

The Royal Central School of Speech and Drama

‘Phase 5’ – Studio 1 Redevelopment

BREEAM Pre-assessment

Price & Myers



Royal Central School of Speech & Drama

BREEAM 2011 Pre-Assessment Report

Stage D

Project No: 22479.002
Report: v4
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Executive Summary

Price & Myers has been commissioned to carry out a BREEAM 2011 New Construction pre-assessment for the Royal Central School of Speech & Drama Studio 1 re-development.

This report demonstrates that the development has the potential to achieve a score of 72.64%, which equates to an 'Excellent' BREEAM rating and includes achievement of more than 60% of the Energy and Water credits as well as 40% of the Materials credits, as required by Camden's policy DP22.

This provides a small buffer over the target score of 70% (the threshold for an Excellent rating) should credits be lost through design or cost constraints as the project progresses.

It will be important to monitor the assessment carefully to ensure additional credits are achieved for the development.

It is key for the design team to remain in contact with the assessor throughout the process and to check that all specifications are in line with the pre-assessment to ensure the required level is achieved upon construction. In order to sign off the planning condition, a Design Stage and Post Construction Stage assessment will be required and the reports submitted to the BRE for certification.

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1. Introduction

Price & Myers has been commissioned to carry out a Preliminary BREEAM (BRE Environmental Assessment Method) 2011 New Construction assessment for the proposed Studio 1 re-development of the Royal Central School of Speech & Drama.

The proposed development (also known as 'Phase 5') comprises three storeys above ground level, together with a basement. The new building will connect to the existing West Block, and tie into the existing floor levels; these are sufficiently tall to accommodate teaching and rehearsal studios, with smaller scale teaching and office accommodation on intermediate mezzanine levels.

This report comprises a pre-assessment of the development against the BREEAM 2011 scheme and under the BREEAM scheme, the building type is classed as Further Education.

2. BREEAM 2011 New Construction

BREEAM 2011 is an environmental performance standard against which new, non-domestic buildings in the UK can be assessed, rated and certified.

The primary aim of the scheme is to improve the environmental performance of non-domestic buildings in a robust and cost effective manner. The performance of the building on the scheme is quantified by a number of individual measures and associated criteria stretching across a range of environmental issues, categorised into the following sections:

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

BREEAM Scoring

Within each of the BREEAM categories outlined above, there are a number of credit requirements that reflect the options available to designers and managers of buildings.

An environmental weighting is applied to the scores achieved under each category, illustrated in Section 3, in order to calculate the final BREEAM score. 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.

The current rating benchmarks for the BREEAM 2011 scheme are detailed in the table below:

BREEAM Rating	% Score
Outstanding	≥ 85
Excellent	≥ 70
Very Good	≥ 55
Good	≥ 45
Pass	≥ 30
Unclassified	< 30

Table 2.1 - BREEAM 2011 rating benchmarks

Minimum Standards

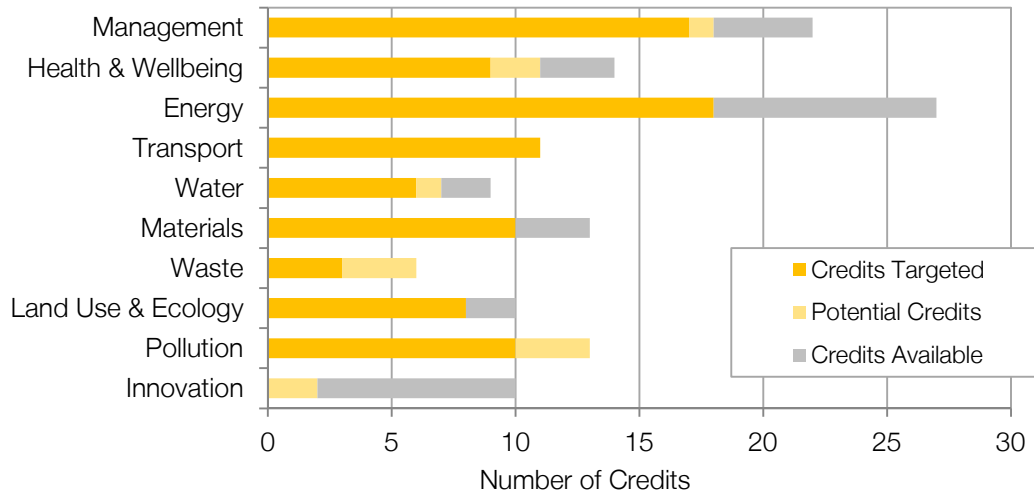
In order to achieve particular benchmark scores, there is a minimum performance requirement within the BREEAM schemes. The minimum performance requirements are detailed in the table below and a project cannot achieve a particular rating unless the minimum requirements have been met, irrespective of the overall percentage score.

BREEAM Credit	Minimum Standards by Rating Level				
	Pass	Good	Very Good	Excellent	Outstanding
Man 01: Sustainable Procurement	1 Credit	1 Credit	1 Credit	1 Credit	2 Credits
Man 02: Responsible Construction Practices	-	-	-	1 Credit	2 Credits
Man 04: Stakeholder Participation	-	-	-	1 Credit (Building user Information)	1 Credit (Building user Information)
Hea 01: Visual Comfort	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only
Hea 04: Water Quality	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only
Ene 01: Reduction of CO ₂ Emissions	-	-	-	6 Credits	10 Credits
Ene 02: Energy Monitoring	-	-	1 Credit (1st Sub-metering credit)	1 Credit (1st Sub-metering credit)	1 Credit (1st Sub-metering credit)
Ene 04: LZC Technologies	-	-	-	1 Credit	1 Credit
Wat 01: Water Consumption	-	1 Credit	1 Credit	1 Credit	2 Credits
Wat 02: Water Monitoring	-	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only
Mat 03: Responsible Sourcing	Criterion 3 only	Criterion 3 only	Criterion 3 only	Criterion 3 only	Criterion 3 only
Wst 01: Construction Waste Management	-	-	-	-	1 Credit
Wst 03: Operational Waste	-	-	-	1 Credit	1 Credit
LE 03: Mitigating Ecological Impact	-	-	1 Credit	1 Credit	1 Credit

Table 2.2 - Minimum BREEAM 2011 standards

3. Score Summary

The potential BREEAM score of the development has been determined based on discussions with the design team and is currently expected to achieve the following:



BREEAM Section	Credits Available	Credits Targeted	% of Credits Achieved	Section Weighting	Section Score
Management	22	17	77.3%	12%	9.27
Health & Wellbeing	14	9	64.3%	15%	9.64
Energy	27	18	66.7%	19%	12.67
Transport	11	11	100.0%	8%	8.00
Water	9	6	66.7%	6%	4.00
Materials	13	10	76.9%	12.5%	9.62
Waste	6	3	50.0%	7.5%	3.75
Land Use & Ecology	10	8	80.0%	10%	8.00
Pollution	13	10	76.9%	10%	7.69
Innovation	10	0	0.0%	10%	0.00
Target BREEAM Score			72.64		
Target BREEAM Rating			Excellent		
Potential BREEAM Score			84.05		
Potential BREEAM Rating			Excellent		

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

This report demonstrates that the development has met all of the minimum standards and can achieve an Excellent rating on the BREEAM 2011 scheme.

4. Pre-assessment Credit Summary

The following section details the BREEAM credits assessed under the scheme and whether they will be targeted for the development.

Management					
Criteria	Available Score	Status	Target Score	Pre-Assessment Stage Assumptions	Responsibility
Man 01 Sustainable Procurement					
Compliant roles, responsibilities and training schedule, in accordance with details in Appendix A1	0.55	Targeted	0.55	The design team have met at Stage B to identify and define their roles, responsibilities and contributions. A contractor will be consulted with in the early stages. There will be a schedule of training identified for relevant building occupiers/premises managers.	Tim Ronalds Architects
BREEAM AP appointed at or before RIBA Stage C and a target rating contractually agreed. The target rating must be achieved at certification	0.55	Targeted	0.55	A BREEAM AP from Price & Myers has been involved in early design team meetings.	P&M
BREEAM AP involved and reports on progress through RIBA Stages B to E. The BREEAM target must be part of the main contractors contract	0.55	Targeted	0.55	There is a contractual requirement to achieve an Excellent rating and the AP will show this is being achieved through regular progress reports and the completed BREEAM assessments to be submitted to the BRE for certification.	
BREEAM AP monitors and reports progress through RIBA Stages F to L, targets agreed at Stage C and demonstrably achieved	0.55	Targeted	0.55		
Thermographic survey conducted and any defects must be rectified. See Appendix A1 for details	0.55	Potential	0.00	This credit will not be targeted initially due to the high cost of compliance but has been marked as potential. It could be targeted later on if additional credits were required.	RCSSD / Contractor
Commissioning of building services to CIBSE, BSRIA regs, monitored on behalf of the RCSSD by an appropriate person. For complex systems, a specialist commissioning agent must be appointed. Refer to Appendix A1 for detailed requirements	0.55	Targeted	0.55	An appropriate project team member will be appointed to monitor and programme pre-commissioning, commissioning and, where necessary, re-commissioning. All commissioning will be carried out in accordance with the relevant guidelines. A specialist commissioning manager will be appointed during the design stage to provide design advice regarding commissioning.	Max Fordham / Contractor
Seasonal commissioning of building services over 12 months post occupation. See Appendix A1	0.55	Targeted	0.55	The contractor will be required to undertake seasonal commissioning responsibilities over a minimum 12 month period.	Max Fordham / Contractor
Commitment to provide aftercare support to building occupants for 12 months post occupation, in accordance with requirements in Appendix A1	0.55	Targeted	0.55	There will be a mechanism to collect the energy and water consumption data for at least 12 months after occupation, compare this with expectations and analyse any differences. There will also be a contract or commitment to provide aftercare support to all the building occupiers. See Appendix A1 for details.	Contractor / RCSSD
Man 02 Responsible Construction Practices					
CCS Score 25 - 34 (score of 5 in each section)	0.55	Targeted	0.55	The contractor will be expected to achieve a score of at least 35 points on the new CCS scheme (with a score of at least 7 in each of the 5 sections).	Contractor
CCS Score 35 - 39 (score of 7 in each section)	0.55	Targeted	0.55		
Man 03 Construction Site Impacts					
Site Energy consumption metered / monitored	0.55	Targeted	0.55	The principal contractor will be expected to carry out these site activities during the construction stages of the project.	Contractor
Site Water consumption metered / monitored	0.55	Targeted	0.55		
Transport of construction materials and waste metered / monitored	0.55	Targeted	0.55	See Appendix A2 for full details of the requirements.	
All site timber is sourced in accordance with the governments sustainable site timber policy	0.55	Targeted	0.55		

Principal contractor uses compliant EMS and implements best practice pollution prevention policies (air & water pollution)	0.55	Targeted	0.55		
Man 04 Stakeholder Participation					
Consultation activities undertaken in line with requirements in Appendix A3	0.55	Not Achievable	0.00	It is not expected that consultation will involve a third party or utilise DQI but this will be investigated further.	Tim Ronalds Architects / RCSSD
An access statement is developed in line with the requirements in Appendix A3	0.55	Targeted	0.55	A design and access statement will be written to cover all of the additional BREEAM topics detailed in Appendix A3.	Tim Ronalds Architects
A building user guide is provided to occupants. Refer to Appendix A3 for detailed contents requirements	0.55	Targeted	0.55	A BREEAM compliant BUG will be developed for the new build building.	Contractor
Post occupancy evaluation (POE) is undertaken by a third party. Refer to Appendix A3 for detailed requirements	0.55	Targeted	0.55	A Post Occupancy Evaluation (POE) will be carried out one year after building occupation, to gain building performance feedback. This will be carried out by an Independent party.	RCSSD
Man 05 Life Cycle Cost and Service Life Planning					
Feasibility stage LCC analysis commissioned in line with requirements in Appendix A4 (RIBA Stages C/D)	0.55	Not Achievable	0.00	These credits are not being targeted due to the cost of carrying out a compliant LCC analysis.	RCSSD / QS
Strategic & system level LCC commissioned (RIBA Stages C/D)	0.55	Not Achievable	0.00		
Technical design LCC commissioned (RIBA Stages D/E)	0.55	Not Achievable	0.00		

Health & Wellbeing					
Criteria	Available Score	Status	Target Score	Pre-Assessment Stage Assumptions	Responsibility
Hea 01 Visual Comfort					
Pre-requisite - High Frequency Ballasts fitted to all fluorescent and compact fluorescent lighting		Targeted		This is a mandatory requirement and so High Frequency Ballasts will be fitted to all fluorescent and compact fluorescent lighting.	Max Fordham
Daylighting - 2% daylight factor AND either - Uniformity ratio of 0.4 or point daylight factor 0.8% OR - View of the sky from desk height AND room depth criterion satisfied	1.07	Potential	0.00	It is expected that this credit cannot be achieved but daylighting analysis will be carried out to confirm. (Max Fordham to run model on Studio C to see whether credits are achievable)	Max Fordham
View out - Window with a view within 7m of areas with a desk or where close up work is done Glare Control - Glare control (e.g., blinds/external shading) fitted to windows in occupied rooms	1.07	Targeted	1.07	View out - There will be a view out in ALL office spaces of a landscape or buildings ≥10m away (rather than just the sky) at seated eye level (1.2 – 1.3m). The window will be ≥20% of the wall area. Glare control - There will be a method to control glare in all occupied rooms/areas (e.g. blinds, brise soleil but curtains are non compliant).	Tim Ronalds Architects
Internal / external lighting specified to SLL and CIBSE standards and adequately zoned and controlled. Refer to Appendix B1 for detailed requirements	1.07	Targeted	1.07	It will be included within the design specification that all internal and external lighting will be designed to meet CIBSE standards and be adequately zoned and controlled.	Max Fordham
Hea 02 Indoor Air Quality					
An air quality plan is developed (requirements in Appendix B2) Fresh air is provided as follows: - All openable windows in naturally ventilated areas are >10m from sources of pollution (roads/car parks/delivery routes/building exhausts) -All mechanical intakes are >20m from sources of pollution & >10m from the exhaust - CO ₂ sensors are provided for high/variable occupancy areas	1.07	Not Achievable	0.00	This credit is not being targeted due to the buildings close proximity to the road.	

An air quality plan is developed & relevant products meet VOC emission levels in Appendix B2	1.07	Targeted	1.07	An air quality plan will be produced and low VOC products specified for paints and internal finishes.	Tim Ronalds Architects
An air quality plan is developed & formaldehyde and VOC levels measured post construction and indoor air quality. See Appendix B2 for full details	1.07	Potential	0.00	VOC monitoring may be carried out post occupation. The VOC monitoring is considered expensive and therefore prohibitive.	Contractor
Building has potential to be naturally ventilated - 5% openable window areas and two levels of user controls. This can be achieved for mechanically ventilated buildings provided the windows could be openable in the future (i.e. not fixed panes)	1.07	Not Achievable	0.00	The building contains some fully internal spaces that will not achieve this criteria.	
Hea 03 Thermal Comfort					
Thermal modelling is carried out using software in accordance with CIBSE AM11 and confirms comfort levels meet CIBSE Guide A by providing "Time out of range" figures	1.07	Targeted	1.07	Thermal modelling will be carried out and it is expected that the design will demonstrate summer comfort levels within CIBSE Guide A can be met.	Max Fordham
Appropriate thermal zoning strategy, providing user control within the zone. Less complex systems require separate occupant control for perimeter zone (7m from perimeter) and central zone	1.07	Targeted	1.07	The thermal modelling analysis will aim to inform the temperature control strategy for the building and it's users. Adequate user control will be provided for each thermal zone and areas appropriately zoned.	Max Fordham
Hea 04 Water Quality					
All water systems designed in compliance with relevant Legionnaires' disease best practice guidance & failsafe humidification system is provided		Targeted		All water systems designed to best practice regarding Legionella.	Max Fordham
Provision of clean, fresh sources of water for building users in line with requirements in Appendix B3	1.07	Targeted	1.07	Chilled, mains-fed point-of-use water coolers will be provided for every 200 users accessible to pupils/students/users/staff throughout the day.	Max Fordham
Hea 05 Acoustic Performance					
Pre-requisite - A suitably qualified acoustician is appointed at pre-bid/briefing stage to provide early design advice		Targeted		An acoustician has been appointed to ensure reverberation times comply with the relevant criteria and All relevant rooms will be designed to meet the British Standards/Building Bulletin, as per the Acoustician's report. It has been confirmed by the acoustician that due to the adoption of natural ventilation systems the credit for indoor ambient noise levels is not achievable.	Acoustician
Achieve the indoor ambient noise level criteria for secondary schools in Section 1 of Building Bulletin 93. Where appropriate indoor ambient noise levels in all non-teaching spaces i.e. spaces/rooms not covered in BB93, comply with the "good practice" criteria levels of BS 82333, Tables 5 & 6	1.07	Not Achievable	0.00	Pre-completion testing will be carried out to ensure that the relevant spaces (as built) achieve the required performance standards. Remedial works carried out prior to handover and occupation if standards are not met.	
All areas used for teaching, training and educational purposes (such as classrooms, seminar rooms and lecture theatres) achieve reverberation times compliant with Table 1.5 of BB93.	1.07	Targeted	1.07		
Hea 06 Safety and Security					
Safe access for pedestrians and cyclists in line with requirements in Appendix B4	1.07	Targeted	1.07	There will be dedicated pedestrian and cycle lanes with direct access from the site entrance(s) to building entrance and any cycle storage facilities respectively.	Tim Ronalds Architects / RCSSD
Qualified security consultant appointed (e.g. ALO or CPDA) at or before RIBA Stage C and achieve SBD or comply with a site specific security risk and threat assessment	1.07	Targeted	1.07	The design team will consult with a suitably qualified security consultant and work towards achieving Secured by Design (SbD).	Tim Ronalds Architects

Energy					
Criteria	Available Score	Status	Target Score	Pre-Assessment Stage Assumptions	Responsibility
Ene 01 Reduction of CO₂					
Energy Performance Ratio for New Constructions (EPR _{NC}) (Based on BREEAM calculation methodology, using information from the BRUKL):				To achieve BREEAM Excellent a minimum EPR of 0.36 and a 25% reduction in CO ₂ is required.	Max Fordham
0.06	0.70	Targeted	0.70	The Local Authority require 60% of the energy credits to be achieved It is anticipated that a minimum of 10 credits can be achieved.	
0.12	0.70	Targeted	0.70		
0.18	0.70	Targeted	0.70		
0.24	0.70	Targeted	0.70		
0.30	0.70	Targeted	0.70		
0.36	0.70	Targeted	0.70		
0.42	0.70	Targeted	0.70		
0.48	0.70	Targeted	0.70		
0.54	0.70	Targeted	0.70		
0.60	0.70	Targeted	0.70		
0.66	0.70	Not Achievable	0.00		
0.72	0.70	Not Achievable	0.00		
0.78	0.70	Not Achievable	0.00		
0.84	0.70	Not Achievable	0.00		
0.90	0.70	Not Achievable	0.00		
Ene 02 Energy Monitoring					
Major energy consuming systems (as listed in Appendix C1) are monitored through either accessible sub-meters or accessible BEMS	0.70	Targeted	0.70	All major energy consuming items will be metered (with a pulsed output and/or connected to a BMS): 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 taken at each floor/department). h.Other major energy-consuming items where appropriate	Max Fordham
Separate tenanted areas or building function areas/floor plates have energy consumption separately metered through either accessible sub-meters or accessible BEMS	0.70	Targeted	0.70	To achieve the credit, studio spaces, classroom spaces and office spaces would have to be separately metered.	Max Fordham
Ene 03 External Lighting					
Specification of energy-efficient light fittings for external areas (in line with Appendix C2), controlled through a time switch, or daylight sensor, to prevent operation during daylight hours	0.70	Targeted	0.70	Energy efficient lighting will be specified for all external areas and controlled through daylight sensors.	Max Fordham
Ene 04 LZC Technologies					
Feasibility study carried out and implemented, covering points listed in Appendix C3	0.70	Targeted	0.70	CPG 3 requires developments to target a 20% reduction in Carbon dioxide emissions through the use of onsite low or zero carbon technologies	Max Fordham
10% reduction in CO ₂	0.70	Targeted	0.70		
20% reduction in CO ₂	0.70	Targeted	0.70		
Feasibility study includes a Life Cycle Assessment of the carbon impact of the chosen LZC system(s). See Appendix C2 for full requirements	0.70	Not Achievable	0.00	A 20% reduction in CO ₂ emissions from renewable technologies is currently being targeted. It has been confirmed that the feasibility study will not include an LCA.	
The building utilises a free cooling strategy and the first credit within the BREEAM issue Hea 03 Thermal comfort has been achieved	0.70	Not Achievable	0.00	Not achievable as some spaces are mechanically cooled.	

Ene 06 Energy Efficient Transportation Systems					
Analysis of the transportation demand and usage patterns for the building has been carried out	0.70	Targeted	0.70	The lift manufacturer (with the design team's support) is expected to ensure these credits are achieved.	Max Fordham & Lift Manufacturer
Potential energy savings are specified	0.70	Targeted	0.70		
Ene 08 Energy Efficient Equipment					
All relevant equipment is specified to meet relevant energy efficiency standards. See Appendix C5 for requirements.	1.41	Not Achievable	0.00	Energy efficient equipment will be not be specified.	

Transport					
Criteria	Available Score	Status	Target Score	Pre-Assessment Stage Assumptions	Responsibility
Tra 01 Public Transport Accessibility					
Credits are awarded based on the level of public transport provision. This is based on the PTAL for buildings in London or the location of bus/train stops and frequency of services for other locations	0.73	Targeted	0.73	The Transport for London PTAL (relating to access to public transport) shows an Accessibility Index of 36.54 for the site, which equates to all 5 credits being achieved.	P&M / Tim Ronalds Architects
	0.73	Targeted	0.73		
	0.73	Targeted	0.73		
	0.73	Targeted	0.73		
	0.73	Targeted	0.73		
Tra 02 Proximity to Amenities					
Encourage and reward a building that is located in close proximity to local amenities, thereby reducing the need for extended travel or multiple trips	0.73	Targeted	0.73	The building is within 500m of a: - Grocery shop or food shop - Post box - Cash machine	P&M / Tim Ronalds Architects
Tra 03 Cyclist Facilities					
Adequate provision of compliant cycle storage cyclist facilities See Appendix D1 for full requirements	0.73	Targeted	0.73	The number of cycle spaces will need to be calculated based on all the users of the site, as it is not possible to allocate spaces specifically for the new block. Secure covered cycle spaces will be required as follows: - 1 for every 20 users (students plus FTE staff) up to 500 users - 1 for every 30 users from 500 up to 1000 users - 1 for every 40 users from 1000 users+	Tim Ronalds Architects
Adequate provision of compliant cycle storage cyclist facilities	0.73	Targeted	0.73	Two of the following are required: - 1 shower per 10 spaces (provision for male and female) but don't just have to be for cyclists. Showers for staff only. - Changing facilities (for male and female) and 1 locker per cycle space. - Drying space (for wet clothes).	Tim Ronalds Architects
Tra 04 Maximum Car Parking Capacity					
Building's car parking capacity is compared to the maximum car parking capacity permitted according to the BREEAM benchmarks	0.73	Targeted	0.73	No new car parking facility is to be provided.	Tim Ronalds Architects
	0.73	Targeted	0.73		
Tra 05 Travel Plan					
Compliant travel plan developed at feasibility stage and implemented. See Appendix D2 for full details	0.73	Targeted	0.73	A BREEAM compliant travel plan will be developed.	RCSSD

Water					
Criteria	Available Score	Status	Target Score	Pre-Assessment Stage Assumptions	Responsibility
Wat 01 Water Consumption					
Improvement over notional baseline of 12.5% (Based on BREEAM calculation taking into account flow rates/ consumption of sanitary ware & appliances)	0.67	Targeted	0.67	DP22 requires 60% of the water credits to be targeted. The following flow rates will be used as guidance to achieve more than a 25% improvement:	Max Fordham / Tim Ronalds Architects / P&M
Improvement over notional baseline of 25%	0.67	Targeted	0.67	WC - 4 litre effective flush volume	
Improvement over notional baseline of 40%	0.67	Potential	0.00	Urinal - 1.5 litre/bowl/hour WHB taps - 4.5 l/min Showers - 8 l/min	
Improvement over notional baseline of 50%	0.67	Not Achievable	0.00	Kitchen taps - 8.3 l/min Commercial sized dishwashers - 6 l/rack	
Improvement over notional baseline of 55%	0.67	Not Achievable	0.00	Commercial sized washing machines - 10 l/kg	
Wat 02 Water Monitoring					
The specification of a water meter on the mains water supply to each building		Targeted		A meter will be specified on the mains incoming water supply to the building and this will be fitted with a pulsed output to enable connection to a BMS.	Max Fordham
Water-consuming plant or building areas, consuming 10% or more of the building's total water demand, are either fitted with sub meters or have water monitoring equipment integral to the plant or area AND Each meter (main and sub) has a pulsed output to enable connection to a Building Management System (BMS) and any water consuming plant (>10%) is separately metered	0.67	Targeted	0.67	Sub-meters will also be required for the leisure centre area, laundry area and main kitchen area unless it can be argued that these areas do not have a high water demand. All meters to be labelled and pulsed to allow connection to a BMS.	Max Fordham
Wat 03 Water Leak Detection and Prevention					
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. See Appendix E1 for details of requirements	0.67	Targeted	0.67	A BREEAM compliant leak detection system will be installed on the mains incoming water supply.	Max Fordham
Flow control devices are fitted in WC areas to ensure water is supplied only when needed (and therefore prevent minor water leaks). See Appendix E1 for details of compliant systems	0.67	Targeted	0.67	Flow control devices (e.g. linked to a PIR) will be provided in the WC areas of the new building.	Max Fordham
Wat 04 Water Efficient Equipment					
Water efficient irrigation for internal or external planting and/or landscaping is specified in line with requirements in Appendix E2	0.67	Targeted	0.67	No irrigation systems will be installed. External taps to be provided for manual watering.	RCSSD / Landscape Architect

Materials					
Criteria	Available Score	Status	Target Score	Pre-Assessment Stage Assumptions	Responsibility
Mat 01 Environmental Impact of Materials					
Credits are awarded based on the green guide to specification ratings of the following elements: The score is calculated using a BREEAM calculation methodology: - External walls - Windows - Roof - Upper Floor Slab - Internal Walls - Floor finishes	0.96	Targeted	0.96	DP22 requires 40% of the materials credits to be targeted.	Tim Ronalds Architects
	0.96	Targeted	0.96	The following materials and build-ups are being considered:	
	0.96	Targeted	0.96	- External walls - - Windows -	
	0.96	Targeted	0.96	- Roof - - Upper floor slab - - Internal walls -	
	0.96	Not Achievable	0.00	- Floor -	
Mat 02 Hard Landscaping & Boundary Protection					
At least 80% of all external hard landscaping and boundary protection (by area) achieves an A or A+ rating in the Green Guide to Specification	0.96	Targeted	0.96	At least 80% of materials for external hard landscaping (including the sub-base) and boundary protection will be specified to achieve an A or A+ Green Guide rating.	Tim Ronalds Architects / Infrastructure
Mat 03 Responsible Sourcing of Materials					
All timber is sourced Independently verifiable legal and sustainable sources OR FLEGT-licensed timber or equivalent sources		Targeted		All timber used on site will be responsibly and legally sourced.	Contractor
Construction materials are responsibly sourced in line with requirements in Appendix F1. Responsible sourcing tier level % of available points achieved - 18%	0.96	Targeted	0.96	The appointed contractor must be responsible for ensuring that materials for major building elements are responsibly sourced (i.e. FSC timber, BES6001 etc.) to achieve at least 1 credit.	
Responsible sourcing tier level % of available points achieved - 36%	0.96	Targeted	0.96		
Responsible sourcing tier level % of available points achieved - 54%	0.96	Not Achievable	0.00		
Mat 04 Insulation					
The (BREEAM) Insulation Index for new insulation is ≥ 2 based on the Green Guide rating and thermal performance for insulation within: - External walls - Ground floor - Roof - Building services	0.96	Targeted	0.96	Insulation will be specified to achieve a sufficient score based on the Green Guide rating for the products.	Max Fordham
Where $\geq 80\%$ of the new thermal insulation used in the building elements is responsibly sourced (for key processes and supply chain - See Appendix F2 for details)	0.96	Targeted	0.96	Insulation will be specified from manufacturers who can provide certification for Environmental Management Systems (EMS) (certified) for Key process and supply chain extraction process.	Contractor
Mat 05 Design for Robustness					
The design incorporates suitable durability and protection measures or design features/solutions to prevent damage to the vulnerable parts of the building, as follows: - Protection from the effects of high pedestrian traffic in main entrances/public areas - Protection against any internal vehicular/trolley movement within 1m of the internal building fabric - Protection against any potential vehicular collision (within 1m of the external building façade for car parking areas and 2m for delivery areas)	0.96	Targeted	0.96	Appropriate design for robustness will be included within the design and specification of materials and fittings. If relevant, bollards will be provided in car parking/drop-off areas to prevent damage to external walls.	Tim Ronalds Architects

Waste					
Criteria	Available Score	Status	Target Score	Pre-Assessment Stage Assumptions	Responsibility
Was 01 Construction Site Waste Management					
A SWMP is developed and the amount of waste generated per 100m2 = 13.3m3 / 11.1 tonnes	1.25	Targeted	1.25	A compliant SWMP will be developed and the main contractor will be expected to ensure construction waste does not exceed 13.3m3 / 11.1 tonnes per 100m2 floor space.	Contractor
Amount of waste generated per 100m2 = 7.5m3 / 6.5 tonnes	1.25	Potential	0.00		
Amount of waste generated per 100m2 = 3.4m3 / 3.2 tonnes	1.25	Not Achievable	0.00	They will also be expected to divert waste from landfill to achieve this credit. Further review will be required once the contractor is appointed and final details of the landscaping are confirmed.	
Waste diverted from landfill - Non-demolition 70 / 80% or demolition 80 / 90%	1.25	Targeted	1.25		
Was 02 Recycled Aggregates					
The total amount of recycled and/or secondary aggregate specified is >25% (by weight or volume) of the total high-grade aggregate specified for the development. See Appendix G1 for full details	1.25	Potential	0.00	The total amount of recycled and/or secondary aggregate specified will be greater than 25% (by weight or volume) of the total high-grade aggregate specified for the development. (PFA or GGBS are classed as secondary aggregate).	Contractor
Was 03 Operational Waste					
Provision of labelled dedicated storage facilities for a building's operational-related recyclable waste Sized either to meet known waste or 2m2 (4m2 if catering provided) for every 1000m2 of floor area Where significant food waste is produced, composting facilities is provided and where significant packaging waste, a compactor/baler is provided	1.25	Targeted	1.25	An appropriately sized space will be provided for the storage of recyclable waste.	Tim Ronalds Architects
Land Use & Ecology					
Criteria	Available Score	Status	Target Score	Pre-Assessment Stage Assumptions	Responsibility
LE 01 Site Selection					
At least 75% of the proposed development's footprint is on an area of land which has previously been developed for use	1.00	Targeted	1.00	At least 75% of the proposed development's footprint is on land with was previously developed.	Tim Ronalds Architects / Ecologist
The site is deemed to be significantly contaminated and will be remediated	1.00	Not Achievable	0.00	The site is not contaminated.	
LE 02 Ecological Value of Site and Protection of Ecological Features					
Land has low ecological value. This can be confirmed if there are no ecological features on the site of if a suitably qualified ecologist confirms this. Any existing ecological features must be protected	1.00	Targeted	1.00	An ecologist will be appointed to prepare a BREEAM compliant report and is expected to confirm that the land has low ecological value. The ecologist should be appointed no later than RIBA Stage B.	Ecologist
LE 03 Mitigating Ecological Impact					
The change in ecological value of the site is < 0 but => -9 (i.e. a minimal negative change) This can either be confirmed through BREEAM calculation based on known vegetation information or by a suitably qualified ecologist (SQE)	1.00	Targeted	1.00	A suitably qualified ecologist will be appointed to provide recommendations to achieve a neutral or positive increase in the ecological value of the site.	Ecologist
Where the change in ecological value of the site is equal to or greater than zero (i.e. no negative change)	1.00	Targeted	1.00		

LE 04 Enhancing Site Ecology					
A suitably qualified ecologist (SQE) has been appointed to report on enhancing and protecting the ecology of the site and their recommendations are implemented	1.00	Targeted	1.00	An ecology report will be developed with the aim to enhance the site ecology. The design team will target a positive change of 0-6 species (as per the ecologist's calculations and planting recommendations). The design team will also be required to follow and implement any recommendations proposed by the ecologist.	Ecologist
Measure ecological value & recommendations for change of 0-6 species	1.00	Targeted	1.00		
Measure ecological value & recommendations for change of more than 6 species	1.00	Not Achievable	0.00		

LE 05 Long Term Impact on Biodiversity					
Minimise the long term impact of the development on the site and the surrounding area's biodiversity by adopting all mandatory criteria AND 2 of the additional criteria detailed in Appendix H1	1.00	Targeted	1.00	The ecologist will advise on how to meet all mandatory ecological requirements and on suitable additional criteria for the design team to implement.	Ecologist / Contractor
Adopt 4 of the additional criteria detailed in Appendix H1	1.00	Targeted	1.00	The design team will then aim to follow 4 of the additional criteria detailed in Appendix H1.	

Pollution

Criteria	Available Score	Status	Target Score	Pre-Assessment Stage Assumptions	Responsibility
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Pol 01 Impact of Refrigerants					
Building does not require the use of refrigerants within its installed plant / systems	2.31	Not Achievable	0.00	The building does use refrigerants and it is to be confirmed whether these have a DELC CO ₂ e of less than 1000 kgCO ₂ e/kW.	Max Fordham
OR Systems using refrigerants have Direct Effect Life Cycle CO ₂ equivalent emissions (DELC CO ₂ e) of ≤100 kgCO ₂ e/kW cooling capacity OR Refrigerants used have a Global Warming Potential (GWP) ≤10	1.54	Potential	0.00	Further details of the type of systems and refrigerants in use are required. A BREEAM compliant refrigerant leak detection system will be specified.	
Systems using refrigerants have DELC CO ₂ e of ≤1000 kgCO ₂ e/kW cooling capacity	0.77	Potential	0.00		
BREEAM compliant refrigerant leak detection and containment. Refer to Appendix J1 for full details	0.77	Targeted	0.77		

Pol 02 NOx Emissions					
NOx space heating <100mg/kWh	0.77	Targeted	0.77	Space and hot water heating is via gas fired boilers and so NOx emissions are expected to be less than 40mg/kWh.	Max Fordham
NOx space heating <70mg/kWh	0.77	Targeted	0.77		
NOx space heating <40mg/kWh & water heating <100mg/kWh	0.77	Targeted	0.77		

Pol 03 Surface Water Run-off					
Development is situated in a flood zone that is defined as having a low annual probability of flooding AND A site specific Flood Risk Assessment (FRA) confirms that there is a LOW risk of flooding	1.54	Targeted	1.54	A FRA is to be carried out, the site is in a Flood Zone 1, so it is expected this credit will be achieved.	Infrastructure
An appropriate SUDS consultant is appointed		Targeted		A consultant will be appointed to advise on SuDS.	Infrastructure
Drainage measures are specified to ensure that the peak rate of run-off from the site are no greater than for the pre-developed site. This should comply at the 1 year and 100 year return period events. Calculations should include an allowance for climate change	0.77	Targeted	0.77	It is expected that the peak run-off rate for the site is less than for the pre-developed site. Calculations will be required to confirm this if the areas of hard landscaping has changed.	Infrastructure

Where flooding of property will not occur in the event of local drainage system failure AND The post development run-off volume, over the development lifetime, is no greater than it would have been prior to the assessed site's development Any additional predicted volume of run-off for the 100 year 6 hour event must be prevented from leaving the site by using infiltration or other SUDS techniques	0.77	Targeted	0.77	Calculations and a report will be required to confirm that flooding will not occur in the event of local drainage system failure and the run-off volume is no greater than for the previous development.	Infrastructure
Measures are implemented to minimise water course pollution in line with requirements in Appendix J2	0.77	Not Achievable	0.00	Calculations and a drainage strategy will be developed to ensure water course pollution will be considered and suitably treated.	Infrastructure

Pol 04 Reduction of Night Time Light Pollution

Reducing unnecessary light pollution, energy consumption and nuisance to neighbours - designed in accordance with ILE Guidance and provided with a time switch to allow lighting to be switched off between 2300hrs and 0700hrs	0.77	Targeted	0.77	All external lighting will be designed in compliance with ILP guidance and can be automatically switched off between 23:00 hr and 07:00 hr. Safety and security lighting will be designed to meet the lower lighting levels.	Max Fordham
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Pol 05 Noise

Where there are or will be noise-sensitive areas or buildings within 800m radius of the assessed development a noise impact assessment in compliance with BS 7445:199120 has been carried out by an acoustician and the following noise levels measured/determined: - Existing background noise levels - The rating noise level resulting from the new noise-source The noise level from the proposed site/building is a difference no greater than +5dB during the day (0700hrs to 2300hrs) and +3dB at night (2300hrs to 0700hrs) compared to the background noise level. Attenuation must be used if required	0.77	Targeted	0.77	An acoustician will be appointed and is expected to confirm this credit can be achieved.	Acoustician
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Innovation

Criteria	Available Score	Status	Target Score	Pre-Assessment Stage Assumptions	Responsibility
Man 01 Sustainable Procurement					
Commitment or contract for the FM or equivalent to undertake certain tasks at quarterly intervals for the first 3 years after occupation	1.00	Potential	0.00	There will be a contract for 3 years after occupation to collect occupant satisfaction results, energy and water consumption, set targets and compare results and feed back results to the design team and BRE Global.	RCSSD
Man 02 Responsible Construction Practices					
Achieve a CCS score of 40+	1.00	Potential	0.00	TBC if a CCS score of 40+ can be achieved, given that this is a limited site area.	Contractor
Hea 01 Visual Comfort					
Exemplary level daylight factor	1.00	Not Achievable	0.00	This credit is not being targeted.	Max Fordham
Ene 01 Reduction of CO₂ Emissions					
Recognise and encourage buildings designed to minimise operational energy demand, consumption and CO ₂ emissions	1.00	Not Achievable	0.00	This credit is not being targeted.	Max Fordham
	1.00	Not Achievable	0.00	This credit is not being targeted.	
	1.00	Not Achievable	0.00	This credit is not being targeted.	
	1.00	Not Achievable	0.00	This credit is not being targeted.	
	1.00	Not Achievable	0.00	This credit is not being targeted.	

Ene 04 LZC Technologies					
30% reduction in CO ₂ from LZCs	1.00	Not Achievable	0.00	This credit is not being targeted.	Max Fordham
Ene 05 Energy Efficient Cold Storage					
Installed refrigeration system is a type described in 'Future technologies'	0.00	Not Applicable	0.00	This credit is not applicable to this project.	Max Fordham
Wat 01 Water Consumption					
65% Improvement over notional baseline	1.00	Not Achievable	0.00	This credit is not being targeted.	Tim Ronalds Architects
Mat 01 Life Cycle Impacts					
Where ≥ 4 applicable elements, the building achieves ≥ 2 points additional to the total points required to achieve maximum credits OR Where < 4 applicable elements, the building achieves at least one point additional to the total points required to achieve maximum credits	1.00	Not Achievable	0.00	This credit is not being targeted.	Max Fordham
Mat 03 Responsible Sourcing of Materials					
Responsible sourcing tier level % of available points achieved = 70%	1.00	Not Achievable	0.00	This credit is not being targeted.	Contractor
Wst 01 Construction Site Waste Management					
Amount of waste generated per 100m ² - 1.6m ³ / 1.9 tonnes AND Waste diverted from landfill - Non-demolition 85 / 90% or demolition 85 / 95%	1.00	Not Achievable	0.00	This credit is not being targeted.	Contractor
Wst 02 Recycled Aggregates					
Total amount of recycled and/or secondary aggregate specified is greater than 35% (by weight or volume) of the total high-grade aggregate specified for the project	1.00	Not Achievable	0.00	This credit is not being targeted.	Structures / Contractor

5. Conclusion

This BREEAM 2011 pre-assessment report demonstrates that an 'Excellent' rating can be achieved, with a score of 72.64%, based on the credits targeted by the design team.

The report and score summary also confirms that the Camden Council requirement to achieve at least 60% of the Energy and Water credits as well as 40% of the Materials credits has been satisfied.

A number of additional credits have been highlighted as potential. These credits will be reviewed by the design team in order to provide a slightly larger buffer above the 70% target score.

Appendices

Appendix A - Management

- A1: Man 01 - Sustainable Procurement
- A2: Man 03 - Construction Site Impacts
- A3: Man 04 - Stakeholder Participation
- A4: Man 05 - Life Cycle Cost and Service Life Planning

Appendix B - Health & Wellbeing

- B1: Hea 01 - Visual Comfort
- B2: Hea 02 - Indoor Air Quality
- B3: Hea 04 - Water Quality
- B4: Hea 06 - Safety and Security

Appendix C - Energy

- C1: Ene 02 - Energy Monitoring
- C2: Ene 03 - External Lighting
- C3: Ene 04 - Low and Zero Carbon Technologies
- C4: Ene 06 - Energy Efficient Transportation Systems

Appendix D - Transport

- D1: Tra 03 - Cyclist Facilities
- D2: Tra 05 - Travel Plan

Appendix E - Water

- E1: Wat 03 - Water Leak Detection and Prevention
- E2: Wat 04 - Water Efficient Equipment

Appendix F - Materials

- F1: Mat 02 - Responsible Sourcing of Materials
- F2: Mat 03 - Insulation

Appendix G - Waste

- G1: Wst 02 - Recycled Aggregates

Appendix H - Land Use & Ecology

- H1: LE05 - Long Term Impact on Biodiversity

Appendix J - Pollution

- J1: Pol 01 - Impact of Refrigerants
- J2: Pol 03 - Surface Water Runoff

Appendix A - Management

A1: MAN 01 – Sustainable Procurement

Design Brief: Responsibilities & Training

The requirements for this are as follows:

- Must be undertaken at RIBA stage B
- The following people must be involved:
 - Client
 - Building occupier
 - Design team
 - Contractor (does not need to be the contractor who is eventually appointed for the job but a contractor must be part of the process)
- As a minimum the process must include meeting to identify and define their roles, responsibilities and contributions during the following phases:
 - Design
 - Construction
 - Commissioning and handover
 - Occupation i.e. up to and including Stage L (Post practical completion) or equivalent.
- The roles and responsibilities outlined above include consideration of:
 - End user requirements
 - Aims of the design and design strategy
 - Particular installation and construction requirements
 - Occupiers budget and technical expertise in maintaining any proposed systems
 - Usability and manageability of any proposals
 - Production of documentation
 - Commissioning, training and aftercare
- There is a schedule of training identified for relevant building occupiers/ premises manager (based approximately around handover and exposed occupation plans) which includes the following minimum:
 - Contents of the Building User Guide(s) (BUG) as specified in Man 04 Stakeholder Participation
 - Design Strategy
 - Installed systems and key features (maintenance, operation, replacement, repair)
 - Documentation to be provided (e.g. user guide, log book etc.)
 - Training responsibilities

Thermographic Survey

The requirements relating to the thermographic survey are as follows:

- The main contractor accounts for a thermographic survey within the project budget and programme of works.

- The thermographic survey of the building fabric is undertaken post construction in accordance with the appropriate standard and by a professional holding a valid Level 2 certificate in thermography (as defined by the UKTA website <http://www.ukta.org>)
- The survey confirms:
 - Continuity of insulation in accordance with the construction drawings
 - Avoidance of excessive thermal bridging
 - Avoidance of air leakage paths through the fabric (except through intentional openings)
- Any defects identified via the post construction inspections are rectified.

Commissioning

Commissioning monitor

An appropriate project team member(s) is appointed to monitor and programme pre-commissioning, commissioning and, where necessary, re-commissioning on behalf of the client. This person can be from the Contractor/Sub-contractor organization provided they are not involved in any installation.

Commissioning requirements

- All building services are included in the commissioning schedule and commissioning is to be carried out in line with current Building Regulations, BSRIA and CIBSE guidelines and/or other appropriate standard, where applicable (where a BMS is specified).
- The main contractor accounts for the commissioning programme, responsibilities and criteria within the main programme of works.

Specialist Commissioning Manager

A specialist commissioning manager is appointed during the design stage (by either client or contractor) for complex systems and the scope of their responsibility includes:

- Design input: 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.

Seasonal commissioning

Commissioning responsibilities over a minimum 12-month period, once the building becomes occupied:

- Complex Systems – Specialist commissioning manager
 - Testing of all building services under full load conditions, i.e. heating equipment in mid-winter, cooling/ventilation equipment in mid-summer, and under part load conditions (spring/ autumn);
 - Where applicable, testing should also be carried out during periods of extreme (high or low) occupancy.

- Interviews with building occupants (where they are affected by the complex services) to identify problems or concerns regarding the effectiveness of the systems
- Re-commissioning of systems (following any work needed to serve revised loads), and incorporating any revisions in operating procedures into the O&M manuals.
- Review thermal comfort, ventilation, and lighting, at three, six and nine month intervals after initial occupation, either by measurement or occupant feedback.
- Take all reasonable steps to re-commission systems following the review and incorporate any relevant revisions in operating procedures into the O&M manuals.
- *NB 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
 - Review thermal comfort, ventilation, and lighting, at three, six and nine month intervals after initial occupation, either by measurement or occupant feedback.
 - Take all reasonable steps to re-commission systems following the review and incorporate any relevant revisions in operating procedures into the O&M manuals.

Aftercare

The aftercare support to all the building occupiers should include the following as a minimum:

- A meeting (programmed to occur as soon as possible after occupation) to introduce the aftercare team (or individual) and Building User Guide (where existing), present key information about how the building operates and answer questions.
- Initial aftercare e.g. on site attendance on a weekly basis (this could be more or less frequent depending on the complexity of the building) for at least 4 weeks after handover
- On site FM training to include a walkabout of the building
- Longer term after care e.g. a helpline, nominated individual or other appropriate system to support building users for at least the first 12 months of occupation

A2: MAN 03 – Construction site impacts

Monitoring of Transport of construction material and waste

This should include the following as a minimum:

- Transport of materials from the factory gate to the building site, including any transport, intermediate storage and distribution; Scope of this monitoring must cover the following as a minimum:
 - Materials used in major building elements (i.e. those defined in BREEAM issue Mat 01), including insulation materials,
 - Ground works and landscaping materials
- Transport of construction waste from the construction gate to waste disposal processing/recovery centre gate. Scope of this monitoring must cover the construction waste groups outlined in the project's site waste management plan (SWMP)

A3: MAN 04 – Stakeholder Participation

Consultation

The consultation process must include:

- The preparation of a consultation plan that includes a timescale and methods of consultation for all relevant parties/bodies and how consultees will be kept informed about progress on the project.
- Consultation with all relevant parties/bodies, including but not limited to:
 - Actual/intended building users (if known) including FM staff/those responsible for the day to day operation of the building and grounds
 - Representative consultation group from the existing community (if the building is a new development in an existing community) or for a community still under construction.
 - Existing partnerships and networks that have knowledge and experience from existing buildings of the same type.
 - Potential users of any shared facilities e.g. operators of clubs and community groups
 - In educational buildings, representatives of Local Education Authority, Board of Governors etc.
 - Local or national historic/heritage groups (over and above any requirements relating to statutory consultees – where relevant)
 - Specialist service and maintenance contractors/representatives where the building function has particular technical requirements in complex environments (e.g. buildings containing laboratories).
- Consultation covering the following as a minimum:
 - Functionality, Build Quality and Impact (including aesthetics)
 - Provision of appropriate internal and external facilities (for future building occupants and visitors/users)
 - Management and operational implications
 - Maintenance resources implications
 - Impacts on the local community e.g. Local traffic/transport impact
 - Opportunities for shared use of facilities and infrastructure with the community/appropriate stakeholders, if relevant/appropriate to building type.
 - Compliance with statutory (national/local) consultation requirements
 - For education buildings: How the building/grounds could best be designed to facilitate learning and provide a range of social spaces appropriate to pupils'/students' and other users' needs.
 - For buildings with technical areas (e.g. laboratories and/or workshops):The client's broad requirements with concern to laboratory/workshop facilities, including appropriate sizing, optimisation and integration of equipment and systems & a risk assessment approach taken by the design team and, where possible, supported by the use of 3D modelling for pipework and duct planning of laboratory facilities where present.
- Findings must influence the design

- Where relevant the results of consultation with relevant bodies results in agreed measures to protect features of historic/heritage value
- Consultation feedback is given to and received by all relevant parties, at the design stage, regarding suggestions made, including how the results of the consultation process have influenced, or resulted in modifications to, the proposed design and building operation/use.

Inclusive and accessible design

The access statement, developed in line with the CABI publication “Design & Access Statements, How to write, read and use them” results in a strategy that must address, as a minimum, access to and throughout the development for all users, with particular emphasis on the following:

- Disabled users; addressing and proposing design solutions that remove obstacles that define disability.
- People of different age groups, genders, ethnicity and stamina/fitness levels
- Parents with children (where appropriate to building use/type)
- Provision of facilities for future building occupants and users including, where relevant, facilities that can be shared and are accessible to members of the public/ community without gaining uncontrolled access to other parts of the building.

Building User Guide

The building user guide scope and contents should be as follows:

- The guide should provide information relevant to the following stakeholders:
 - The building’s staff (or where relevant residents)
 - The non technical facilities management team/building manager
 - Other building users e.g. visitors / community users
- The content of the guide will be specific to the building type, but should broadly include information on the following:
 - Overview of the building and its environmental strategy e.g. energy/water/waste efficiency policy/strategy and how users should engage with/deliver the policy/strategy.
 - Building services overview and access to controls (where to find them, what they control, how to operate effectively and efficiently etc.)
 - Pre-arrival information for visitors e.g. access and security procedures/provisions
 - Provision of and access to shared facilities
 - Safety and emergency information / instructions
 - Building related operational procedures specific to building type/operation e.g. labs.
 - Building related incident reporting/feedback arrangements
 - Building related training information / links
 - Provision of and access to transport facilities e.g. public transport, cyclist facilities, pedestrian routes etc.
 - Provision of and access to local amenities
 - Re-fit, refurbishment and maintenance arrangements/considerations
 - Links, references and relevant contact details

Post Occupancy Evaluation (POE)

The POE should be carried out by an independent third party and should cover:

- A review of the design and construction process (review of design, procurement, construction and handover processes)
- Feedback from a wide range of building users including Facilities Management on the design and environmental conditions of the building covering:
 - Internal environmental conditions (light, noise, temperature, air quality)
 - Control, operation and maintenance
 - Facilities and amenities
 - Access and layout
 - Other relevant issues
- Sustainability performance (energy/water consumption, performance of any sustainable features or technologies e.g. materials, renewable energy, rainwater harvesting etc.)

Relevant information for dissemination; the published case study should cover:

- A basic description of the project and building
- BREEAM Rating and score
- The key innovative and low-impact design features of the building
- Project cost
- Project size: Floor area, site area
- Facilities to be used by community (where relevant)
- Any steps taken during the construction process to reduce environmental impacts, i.e. innovative construction management techniques
- Predicted and actual carbon dioxide emissions and/or EPC rating
- Outcomes of the Post Occupancy Evaluation study, to share the lessons learned from the project including
 - Occupant feedback
 - Energy and water consumption including renewable energy generation, level of rainwater/grey water provision

Appendix B - Health & Wellbeing

B1: HEA 01 – Visual Comfort

View out

All positions within relevant building areas are within 7m of a wall which has a window or permanent opening that provides an adequate view out. The window/opening must be $\geq 20\%$ of the surrounding wall area.

Where the room depth is greater than the 7m requirement, compliance is only possible where the percentage of window/opening is the same as or greater than the values in table 1.0 of BS 8206.

Internal & External Lighting

Internal lighting

Illuminance (lux) levels in all internal relevant building areas of the building are specified in accordance with the CIBSE Code for Lighting 2009 and any other relevant industry standard.

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:

- Limits to the luminance of the luminaires, to avoid screen reflections. (Manufacturers' data for the luminaires should be sought to confirm this).
- 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.
- Recommendations for direct lighting, ceiling illuminance, and average wall illuminance.

Lighting Zones & Controls

The zoning of and occupant controls for internal lighting are in accordance with the criteria below for relevant areas present within the building.

- In office areas, zones of no more than four workplaces,
- Workstations adjacent to windows/atria and other building areas separately zoned and controlled,
- Seminar and lecture rooms: zoned for presentation and audience areas,
- Library spaces: separate zoning of stacks, reading and counter areas,
- Teaching space/demonstration area,
- Whiteboard/display screen
- Auditoria: zoning of seating areas, circulation space and lectern area,
- Dining, restaurant, café areas: separate zoning of servery and seating/dining areas,
- Bar areas: separate zoning of bar and seating areas,
- Waiting areas: zoning of seating and activity areas and circulation space with controls accessible to staff.

- Areas used for teaching, seminar or lecture purposes have lighting controls provided in accordance with CIBSE Lighting Guide 5. The controls specified will depend on the size and use of the space but a typical auditorium or lecture theatre with stepped seating and a formal lectern/demonstration/performance area would typically be expected to have lighting controls as follows:
 - Full normal lighting (to allow for entry/exit, cleaning etc.),
 - Demonstration area lighting off and audience area lighting reduced to a low level (for the purpose of line slide projection, but allowing enough light for the audience to take notes),
 - All lighting off (for the projection of tone slides, colour slides, and for the purposes of visual demonstrations/performances),
 - Separate localised lectern lighting.

External lighting

Illuminance levels for lighting in all external areas within the construction zone are specified in accordance with BS5489-1:2003+A2:2008 Lighting of roads and public amenity areas.

B2: Hea 02 – Indoor Air Quality

Air Quality Plan

The air quality plan must cover:

- Removal of contaminant sources
- Dilution and control of contaminant sources
- Procedures for pre-occupancy flush out
- 3rd party testing and analysis.

VOC Emission requirements

The criteria to be met are as follows:

- All decorative paints and varnishes must meet the requirements listed in Table - 8
- At least five of the eight remaining product categories listed in Table - 8 must meet the testing requirements and emission levels for Volatile Organic Compound (VOC) emissions against the relevant standards identified within this table. Where five or less products are specified within the building, all must meet the requirements in order to achieve this credit.

Product	European Standard	Emission levels for VOC's required
Decorative paints and varnishes	BS EN 13300:2001 referred to the criteria of Decorative Paint Directive 2004/42/CE	VOC (organic solvent) content (testing req. 6), requirement for Phase 2. Fungal and algal resistant.
Wood Panels 1. Particleboard, 2. Fibreboard including MDF, 3. OSB,	EN 13986:2004	Formaldehyde E1 in accordance with EN 13986:2004 Annex B (see also Compliance notes) Verify that regulated wood

4. Cement-bonded particleboard 5. Plywood 6. Solid wood panel and acoustic board		preservatives are absent as defined by the standard.
Timber Structures 1. Glued laminated timber	EN 14080:2005	Formaldehyde E1 (Testing req 1)
Wood flooring 1. e.g. parquet flooring	EN 14042:2005	Formaldehyde E1 (Testing req 1) Verify that regulated wood preservatives are absent as defined by the standard.
Resilient, textile and laminated Floor coverings 1. Vinyl/ linoleum 2. Cork and rubber 3. Carpet 4. Laminated wood flooring	EN 14041:2004	Verify that regulated preservatives are absent as defined by the standard.
Suspended ceiling tiles	EN 13999-1:2007	Formaldehyde E1 (Testing req 1) No asbestos.
Flooring adhesives (and if relevant adhesives for rigid wall coverings)	EN 13999-1:2007	Verify that carcinogenic or sensitising volatile substances are absent (Testing req. 2-4).
Wall-coverings 1. Finished wallpapers 2. Wall vinyl's and plastic wall-coverings 3. Wallpapers for subsequent decoration 4. Heavy duty wall-coverings 5. Textile wall-coverings	EN 233:1999 EN 234:1997 EN 259:2001 EN 266:1992	Formaldehyde (testing req. 5) and Vinyl chloride monomer (VCM) (testing req. 5) release should be low and within the EN standard for the material. Verify that the migration of heavy metals and other toxic substances are within the EN standard for the material.
Adhesives for hanging flexible wall coverings (for rigid wall coverings use flooring adhesives criteria)	BS 3046:1981	No harmful substances and preservatives used should be minimum toxicity.
Testing requirements: 1. EN 717-1:2004 2. EN 13999-2:2007 – Volatile Organic Compounds (VOCs) 3. EN 13999-3:2007 – Volatile aldehydes 4. EN 13999-4:2007 – Volatile diisocyanates 5. EN 12149:1998 6. BS EN ISO 11890-2:2006		

Table – 8: VOC testing requirements

Formaldehyde and VOC Testing

- Formaldehyde concentration level is measured post construction (but pre-occupancy) and is found to be less than or equal to 100µg/m³ averaged over 30 minutes (WHO guidelines, source BRE Digest 464 part 2).

- The total volatile organic compound (TVOC) concentration is measured post construction (but pre-occupancy) and found to be less than 300µg/m³ over 8 hours, in line with the Building Regulation requirements.
- Where levels are found to exceed these limits, the project team confirms the measures that have, or will be undertaken in accordance with the IAQ plan, to reduce the TVOC and formaldehyde levels to within the above limits.
- The testing and measurement of the above pollutants are in accordance with the following standards where relevant:
 - BS EN ISO 16000-4: 2004 Diffusive sampling of formaldehyde in air
 - EN ISO 16000-6 VOCs in air by active sampling²²
 - BS EN 16017-2: 2003 VOCs - Indoor, ambient and workplace air by passive sampling²³
 - BS EN ISO 16000-3: 2001²⁴ formaldehyde and other carbonyls in air by pumped sampling.
- The measured concentration levels of formaldehyde (µg/m³) and TVOC (µg/m³) are reported, via the BREEAM scoring and reporting tool

Laboratory fume cupboards & containment areas (where applicable)

To meet the requirements; where fume cupboards are specified, they are manufactured and installed in accordance with all of the following:

- General purpose fume cupboards: BS EN 14175-2:2003³⁸
- Recirculatory filtration fume cupboards: BS 7989:2001³⁹
- Microbiological safety cabinets: BS EN 12469:2000⁴⁰
- Or, for Schools, Sixth Form Colleges and Further Education with labs and fume cupboards for subjects up to and including A-level (or equivalent): Building Bulletin 8841, Fume cupboards in schools.

Where ducted fume cupboards are specified, the discharged velocity from the extract fan stack from a ducted fume cupboard must be ≥10m/s as recommended by BS EN 14175-2⁴².

Buildings with Containment Level 2 and 3 laboratory facilities (where applicable)

To meet the requirements, the following is required:

- Ventilation systems are designed in compliance with the best practice guidance set out in The management design and operation of microbiological containment laboratories ACDP, 2001⁴³.
- Filters for all areas designated as Containment Level 2 and 3 are located outside the main laboratory space for ease of cleaning/replacement and the filters are easily accessible for maintenance staff/technicians.
- An emergency button is specified in each Containment Level 2 and 3 laboratory area.

B3: Hea 04 – Water Quality**Provision of fresh drinking water**

Educational buildings and community use/centres:

- Chilled, mains-fed point-of-use water coolers accessible to pupils/students/users/staff (as applicable) throughout the day.
- Provision in safe and convenient locations e.g. dining/assembly halls, classrooms/common rooms, wide corridors, indoor social areas, changing rooms/gymnasia, concourse.
- One compliant point-of-use water cooler is provided for every 200 building users, subject to a minimum of one water cooler being provided for any building with less than 200 building users.
- All coolers must be attached to both the wall and the floor to prevent vandalism, and contain security covers to protect all water and electrical connections.

Permanently staffed buildings/office areas:

- Chilled, mains-fed point-of-use water supply or point-of-use water coolers.
- Provision in each staff kitchenette, or in a suitable location on each floor level, and in a staff canteen (if provided).

Sports/fitness and recreation areas/buildings:

- Chilled, mains-fed point-of-use water coolers.
- Provision in each changing area or a public concourse
- Where point-of-use coolers are provided they must be attached to both the wall and the floor to prevent vandalism, and contain security covers to protect all water and electrical connections.

B4: Hea 06 Safety and Security**Safe access**

The requirements for access are as follows:

- Where the site has not vehicular access and entrance to the building is directly from the public highway for pedestrians & cyclists this credit can be achieved by default
- Dedicated cycle lanes are provided and have been designed and constructed in accordance with either:
 - Local Transport Note 2/08 Cycle Infrastructure Design, Department of Transport, 2008.
 - The National Cycle Network Guidelines and Practical Details – issue 2, Sustrans and the relevant parts of Appendix VI NCN Design and Construction Checklist
- The cycle lanes provide direct access from the site entrance(s) to any cycle storage facilities provided, without the need to deviate from the cycle path and, if relevant, connects to off-site cycle paths where these run adjacent to the development's site boundary.
- Footpaths on site provide direct access from the site entrance(s) to the building entrance(s) and connect to public footpaths off site (where existing), providing access to local transport nodes and other offsite amenities (where existing).
- Where provided, drop-off areas are designed off/adjoining to the access road and provide direct access to pedestrian footpaths, therefore avoiding the need for the pedestrian to cross vehicle access routes.
- Where a 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), unless pavement is at road level (this may be the case in some car parks).

- For large developments with a high number of public users/visitors, pedestrian pathways must be signposted to other local amenities off site, including public transport nodes (where existing).
- The lighting for access roads, pedestrian areas, footpaths and cycle lanes is compliant with the external lighting criteria defined in BREEAM issue Hea 01, i.e. in accordance with BS5489-1:2003+A2:2008 Lighting of roads and public amenity areas.

Where dedicated delivery access and drop-off areas form part of the assessed development the following apply:

- Delivery areas are not directly accessed through general parking areas and do not cross or share pedestrian and cyclist routes and other outside amenity areas accessible to building users and general public.
- There is a separate parking/waiting area for goods vehicles away from / adjacent to the manoeuvring area and staff/visitor car parking.
- Parking and turning areas are designed for simple manoeuvring according to the type of delivery vehicle likely to access the site, thus avoiding the need for repeated shunting.
- There is a dedicated space for the storage of refuse skips and pallets away from the delivery vehicle maneuvering area and staff/visitor car parking (if appropriate given the building type / function).

Appendix C - Energy

C1: Ene 02 – Energy Monitoring

The following major energy consuming systems (where present) are monitored using either a Building Energy Management System (BEMS) or separate accessible energy sub-meters with a pulsed output to enable future connection to a BEMS:

- Space Heating
- Domestic Hot Water
- Humidification
- Cooling
- Fans (major)
- Lighting
- Small Power (lighting and small power can be on the same sub-meter where supplies are taken at each floor/department).
- Other major energy-consuming items where appropriate (see further information below).

C2: Ene 03 – External Lighting

All external light fittings must be controlled through a time switch, daylight sensor or daylight sensor override on a manually switched lighting circuit and must meet the following efficiency requirements:

External lighting location	Light fittings (Lamp lumens/circuit Watt)		LED luminaries where the lamp is integral to the fitting (Lamp lumens/circuit Watt)	
	Colour rendering index (Ra ≥ 60)	Colour rendering index (Ra < 60)	Colour rendering index (Ra ≥ 60)	Colour rendering index (Ra < 60)
Building, access ways and pathways	50	60	40	50
Car parking, associated roads and flood lighting	70	80	55	60
	Lamp wattage ≥ 25W	Lamp wattage < 25W	Lamp wattage ≥ 25W	Lamp wattage < 25W
Signs and up lighting	60	50	50	50

BREEAM Table 12 - External lighting requirements by location

C3: Ene 04 – Low and Zero Carbon Technologies

Feasibility Study

The feasibility study must cover the following as a minimum:

- Energy generated from LZC energy source per year
- Life cycle cost of the potential specification, accounting for payback
- Local planning criteria, including land use and noise
- Feasibility of exporting heat/electricity from the system
- Any available grants
- All technologies appropriate to the site and energy demand of the development.
- Reasons for excluding other technologies.
- Where appropriate to the building type, connecting the proposed building to an existing local community CHP system or source of waste heat or power OR specifying a building/site CHP system or source of waste heat or power with the potential to export excess heat or power via a local community energy scheme.

Life Cycle assessment of chosen technology

Where a life cycle assessment is carried out for the LZC, this must account for its embodied carbon emissions and operational carbon savings and emissions, and this method of supply results in a reduction in life cycle CO₂ emissions as follows:

- The LCA study must be completed in accordance with ISO 14044:2006 Environmental Management Life Cycle Assessment – Requirements and Guidelines
- The LCA must consider a 60 year period (a typical assumption for the life of a building) and any necessary replacements/maintenance requirements within this period.

Free cooling

The free cooling credit can be achieved if one of the following is used to meet the entire cooling requirement.

- Night-time cooling (requires fabric to have a high thermal mass)
- Ground coupled air cooling
- Displacement ventilation
- Ground water cooling
- Surface water cooling
- Evaporative cooling, direct or indirect
- Desiccant dehumidification and evaporative cooling, using waste heat
- Absorption cooling, using waste heat.
- The building does not require any form of cooling (i.e. naturally ventilated)

C4: Ene 06 – Energy Efficient Transportation Systems

Energy Efficient Specification

NB: Platform lifts are excluded from the assessment provided that they have a rated speed less than 0.15m/s.

For lifts, of the following energy-efficient features the three that offer the greatest potential energy savings are specified:

- The lifts operate in a stand-by condition during off-peak periods. For example the power side of the lift controller and other operating equipment such as lift car lighting, user displays and ventilation fans switch off when the lift has been idle for a pre-scribed length of time.
- The lift car uses energy-efficient lighting and display lighting i.e. an average lamp efficacy, across all fittings in the car, of >55 lamp lumens/ circuit watt and lighting switches off after the lift has been idle for a prescribed length of time.
- The lift uses a drive controller capable of variable-speed, variable-voltage, variable-frequency (VVVF) control of the drive motor.
- The lift has a regenerative drive unit so that any energy generated by a traction lift (due to running up loaded to less than the counterbalancing ratio or running down loaded to more than the counter balancing ratio) or by a hydraulic lift (due to running down) is returned back to the electricity utility supplier or used elsewhere in the building.

For escalators and/or moving walks, each escalator and/or moving walk complies with EITHER of the following:

- It is fitted with a load sensing device that synchronises motor output to passenger demand through a variable speed drive. OR
- It is fitted with a passenger sensing device for automated operation (auto walk), so the escalator operates in stand-by mode when there is no passenger demand.

C5: Ene 08 – Energy Efficient Equipment

The table below details the relevant equipment and the standard that should be met for any that are present in the development.

Function/ equipment	Criteria
Small power, plug in equipment	<p>The following equipment EITHER qualifies for an Enhanced Capital Allowance Scheme claim (i.e. is on the Energy Technology Product List, ETPL) OR has been awarded an Energy Star rating OR has been procured in accordance with the Government Buying Standards OR are identified as products with at least a 'green tick' standard on the Buying Solutions website.</p> <ol style="list-style-type: none"> 1. Office equipment 2. Domestic scale white goods and other small powered equipment 3. Supplementary electric heating.
Swimming pool	<ol style="list-style-type: none"> 1. Where automatic or semi-automatic pool covers or 'liquid' pool covers with an automatic dosing system is fitted to ALL pools, including spa pools and Jacuzzi (if relevant). 2. The covers envelop the entire pool surface when fully extended.

	<ol style="list-style-type: none"> 3. Where the air temperature in the pool hall can be controlled so that it is 1°C above the water temperature.
Communal laundry	<p>At least one of the following can be demonstrated for commercial sized appliances:</p> <ol style="list-style-type: none"> 1. Specification of heat recovery from waste water 2. Use of greywater for part of the washing process i.e. either water from the final rinse used for the next pre-wash or water sourced from a rain water collection tank(s) 3. The commercial or industrial sized machine(s) is identified as eligible for the UK's Enhanced Capital Allowance Scheme.
Data Centre	<ol style="list-style-type: none"> 1. Design is in accordance with the 'Best practices for the EU Code of Conduct on Data Centres' principles with the data centre achieving at least the 'Expected minimum practice' level. 2. Temperature set points are not less than 24°C, as measured at the inlet of the equipment in the rack.
IT-intensive operating areas	<ol style="list-style-type: none"> 1. Uses a natural ventilation and cooling strategy as standard, with forced ventilation only to be used when the internal temperature exceeds 20°C and active cooling only when the internal temperature exceeds 22°C. 2. There is a mechanism to achieve automatic power-down of equipment when not in use, including overnight.
Residential areas	<ol style="list-style-type: none"> 1. Fridges, fridge freezers, washing machines, tumble dryers and dishwashers are all recommended by the Energy Savings Trust website 2. Washer-dryers have a B rating (or better) under the EU Energy Efficiency Labelling Scheme. <p>OR</p> <ol style="list-style-type: none"> 3. If appliances will be purchased during occupation by the tenant/owner, information on the EU Energy Efficiency Labelling Scheme of efficient white goods must be provided to the residential aspect of the building. <p>Note:</p> <ol style="list-style-type: none"> 1. Any white goods available to purchase from the developer must be compliant with criteria F1 and F2 above. 2. If criteria F3 is chosen to demonstrate compliance, only one of the two available credits can be awarded.
Healthcare	<ol style="list-style-type: none"> 1. The procurement of large scale equipment and sets of electrical equipment (where numbering more than 50) has been informed and selected by life cycle costing analysis in accordance with EnCO₂de, Chapter 3.0 2. For each piece of equipment at least two options 'fit for purpose' have been analysed and the option(s) specified are those that demonstrate better performance in terms of: <ol style="list-style-type: none"> a. Direct running costs b. Indirect running costs and additional administration costs c. Cost of disposal d. Spending to save e. Recyclability f. Improved manageability g. Energy performance

	<ul style="list-style-type: none"> h. Reduced harmful emissions to the atmosphere i. Improved services, comfort and productivity.
Kitchen and catering facilities	<p>Where the project team can demonstrate that the project has incorporated at least one energy efficiency measure outlined in each of the following sections of CIBSE Guide TM50:</p> <ol style="list-style-type: none"> 1. Section 8 (Drainage and kitchen waste removal) 2. Section 9 (Energy controls - specifically controls relevant to equipment), 3. Section 11 (Appliance specification, fabrication specification - not utensil specification), 4. Section 12 (Refrigeration), 5. Section 13 (Warewashing: dishwashers and glass washers), 6. Section 14 (Cooking appliance selection), 7. Section 15 (Water temperatures, taps, faucets and water saving controls)

Data centre

For the purpose of this BREEAM issue, the term 'data centres' includes all buildings, facilities and rooms which contain enterprise servers, server communication equipment, cooling equipment and power equipment, and may provide some form of data service (e.g. large scale mission critical facilities all the way down to small server rooms located in office buildings).

I.T-intensive areas

These include computer areas where more than 1 PC per 5 is provided, e.g. training suites, design studios, libraries' I.T areas and other areas with a high density of computing devices.

Appendix D - Transport

D1: Tra 03 – Cyclist Facilities

Compliant cycle storage space:

- The space is covered overhead and protected from the weather
- Cycles are secured within spaces in rack(s) and consists of fixings for 1 or more spaces.
- The covered area and the cycle racks are set in or fixed to a permanent structure (building or hardstanding). Alternatively the cycle storage may be located in a locked structure fixed to or part of a permanent structure with CCTV surveillance. For proprietary systems see also compliance note below.
- The distance between each cycle rack, and cycle racks and other obstructions e.g. a wall, allows for appropriate access to the cycle storage space, to enable bikes to be easily stored and accessed.
- The facilities are in a prominent site location that is viewable/overlooked from either an occupied building or a main access to a building.
- Lighting of the cycle storage facility must be compliant with the external (or internal where relevant) lighting criteria defined in BREEAM issue Hea 01. The lighting must be controlled to avoid 'out-of-hours' use and operation during daylight hours, where there is sufficient daylight in/around the facility.
- The majority of the cycle racks are within 100m of a building entrance (ideally within 50m). Or alternatively, in the case where the building forms part of a larger site e.g. campus, business park, hospital or prison establishment where it is not feasible to meet the 100m requirement, the assessor justifiably deems the facilities to be in an easily accessible location (within the site boundary).

Compliant showers:

One shower must be provided for every 10 cycle storage spaces and both male and female users catered for i.e. either separate showers within shared gender-specific facilities or single shower cubicles and changing space for mixed use. The showers can be available for others to use in addition to cyclists.

Compliant changing facilities:

Where a shower/changing cubicle is provided there should be a minimum of one square metre of changing space adjacent to the shower(s) with a bench seat and hooks for hanging clothes. Where there is more than one shower provided there should be a minimum of one square metre of changing space per shower, subject to a minimum changing area of four square metres. Where there are no showers specified, but there is a changing facility, there is a minimum of one square metre of changing space per 10 cycle storage spaces, subject to a minimum of four square metres of changing area with a bench seat and hooks for hanging clothes.

Compliant lockers:

- The number of lockers is at least equal to the number of cycle spaces provided.
- Lockers are either in or adjacent to compliant changing rooms. Where the changing space is a cubicle the locker(s) must not be located within the cubicle.
- Each locker is at least 900mm X 300mm X 450mm, or a locker with dimensions that provide an equivalent volume of storage space.
- Both male and female users are catered for i.e. either gender specific, shared facilities or single changing cubicles in mixed-use areas.
- Toilet/shower cubicles do not count as changing facilities.

Compliant drying space:

The drying space (for wet clothes) must be a specially designed and designated space with adequate heating/ventilation. A plant room is not a compliant drying space.

D2: Tra 05 – Travel Plan

The travel plan must cover all the criteria listed below:

- 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
- 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
 - Requirements 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 offsite pedestrian and cycle routes.
 - Providing suitable taxi drop-off/waiting areas.
 - Ensuring that rural buildings are located with appropriate transport access to ensure that they adequately serve the local community (where procured to do so e.g. community centre).
- Where appropriate to the building type, size and intended operation, the travel plan includes measures tailored to minimise the impacts of operational-related transport e.g. deliveries of supplies, equipment and support services to and from the site.
- Where the building's final occupier is known, they confirm that the travel plan will be implemented post construction and supported by the building's management during building operation.

Appendix E - Water

E1: Wat 03 – Water Leak Detection and Prevention

Leak detection system

The system must be:

- Audible when activated
- 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.
- Able to identify different flow and therefore leakage rates, e.g. continuous, high and/or low level, over set time periods.
- Programmable to suit the owner/occupiers' water consumption requirements
- Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers.

Flow control

The following devices are acceptable:

- A time controller i.e. an automatic time switch device to switch off the water supply after a predetermined interval
- A programmed time controller i.e. an automatic time switch device to switch water on and/or off at predetermined times.
- A volume controller i.e. an automatic control device to turn off the water supply once the maximum preset volume is reached.
- A presence detector and controller i.e. an automatic device detecting occupancy or movement in an area to switch water on and turn it off when the presence is removed.
- A central control unit i.e. a dedicated computer-based control unit for an overall managed water control system, utilising some or all of the types of control elements listed above.

E2: Wat 04 - Water Efficient Equipment

Water efficient irrigation systems

Any of the following would comply

- Drip feed subsurface irrigation that incorporates soil moisture sensors. The irrigation control should be zoned to permit variable irrigation to different planting assemblages.
- Reclaimed water from a rainwater or greywater system. The storage system must be appropriately sized i.e. storage capacity is relative to the size of the soft landscaped area.
- External landscaping and planting that relies solely on precipitation, during all seasons of the year.
- All planting specified is restricted to species that thrive in hot and dry conditions.
- 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.

Appendix F - Materials

F1: Mat 03 - Responsible Sourcing of Materials

Building elements to be included in assessment:

- Structural Frame
- Ground floor
- Upper floors (including separating floors)
- Roof
- External walls
- Internal walls (including separating walls)
- Foundation/substructure (excluding sub-base materials)
- Staircase
- Windows, External and internal doors
- Secondary fixes including skirting, paneling, fascias and balustrades
- Fixed furniture
- Any other significant use

Applicable materials within above elements:

- Brick (including clay tiles and other ceramics)
- Resin-based composite materials, including GRP and polymeric render
- Concrete (including in-situ and pre-cast concrete, blocks, tiles, mortars, cementitious renders etc.)
- Glass
- Plastics and rubbers (including EPDM, TPO, PVC and VET roofing membranes including polymeric renders)
- Metals (steel, aluminum etc.)
- Dressed or building stone including slate
- Timber, timber composite and wood panels (including structural laminated timber components, plywood, OSB, MDF, chip-board 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

All other materials should be ignored when providing information

Compliant responsible sourcing schemes

The following table details all compliant schemes. The higher the tier achieved by the materials in the building, the higher the score in this section is likely to be, with 2 being the best and 7 the worst.

Responsible Sourcing & Tiers		
Scheme	Certification level/scope	Tier level
BRE Global, BES6001 Product /Standard certification	Excellent	2
	Very Good	3
	Good	4
	Pass	5
Canadian Standards Association's (CSA) Chain of Custody Scheme	Chain of custody certification	3
Environmental Management System (EMS) (certified)	Key process and supply chain extraction process ⁴	6
Environmental Management System (EMS) (certified)	Key process	7
Forest Stewardship Council (FSC)	Chain of custody certification	3
Green Dragon Environmental Standard	Level 4 and above	7
Recycled materials	Certified EMS for key process	6
Re-used materials	-	3
Malaysian Timber Certification Council (MTCC)	Chain of custody certification	6
Programme for the Endorsement of Forest Certification (PEFC)	Chain of custody certification	3
Sustainable Forestry Initiative (SFI)	Chain of custody certification	3
Société Générale de Surveillance's (SGS) 'Timber Legality and Traceability' scheme	Timber Legality & Traceability Verification (TLTV)	6
Rainforest Alliance's 'Verification of Legal Origin and Compliance' scheme (supersedes SmartWood Verified)	Verification of Legal Origin and Compliance (VLO/VLC)	6

Table D1-1

Key process and supply chain (extraction) processes by material type		
Material	Key Process	Supply Chain Processes
Brick (including clay tiles and other ceramics)	Product Manufacture	Clay Extraction
Resin-based composites and materials (including GRP and polymeric render but excluding timber based composites)	Composite product manufacture	Glass fibre production (or other principle matrix material) Polymer production
In situ Concrete (including ready mix and cementitious mortars and renders)	Ready mixed concrete plant	Cement production Aggregate extraction and production
Precast concrete and other concrete products (including blocks, cladding, precast flooring, concrete or cementitious roof tiles)	Concrete product manufacture	Cement production Aggregate extraction and production
Glass	Glass production	Sand extraction Soda Ash production or extraction
Plastics and rubbers (including polymeric renders, EPDM, TPO, PVC and VET roofing membranes)	Plastic/rubber product manufacture	Main polymer production
Metals (steel, aluminum etc)	Metal Product manufacture - e.g. cladding production, steel	Metal production: Steel: Electric arc furnace or Basic oxygen furnace process

F2: Mat 04 - Insulation

Key process and supply chain (extraction) processes for insulation		
Material	Key Process	Supply chain processes
Foam Insulation	Insulation manufacture	Principal Polymer production, e.g. Polystyrene, MDI , Phenolic resin or equivalent
Stone wool, glass & cellular glass made using < 50% recycled input	Product manufacture	Any quarried or mined mineral over 20% of input
Wool	Product manufacture	Wool Scouring
Products using > 50% recycled content except those using timber	Product manufacture	Recycled content by default
Timber-based insulation materials including those using recycled timber	Product manufacture	Recycled timber by default, all other timber from one of the recognised timber certification schemes in Mat 02 Responsible Sourcing of Materials
Other renewable-based insulation materials using agricultural by-products (e.g. straw)	Product manufacture	By-product manufacture by default
Any other product	Product manufacture	1 or 2 main inputs with significant production or extraction impacts should be identified

Appendix G - Waste

G1: Wst 02 – Recycled Aggregates

To contribute to the total amount, the percentage of high-grade aggregate specified per application (where present) that is recycled and/or secondary aggregate, must meet the following minimum levels (by weight or volume):

Application	Min. % One credit	Min. % Exemplary performance
Structural frame	25%	50%
Floor slabs including ground floor slabs	25%	50%
Bitumen or hydraulically bound base, binder, and surface courses for paved areas and roads	50%	75%
Concrete road surfaces	25%	50%
Pipe bedding	50%	100%
Building foundations	25%	50%
Granular fill and capping (see Compliance notes)	75%	100%
Gravel landscaping	100%	100%

The aggregates are EITHER:

- Obtained on site OR
- 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 planning OR
- Secondary aggregates obtained from a non-construction post-consumer or post-industrial by-product source.

Secondary aggregates

Recognised non-construction post-consumer or post-industrial by-products include:

- | | |
|--|--|
| - China clay waste | - Foundry sands |
| - Slate overburden | - Recycled glass |
| - Pulverised Fuel Ash (PFA) | - Recycled plastic |
| - Ground Granulated Blast Furnace Slag (GGBFS) | - Tyres |
| - Air-cooled blast furnace slag | - Spent oil shale |
| - Steel slag | - Colliery spoil |
| - Furnace bottom ash (FBA) | - Municipal Solid Waste Treatment Residues |
| - Incinerator bottom ash | |

High Grade aggregate uses are considered to be:

Bound

- Structural frame;
- Floor slabs including ground floor slabs;
- Bitumen or hydraulically bound base, binder, and surface courses for paved areas and roads.

Unbound

- Asphalt-based or similar road surfaces
- Granular fill and capping
- Pipe bedding
- Sub bases/building foundations
- Gravel landscaping.

Crushed masonry used as fill material for general landscaping is not considered to be high grade. This practice is now commonplace on construction sites due to landfill costs.

Appendix H – Land Use & Ecology

H1: LE05 – Long term impact on biodiversity

Mandatory criteria

- A suitably qualified ecologist (SQE) has been appointed prior to commencement of activities on site.
- 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.
- 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

- The principal 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.
- The principal contractor trains the site workforce on how to protect site ecology during the project. Specific training must be carried out for the entire site workforce to ensure they are aware of how to avoid damaging site ecology during operations on site. Training should be based on the findings and recommendations for protection of ecological features highlighted within a report prepared by a suitably qualified ecologist.
- The principal contractor records actions taken to protect biodiversity and monitor their effectiveness throughout key stages of the construction process. The requirement commits the principal contractor to make such records available where publicly requested.
- 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)², Local Biodiversity Action Plan (LBAP), those protected within statutory sites (e.g. SSSIs), or those within non-statutory sites identified in local plans.
- 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.
- Education buildings only: A partnership has been set up by the design team with a local group that has wildlife expertise (e.g. local wildlife trust or similar local body) and the group has:
 - Provided advice early in the design process regarding protecting and/or providing habitat for species of local importance on the site.

- Provided advice to ensure the design is in keeping with the local environment. In particular this should draw on their local knowledge of any features or species of eco-logical interest on or near the site.
- Provided or will continue to provide ongoing support and advice to the educational establishment to help them manage, maintain and develop the outdoor space in the longer term.
- A suitable starting point for discussion with the local wildlife group would be to ask for advice on how to take account of the Local Biodiversity Action Plan (LBAP) in the school/college landscape design.

Appendix J - Pollution

J1: Pol 01 – Impact of Refrigerants

Refrigerant leak detection

- Where systems using refrigerants are contained in a moderately air tight enclosure (or a mechanically ventilated plant room), and an automated permanent refrigerant leak detection system is installed covering high-risk parts of the plant OR where a refrigerant leakage/charge loss detection system is specified, which is not based on the principle of detecting or measuring the concentration of refrigerant in air.
- The automatic shutdown and pump down of refrigerant occurs on the detection of refrigerant leakage/charge loss.
- 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.
- The alarm threshold that triggers automatic pump down upon detection of refrigerant in the plant room/enclosure is set to a maximum of 2000ppm (0.2%), but lower levels can be set.
- Use a robust and tested automated permanent refrigerant leak detection system, normally defined as that included on the Enhanced Capital Allowance (ECA) Energy Technology Product List1 (or an equivalent list).

J2: Pol 03 – Surface Water Runoff

Minimising watercourse pollution

- The Appropriate Consultant confirms that there is no discharge from the developed site for rainfall up to 5mm.
- Specification of Sustainable Urban 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.
- 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.
- 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.
- A comprehensive and up-to-date drainage plan of the site will be made available for the building/site occupiers.
- Where the building has chemical/liquid gas storage areas, shut-off valves are fitted to the site drainage system to prevent the escape of chemicals to natural watercourses (in the event of a spillage or bunding failure).
- Where present, all external storage and delivery areas designed and detailed in accordance with the recommendations of the Environment Agency's publication Pollution Prevention Pays Guidance and, if relevant to the building type, PPG25 Hospitals and Healthcare establishments.