BREEAM Pre-assessment Report for the new development of Canolfan Tyfu for the National Botanical Gardens of Wales

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1. Introduction

Paul & Price has been commissioned to carry out a BREEAM (**BRE E**nvironmental **A**ssessment **M**ethod) Further Education 2008 pre-assessment for the proposed new construction of Canolfan Tyfu at the National Botanic Garden of Wales.

1.1 The BREEAM Standard

BREEAM (Building Research Establishment's Environmental Assessment Method) is the world's leading and most widely used environmental assessment method for buildings. It sets the standard for best practice in sustainable design and has become the de facto measure used to describe a building's environmental performance.

The aims and objectives of BREEAM are:

Aims of BREEAM to:

- Mitigate the impacts of buildings on the environment
- Enable buildings to be recognised according to their environmental benefits
- Provide a credible, environmental label for buildings
- Stimulate demand for sustainable buildings

Objectives of BREEAM to:

- Provide market recognition to low environmental impact buildings
- Ensure best environmental practice is incorporated in buildings
- Set criteria and standards surpassing those required by regulations and challenge the
- Market to provide innovative solutions that minimise the environmental impact of buildings
- Raise the awareness of owners, occupants, designers and operators of the benefits of buildings with a reduced impact on the environment
- To allow organisations to demonstrate progress towards corporate environmental objectives

Building projects are assessed at the design and post-construction stages using a system of environmental issues grouped within the following categories:

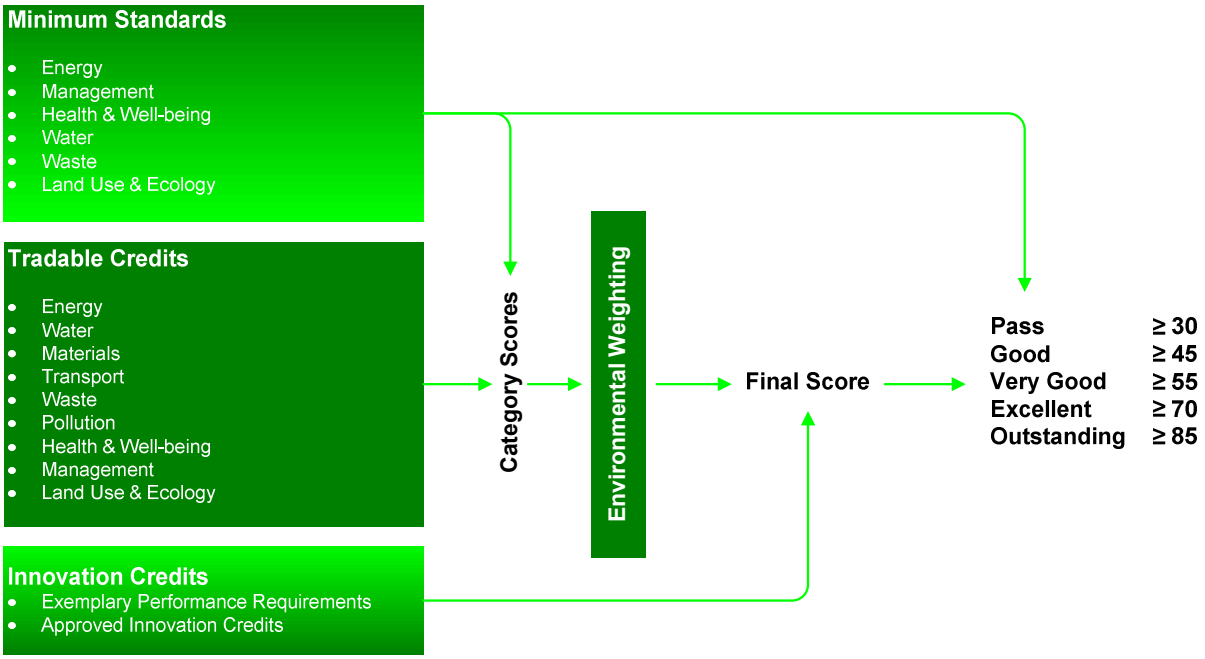
- Management
- Health and Wellbeing
- Energy
- Transport
- Water
- Materials
- Waste
- Land Use and Ecology
- Pollution
- Innovation

The assessment of the building results in a final report and BRE Global BREEAM certificate detailing the performance of the assessed building against the environmental issues covered by Standard. The building's performance is expressed as a BREEAM rating of PASS, GOOD, VERY GOOD, EXCELLENT or OUTSTANDING.

BREEAM is developed, operated and maintained by BRE Global Ltd and the operation and direction of the method is overseen by an independent Sustainability Board, representing a wide cross-section of construction industry stakeholders. Further information about BREEAM, including copies of the BREEAM standards, can be found at www.breeam.org

1.2 BREEAM Scoring and Rating

The diagram and text below describes how BREEAM scores and rates an assessed building:



The BREEAM categories contain a number of environmental issues that reflect the options available when designing, procuring and constructing a building.

BREEAM Issues and Credits

Tradable Credits
Each environmental issue has a set number of 'credits' available and these credits are awarded where the building demonstrates that it complies with the requirements of that issue.

Minimum Standards
A number of issues within a category have set minimum standards, i.e. a minimum number of credits that must be achieved in order for a particular BREEAM rating level to be met.

Innovation Credits
Innovation credits provide additional recognition for a building that innovates in the field of sustainable performance, above and beyond the level that is currently recognised and rewarded by standard BREEAM issues. Innovation credits are awarded for either complying with pre-defined BREEAM issue exemplary level requirements, through the appointment of a BREEAM Accredited Professional or Suitably Qualified Assessor or via application to BRE Global to have a particular building feature, system or process approved as 'innovative'.

Environmental Weightings, Final Score and BREEAM Rating
Once each BREEAM issues has been assessed the category percentage scores are determined (based on the number of credits achieved over those available within a category), and an environmental weighting applied (as shown below).

The weighted category scores are then totalled to give an overall score, and any additional score for innovation is added to give the final BREEAM score that is used to determine the BREEAM rating.

The environmental weightings are as follows:

Issue Category	Issue Weighting
Management	12%
Health and Wellbeing	15%
Energy	19%
Transport	8%
Water	6%
Materials	12.5%
Waste	7.5%
Land Use and Ecology	10%
Pollution	10%

There is also an additional (up to 10%) score for Innovation, available to projects that demonstrate they have gone above and beyond the best practice levels of BREEAM.

The weighting factors have been derived from consensus based research with various groups such as government, material suppliers and lobbyists. This research was carried out by BRE to establish the relative importance of each environmental issue.

1.3 Project Team Details

Name / Position	Company / Address
Daryl Price	Paul & Price
Shane Paul	Paul & Price
Adam Watkins	Hughes Architects
Tabitha Binding	Coed Cymru
Main contractor	Elements Europe, Mile Oak Industrial Estate, Maesbury Rd Oswestry, SY10 8GA
System manufacturer	Kenton Jones Ltd, Henfaes Lane, Welshpool, SY21 7BE
Site contractor	G Adams Construction Ltd, Bridge St, Tredegar NP22 4LA

1.4 Building Details

General	**Building**	The building is a single storey multi-use design, specifically for educational and social uses within the confines of National Botanical Garden Wales.
	Site	The site is situated within the National Botanic Garden Wales (NBGW). It is in a wooded and planted area, with existing but limited infrastructure in place. Amenity grassland and associated hardstanding areas surround the site. Additional habitats on site include scattered trees and introduced & varied shrub planting.
	Floor Area	The gross internal building area is 130.8m^2 and has a nett floor area of 120m^2
Building Fabric	**Walls**	The walls are built from 'Ty Unnos' box-beam panels with integrated 'Warmcell' cellulose insulation.
	Roof	The roof is built from 'Ty Unnos' panels with integrated insulation.
	Floor	The suspended ground floor is from Ty Unnos softwood joists.
Building Services	**Heating**	Heating is provided by a biomass (wood chip) fuelled boiler via radiators.
	Ventilation	The ventilation strategy is natural by openable windows with mechanical exhaust extraction in bathrooms and 'wet' spaces to limit condensation and accumulation of foul odours.
	Cooling	n/a
	Hot Water	Hot water is provided by a biomass (wood chip) fuelled boiler.
Other	**Other**	The building is integrated with a photovoltaic array with an output of 3.84kWp.

2. Summary of Building's pre-assessment Performance

Based on a pre-assessment meeting and review of the proposed design and specification, Canolfan Tyfu at the National Botanic Garden of Wales is anticipated to achieve a post-construction score of **71.27%** against the BREEAM Multi-residential 2008 Environmental and Sustainability Standard. This translates into an post-construction BREEAM rating of **Excellent.**

Minimum BREEAM Standards					
Rating Level	**Pass**	**Good**	**Very Good**	**Excellent**	**Outstanding**
Minimum Standards Achieved	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Building Performance by Section					
	Environmental weighting	**Credits available**	**Credits achieved**	**% Achieved**	**Weighted Score**
Management	12.00%	20.00	14.00	70.00%	8.40%
Health and Wellbeing	15.00%	15.00	14.00	93.33%	14.00%
Energy	19.00%	22.00	19.00	86.36%	16.41%
Transport	8.00%	11.00	3.00	27.27%	2.18%
Water	6.00%	8.00	6.00	75.00%	4.50%
Materials	12.50%	15.00	11.00	73.33%	9.17%
Waste	7.50%	6.00	5.00	83.33%	6.25%
Land Use and Ecology	10.00%	10.00	4.00	40.00%	4.00%
Pollution	10.00%	11.00	7.00	63.64%	6.36%
Innovation	10.00%	10.00	0.00	0.00%	0.00%
				Total BREEAM Score	**71.27%**

The following section summarises each of the issue requirements for this BREEAM pre-assessment by environmental section, and the information that has been provided as evidence of the buildings performance against those requirements. On the basis of the documentary evidence needed and the relevant number of BREEAM credits available.

Each issue assessed includes the BREEAM assessor's evidence requirements. This statement summarises their assessment of the buildings performance against the BREEAM issue requirements to validate the number of BREEAM credits awarded.

3. Detailed Credit Assessment

3.1 MANAGEMENT

Man 1 - Commissioning		Credits available	2
		Credits likely	2
Aim	To recognise and encourage an appropriate level of building services commissioning that is carried out in a co-ordinated and comprehensive manner, thus ensuring optimum performance under actual occupancy conditions.		
Development comments	Commissioning and seasonal commissioning will be carried out on the development. Note: Mandatory requirements of one credit for all assessments with two required for Outstanding.		
Evidence needed	First credit: Specification stating commissioning will be carried out in line with current Building Regulations and BSRIA and CIBSE guidelines. An appropriate project team member is appointed to monitor and programme pre-commissioning, commissioning and, where necessary, re-commissioning on behalf of the client. A specialist commissioning manager is appointed during the design stage 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. Second credit: Confirmation of seasonal commissioning responsibilities over a minimum 12 month period, once the building becomes occupied.		

Man 2 – Considerate Constructors		Credits available	2
		Credits likely	2
Aim	To recognise and encourage construction sites which are managed in an environmentally and socially considerate and accountable manner.		
Development comments	It is anticipated that two credits will be achieved by writing into the preliminaries that the contractor is to achieve a CCS score of at least 32. Note: Mandatory requirements of one credit for Excellent and two required for Outstanding.		
Evidence needed	A copy of the relevant section of the main contract specification confirming the requirement to comply with the CCS and the minimum score to be achieved in each CCS section.		
Exemplary Level Requirement Achieved?			No

Man 3 – Construction Site Impacts		Credits available	4
		Credits likely	4
Aim	To recognise and encourage construction sites managed in an environmentally sound manner in terms of resource use, energy consumption and pollution.		
Development comments	It will be written into the preliminaries that the timber used on site will be responsibly and legally sourced and that the contractor will be required to achieve 6 of the items listed below to achieve four credits.		
Evidence needed	Evidence showing that at least 80% of site timber is responsibly sourced and 100% is legally sourced and evidence demonstrating that 6 or more of items a-g are achieved: a) Monitor, report and set targets for CO2 or energy arising from site activities b) Monitor, report and set targets for CO2 or energy arising from transport to and from site c) Monitor, report and set targets for water consumption arising from site activities d) Implement best practice policies in respect of air (dust) pollution arising from the site e) Implement best practice policies in respect of water (ground and surface) pollution occurring on the site f) Main contractor has an environmental materials policy, used for sourcing of construction materials to be utilised on site g) Main contractor operates an Environmental Management System.		

Man 4 – Building User Guide		Credits available	1
		Credits likely	1
Aim	To recognise and encourage the provision of guidance for the non technical building user so they can understand and operate the building efficiently.		
Development comments	A Building User Guide will be fabricated for the project and this shall be included within the preliminaries. Note: Mandatory requirements of one credit for Excellent and Outstanding.		
Evidence needed	Building User Guide with contents required by BREEAM guidance. See the Man 4 requirements document.		

Man 5 – Site Investigation		Credits available	1
		Credits likely	1
Aim	To recognise and encourage detailed site investigation to ensure the building accounts for site		
Development comments	It is envisaged that a comprehensive pre-design stage study of the proposed site shall be investigated to determine local conditions that will affect the design and specification of the proposed development.		
Evidence needed	Copy of the site investigation report carried out to standards required under the BREEAM Education 2008 Man 5 credit criteria. See the Man 5 of the BREEAM technical manual for further information.		

Man 6 – Consultation		Credits available	2
		Credits likely	1
Aim	To involve the relevant stakeholders (including building users, business, residents and local government) in the design process in order to provide buildings fit for purpose and to increase local "ownership". conditions and any remedial action required is taken.		
Development comments	It is envisaged that consultation will form part of the conceptual design stage assessment and shall include the following: a. Members of the local community and appropriate stakeholders identified with whom the design team consulted b. Knowledge and experience collated from the existing buildings of the same type (if relevant) to identify existing partnerships and networks. If the building is a new development in an existing community or for a community still under construction, a representative consultation group should be identified from similar buildings of the same type in the same authority/area c. A consultation plan was prepared and included a timescale and methods of consultation, clearly identifying at which points consultees can usefully contribute and how they will be kept informed about progress on the project. 2. The consultation included at least the following issues: a. Functionality, building quality and local impact (including aesthetics) b. Building user satisfaction/productivity c. Management and operational implications d. Maintenance resources/burdens e. Good and bad examples of buildings of the same type. f. Local traffic/transport impact. g. Opportunities for shared use of facilities and infrastructure with the community h. Consultation on the opportunities available to design the building so it can be used as a learning resource to demonstrate environmental awareness to pupils/students 3. Feedback has been given to the consultation group regarding suggestions made, and this feedback covered: a. What was proposed during the consultation exercise b. How each of these proposals were considered c. The outcome, e.g. implementation of suggestions or description of why options have not been deemed feasible.		
Evidence needed	Records of consultation having being carried out in line with the above criteria, relevant stakeholders identified and evidence of stakeholder feedback being incorporated into the design where appropriate.		

Man 7 - Shared Facilities		Credits available	2
		Credits likely	0
Aim	To recognise and encourage flexible buildings designed to cater for shared use with the local community.		
Development comments	It is not clear if these credits are appropriate to the building and therefore assumed not to be targeted.		
Evidence needed	One credit where evidence provided demonstrates that shared facilities have been provided as a consequence of consultation feedback. Two credits where, in addition to the above, evidence provided demonstrates that these facilities can be accessed without compromising the safety and security of the building and its occupants.		

Man 8 - Security		Credits available	1
		Credits likely	1
Aim	To recognise and encourage the implementation of effective design measures that will reduce the opportunity for and fear of crime on the new development.		
Development comments	An Architectural Liaison Officer will be consulted about the designs and the recommendations will be implemented.		
Evidence needed	Correspondence from or a copy of the report/feedback from the ALO/CPDA confirming the scope of their advice/involvement, the stage of design in which their advice was sought and a summary of their recommendations. A marked-up copy of the site/design plan(s) highlighting examples of the development conforming to ALO/CPDA recommendations and SBD principles and guidance.		

Man 9 - Publication of Building Information		Credits available	1
		Credits likely	1
Aim	To recognise and encourage the publication of information related to the aspects of the design and procurement process' which reduce the overall environmental impact of the building.		
Development comments	The developer shall commit to make the following information about the building development available to the public through their website or leaflets: · A basic description of the project and building · BREEAM Rating and score · The key innovative and low-impact design features of the building · Basic Building Cost - £/m2 · Services Costs - £/m2 · ExternalWorks - £/m2 · Gross floor area - m2 · Total area of site – hectares · Function areas and their size (m2) · Area of circulation (m2) · Area of storage (m2) · % area of grounds to be used by community (where relevant) · % area of buildings to be used by community (where relevant) · Predicted electricity consumption - kWh/m2 · Predicted fossil fuel consumption - kWh/m2 · Predicted renewable energy generation - kWh/m2 · Predicted water use - m3/person/year · % predicted water use to be provided by rainwater or greywater · The steps taken during the construction process to reduce environmental impacts, i.e. innovative construction management techniques · A list of any social or economically sustainable measures achieved/piloted.		
Evidence needed	Developer is to provide a formal letter and perform the following: · Produce a case study for the development covering the above requirements. · Display this information through an appropriate medium publication i.e. website		

Man 10 - Development as a Learning Resource		Credits available	1
		Credits likely	1
Aim	To recognise and encourage the use of the building and site as a learning resource for demonstrating environmental awareness.		
Development comments	Design team to include and demonstrate that the proposed building or landscape design provides a learning resource that can be used to facilitate development of environmental issues for building users and visitors. See BREEAM Technical Manual Man 10 for relevant examples.		
Evidence needed	Design team to provide a marked-up design plan demonstrating the proposed/specified feature and its installation.		

Man 11 - Ease of Maintenance		Credits available	1
		Credits likely	0
Aim	To recognise and encourage the specification of a building and building services that can be easily maintained during their lifecycle.		
Development comments	This credit is not targeted.		
Evidence needed	This credit is not targeted.		

Man 12 - Life Cycle Costing		Credits available	2
		Credits likely	0
Aim	To recognise and encourage the development of a Life Cycle Cost (LCC) analysis model for the project to improve design, specification and through-life maintenance and operation.		
Development comments	This credit is not targeted.		
Evidence needed	This credit is not targeted.		

3.2 HEALTH AND WELLBEING

Hea 1 - Daylighting		Credits available	1
		Credits likely	1
Aim	To give building users sufficient access to daylight.		
Development comments	Further investigation needs to be carried out to determine whether daylighting levels will be met.		
Evidence needed	At least **80%** of floor area in *occupied spaces* for schools and further education colleges and 60% of floor area in *occupied spaces* for higher education buildings is adequately daylit as follows: a) An average daylight factor of 2% or more. **PLUS** either (b) **OR** (c) **AND** (d) below b) 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** c) A view of sky from desk height (0.7m) is achieved. **AND** d) 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.		
Exemplary Level Requirement Achieved?		No	

Hea 2 – View Out		Credits available	1
		Credits likely	1
Aim	To allow occupants to refocus their eyes from close work and enjoy an external view, thus reducing the risk of eyestrain and breaking the monotony of the indoor environment.		
Development comments	Areas with workstations will be designed to ensure desk areas are within 7m of an adequate view out.		
Evidence needed	Design plan and elevation showing all relevant building areas and room depths, actual or notional workstations/desk layout and window/open areas. Also a site plan showing the building location and proximity to external obstructions.		

Hea 3 – Glare Control		Credits available	1
		Credits likely	1
Aim	To reduce problems associated with glare in occupied areas through the provision of adequate controls.		
Development comments	Design team to ensure occupant-controlled shading system on all windows, glazed doors and rooflights in all relevant building areas.		
Evidence needed	Marked-up copy of the design plans confirming a description of the function of each of the building spaces and a copy of the relevant specification clauses along with a window schedule or design plan confirming the type of shading system(s) and control to be installed.		

Hea 4 – High Frequency Lighting		Credits available	1
		Credits likely	1
Aim	To reduce the risk of health problems related to the flicker of fluorescent lighting.		
Development comments	All fluorescent lighting will have high frequency ballasts. Note: Mandatory requirements of one credit for all assessments.		
Evidence needed	A copy of the specification clause or room data sheets confirming a compliant lighting strategy is to be installed.		

Hea 5 – Internal and External Lighting Levels		Credits available	1
		Credits likely	1
Aim	To ensure lighting has been designed in line with best practice for visual performance and comfort.		
Development comments	Lighting will be designed in accordance with the BREEAM guidance.		
Evidence needed	Illuminance (lux) levels in all internal areas of the building are specified in accordance with the CIBSE Code for Lighting 2006. 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. 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		Credits available	1
		Credits likely	1
Aim	To ensure occupants have easy and accessible control over lighting within each *relevant building area*.		
Development comments	Lighting will be zoned and controlled in accordance with the BREEAM requirements.		
Evidence needed	Drawings to show that office lighting is zoned to 4 workplaces or less. Workstations adjacent to windows and other building areas must be separately zoned and controlled. Additional requirements would be needed for teaching areas if these were constructed in future developments.		

Hea 7 – Potential for Natural Ventilation		Credits available	1
		Credits likely	1
Aim	To recognise and encourage adequate cross flow of air in naturally ventilated buildings and flexibility in air-conditioned/mechanically ventilated buildings for future conversion to a natural ventilation strategy.		
Development comments	The building is to be naturally ventilated and therefore the design must adhere to the following guidance.		
Evidence needed	*Occupied spaces* 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 AM1015) that the natural ventilation strategy provides adequate cross flow of air to maintain required thermal comfort conditions and ventilation rates.		

Hea 8 – Indoor Air Quality		Credits available	1
		Credits likely	0
Aim	To reduce the risk to health associated with poor indoor air quality.		
Development comments	It is thought unlikely that this credit will be achieved due to external sources of pollution such as car parking areas could impact on the building.		
Evidence needed	A marked-up proposed site plan highlighting the locations of intakes, extracts, openable windows, ventilators and showing any existing or proposed sources of external pollution. Design team calculations and/or performance specification criteria confirming the fresh air rate set for each space, that the fresh air rate can be met using the chosen strategy and the relevant standards to which the design is in accordance with.		

Hea 9 – Volatile Organic Compounds		Credits available	1
		Credits likely	1
Aim	To recognise and encourage a healthy internal environment through the specification of internal finishes and fittings with low emissions of volatile organic compounds (VOCs).		
Development comments	Products will be specified in line with the credit requirements.		
Evidence needed	A copy of the relevant specification clause confirming the VOC content of the relevant specified product types will comply with the standards specified above. This will be checked at Post Construction to ensure the task has taken place.		

Hea 10 – Thermal Comfort		Credits available	1
		Credits likely	1
Aim	To ensure, with the use of design tools, that appropriate thermal comfort levels are achieved.		
Development comments	Dynamic modelling should be used to assess overheating risk and occupant thermal comfort is satisfactory.		
Evidence needed	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 requirements 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		Credits available	1
		Credits likely	1
Aim	To recognise and encourage the provision of user controls which allow independent adjustment of heating/cooling systems within the building.		
Development comments	It was thought the development would be occupant controlled via TRVs and zoned in compliance with the credit.		
Evidence needed	The heating/cooling system must be designed to allow occupant control within all occupied spaces of the building. The zoning must also allow 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		Credits available	1
		Credits likely	1
Aim	Where evidence provided demonstrates that the risk of waterborne and airborne legionella contamination has been minimised.		
Development comments	All water systems will be designed in accordance with the HSE's Approved Code of Practise. Note: Mandatory requirements of one credit for all assessments.		
Evidence needed	A copy of the relevant specification clause confirming the types of water system in the building and on the assessed site and the standards to which they will be designed. Where design responsibility is to be passed on to the contractor/installer, a copy of the relevant specification clause stating the requirements with regards to minimising the risk of Legionnaires disease from the specified water systems.		

Hea 13 – Acoustic Performance		Credits available	2
		Credits likely	2
Aim	To ensure the acoustic performance of the building meets the appropriate standards for its purpose.		
Development comments	As the building is intended to serves as an educational environment, consideration should be given to minimising internal ambient noise levels and reverberation times in accordance with relevant performance standards. An acoustician shall therefore be appointed.		
Evidence needed	1. Indoor ambient noise levels in *unoccupied* staff/office areas comply with the following: a. ≤ 40dB *L*Aeq,*T* in single occupancy offices b. 40-50dB *L*Aeq,*T* in multiple occupancy offices c. 40 dB *L*Aeq,*T* general spaces (staffrooms, restrooms) d. 35 dB *L*Aeq,*T* in spaces designed for speech e.g. seminar/lecture rooms e. ≤ 50 dB *L*Aeq,*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 BS823342. 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.		

3.3 ENERGY

Ene 1 – Reduction of CO_2 emissions		Credits available	15
		Credits likely	12
Aim	To recognise and encourage buildings that are designed to minimise the CO_2 emissions associated with their operational energy consumption.		
Development comments	A potential of 12 credits could be achieved through utilisation of renewable energy and heat technology for this building. It is recommended that biomass is utilised as the primary fuel for space heating. In addition to this, photovoltaic technology should be utilised to further enhance energy efficiency and reduce carbon emissions further. Note: Mandatory requirements of six credits for Excellent and ten credits for Outstanding.		
Evidence needed	A copy of the EPC output from the *approved software* for the assessed building at the design stage. The *accredited energy assessor's* name and accreditation number (this information will be on the EPC).		
Exemplary Level Requirement Achieved?	No		

Ene 2 – Sub metering of Substantial Energy Uses		Credits available	1
		Credits likely	1
Aim	To recognise and encourage the installation of energy sub-metering that facilitates the monitoring of in use energy consumption.		
Development comments	Sub-metering will be present in the development. Note: Mandatory requirements of one credit for Very Good, Excellent and Outstanding.		
Evidence needed	Separate accessible energy sub-meters, with a pulsed output, labelled with the end energy consuming use, must be provided for the following systems (where present): a) Space Heating b) Domestic Hot Water c) Humidification d) Cooling e) Fans (major) 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) Other major energy-consuming items where appropriate. Specification document or technical drawings confirming energy-consuming systems and their rated outputs, metering arrangements for each system, type and location of meter specified and if applicable, scope of BMS and its energy-monitoring capability.		

Ene 3 – Sub-metering of high energy load and tenancies		Credits available	1
		Credits likely	1
Aim	To recognise and encourage the installation of energy sub-metering that facilitates the monitoring of in-use energy consumption by tenant or end user.		
Development comments	Areas of high energy load will be sub-metered.		
Evidence needed	Marked-up drawings and site plan detailing building areas by department/function and/or tenancy and the location of the meters. Specification document or technical drawings confirming the metering arrangements for each department/function and/or tenancy area and the type of meter specified.		

Ene 4 – External Lighting		Credits available	1
		Credits likely	1
Aim	To recognise and encourage the specification of energy-efficient light fittings for external areas of the development.		
Development comments	M&E consultant to design external lighting to comply with the following standards.		
Evidence needed	All external light fittings for the building, access ways and pathways need to 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. All external light fittings to car parking areas, associated roads and floodlighting will have a luminous efficacy of at least 70 lamp lumens/circuit Watt 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. 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. External light fittings will be controlled through a time switch, or daylight sensor, to prevent operation during daylight hours. A daylight sensor override on a manually switched lighting circuit is acceptable. Marked-up site plan and building elevations showing the location and purpose of all external light fittings. Lighting specification or lighting designer's calculations confirming the lamp lumens/circuit watt for each type of fitting as well as the colour rendering index Ra (where appropriate) and the external lighting control strategy.		

Ene 5 – Low or Zero Carbon Technologies		Credits available	3
		Credits likely	3
Aim	To reduce carbon emissions and atmospheric pollution by encouraging local energy generation from renewable sources to supply a significant proportion of the energy demand.		
Development comments	Design team to commission a feasibility study at RIBA Stage C. The development will include low or zero carbon technology such as biomass and photovoltaic energy in order to achieve a minimum 15% carbon reduction. Note: Mandatory requirements of one credit for Excellent and Outstanding.		
Evidence needed	A feasibility study must be carried out at RIBA Stage C by an *energy specialist t*o establish the most appropriate local (on-site or near-site) LZC energy source for the building/development. This study covers as a minimum: a) Energy generated from LZC energy source per year b) Payback c) Land use d) Local planning requirements e) Noise f) Feasibility of exporting heat/electricity from the system g) Life cycle cost/lifecycle impact of the potential specification in terms of carbon emissions h) Any available grants i) All technologies appropriate to the site and energy demand of the development. j) Reasons for excluding other technologies. One or more LZC technologies should be specified to achieve a minumum 15% CO2 reduction as a result of the findings in the study to achieve a further two credits.		
Exemplary Level Requirement Achieved?			No

Ene 10 - Free Cooling		Credits available	1
		Credits likely	1
Aim	To reduce the dependency of the building on conventional mechanical refrigeration to provide adequate thermal comfort conditions.		
Development comments	The building is intended to be naturally ventilated with adequate cross-flow ventilation provided. Therefore, the building shall not have any fixed cooling systems.		
Evidence needed	A written description from the building services engineer summarising the 'purpose designed' free cooling strategy in this case, no cooling will be provided.		

3.4 TRANSPORT

Tra 1 – Provision of Public Transport		Credits available	5
		Credits likely	0
Aim	To recognise and encourage development in proximity to good public transport networks, thereby helping to reduce transport-related emissions and traffic congestion.		
Development comments	Credits allocated to this issue vary by site depending the local public transport services, frequency services and distance from the site to the transport node. The site is located in an area of low public transport services. Consider public transport services when selecting sites for further development.		
Evidence needed	Scale map highlighting the location of the building and all public transport nodes in proximity of the building. Timetables for each service at each public transport node considered.		

Tra 2 – Proximity to Amenities		Credits available	1
		Credits likely	0
Aim	To encourage and reward a building that is located in proximity to local amenities, thereby reducing the need for extended travel or multiple trips.		
Development comments	As per Ene 1, the credit is awarded on proximity of the site to local services.		
Evidence needed	Marked-up site plan or map highlighting the location of the assessed building, the location and type of amenities and the route to the amenities on a plan/map shown to scale.		

Tra 3 – Cyclist Facilities		Credits available	2
		Credits likely	1
Aim	To encourage building users to cycle by ensuring adequate provision of cyclist facilities.		
Development comments	The development contains 52 proposed cycle spaces. By taking the requirements of each scheme (bus station, offices and retail) into account, it is anticipated that 48 spaces will be required for the purpose of the BREEAM assessment. A minimum of 10 compliant parking spaces should also be provided within 100m of the shop entrance. Please note that these figures have been halved due to the urban location of the site.		
Evidence needed	**First credit** The number of *compliant cycle storage spaces* provided is as follows: a. 10% of *building users* up to 500 **PLUS** b. 7% for *building users* in the range of 501 – 1000 **PLUS** c. 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*: a. Compliant showers b. Compliant changing facilities and lockers for clothes c. Compliant drying space for wet clothes		

Tra 4 – Pedestrian and Cyclist Safety		Credits available	1
		Credits likely	0
Aim	To recognise and encourage the provision of safe and secure pedestrian and cycle access routes on the development.		
Development comments	Credit not targeted.		
Evidence needed	Credit not targeted.		

Tra 5 – Travel Plan		Credits available	1
		Credits likely	1
Aim	To recognise the consideration given to accommodating a range of travel options for building users, thereby encouraging the reduction of user reliance on forms of travel that have the highest environmental impact.		
Development comments	A transport assessment shall be carried out for planning. The Travel plan will be produced by the user at a later date.		
Evidence needed	The travel plan needs to be developed at feasibility/design stages. A transport survey should include: a) 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 b) Travel patterns and transport impact of future building users c) Current local environment for walkers and cyclists (accounting for visitors who may be accompanied by young children) d) Disabled access (accounting for varying levels of disability and visual impairment) e) Public transport links serving the site f) Current facilities for cyclists. The travel plan should include 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: a) Providing parking priority spaces for car sharers b) Providing dedicated and convenient cycle storage and changing facilities c) Lighting, landscaping and shelter to make pedestrian and public transport waiting areas pleasant d) Negotiating improved bus services, i.e. altering bus routes or offering discounts e) Restricting and/or charging for car parking f) Criteria for lobby areas where information about public transport or car sharing can be made available g) 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 offsite pedestrian and cycle routes.		

Tra 8 – Deliveries & Manoeuvring		Credits available	1
		Credits likely	1
Aim	To ensure that safety is maintained and disruption due to delivery vehicles minimised through well-planned layout and access to the site.		
Development comments	Design team to design and provide evidence to demonstrate that vehicle access areas have been designed to ensure adequate space for manoeuvring delivery vehicles and provide space away from manoeuvring area for storage of refuse skips and pallets.		
Evidence needed	Proposed site plan clearly showing the manoeuvring area, delivery vehicle waiting area and designated area for skips/pallets.		

3.5 WATER

Wat 1 – Water Consumption		Credits available	3
		Credits likely	3
Aim	To minimise the consumption of potable water in sanitary applications by encouraging the use of low water use fittings.		
Development comments	It is anticipated that low water using fixtures will include dual flush WCs and be specified to give a water consumption rate of <1.5 m^3 per person. Note: Mandatory requirements of one credit for Good, Very Good, Excellent and two credits for Outstanding.		
Evidence needed	One credit where consumption is 4.5 - 5.5m^3 per person per year Two credits where consumption is 1.5 - 4.4 m^3 per person per year Three credits where consumption is <1.5 m^3 per person per year To determine the water consumption figure for the assessed building, determine the *effective flush volumes* and flow rates for the following installed sanitary fittings and enter this data into the BREEAM Water Calculator Tool: a) WCs b) Urinals c) Taps d) Showers Exclude kitchen taps, cleaners' sinks and external taps. If any rainwater collection or greywater recycling systems are specified for the purpose of meeting WC/urinal flushing demand, determine the following information (as appropriate to system type): a) Annual rainfall for the site location (mm) b) Rainwater catchment area (m^2) c) Catchment type e.g. pitched roof, flat roof d) Rainwater filter co-efficient e) Rainwater collection tank capacity f) Percentage of tap and shower water collected and used for WC/urinal flushing. g) Percentage of building's WC/urinals using greywater to meet flushing demand.		

Wat 2 – Water Meter		Credits available	1
		Credits likely	1
Aim	To ensure water consumption can be monitored and managed and therefore encourage reductions in water consumption.		
Development comments	A pulsed output water meter will be installed on the development. Note: Mandatory requirements of one credit for Good, Very Good, Excellent and Outstanding.		
Evidence needed	A copy of the specification clause confirming the specification and type of water meters. Note: Mandatory requirements of one credit for Very Good, Excellent and two credits for Outstanding.		
Exemplary Level Requirement Achieved?			No

Wat 3 – Major Leak Detection		Credits available	1
		Credits likely	1
Aim	To reduce the impact of major water leaks that may otherwise go undetected.		
Development comments	Pulsed output meters will be monitored through the BMS.		
Evidence needed	To award this credit, a leak detection system capable of detecting major leaks on the water supply must be specified. The system must cover all mains water supply between and within the building and the site boundary and be: 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 minimum 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 Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers. A copy of the specification clause confirming the scope and performance criteria of the leak detection system AND/OR manufacturer's details confirming the technical specification the system.		

Wat 4 – Sanitary Supply Shut Off		Credits available	1
		Credits likely	1
Aim	To reduce the risk of minor leaks in toilet facilities.		
Development comments	Solenoid valves will be specified within the development.		
Evidence needed	A copy of the specification clause confirming the specification of shut-off valves and the controls for the shut-off valves. A design plan showing the location of the toilet facilities.		

3.6 MATERIALS

Mat 1 – Materials Specification – Major building elements		Credits available	6
		Credits likely	6
Aim	To recognise and encourage the use of construction materials with a low environmental impact over the full life cycle of the building.		
Development comments	The exact number of credits likely to be awarded for this issue is unknown, however, the design indicates good consideration to materials specification and would appear that maximum credits should be achieved under this issue.		
Evidence needed	Specification confirming the detailed description of each applicable element and its constituent materials. Design drawings or specification detailing the location and area (m2) of each applicable element. A copy of the output from the Mat 1 Calculator, including Green Guide rating and element number* for each specification assessed.		

Mat 2 – Hard Landscaping and Boundary Protection		Credits available	1
		Credits likely	1
Aim	To recognise and encourage the specification of materials for boundary protection and external hard surfaces that have a low environmental impact, taking account of the full life cycle of materials used.		
Development comments	Design team to ensure at least 80% of the combined area of external hard landscaping and boundary protection specifications achieve an A or A+ rating, as defined by the Green Guide to Specification.		
Evidence needed	Specification confirming a detailed description of each applicable element and its constituent materials. Design drawings or specification detailing the location and area (m2) of each applicable element. The Green Guide rating and element number for the assessed specifications.		

Mat 3 – Reuse of Facade		Credits available	1
		Credits likely	0
Aim	To recognise and encourage the in-situ reuse of existing building façades.		
Development comments	The development is a new build and cannot achieve this credit.		
Evidence needed	This credit cannot be achieved.		

Mat 4 – Reuse of Structure		Credits available	1
		Credits likely	0
Aim	To recognise and encourage the reuse of existing structures that previously occupied the site.		
Development comments	The development is a new build and cannot achieve this credit.		
Evidence needed	This credit cannot be achieved.		

Mat 5 – Responsible Sourcing of Materials		Credits available	3
		Credits likely	2
Aim	To recognise and encourage the specification of responsibly sourced materials for key building elements		
Development comments	It is considered that the building will comprise a high percentage of timer products supported by FSC certification. It is considered that 80% of materials specified will be supported by appropriate chain of custody documentation proving materials sourced have come from environmental sustainable practices.		
Evidence needed	A BREEAM calculator tool is used to establish the number of credits awarded. This makes sure that 80% of the *applicable materials* (listed below) comprising each of the following building elements are responsibly sourced: a) Structural Frame b) Ground floor c) Upper floors (including separating floors) d) Roof e) External walls f) Internal walls g) Foundation/substructure h) 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 Design plan and/or specification confirming the location of elements and materials Specified and the details of the materials specified. A copy of the output from the BREEAM Calculator **AND EITHER** a letter of intent from the design team confirming the product shall be sourced from suppliers capable of providing certification to the level required for the particular tier claimed **OR** if the material has been ordered, supplied or the supplier is known purchase order from the supplier including (as		
	appropriate) Chain of Custody (CoC) number and/or BES6001:2008 Certificate number and/or EMS Certificate number **OR** a copy of the CoC and/or BES6001 and/or EMS certificate.		
Exemplary Level Requirement Achieved?			No

Mat 6 - Insulation		Credits available	2
		Credits likely	1
Aim	To recognise and encourage the use of thermal insulation which has a low embodied environmental impact relative to its thermal properties and has been responsibly sourced.		
Development comments	The design team will specify A and A+ rated materials to ensure one credit is achieved. Potential for second credit if required for the assessment.		
Evidence needed	Marked-up design plan/elevations and/or a copy of the specification confirming the location of insulating materials, the area (m^2) and thickness (m) or volume (m^3) of insulation specified. Manufacturer's technical details confirming thickness and thermal conductivity of the insulating materials specified. This information needs to be entered into the Insulation Index Calculator Tool along with the Green Guide rating, which will then award the credits. A further credit can be awarded where evidence shows the responsible sourcing requirements (Environmental Management Systems for the manufacturing process and supply chain) have been met.		

Mat 7 – Designing for Robustness		Credits available	1
		Credits likely	1
Aim	To recognise and encourage adequate protection of exposed parts of the building and landscape, therefore minimising the frequency of use of replacement materials.		
Development comments	Vulnerable areas of the building will be identified and mitigation measures implemented.		
Evidence needed	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 not be 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.		

3.7 WASTE

Wst 1 – Construction Site Waste Management		Credits available	4
		Credits likely	4
Aim	To promote resource efficiency via the effective and appropriate management of construction site waste.		
Development comments	Four credits will be targeted as a result of generating less than 4.7 tonnes of waster per 100m^2 of floor area. Note: Mandatory requirements of one credit for Excellent and Outstanding.		
Evidence needed	A copy of the compliant Site Waste Management Plan containing the appropriate benchmarks, commitments and procedures. A copy of the specification clause that: • Requires the principal contractor to produce a SWMP in line with the requirements • Contains the detailed requirements with respect to resource efficiency benchmarks • and target(s) and procedures to be included in the SWMP • Where relevant, requires the principal contractor to carry out a pre-demolition/pre-refurbishment audit.		
Exemplary Level Requirement Achieved?			No

Wst 2 – Recycled aggregates		Credits available	1
		Credits likely	0
Aim	To recognise and encourage the use of recycled and secondary aggregates in construction, thereby reducing the demand for virgin material.		
Development comments	This credit is not targeted.		
Evidence needed	This credit is not targeted.		

Wst 3 – Recyclable Waste Storage		Credits available	1
		Credits likely	1
Aim	To recognise the provision of dedicated storage facilities for a building's operational-related recyclable waste streams, so that such waste is diverted from landfill or incineration.		
Development comments	A recyclable waste storage area will be provided and clearly labelled with the materials accepted. Note: Mandatory requirements of one credit for Excellent and Outstanding.		
Evidence needed	Recyclable waste storage must be provided, be easily accessible for collection and labelled in line with the following area requirements: a) At least 2m^2 per 1000m^2 of net floor area for buildings <5000m^2 b) A minimum of 10m^2 for buildings ≥5000 m^2 c) An additional 2m^2 per 1000m^2 of net floor area where catering is provided (up to an additional minimum of 10m^2 ≥5000m^2).		

3.8 LAND USE AND ECOLOGY

LE1 – Reuse of Land		Credits available	1
		Credits likely	0
Aim	To encourage the reuse of land that has been previously developed, and discourage the use of previously undeveloped land for building.		
Development comments	The development is on a site that is likely not to have been previously developed meaning this credit is not likely to be achieved.		
Evidence needed	Existing site plan, report or site photographs confirming previous land use and the area (m^2) of previous land use. Proposed site plan showing the location and footprint (m^2) of proposed development and temporary works.		

LE2 – Contaminated Land		Credits available	1
		Credits likely	0
Aim	To encourage positive action to use contaminated land that otherwise would not have been remediated and developed.		
Development comments	A Site Investigation will be conducted to determine if the land is considered contaminated. As the site is not previously been developed, the land is unlikely to be contaminated and therefore, the credit is unlikely.		
Evidence needed	A copy of the specialist's land contamination report confirming the degree, type and sources of site contamination and the options for remediating the site. Existing site plans showing the location of areas contaminated and to be remediated in relation to any proposed development.		

LE3 – Ecological Value of Site and Protection of Ecological Features		Credits available	1
		Credits likely	1
Aim	To encourage development on land that already has limited value to wildlife and to protect existing ecological features from substantial damage during site preparation and completion of construction works.		
Development comments	It is expected that the land will be classed as having a degree of ecological value. This will need to be verified by a Suitably Qualified Ecologist. The credit can be awarded where Ecological Features are protected in accordance with Ecologist recommendations.		
Evidence needed	A copy of the ecologist's report containing confirmation that the land within the construction zone is of low ecological value along with a description of any ecological features within the site or on the site boundary. If any ecologically valuable features are identified, proof is required that these will be protected.		

LE4 – Mitigating Ecological Impact		Credits available	2
		Credits likely	1
Aim	To minimise the impact of a building development on existing site ecology.		
Development comments	A suitably qualified ecologist will investigate the impact of the development during the detailed design stage. Note: Mandatory requirements of one credit for Very Good, Excellent and Outstanding.		
Evidence needed	A copy of the suitably qualified ecologist's report confirming the landscape and vegetation plot types and areas prior to and after the development.		

LE5 – Enhancing Site Ecology		Credits available	3
		Credits likely	1
Aim	To recognise and encourage actions taken to maintain and enhance the ecological value of the site as a result of development.		
Development comments	The design team aim to implement the ecology report's recommendations in order to increase the biodiversity value of the site after the development.		
Evidence needed	Credits for this issue are awarded for the level of positive impact the development has on ecology. This is calculated by the number of new species that are to be introduced by implementing recommendations from the ecologist's report. One credit is awarded where general recommendations are implemented, two credits where this equates to an increase of up to six species and three credits where this results in an increase of six species or more. The ecologist's report showing details of the site survey and recommendations. Copy of site plans showing the planting schedule includes the recommendations.		

LE6 – Long Term Impact on Biodiversity		Credits available	2
		Credits likely	1
Aim	To minimise the long term impact of the development on the site's, and surrounding areas, biodiversity.		
Development comments	It is anticipated that at least all mandatory requirements will be met to achieve one credit.		
Evidence needed	This issue awards credits based on the achievement of mandatory and additional items detailed in the list below. All mandatory credits must be achieved, with one credit awarded for achieving two additional requirements and two credits awarded for achieving four additional requirements. **Mandatory Requirements** 1. A suitably qualified ecologist (SQE) has been appointed prior to commencement of activities on site. 2. The suitably qualified ecologist (SQE) 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 Requirements** 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.		

3.9 POLLUTION

Pol 1 – Refrigerant GWP – Building Services		Credits available	1
		Credits likely	1
Aim	To reduce the contribution to climate change from refrigerants with a high global warming potential.		
Development comments	It is anticipated that the development will not have a fixed cooling system with refrigerants or will have small scale cooling with refrigerant charge of less than 5Kg. Based on this assumption, one credit can be awarded by default.		
Evidence needed	A copy of the specification clause confirming either the absence of refrigerant in the development OR the type of refrigerant to be used and it's charge weight.		

Pol 2 – Preventing Refrigerant Leaks		Credits available	2
		Credits likely	2
Aim	To reduce the emissions of refrigerants to the atmosphere arising from leakages in cooling plant.		
Development comments	It is anticipated that the development will not have a fixed cooling system with refrigerants or will have small scale cooling with refrigerant charge of less than 5Kg. Based on this assumption, two credits can be awarded by default.		
Evidence needed	A copy of the specification clause confirming either the absence of refrigerant in the development OR the type of refrigerant to be used and it's charge weight.		

Pol 4 – NO_x emissions from Heating Source		Credits available	3
		Credits likely	0
Aim	To encourage the supply of heat from a system that minimises NOx emissions, and therefore reduces pollution of the local environment.		
Development comments	It is unlikely that any credits will be achieved as the building will be heated by a primary fuel other than mains gas.		
Evidence needed	Details of NO_x emissions of heating source. One credit awarded where dry NO_x emissions from delivered space heating energy are ≤100 mg/kWh (at 0% excess O_2). Two credits where dry NO_x emissions from delivered space heating energy are ≤70 mg/kWh (at 0% excess O_2). Three credits where dry NO_x emissions from delivered space heating energy are ≤40 mg/kWh (at 0% excess O_2).		

Pol 5 – Flood Risk		Credits available	3
		Credits likely	3
Aim	To encourage development in low flood risk areas or to take measures to reduce the impact of flooding on buildings in areas with a medium or high risk of flooding.		
Development comments	Appoint a suitably qualified Hydrologist to carry out a BREEAM compliant Flood Risk Assessment and propose attenuation measures to reduce the impact of flooding with an allowance for Climate Change.		
Evidence needed	Copy of the Flood Risk Assessment. Site plans/sections confirming the design flood level for the site, the design ground level(s) for all developed areas of the site and safe access and escape routes. Site plans and a copy of the specification or consultants report confirming the type and storage volume (l) of the water run-off attenuation measures, total area of hard surfaces (m2), peak flow rate (l/s) for the design storm event and any additional allowance for climate change designed in to the system.		

Pol 6 – Minimising Water Course Pollution		Credits available	1
		Credits likely	0
Aim	To reduce the potential for silt, heavy metals, chemicals or oil pollution to natural watercourses from surface water run-off from buildings and hard surfaces.		
Development comments	This credit is not targeted.		
Evidence needed	This credit is not targeted.		

Pol 7 – Reduction of Night Time Light Pollution		Credits available	1
		Credit likely	1
Aim	To ensure that external lighting is concentrated in the appropriate areas and that upward lighting is minimised, reducing unnecessary light pollution, energy consumption and nuisance to neighbouring properties.		
Development comments	External lighting will be designed in accordance with the BREEAM requirements.		
Evidence needed	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. 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		Credits available	1
		Credits likely	1
Aim	To reduce the likelihood of noise from the new development affecting nearby noise-sensitive buildings.		
Development comments	An Acoustician will be appointed to undertake a noise assessment.		
Evidence needed	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. 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. The primary professional body for acoustics in the UK is the Institute of Acoustics. 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. 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.		

4. Summary

The initial score of 71.27% identified following the pre-assessment meeting would mean the development achieves a 'Excellent' rating. Please note that this is based on the current design; for the BRE to award a certificate, evidence would need to be provided at a later stage to demonstrate that all of these items are being carried out, both for the design and procurement interim report and the final post construction review.

It is more likely that as the scheme progresses, credits may be dropped as a result of cost implications. Therefore it is ideal to have a backup list of credits that can be worked towards if the BREEAM scoring dropped towards the lower threshold of 70% for 'Excellent'. It is important to aim to devote most attention to maximising energy and ecology credits as these credits are weighted higher.