACoP (Control of legionella)
	Hea 13	Acoustic Performance	•						1	1		Acoustic consultant's early consultation to confirm if additional works/insulation are required in sensitive admin rooms (P5-North).
	Ene 01	Reduction of CO2 emissions*	•				•		15	9		Energy performance from ancillary building and data halls (Design Stage EPC certificate) and Evidence confirming PUE performance
	Ene 02	Submetering Energy use*				•	•		1	1		Ancillary and data halls: Drawings/schematics and specs confirming metering strategy
		BMS monitoring systems				•	•		1	1		Ancillary and data halls: Drawings/schematics and specs confirming BMS systems
	Ene 04	External lighting				•			1	1		Luminous efficacy and automated lighting control of external lighting features-- (Including roof lighting)
	Ene 05	Low Zero Carbon Feasibility study*							1			Low Zero Carbon technologies confirming meaningful CO2 reduction
		Installation of LZC and CO2 reduction							2			Installed LZC technology- results in a 10% reduction in the building's CO2 emissions (1 credit).--> >15% reduction= 2 credits. >20% reduction= +1 Exemplary credit.
Transport (0.50% per credit)	Ene 08	Lift analysis study							0			Speed of lift platforms is not greater than 0.15 m/sec -Credit excluded
		Lift specification							0			Speed of lift platforms is not greater than 0.15 m/sec -Credit excluded
	Ene 22	Sustainable IT Equipment	•				•		2			Tenant unknown- The new tenant should confirm that installed IT systems align with EU Code of Conduct.
	Tra 01	Provision of Public transport							3			Due to the building location, occupants do not have a minimum provision of public transport as required by BREEAM.
	Tra 02	Proximity to Amenities							1			Due to the building location, occupants do not have a minimum provision of amenities as required by BREEAM.
	Tra 03	Cyclist storage spaces							1			Cyclist storage spaces cannot be located within 100m of the building entrance
		Cyclist facilities							1			First credit not achieved
Water (1.06% per credit)	Tra 04	Pedestrian and Cycle safety							1			Criteria for segregated cycling paths and pedestrian routes are not suitable for the development
	Tra 05	Travel Plan							1			Producing a Travel plan is not expected for the development
	Tra 06	Maximum Car Parking Capacity							2			The building requirements for parking capacity do not meet the minimum criteria for this chapter.
	Wat 01	Water consumption- Sanitary fittings efficiency*	•						1	1		Maximum performance of water-efficient fittings is expected
		Cooling systems (>20% potable water reduction)					•		1	1		BladeRoom design allows great performance in systems with a water reduction of +50% from the baseline- (to achieve an additional Exemplary credit for Wat 01)
	Wat 02	Cooling systems (>40% potable water reduction)					•		1	1		BladeRoom design allows great performance in systems with a water reduction of +50% from the baseline- (to achieve an additional Exemplary credit for Wat 01)
		Water Meter*				•	•		1	1		Water meter with pulsed output connected to BMS for the monitoring of water consumption. Specs and drawings/schematics are required
Materials (0.47% per credit)	Wat 03	Major Leak detection	•	•					1	1		Specification leak detection systems (Main building income water)
	Wat 04	Sanitary Supply Shut Off				•			1	1		Specification of Solenoid valves in toilet facilities (WC, showers, taps, etc) - <u>Required</u> : Product data sheets and drawings/schematics
	Wat 05	Water Recycling	•						1	1		Water harvesting (re-use of water or rainwater) to meet toilet flushing needs
	Wat 06	Irrigation Systems	•						1	1		Main Contractor to produce an statement confirming that the external landscaping and planting rely solely on precipitation, during all seasons of the year.
	Mat 01	Materials specification			•		•		6	4	2	Rating for low environmental impact materials over the life cycle of the building
	Mat 02	Hard Landscaping and boundary protection		•	•				1	1		Rating for low env. impact materials over the life cycle of landscape and boundary elements.
	Mat 03	Reuse of building façade							1			Not applicable to this building
Waste (0.64% per credit)	Mat 04	Reuse of structure							1			Not applicable to this building
	Mat 05	Responsible sourcing of materials		•		•	•		3	3		Specifications of materials with Chain of Custody (CoC) and/or BES6001:2008 Certificate number and/or EMS Certificate number or BES6001 or EMS certificate.
	Mat 06	Insulation				•	•	•	2	1	1	Credits achieved by using responsibly sourced insulation elements with low embodied environmental impact
	Mat 07	Designing for Robustness			•		•	•	1	1		Protection for vulnerable areas (Exposed parts of the building Internal-External-Landscape) to minimise the frequency of use of replacement materials
	Wst 01	Construction Site Waste management		•			•		3	3		Site Wate Management Plan (SWMP) reflecting waste targets generated during construction •KPIs Waste monitoring on site
	Wst 02	Diversion of waste to landfill		•			•		1	1		Site Waste Management Plan (SWMP) and KPIs Waste monitoring on site reflecting level of waste diverted to landfill.
	Wst 03	Recycled Aggregates		•					1	1		Potential use of aggregates from demolition of existing building-- high-aggregates for the project (i.e. concrete structure, ground floor, slabs, paved areas or roads) —
Land and Ecology (0.60% per credit)	Wst 04	Recyclable Waste Storage*	•						1	1		Provision of appropriate dedicated Bin storage facilities for recycling during occupation
	Le 01	Compactor / Baler							1			Installation of a Compactor/Baler is not expected for the development
		Reuse of Land	•						1	1		More than 75% area of the land was previously developed (including hard landscaping)
	Le 02	Contaminated Land							1			The selected site does not meet the criteria to be considered as a 'contaminated land'.--(Use of contaminated land that has been remediated and developed).
	Le 03	Ecological value and protection of Ecological features	•					•	1	1		Ecology survey should confirm the ecological value of the site and existing ecological features that will be protected during construction
	Le 04	Mitigating Ecological impact (Site Ecological value)*	•					•	2	1	1	Change in ecological value of the site - existing habitats and new species are confined by the Ecologist. The resulting ecological change will confirm awarded credits.
	Le 05	Ecologist (SQE) recommendations	•					•	1	1		Ecology survey and report -Ecology protection and enhancement in line with Ecologist's recommendations
Pollution (0.91% per credit)	Le 06	Implementation and species increment	•					•	2	1		Ecology survey and report -Ecology protection and enhancement in line with Ecologist's recommendations-Increment of species
	Pol 01	Long Term Impact on Biodiversity	•					•	2	2		First Credit: Landscape Habitat Management Plan. Second: additional features Biodiversity Champion; Training Ecology protection; Records biodiversity protection
	Pol 02	Refrigerants				•	•		1			Data Centre refrigerants cannot meet the minimum GWP required to achieve the credit.
	Pol 03	Refrigerant leaks				•	•		2	1		Refrigerant leak detection systems (or refrigerant recovery) are specified.
	Pol 04	Nox Emissions							2			Credit not achievable as ancillary building's space heating is fuelled by electricity
	Pol 05	Flood Risk	•					•	3	2		Flood Risk Assessment (FRA) and SuDS assessment confirming criteria
	Pol 06	Minimising Watercourse Pollution	•					•	1	1		Water pollution control systems are specified to avoid watercourse contamination (Oil-separators)
Innovation (1.0% per credit)	Pol 07	Reduction of Night Time Light Pollution				•	•		1	1		Specified external lighting features with reduced uplighting to prevent unnecessary lighting pollution -Automated switch during night time.
	Pol 08	Noise attenuation	•						1	1		Acoustician report assessing noise equipment from building plant (ancillary and data hall modules) and the impact to noise-sensitive building nearby (>800m)
	Man 02	Considerate Constructors		•					1	1		Main Contractor to confirm Considerate Constructors final report score. > 36 or more to achieve Exemplary credit.
	Hea 01	Daylighting							1			Building design cannot guarantee meeting the minimum requirements
	Ene 01	Reduction of CO2 emissions							2			to award one exemplary credit, the following performance is required: ≤ 25 EPC and ≤ 1.20 PUE (or ≤ 1.10 PUE for two exemplary credits)
	Ene 05	Low Zero Carbon Technologies							1			Installed LZC technology- results in >15% reduction in the building's CO2 emissions= +1 Exemplary credit.
	Wat 01	Water Consumption							1			Design demonstrates a water reduction of +50% from the baseline- (to achieve an additional Exemplary credit for Wat 01)
BREEAM AP	Wat 02	Water meter (BMS monitoring Water consuming plant)	•				•		1	1		BMS connection and water meter control of water consuming plant.
	Mat 01	Materials specification			•		•		1			Exemplary performance for low environmental impact in materials--Credit no discarded yet. BREEAM assessor to calculate Mat 01 rating and confirm if targeted
	Mat 05	Responsible sourcing of materials			•		•		1			Exemplary performance for responsible sourced materials. >95% of total responsible sourced materials to achieve this Innovation credit
	Wst 01	Construction Site Waste management		•			•		1			Site Wate Management Plan (SWMP) reflecting waste targets generated during construction •KPIs Waste monitoring on site
	BREEAM AP	BREEAM AP appointment							2	2		BREEAM Advisory Professional (AP)-- Early stage appointment and project involvement (sustainability matters)

Appendix B – Detailed BREEAM criteria

Management	Compliance Requirements
Man 1: Commissioning	First credit 1. An appropriate project team member(s) is appointed to monitor and programme precommissioning, commissioning and, where necessary, re-commissioning on behalf of the client. 2. Commissioning to be carried out in line with current Building Regulations and BSRIA and CIBSE guidelines, where applicable. 3. The main contractor accounts for the commissioning programme, responsibilities and criteria within the main programme of works. 4. A specialist commissioning manager is appointed (by either client or contractor) for complex systems such as: • Air conditioning • Mechanical ventilation, displacement ventilation, complex passive ventilation • Building management systems (BMS) • Renewable energy sources • Microbiological safety cabinets and fume cupboards • Cold storage enclosures and refrigeration plant • Uninterruptable Power Supply (UPS) systems • Standby power generation The specialist commissioning manager must have been appointed during the design stage and the scope of their responsibility includes: • Design input: commissionability design reviews • Commissioning management input to construction programming • Commissioning management input during installation stages • Management of commissioning, performance testing and handover/post handover stages 5. Where BMS specified, the following commissioning procedures must be carried out: a. Commissioning of air and water systems is carried out when all control devices are installed, wired and functional b. In addition to air and water flow results, commissioning results include physical measurements of room temperatures, off coil temperatures and other key parameters as appropriate c. The BMS/controls installation should be running in auto with satisfactory internal conditions prior to handover d. All BMS schematics and graphics (if BMS is present) are fully installed and functional to user interface before handover e. The occupier will be fully trained in the operation of the system. Second credit 1. The first credit has been achieved. 2. The above appointment(s) include the following seasonal commissioning responsibilities over a minimum 12 month period, once the building becomes occupied: Complex Systems – Specialist commissioning manager a. Testing of all building services under full design load conditions, including heating/cooling/ventilation/humidity control/power supply systems and those in office/ancillary areas. b. Where applicable, testing should also be carried out during periods of extreme (high or low) load conditions. c. Where specified, free cooling systems should be tested on a seasonal basis. d. Interviews with building occupants (where they are affected by the complex services) to identify problems or concerns regarding the effectiveness of the systems. e. Re-commissioning of systems (following any work needed to serve revised loads), and incorporating any revisions in operating procedures into the O&M manuals. Where specialist building services systems such as fume cupboards, microbiological safety cabinets and a cold storage system are present then the assessor must ensure that these systems are included in the specialist commissioning agent's responsibilities. Simple Systems (naturally ventilated) – External Consultant/Facilities Manager a. Review thermal comfort, ventilation, and lighting, at three, six and nine month intervals after initial occupation, either by measurement or occupant feedback. b. Take all reasonable steps to re-commission systems following the review and incorporate any relevant revisions in operating procedures into the O&M manuals.
Man 2: Considerate Constructors	1. The main contractor has complied with and achieved formal certification under the Considerate Constructors Scheme (CCS), credits awarded as follows: (see Checklist A1) a. One credit where the contractor achieved a CCS Code of Considerate Practice score between 24 and 31.5. b. Two credits where the contractor achieved a CCS Code of Considerate Practice score between 32 and 35.5. - OR 2. The main contractor has complied with an alternative, independently assessed scheme (equivalent to CCS), credits awarded as follows: (see Checklist A2) a. One credit where the site has been independently assessed using the alternative scheme, AND the alternative scheme addresses all the mandatory items plus 50% of the optional items in Checklist A2. b. Two credits where the site is to be independently assessed using the alternative scheme AND the alternative scheme addresses all the mandatory items plus 80% of the optional items in Checklist A2. Exemplary level criteria The following outlines the exemplary level criteria to achieve an innovation credit for this BREEAM issue: 1. The main contractor has complied with and achieved a certified CCS Code of Considerate Practice score of 36 or more. - OR 2. The main contractor has complied in full with the alternative, independently assessed scheme, and the alternative scheme addresses all the mandatory and optional items in Checklist A2. NOTE: If the scheme is assessed under the Considerate Constructors scheme January 2013 onwards please refer to the revised scoring requirement within the supporting documents for correct scoring compliance.
Man 3: Construction Site Impacts	1. One credit where evidence provided demonstrates that 2 or more of items a-g (listed below) are achieved. - OR - Two credits where evidence provided demonstrates that 4 or more of items a-g (listed below) are achieved. - OR

	Three credits where evidence provided demonstrates that 6 or more of items a-g (listed below) achieved: - Monitor, report and set targets for CO2 or energy arising from site activities 2 or energy arising from transport to and from site - Monitor, report and set targets for CO - Monitor, report and set targets for water consumption arising from site activities - Implement best practice policies in respect of air (dust) pollution arising from the site - Implement best practice policies in respect of water (ground and surface) pollution occurring on the site - Main contractor has an environmental materials policy, used for sourcing of construction materials to be utilised on site - Main contractor operates an Environmental Management System. The Assessment Criteria for items a-g are detailed in the relevant section of Checklist A3. 2. One credit where evidence provided demonstrates that at least 80% of site timber is responsibly sourced and 100% is legally sourced. Fit Out only assessments - One credit where evidence provided demonstrates that the fit-out contractor adopts best practice policies in respect of air (dust) pollution arising from the site. - One credit where evidence provided demonstrates that the fit-out contractor has an environmental materials policy, used for sourcing of construction materials to be utilised on site. - One credit where evidence provided demonstrates that the fit-out contractor operates an Environmental Management System. The Assessment Criteria for each of the above items are detailed in the relevant section of Checklist A3
Man 4: Building User Guide	- A Building User Guide that contains the information described under the User Guide Contents heading (see additional guidance) has been developed. - The guide is relevant to the non-technical building user and appropriate to the stakeholder(s) that will occupy the building.
Man 8: Security	- The design team has consulted with and sought the advice of the local police Architectural Liaison Officer (ALO) or Crime Prevention Design Advisor (CPDA) on designing out the opportunity for crime, in accordance with the principles and guidance of Secured by Design - Consultation with the ALO/CPDA occurred during or prior to the concept design stage (RIBA stage C) or equivalent. - The final design embodies the recommendations of the ALO/CPDA and is built to conform to the principles and guidance of <i>Secured by Design</i>.
Man 12: Life cycle Costing	First credit - A Life Cycle Cost (LCC) analysis has been carried out based on the proposals developed during RIBA Work Stages C/D (concept design/design development), or equivalent. - The Life Cycle Costs analysis, based on the concept design/design development proposals, covers the following stages: - Construction - Operation - includes, as a minimum, utilities - Maintenance - includes, as a minimum, planned maintenance, replacements and repairs, cleaning, management costs - End of life. - The LCC analysis uses a study period of 25 or 30 (as applicable) AND 60 years, shown in real and discounted cash flow terms. - The analysis demonstrates that at least two of the following issues have been analysed at a strategic and system level (as per figure 6, Different levels of analysis at different stages of the life cycle, ISO 15686-5 8), comparing alternative options: - Structure - Envelope - Services - Finishes The chosen solution is the one that best meets the performance criteria for the built asset. 5. The option(s) with the lowest discounted LCC over the period is preferred, assuming that their selection results in at least one of the following: - The lowest building energy consumption over the operational life span of the building (compared to other options/alternatives analysed) - A reduction in maintenance requirement/frequency - Prolonged replacement intervals of services infrastructure/systems or building fabric - Dismantling and recycling or reuse of building components. 6. The model was updated during RIBA Work Stages D/E (design development/technical design) or equivalent. Second Credit - The first credit is achieved. - The results of the study have been implemented in the specification, design and final construction of the assessed building.

Health and Wellbeing	Compliance Requirements
Hea 1: Daylighting	- At least 80% of net lettable office floor area is adequately daylight as follows: - An average daylight factor of 2% or more. PLUS either (b) OR (c AND d) below - A uniformity ratio of at least 0.4 or a minimum point daylight factor of at least 0.8% (spaces with glazed roofs, such as atria, must achieve a uniformity ratio of at least 0.7 or a minimum point daylight factor of at least 1.4%). OR - A view of sky from desk height (0.7m) is achieved. AND - The room depth criterion $d/w + d/HW < 2/(1-RB)$ is satisfied. Where: d = room depth w = room width HW = window head height from floor level

	RB = average reflectance of surfaces in the rear half of the room. Note: Table 7 Reflectance for maximum room depths and window head heights (see Additional Information) gives maximum room depths in metres for different room widths and window head heights of sidelit rooms 2. The provision of daylight has been designed in accordance with the guidance in CIBSE Lighting Guide 10 Daylighting and window design, BS8206 Part 2 and the BRE Site Layout Guide 10 Exemplary level criteria The following outlines the exemplary level criteria to achieve an innovation credit for this BREEAM issue. 1. At least 80% of the floor area (for the building spaces/room identified above in the standard criteria) has an average daylight factor of 3% in multi-storey buildings and 4% in single-storey buildings. 2. The criteria outlined above concerning uniformity ratio, view of sky or room depth criterion are met. Where demonstrating compliance via uniformity ratio or point daylight factor the following minimum criteria apply: a. Multi-storey: A uniformity ratio of at least 0.4 or a minimum point daylight factor of at least 1.2%; (spaces with glazed roofs, such as atria, must achieve a uniformity ratio of at least 0.7 or a minimum point daylight factor of at least 2.1%). b. Single storey: a minimum point daylight factor of at least 1.6%; (spaces with glazed roofs, such as atria, must achieve a uniformity ratio of at least 0.7 or a minimum point daylight factor of at least 2.8%).
Hea 2: View Out	1. The relevant building areas are within 7m distance of a wall with a window or permanent opening providing an adequate view out, where the window/opening is $\geq 20\%$ of the total inside all area (refer to Compliance Notes for a definition of relevant building areas and adequate view out)
Hea 3: Glare Control	1. An occupant-controlled shading system on all windows, glazed doors and rooflights in all <i>relevant building areas</i> .
Hea 4: High Frequency Lighting	1. All fluorescent and compact fluorescent lamps are fitted with high frequency ballasts.
Hea 5: Internal and external lighting levels	1. Illuminance (lux) levels in all internal areas of the building are specified in accordance with the CIBSE Code for Lighting 2006 2. For areas where computer screens are regularly used, the lighting design complies with CIBSE Lighting Guide 7 sections 3.3, 4.6, 4.7, 4.8 and 4.9. This gives recommendations highlighting: a. Limits to the luminance of the luminaires, to avoid screen reflections. (Manufacturers' data for the luminaires should be sought to confirm this). b. For up-lighting, the recommendations refer to the luminance of the lit ceiling rather than the luminaire; a design team calculation is usually required to demonstrate this. c. Recommendations for direct lighting, ceiling illuminance, and average wall illuminance. 3. Illuminance levels for lighting in all external areas within the construction zone are specified in accordance with CIBSE Lighting Guide 6, 'The outdoor environment'
Hea 6: Lighting zones and controls	1. Lighting is zoned to allow separate occupant control of the following areas (where applicable): a. Office and circulation spaces b. In office areas, zones of no more than four workplaces c. Workstations adjacent to windows/atria and other building areas separately zoned and controlled d. Seminar and lecture rooms: zoned for presentation and audience areas e. Library spaces: separate zoning of stacks, reading and counter areas f. Dining, restaurant, cafe areas: separate zoning of servery and seating/dining areas
Hea 7: Potential for Natural Ventilation	1. <i>Occupied spaces</i> of the building are designed to be capable of providing fresh air entirely via a natural ventilation strategy, demonstrated via EITHER of the following: a. The openable window area in each occupied space is equivalent to 5% of the gross internal floor area of that room/floor plate. For room/floor plates between 7m-15m depth, the openable window area is on opposite sides and evenly distributed across the area to promote adequate cross-ventilation. OR b. The design demonstrates (by calculation, using ventilation design tool types recommended by CIBSE AM10) that the natural ventilation strategy provides adequate cross flow of air to maintain required thermal comfort conditions and ventilation rates. For a strategy which does not rely on openable windows, or which has occupied spaces with a plan depth greater than 15m, the design must demonstrate (by calculation in accordance with requirement 1b above) that the ventilation strategy can provide adequate cross flow of air to maintain the required thermal comfort conditions and ventilation rates. 2. The strategy is capable of providing at least two levels of user-control on the supply of fresh air to the occupied space with higher rates of ventilation achievable to remove short-term odours and/or prevent summertime overheating. This would typically be demonstrated by providing a large enough area of manually opening windows or powered window actuators. Any opening mechanisms must be easily accessible and provide adequate user-control over air low rates to avoid draughts.
Hea 8: Indoor Air Quality	1. Air-conditioned and mixed-mode buildings : Where the building's air intakes and exhausts are over 10m apart to minimise recirculation AND intakes are over 20m from sources of external pollution 2. Naturally-ventilated buildings: Where openable windows/ventilators are over 10m from sources of external pollution 3. In addition to the specific BREEAM criteria above, the building has been designed to provide fresh air rates to dilute pollutants in accordance with the following good practice: a. In general office type areas fresh air is provided in accordance with the top of the range recommended in the British Council for Offices Guide to Best Practice in the Specification of Offices i.e. 12 litres per second per person.
Hea 9: Volatile Organic Compounds	1. The following products (where specified) have been tested against and meet the relevant standards outlined in the table below for Volatile Organic Compound (VOC) emissions (See supporting documents for Table 8 VOC criteria by product type)
Hea 10: Thermal Comfort	1. Thermal modelling has been carried out using software selected and applied in accordance with CIBSE AM11 Building Energy and Environmental Modelling 2. The modelling demonstrates that the building design and services strategy can deliver thermal comfort levels in occupied spaces in accordance with the criteria set out in CIBSE Guide A Environmental Design; in particular that internal winter and summer temperature ranges will be in line with the recommended comfort criteria in table 1.5 of the Guide. 3. The software used to carry out the simulation at the detailed design stage must provide full dynamic thermal analysis. For smaller and more basic building designs an alternative less complex means of analysis may be appropriate (such methodologies must still be selected and applied in accordance with CIBSE AM11)
Hea 11: Thermal Zoning	1. The heating/cooling system is designed to allow occupant control of zoned areas within all occupied spaces in the building.

	2. The zoning allows separate occupant control (within the occupied space) of each perimeter area (i.e. within 7m of each external wall) and the central zone (i.e. over 7m from the external walls).
Hea 12: Microbial Contamination	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. 2. Where no humidification is specified or only steam humidification is provided.
Hea 13: Acoustic Performance	1. Indoor ambient noise levels in unoccupied staff/office areas comply with the following: a. $\leq 40\text{dB LAeq,T}$ in single occupancy offices b. $40\text{--}50\text{dB LAeq,T}$ in multiple occupancy offices c. $\leq 40\text{ dB LAeq,T}$ general spaces (staffrooms, restrooms) d. $\leq 35\text{ dB LAeq,T}$ in spaces designed for speech e.g. seminar/lecture rooms e. $\leq 50\text{ dB LAeq,T}$ in informal café/canteen areas 2. Fully fitted buildings only: The sound insulation between acoustically sensitive rooms and other occupied spaces complies with section 7.6.3.1 of BS8233, as follows: a. $D_w + \text{LAeq,T} > 75$ • D_w is the weighted sound level difference between the two spaces • LAeq,T is the design (or measured) indoor ambient noise level in the space adjacent to the acoustically sensitive room. The source and receive room sound pressure levels from which D_w is derived must be measured in accordance with BS EN ISO 140-4:1998 and the guidance in Annex B of Approved Document E. Measurements must be based on finished rooms, accounting for any carpets and acoustically absorbent ceilings specified. The measurements can be conducted in either furnished or unfurnished rooms. 3. Pre-completion acoustic testing is carried out by a suitably qualified acoustician to ensure that all relevant spaces (as built) achieve the performance standards required, and any required remedial works in spaces that do not meet the standards are completed prior to handover and occupation.

Energy	Compliance Requirements
Ene 1: Reduction of CO2 Emissions	1. The number of credits achieved is determined by comparing the building's: a. predicted Power Usage Effectiveness (PUE) AND b. CO2 index (EPC Rating), taken from the Energy Performance Certificate (EPC), with the table of benchmarks (see supporting documents). Both benchmarks must be met in order to achieve the associated number of credits (e.g to achieve 8 credits for a new build project, the building must have a CO2 index which falls between 40 and 26 and a predicted PUE of 1.45). 2. The assessed building's CO2 index (EPC Rating) must be entered in to the relevant box of the Ene 1 Reduction of CO2 emissions calculator. 3. The building has been modelled using a method compliant with the National Calculation Method (NCM) and an Energy Rating and certificate produced using Approved software by an Accredited Energy Assessor. 4. The assessed building's predicted PUE must be calculated as the annual average (i.e not the 'instantaneous' PUE) and must assume full load conditions. Exemplary level criteria The following outlines the exemplary level criteria to achieve an innovation credit for this BREEAM issue: 1. One additional innovation credit can be awarded where evidence provided demonstrates the building achieves a predicted PUE of ≤ 1.20 and an EPC rating of 25 or less (or 31 or less for a refurbished building). 2. Two additional innovation credit can be awarded where evidence provided demonstrates the building achieves a predicted PUE of ≤ 1.10 and an EPC rating of 25 or less (or 31 or less for a refurbished building).
Ene 2: Sub-metering of Substantial Energy Uses	One credit 1. Separate accessible energy sub-meters, labelled with the end energy consuming use, are provided for the following systems (where present): a. Space Heating b. Domestic Hot Water c. Humidification d. Cooling e. Fans (major) excluding fans in chillers/CRACs etc f. Lighting g. Small Power (lighting and small power can be on the same sub-meter where supplies are taken at each floor/department). h. UPS systems (input and output) i. Generators j. Power Distribution Units (PDUs) k. Other major energy-consuming items where appropriate (see Compliance Notes). Second credit 2. The first credit is achieved. 3. A BMS with the ability to monitor and control the following as well as the relevant systems above has been installed: a. Chillers, air handling units and pumps and other major HVAC plant (where specified) b. Internal environmental conditions 4. The BMS must have the ability to draw to the attention of the user out of range operational values (using an alarm system).
Ene 4: External Lighting	The following demonstrates compliance (where provided): 1. All external light fittings for the building, access ways and pathways have a luminous efficacy of at least 50 lamp lumens/circuit Watt when the lamp has a colour rendering index (Ra) greater than or equal to 60. OR 60 lamp lumens / circuit Watt when the lamp has a colour rendering index (Ra) less than 60. 2. All external light fittings to car parking areas, associated roads and floodlighting has a luminous efficacy of at least 70 lamp lumens/circuitWatt when the lamp has a colour rendering index (Ra) greater than or equal to 60. OR 80 lamp Lumens / circuit Watts when the lamp has a colour rendering index (Ra) less than 60. 3. All external light fittings for signs and uplighting have a luminous efficacy of at least 60 lamp lumens/circuit Watt when the lamp wattage is greater than or equal to 25W. OR 50 lamp lumens/circuit Watt when the lamp wattage is less than 25W.

	4. External light fittings are controlled through a time switch, or daylight sensor, to prevent operation during daylight hours. Daylight sensor override on a manually switched lighting circuit is acceptable.
Ene 5: Low or Zero Carbon Technologies	First credit 1. A feasibility study has been carried out by an energy specialist (see Compliance Notes) to establish the most appropriate local (on-site or near-site) LZC energy source for the building/development. This study covers as a minimum: - Energy generated from LZC energy source per year - Payback - Land use - Local planning criteria - Noise - Feasibility of exporting heat/electricity from the system - Life cycle cost/lifecycle impact of the potential specification in terms of carbon emissions - Any available grants - All technologies appropriate to the site and energy demand of the development. - Reasons for excluding other technologies. 2. A local LZC energy technology has been specified for the building/development in line with the recommendations of the above feasibility study. 3. The feasibility study has been carried out at RIBA stage C (concept design) or equivalent procurement stage. OR 4. The organisation that occupies the building has in place a contract with an energy supplier to provide electricity for the assessed building/development from a 100% renewable energy source. This supply must be delivered by an accredited external renewable source. The contract must be valid for a minimum of 3 years from the date the assessed building becomes occupied. Second credit - The first credit for a feasibility study must be achieved. - A local LZC energy technology has been installed in line with the recommendations of the above feasibility study and this method of supply results in a 10% reduction in the building's CO2 emissions. - Figures used for calculations of the percentage carbon reduction provided by LZC technology are based on the output from approved energy modelling software. Third credit - The first credit for a feasibility study must be achieved. - A local LZC energy technology has been installed in line with the recommendations of the above feasibility study and this method of supply results in a 15% reduction in the building's CO2 emissions. - Figures used for calculations of the percentage carbon reduction provided by LZC technology are based on the output from approved energy modelling software. Exemplary level criteria The following outlines the exemplary level criteria to achieve an innovation credit for this BREEAM issue. - The first credit for a feasibility study must be achieved. - A local LZC energy technology has been installed in line with the recommendations of the above feasibility study and this method of supply results in a 20% reduction in the building's CO2 emissions. - Figures used for calculations of the percentage carbon production provided by LZC technology are based on the output from approved energy modelling software. Buildings complying with the exemplary level criteria would therefore achieve four credits for this issue.
Ene 22: Procurement of Sustainable IT Equipment	First credit 1. Where IT Equipment integral to the design and operation of the inherent building systems e.g. UPS systems, Generators, Cooling, BMS/EMS etc), is procured in accordance with the 'EU Code of Conduct on Data Centres' Best practice supplement version 2 Second credit - The first credit is achieved. - Where IT Equipment, for the running and operation of the building (servers, racks etc) once constructed and in use is procured in accordance with the 'EU Code of Conduct on Data Centres' Best practice supplement version 2

Transport	Compliance Requirements
Tra 1: Provision of Public Transport	1. The public transport Accessibility Index for the building is calculated and BREEAM credits awarded in accordance with Table 11 AI benchmarks and BREEAM credits (see supporting documents) The Accessibility Index is determined by entering the following information in to the BREEAM assessor's TRA 1 Provision of Public Transport calculator: - The distance (m) from the main building entrance to each compliant public transport node - The public transport type serving the compliant node e.g. bus or rail - The average number of services stopping per hour at each compliant node during the standard operating hours of the building for a typical day (see supporting documents).
Tra 2: Proximity to amenities	1. Where the building is within 500m of the following amenities: - Grocery shop and/or food outlet - Post box - Cash machine
Tra 3: Cyclist Facilities	First credit - The number of compliant cycle storage spaces provided is as follows: 10% of building users up to 500 PLUS 7% for building users in the range of 501 – 1000 PLUS 5% for building users over 1000 Second credit - The first credit must be achieved. - At least two of the following compliant facilities must be provided for the building users: - Compliant showers - Compliant changing facilities and lockers for clothes - Compliant drying space for wet clothes

Tra 4: Pedestrian and Cyclist Safety	1. Where external site areas form part of the assessed site and these areas contain vehicle access roads, parking and/or pedestrian access to the building, adequate cycle lanes and pedestrian pathways must be provided. If the building does not have any external areas and internal access is directly from the public highway/footpath, then the credit(s) can be awarded on a default basis. Cycle access criteria 2. The cycle lanes have been designed and constructed in accordance with the guidance in the National Cycle Network Guidelines and Practical Details – issue 2, Sustrans and the relevant parts of Appendix VI NCN Design and Construction Checklist (see supporting documents) 3. The cycle lanes and pedestrian paths meet the following minimum width dimensions: - Where pedestrian and cycle routes are shared the minimum total width of the combined path is 3.0m - Where the cycle lane is segregated from both the pedestrian route and carriageway the minimum width of the cycle path is 2.0m and the minimum width of the pedestrian path is 1.5m - Where the cycle route forms a part of the carriageway, the minimum width of the lane is 1.5m Minimum widths should not be regarded as the design target, where possible best practice as detailed in the Sustrans guidelines and DfT guidance must be aimed for. 4. Cycle lanes provide direct access to any cycle storage facilities provided on the site, without the need to deviate from the cycle path and, if relevant, connect to offsite cycle paths where these run adjacent to the development's boundary. Pedestrian access criteria 5. Onsite footpaths connect to public footpaths off site, providing access to local transport nodes and other offsite amenities (where present). 6. Where provided, drop-off areas are designed off the access road and provide direct access to pedestrian pathways/areas, therefore avoiding the need for the pedestrian to cross vehicle access routes. 7. Where dedicated pedestrian crossing of a vehicle access route is provided, the road is raised to the pavement level (i.e. the pavement is not lowered to road level). 8. For larger developments with a high number of public users/visitors, pedestrian pathways must be signposted to other local amenities off site, including public transport nodes. Combined cyclists and pedestrian access criteria 9. Delivery areas are not accessed through parking areas and do not cross or share pedestrian and cyclist routes and other outside amenity areas accessible to building users and general public. 10. Lighting design of pedestrian pathways and cycle paths on site are in compliance with CIBSE Lighting Guide 6 (LG6) and BS5489 Part 1.
Tra 5: Travel Plan	1. A travel plan has been developed as part of the feasibility and design stages which considers all types of travel relevant to the building type and users. 2. The travel plan is structured to meet the needs of the particular site and takes into consideration the findings of a site-specific transport survey and assessment that covers the following (as a minimum): - Where relevant, existing travel patterns and opinions of existing building or site users towards cycling and walking so that constraints and opportunities can be identified - Travel patterns and transport impact of future building users - Current local environment for walkers and cyclists (accounting for visitors who may be accompanied by young children) - Disabled access (accounting for varying levels of disability and visual impairment) - Public transport links serving the site - Current facilities for cyclists 3. The travel plan includes a package of measures that have been used to steer the design of the development in order to meet the travel plan objectives and minimise car-based travel patterns. This is demonstrated via specific examples such as: - Providing parking priority spaces for car sharers - Providing dedicated and convenient cycle storage and changing facilities - Lighting, landscaping and shelter to make pedestrian and public transport waiting areas pleasant - Negotiating improved bus services, i.e. altering bus routes or offering discounts - Restricting and/or charging for car parking - Criteria for lobby areas where information about public transport or car sharing can be made available - Pedestrian and cycle friendly (for all types of user regardless of the level of mobility or visual impairment) via the provision of cycle lanes, safe crossing points, direct routes, appropriate tactile surfaces, well lit and signposted to other amenities, public transport nodes and adjoining off site pedestrians and cycle routes. 4. The travel plan includes measures tailored to minimise the impacts of operational-related transport e.g. deliveries to and from the site.
Tra 6: Maximum Car Parking Capacity	First credit 1. No more than one parking space is provided for every three building users. Second credit 1. No more than one parking space is provided for every four building users.

Water	Compliance Requirements
Wat 1: Water Consumption	Sanitary fittings One credit 1. All WCs have an effective flush volume of 4.5 litres or less. 2. Of the following, the two that offer the greatest possible reduction in annual water consumption have been specified: - All taps except kitchen taps, cleaners' sinks and external taps have a maximum flow rate less than 6 litres/min for a water pressure of 0.3MPa and are one of, or a combination of, the following types: - Timed automatic shut-off taps e.g. push taps - Electronic sensor taps - Low flow screw-down/lever taps - Spray taps - All showers, where specified, have a measured flow rate that does not exceed 9 litres per minute for a water pressure of 0.3MP - All urinals are either: - Fitted with individual presence detectors that operate the flushing control after each use.

	• Ultra low flush or waterless urinals. Cooling systems (including passive systems) Second credit 3. A technology/strategy is adopted which demonstrates a 20% reduction in the potable water consumption associated with the data centres cooling process. Third credit Cooling systems (including passive systems) 4. A technology/strategy is adopted which demonstrates a $\geq 40\%$ reduction in the potable water consumption associated with the data centres cooling process. Exemplary level criteria The following outlines the exemplary level criteria to achieve an innovation credit for this BREEAM issue: Cooling systems (including passive systems) 1. A technology/strategy is adopted which demonstrates a $\geq 50\%$ reduction in the potable water consumption associated with the data centres cooling process.
Wat 2: Water Meter	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. 2. The water meter has a pulsed output to enable connection to a Building Management System (BMS) for the monitoring of water consumption. Exemplary level criteria The following outlines the exemplary level criteria to achieve an innovation credit for this BREEAM issue: 1. Where sub meters are fitted to allow the metering of individual water-consuming plant or building areas, where demand in such areas will be equal to or greater than of 10% of the total water demand of the building (see also compliance note). 2. Each sub meter has a pulsed output to enable connection to a Building Management System (BMS) for the monitoring of water consumption.
Wat 3: Major Leak Detection	1. A leak detection system capable of detecting major leaks on the water supply has been installed. The system must cover all mains water supply between and within the building and the site boundary. 2. The leak detection system is: a. Audible when activated b. Activated when the flow of water passes through the water meter/data logger at a flow rate above a pre-set maximum for a pre-set period of time c. Able to identify different flow and therefore leakage rates, e.g. continuous, high and/or low level, over set time periods d. Programmable to suit the owner/occupiers' water consumption criteria e. Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers.
Wat 4: Sanitary Supply Shut Off	1. Solenoid valves are installed on the water supply to each toilet area in the building and the flow of water through that supply is controlled by a link to either: • Infra-red movement detectors within each toilet facility OR • Sensors or switches placed at or on entry doors to each facility
Wat 5: Water recycling	Where one of the following water recycling strategies has been implemented: 1. Where a rainwater collection tank has been installed and the tank is sized to collect at least 50% of EITHER: a. The total predicted rainwater run-off from the roof catchment area for the defined period of collection. OR b. The rainwater run-off required to meet the total predicted flushing demand for the defined period of collection. 2. Waste water from wash hand basins and showers is collected from $\geq 80\%$ of fittings and recycled to meet part (minimum of 10%) or the total of WC/urinal flushing demand within the building(s). 3. A combination of waste water and rainwater collection that meets at least 50% of EITHER: a. The total predicted toilet and urinal flushing demand for the defined period of collection OR b. The total predicted toilet and urinal flushing demand for the defined period of collection and(where specified) irrigation of planting and landscaping.
Wat 6: Irrigation Systems	1. Where the irrigation method specified for internal or external planting and/or landscaping complies with ANY ONE of the following: a. Drip feed subsurface irrigation that incorporates soil moisture sensors. The irrigation control should be zoned to permit variable irrigation to different planting assemblages. b. Reclaimed water from a rainwater or greywater system. c. External landscaping and planting that relies solely on precipitation, during all seasons of the year. d. The only planting specified is restricted to species that thrive in hot and dry conditions. e. Where no dedicated, mains-supplied irrigation systems (including pop-up sprinklers and hoses) are specified, and planting will rely solely on manual watering by building occupier or landlord. 2. Where a sub surface drip feed irrigation system is installed for external areas, a rainstat must also be installed to prevent automatic irrigation of the planting and the landscape during periods of rainfall.

Materials	Compliance Requirements
Mat 1: Materials Specification (Major Building Elements)	1. The Green Guide rating for the specifications for the following building elements (see supporting documents) must be determined and entered in to the BREEAM assessor's Mat 1 Calculator. Green Guide ratings for the specification(s) making-up each element can be found at www.thegreenguide.org.uk Exemplary level criteria The following outlines the exemplary level criteria to achieve an innovation credit for this BREEAM issue. 1. One exemplary BREEAM credit can be awarded as follows: a. Where assessing four or more applicable building elements, the building achieves at least two points additional to the total points required to achieve maximum credits under the standard BREEAM criteria. b. Where assessing fewer than four applicable building elements, the building achieves at least one point additional to the total points required to achieve maximum credits under the standard BREEAM criteria.

Mat 2: Hard Landscaping and Boundary Protection	1. Where at least 80% of all external hard landscaping and boundary protection (by area) achieves an A or A+ rating, as defined in the Green Guide to Specification. Green Guide ratings for the specification(s) of each element can be found at: www.thegreenguide.org.uk
Mat 3: Re-Use of Facade	1. At least 50% of the total final building façade (by area) is reused. 2. At least 80% of the reused façade (by mass) comprises in-situ reused material.
Mat 4: Re-Use of Structure	1. Where at least 80% by volume of an existing primary structure is reused without significant strengthening or alteration works. 2. Where a project is part refurbishment and part new build, the reused structure comprises at least 50% by volume of the final building, i.e. any new-build extension to a building being refurbished should not be larger than the original building to qualify for this credit.
Mat 5: Responsible Sourcing of Materials	New Build and Major Refurbishment assessments 1. Up to 3 credits are available where evidence provided demonstrates that 80% of the applicable materials (listed below) comprising each of the following building elements are responsibly sourced: - Structural Frame - Ground floor - Upper floors (including separating floors) - Roof - External walls - Internal walls - Foundation/substructure - Staircase Applicable materials • Brick (including clay tiles and other ceramics) • Resin-based composites and materials, including GRP and polymeric render • Concrete (including in-situ and pre-cast concrete, blocks, tiles, mortars, cementious renders etc.) • Glass • Plastics and rubbers (including EPDM, TPO, PVC and VET roofing membranes including polymeric renders) • Metals (steel, aluminium etc.) • Dressed or building stone including slate • Timber, timber composite and wood panels (including glulam, plywood, OSB, MDF, chipboard and cement bonded particleboard) • Plasterboard and plaster • Bituminous materials, such as roofing membranes and asphalt • Other mineral-based materials, including fibre cement and calcium silicate • Products with recycled content Note: Insulation materials, fixings, adhesives and additives are excluded from the assessment. For any other materials that form a part of an applicable building element, but do not fit into the applicable materials list or the exclusions list, please refer to BRE who will identify the relevant Key Process and Supply Chain Process or Processes. 2. Each applicable material is assigned to a responsible sourcing tier level based on the level and scope of certification achieved by the material supplier(s)/manufacturer(s) (see supporting documents for Table 13 Responsible Sourcing Tier Levels and Criteria). 3. Follow the Calculation Procedure outlined in the additional guidance section, and use the Mat 5 Responsible Sourcing Calculator to determine the number of credits to be awarded. 4. Any non-certified timber used in the development comes from a legal source and is not included on the CITES list (see definition for legally sourced timber). Fit Out-only assessments 1. Up to 2 credits are available where evidence provided demonstrates that 80% of the applicable materials (listed below) comprising the following fit out elements are responsibly sourced: - Stairs - Windows - External and internal doors - Skirting - Panelling - Furniture - Fascias - Any other significant use Applicable materials • Brick (including clay tiles and other ceramics) • Resin-based composites and materials, including GRP and polymeric render • Concrete (including in-situ and pre-cast concrete, blocks, tiles, mortars, cementious renders etc.) • Glass • Plastics and rubbers (including EPDM, TPO, PVC and VET roofing membranes including polymeric renders) • Metals (steel, aluminium etc.) • Dressed or building stone including slate • Timber, timber composite and wood panels (including glulam, plywood, OSB, MDF, chipboard and cement bonded particleboard) • Plasterboard and plaster • Bituminous materials, such as roofing membranes and asphalt • Other mineral-based materials, including fibre cement and calcium silicate • Products with recycled content 2. Each applicable material is assigned to a responsible sourcing tier level based on the level and scope of certification achieved by the material supplier(s)/manufacturer(s) (see supporting documents for Table 13 Responsible Sourcing Tier Levels and Criteria and Table 14 EMS Criteria). 3. Follow the Calculation Procedure outlined in the additional guidance section, and use the Mat 5 Responsible Sourcing Calculator to determine the number of credits to be awarded. 4. Any non-certified timber used in the development comes from a legal source and is not included on the CITES list (see definition for legally sourced timber). Exemplary level criteria The following outlines the exemplary level criteria to achieve an innovation credit for this BREEAM issue:

	1. Where, in addition to the above criteria, 95% of the applicable materials, comprised within the applicable building elements, have been responsibly sourced.
Mat 6: Insulation	1. Any new insulation specified for use within the following building elements must be assessed: • External walls • Ground floor • Roof • Building services First credit - Embodied Impact 2. The Green Guide rating for the thermal insulation materials must be determined. Green Guide ratings for thermal insulation can be found at www.thegreenguide.org.uk (please refer to the Compliance Notes supporting documents for guidance where specific insulation has been assessed within an element for the Mat 1 BREEAM issues). 3. Where the Insulation Index for the building insulation is the same as or greater than 2. 4. The Insulation Index is calculated using the Mat 6 Insulation Index Calculator Tool in the BREEAM assessor's spreadsheet tool. For each type of thermal insulation used in the relevant building elements, the volume weighted thermal resistance provided by each type of insulation is calculated as follows: a. $(\text{Area of insulation (m}^2) \times \text{thickness(m)}) / \text{Thermal Conductivity (W/ m.K)}$ OR b. $\text{Total volume of insulation used (m}^3) / \text{Thermal conductivity (W/m.K)}$ The volume weighted thermal resistance for each insulation material is then multiplied by the relevant Green Guide point(s) from table 15 (see supporting documents) To calculate the Insulation Index, the sum of these values is divided by the sum of the volume weighted thermal resistance values (an example calculation is provided in the Additional Information section - see supporting documents). Second credit - Responsible Sourcing 5. At least 80% of the thermal insulation used in the building elements identified in Item 1 must be responsibly sourced, i.e. each insulation product must be certified in accordance with Levels 1, 2 or 3 described in Table 13 Responsible Sourcing Tier Levels and Criteria, as outlined in Mat 5. Table 16 shows the key processes and supply chain processes required for common insulation products (see supporting documents under Mat 5)
Mat 7: Designing for Robustness	1. Internal and external areas of the building where vehicular, trolley and pedestrian movement occur have been identified. 2. Suitable durability and protection measures or design features have been specified to prevent damage to the vulnerable parts of these building areas from such traffic. This must include, but is not necessarily limited to: a. Protection from the effects of high pedestrian traffic in main entrances, public areas and thoroughfares (corridors, lifts, stairs, doors etc). b. Protection against any internal vehicular/trolley movement within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas. c. Protection against, or prevention from, any potential vehicular collision where vehicular parking and manoeuvring occurs within 1m of the external building façade for all car parking areas and within 2m for all delivery areas.

Waste	Compliance Requirements
Wst 1: Construction Site Waste Management	New Build and Major Refurbishments - Up to three credits are available 1. Where non-hazardous construction waste generated by the building's construction phase (excluding demolition and excavation waste) meets or exceeds the following resource efficiency benchmarks per 100m² (Gross Internal Floor Area): One Credit Awarded = 13 - 16.6m³ or 6.6 - 8.5 Tonnes Two Credits Awarded = 9.2 - 12.9m³ or 4.7 - 6.5 Tonnes Three Credits Awarded = <9.2 or <4.7 Tonnes Note the volume (m³) is actual volume of waste (not bulk volume) 2. Where there is a Site Waste Management Plan (SWMP) that contains: a. The target benchmark for resource efficiency i.e. m³ of waste per 100m² or tonnes of waste per 100m² b. Procedures and commitments for minimising non-hazardous waste in line with the benchmark c. Procedures for minimising hazardous waste d. Procedures for monitoring, measuring and reporting hazardous and non-hazardous site waste e. Procedures for sorting, reusing and recycling construction waste into defined waste groups f. The name or job title of the individual responsible for implementing the above. Demolition & refurbishment projects 3. In addition to the above, sites with existing buildings that will be refurbished or demolished, where demolition forms a part of the principal contractor's works contract, must comply with the following: a. Completed a pre-demolition/pre-refurbishment audit of the existing building to determine if, in the case of demolition, refurbishment is feasible and, if not, to maximise the recovery of material from demolition or refurbishment for subsequent high-grade/value applications. The audit must be referenced in the SWMP and cover: i. Identification of the key refurbishment/demolition materials. ii. Potential applications and any related issues for the reuse and recycling of the key refurbishment and demolition materials. Fit Out only assessments - one credit is available 1. Where there is a SWMP that contains: a. Procedures and commitments for minimising non-hazardous and hazardous waste b. Procedures for sorting, reusing and recycling construction waste into defined waste groups c. The name or job title of the individual responsible for implementing the above 2. Construction waste generated from the fit-out works is monitored and measured. 3. Waste materials will be sorted into separate key waste groups (according to the waste streams generated by the fit-out works) either onsite or offsite through a licensed contractor for recovery. New build, Refurbishment and Fit Out only projects - one additional credit is available 1. Where at least 75% by weight or 65% by volume of non-hazardous construction waste generated by the project has been diverted from landfill and either: a. Reused on site (in-situ or for new applications) b. Reused on other sites

	c. Salvaged/reclaimed for reuse d. Returned to the supplier via a 'take-back' scheme e. Recovered from site by an approved waste management contractor and recycled. 2. For demolition projects, in addition to the above requirement for construction-related waste, 90% by weight or 80% by volume of non-hazardous demolition waste has been diverted from landfill. 3. Where there is a SiteWaste Management Plan (SWMP) complying with the above criteria. 4. Waste materials will be sorted into separate key waste groups (according to the waste streams generated by the scope of the works) either onsite or offsite through a licensed contractor for recovery. Exemplary level criteria The following outlines the exemplary level criteria to achieve an innovation credit for this BREEAM issue. 1. Where non-hazardous construction waste generated by the building's development meets or exceeds the resource efficiency benchmark required to achieve three credits (as outlined above). 2. Where at least 90% by weight (80% by volume) of non-hazardous construction waste and 95% of demolition waste by weight (85% by volume) (if applicable) generated by the build has been diverted from landfill and either: a. Reused on site (in-situ or for new applications) b. Reused on other sites c. Salvaged/reclaimed for reuse d. Returned to the supplier via a 'take-back' scheme e. Recovered from site by an approved waste management contractor and recycled. 3. All key waste groups are identified for diversion from landfill at pre-construction stage SWMP.
Wst 2: Recycled Aggregates	1. Where the amount of recycled and secondary aggregate specified is over 25% (by weight or volume) of the total high-grade aggregate uses for the building. Such aggregates can be EITHER: a. Obtained on site OR b. Obtained from waste processing site(s) within a 30km radius of the site; the source will be principally from construction, demolition and excavation waste (CD&E) – this includes road planings OR c. Secondary aggregates obtained from a non-construction post-consumer or post-industrial by-product source (see Compliance Notes).
Wst 3: Recyclable Waste Storage	1. A dedicated storage space to cater for recyclable materials generated by the building during occupation, compliant with the following: a. Clearly labelled for recycling b. Placed within accessible reach of the building (see Compliance Notes) c. In a location with good vehicular access to facilitate collections. 2. The size of the space allocated must be adequate to store the likely volume of recyclable materials generated by the building's occupants/operation. Whilst a fixed area cannot always be given, the following must be complied with as a minimum: a. At least 2m² per 1000m² of net floor area for buildings <5000m² b. A minimum of 10m² for buildings ≥5000 m² c. An additional 2m² per 1000m² of net floor area where catering is provided (with an additional minimum of 10m² for buildings ≥5000m²).
Wst 4: Compactor / Baler	1. A static waste compactor or baler is installed and situated in a service area or dedicated waste management space. 2. At least one water outlet is provided for each waste sorting and/or storing facility. 3. The recyclable waste storage requirements of BREEAM credit WST 3 have been met.

Land Use and Ecology	Compliance Requirements
LE 1: Reuse of Land	1. At least 75% of the proposed development's footprint is on an area of land which has previously been developed for use by industrial, commercial or domestic purposes in the last 50 years.
LE 2: Contaminated Land	1. The site is deemed to be significantly contaminated as confirmed by a contaminated land specialist's site investigation, risk assessment and appraisal identifying: a. the degree of contamination b. the contaminant sources/types c. the options for remediating sources of pollution which present an unacceptable risk to the site. 2. The client or contractor confirms that remediation of the site will be carried out in accordance with the remediation strategy and its implementation plan.
LE 3: Ecological Value of Site and Protection of Ecological Features	1. Land within the construction zone is defined as 'land of low ecological value' using either: a) BREEAM checklist A4 OR b) A suitably qualified ecologist who has identified the land as being of 'low ecological value' within an ecological assessment report, based on a site survey. 2. All existing features of ecological value surrounding the construction zone and site boundary area are adequately protected from damage during clearance, site preparation and construction activities as listed below: • Trees of over 100 mm trunk diameter, and/or of significant ecological value, are protected by barriers. Barriers must prohibit construction works in the area between itself and the tree trunk. Minimum distance between tree trunk and barriers must be either the distance of branch spread or half tree height, whichever is the greater. • In all cases trees must be protected from direct impact and from severance or asphyxiation of the roots. • Hedges and natural areas requiring protection must either have barriers erected and be protected, or, when remote from site works or storage areas, be protected with a prohibition of construction activity in their vicinity. • Watercourses and wetland areas are to be protected by cut-off ditches and site drainage to prevent run-off to natural watercourses (as this may cause pollution, silting or erosion). 3. In all cases, the contractor is required to construct ecological protection prior to any preliminary site construction or preparation works (e.g. clearing of the site or erection of temporary site facilities).
LE 4: Mitigating Ecological Impact	1. One credit where the change in ecological value of the site is less than zero and equal to or greater than minus nine plant species i.e. a minimal change. 2. Two credits where the change in ecological value of the site is equal to or greater than zero plant species i.e. no negative change. The change in ecological value of the site is calculated using EITHER of the following:

	3. Determine the following information and input this data in to Ecology calculator 1 within the spreadsheet tool: a. Plot type(s) that define the landscape of the assessed site, in its existing pre developed state and proposed state (see additional guidance) b. Areas (m2) of the defined existing and proposed plot types. OR 4. Where a suitably qualified ecologist has been appointed and, based on a site survey, they confirm the following and the assessor or ecologist inputs this data in to the Ecology calculator 2: a. Actual plot/habitat types that define the landscape of the assessed site in its existing predeveloped state and proposed state b. Area (m2) of each plot/habitat type c. Number of different plant species found within each plot type.
LE 5: Enhancing Site Ecology	First credit 1. A suitably qualified ecologist (SQE) has been appointed to report on enhancing and protecting the ecology of the site. a. The SQE provides an Ecology Report with appropriate recommendations for protection and enhancement of the site's ecology. b. The report is based on a site visit/survey by the SQE prior to the commencement of initial site preparation works. 2. The general recommendations of the Ecology Report for enhancement and protection of site ecology have been, or will be, implemented. Second credit 1. The first credit is achieved. 2. The recommendations of the Ecology Report for enhancement and protection of site ecology have been implemented, and the suitably qualified ecologist confirms that this will result in an increase in ecological value of the site up to (but not including) 6 plant species. 3. The increase in plant species has been calculated using Ecology calculator 2, using actual species numbers. Third credit 1. The first credit is achieved. 2. The recommendations of the Ecology Report for enhancement and protection of site ecology have been implemented, and the suitably qualified ecologist confirms that this will result in an increase in ecological value of the site of 6 plant species or greater. 3. The increase in plant species has been calculated using Ecology calculator 2, using actual species numbers.
LE 6: Long Term Impact on Biodiversity	One credit can be awarded where there is a commitment to achieve the mandatory criteria and at least two of the additional criteria (listed below). Two credits can be awarded where there is a commitment to achieve the mandatory criteria and at least four of the additional criteria (listed below). The following demonstrates compliance: Mandatory Criteria 1. A suitably qualified ecologist (SQE) has been appointed prior to commencement of activities on site. 2. The suitably qualified ecologist confirms that all relevant UK and EU legislation relating to protection and enhancement of ecology has been complied with during the design and construction process. 3. A landscape and habitat management plan, appropriate to the site, is produced covering at least the first five years after project completion. This is to be handed over to the building occupants and includes: • Management of any protected features on site • Management of any new, existing or enhanced habitats • A reference to the current or future site level or local Biodiversity Action Plan. Additional Criteria 1. The contractor nominates a 'Biodiversity Champion' with the authority to influence site activities and ensure that detrimental impacts on site biodiversity are minimised in line with the recommendations of a suitably qualified ecologist. 2. The contractor trains the site workforce on how to protect site ecology during the project. Specific training should be carried out for the entire site workforce to ensure they are aware of how to avoid damaging site ecology. Training should be based on the findings and recommendations for protection of ecological features highlighted within a report prepared by a suitably qualified ecologist. 3. The contractor records actions taken to protect biodiversity and monitor their effectiveness throughout key stages of construction. The requirement commits the contractor to make such records available where publicly requested. 4. Where a new ecologically valuable habitat, appropriate to the local area, is created. This includes habitat that supports nationally, regionally or locally important biodiversity, and/or which is nationally, regionally or locally important itself; including any habitat listed in the UK Biodiversity Action Plan (UK BAP), Local Biodiversity Action Plan (LBAP), those protected within statutory sites (e.g. SSSIs), or those within non-statutory sites identified in local plans. 5. Where flora and/or fauna habitats exist on site, the contractor programmes site works to minimise disturbance to wildlife. For example, site preparation, ground works, and landscaping have been, or will be, scheduled at an appropriate time of year to minimise disturbance to wildlife. Timing of works may have a significant impact on, for example, breeding birds, flowering plants, seed germination, amphibians etc. Actions such as phased clearance of vegetation may help to mitigate ecological impacts. This additional requirement will be achieved where a clear plan has been produced detailing how activities will be timed to avoid any impact on site biodiversity in line with the recommendations of a suitably qualified ecologist.

Pollution	Compliance Requirements
Pol 1: Refrigerant GWP Building Services	1. The building has no refrigerants OR 2. The refrigerants used within the building services have a GWP less than 5
Pol 2: Preventing Refrigerant Leaks	First Credit - Refrigerant leak detection 1. The building has no refrigerants OR 2. Systems using refrigerants are contained in a moderately air tight enclosure (or a mechanically ventilated plant room), and a refrigerant leak detection system is installed covering high-risk parts of the plant. OR

	3. An automatic permanent refrigerant leak detection system is specified, which is NOT based on the principle of detecting or measuring the concentration of refrigerant in air. Second Credit - Refrigerant recovery system 4. The automatic shutdown and pump down of refrigerant occurs on the detection of high concentrations of refrigerant in the plant room/enclosure. For the majority of cases only systems in mechanically ventilated/moderately air tight plant rooms (or enclosures) comply. 5. Automatic pump-down to either a separate storage tank or into the heat exchanger is acceptable but only where automatic isolation valves are fitted to contain the refrigerant once fully pumped down. 6. The alarm threshold that triggers automatic pump down is set to a maximum of 2000ppm (0.2%), but lower levels can be set. The credit cannot be awarded for manual systems.
Pol 4: NOx emissions from heating source	1. Where manufacturer's details demonstrate that the plant installed to meet the building's space heating demand has dry NOx emission levels as follows: a. One credit where the dry NOx emissions from delivered space heating energy are $\leq 100\text{mg/kWh}$ (at 0% excess O₂). b. Two credits where the dry NOx emissions from delivered space heating energy are $\leq 70\text{mg/kWh}$ (at 0% excess O₂).
Pol 5: Flood Risk	Two credits 1. Where the assessed development is situated in a flood zone that is defined as having a low annual probability of flooding. 2. A site specific Flood Risk Assessment (FRA) confirms that there is a low risk of flooding from all sources. Or one credit 1. Where the assessed development is situated in a flood zone that is defined as having a medium or high annual probability of flooding AND 2. A site specific Flood Risk Assessment (FRA) confirms to the satisfaction of the local authority and statutory body that the development is appropriately flood resilient and resistant from all sources of flooding AND 3. The ground level of the building, and access to it and the site, are designed (or zoned) so they are at least 600mm above the design flood level of the flood zone in which the assessed development is located (see compliance notes for further guidance). One additional credit 1. Where attenuation measures are specified to ensure that the peak rate of run-off from the site to the watercourses (natural or municipal) is no greater for the developed site than it was for the predevelopment site. This should comply with the Interim Code of Practice for Sustainable Drainage systems published by CIRIA, or for at least a 1 year and 100 year return period event with a 6 hour duration. 2. The capacity of the attenuation measures must include an allowance for climate change; this should be made in accordance with current best practice⁷⁶.
Pol 6: Minimising Watercourse Pollution	1. Specification of Sustainable Drainage Systems (SUDs) or source control systems such as permeable surfaces or infiltration trenches where run-off drains are in areas with a relatively low risk source of watercourse pollution. 2. Specification of oil/petrol separators (or equivalent system) in surface water drainage systems, where there is a high risk of contamination or spillage of substances such as petrol and oil (see supporting documents for Compliance Notes for a list of areas). 3. All water pollution prevention systems have been designed and detailed in accordance with the recommendations of Pollution Prevention Guideline 3 and where applicable the SUDS manual. 4. A comprehensive and up-to-date drainage plan of the site will be made available for the building/site occupiers.
Pol 7: Reduction of Night Time Light Pollution	1. The external lighting strategy has been designed in compliance with Table 1 (and its accompanying notes) of the ILE Guidance notes for the reduction of obtrusive light, 2005, (see Additional Information below - Buildings located in Scotland must also refer to the Compliance Notes below for additional criteria). 2. All external lighting (except for safety and security lighting) can be automatically switched off between 2300hrs and 0700hrs. This can be achieved by providing a timer for all external lighting set to the appropriate hours. 3. If safety or security lighting is provided and will be used between 2300hrs and 0700hrs, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 1 of the ILE's Guidance notes, for example by using an automatic switch to reduce the lighting levels at 2300 or earlier. 4. Illuminated advertisements, where specified, must be designed in compliance with ILE Technical Report 5 – The Brightness of Illuminated Advertisements.
Pol 8: Noise Attenuation	1. There are, or will be, existing noise-sensitive areas or buildings within 800m radius of the assessed development. Where there are or will be no noise-sensitive areas or buildings in the locality of the assessed development, the credit can be awarded by default. 2. A noise impact assessment in compliance with BS 4142:1997 has been carried out and the following noise levels measured/determined: a. 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. b. The rating noise level resulting from the proposed noise-source. This can be based upon reference to similar installations or sites, or determined by calculation. The noise impact assessment must be carried out by a suitably qualified acoustic consultant holding a recognised acoustic qualification and membership of an appropriate professional body (see relevant definitions in the additional guidance section). 3. Where the rating level of the noise source(s) from the site/building is equivalent to or less than the background noise level, the credit can be awarded. 4. Where the rating level of the noise source(s) from the site/building is greater than the background noise level, measures have been installed to attenuate the noise at its source to a level where it will comply with requirement 3.

Innovation	Compliance Requirements
Inn 1: Innovation	A maximum of 10 credits are available in aggregate from any combination of the following: Up to 10 credits are available by meeting Exemplary Performance for existing BREEAM issues 1. Exemplary performance is demonstrated by meeting Exemplary Performance criteria for existing BREEAM Issues. Please refer to table 23 in the supporting documents for a list of BREEAM issues with defined exemplary performance criteria (this is also found in section 3.0 of the manual, Scoring and Weighting). For the specific Assessment Criteria please refer to the section of the technical guidance containing the relevant BREEAM issue.

	Up to two credits are available for the Comprehensive use of a BREEAM Accredited Professional (AP) throughout project work stages First credit 1. BREEAM performance objectives are agreed, (and must be achieved at final certification – see Compliance Notes) no later than the end of the design brief stage (e.g. RIBA Stage B or equivalent procurement stage). 2. The appointed BREEAM Accredited Professional is given the opportunity to attend key design team meetings (see Compliance Notes below) held from the start of RIBA Stage B (Design Brief) up to and including Stage E (Technical Design) or equivalent, and is to be included on the circulation list for minutes from all meetings. Second credit 4. The first credit is achieved. 5. The project is reviewed against BREEAM performance objectives by the appointed BREEAM Accredited Professional no later than the end of the Pre-Construction stage (e.g. RIBA Stage H (Tender Action) or equivalent procurement stage). 6. The appointed BREEAM Accredited Professional is given the opportunity to attend key design team meetings held from the start of RIBA Stage F (Production Information) up to and including Stage K (Construction to Practical Completion) or equivalent, and is to be included on the circulation list for minutes from all meetings. 7. A Post Construction stage assessment report is submitted to BRE Global for final certification. Additional credits are available for Approved Innovations not currently recognised by an existing BREEAM issue 1. An application is made to, and approved by the BREEAM office using the Innovation Application Form (downloaded from the Assessor Extranet). 2. The Assessor confirms compliance with the criteria set out within the Innovation Application Form.
Man 2: Considerate Constructors	Assessment criteria 1. For the specific Assessment Criteria please refer to the section of the technical guidance containing the relevant BREEAM issue.
Hea 1: Daylighting	Assessment criteria 1. For the specific Assessment Criteria please refer to the section of the technical guidance containing the relevant BREEAM issue.
Hea 14: Office Space	Assessment criteria 1. For the specific Assessment Criteria please refer to the section of the technical guidance containing the relevant BREEAM issue.
Ene 1: Reduction of CO2 emissions	Assessment criteria 1. For the specific Assessment Criteria please refer to the section of the technical guidance containing the relevant BREEAM issue.
Ene 5: Low or Zero Carbon Technologies	Assessment criteria 1. For the specific Assessment Criteria please refer to the section of the technical guidance containing the relevant BREEAM issue.
Wat 1: Water Consumption	Assessment criteria 1. For the specific Assessment Criteria please refer to the section of the technical guidance containing the relevant BREEAM issue.
Wat 2: Water Meter	Assessment criteria 1. For the specific Assessment Criteria please refer to the section of the technical guidance containing the relevant BREEAM issue.
Mat 1: Materials Specification	Assessment criteria 1. For the specific Assessment Criteria please refer to the section of the technical guidance containing the relevant BREEAM issue.
Mat 5: Responsible Sourcing of Materials	Assessment criteria 1. For the specific Assessment Criteria please refer to the section of the technical guidance containing the relevant BREEAM issue.
Wst 1: Construction Site Waste Management	Assessment criteria 1. For the specific Assessment Criteria please refer to the section of the technical guidance containing the relevant BREEAM issue.