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BREEAM®

66 Charlotte Street, Camden

BREEAM Refurbishment and Fit-out 2014 Pre-Assessment Report

Job No:	26004
Report:	v1
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Executive Summary

Price & Myers has been commissioned to carry out a BREEAM Refurbishment and Fit-out 2014 Pre-Assessment for 66 Charlotte Street.

This report demonstrates that the building has the potential to achieve a score of 71.68%, which equates to an Excellent BREEAM rating.

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 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.

1. Introduction

Price & Myers has been commissioned to carry out a Preliminary BREEAM (BRE Environmental Assessment Method) Refurbishment and Fit-out 2014 Pre-Assessment for the proposed development of 66 Charlotte Street.

The development involves the refurbishment and extension of an existing commercial property in the London Borough of Camden.The proposals entail the refurbishment and extension of an existing building that will provide A1 shop space, A3 cafe and B1 office space across the basement to first floors. Three residential units shall be provided on the first to fourth floors.

This report comprises a pre-assessment of the development against the BREEAM 2014 scheme and concludes the preliminary BREEAM score and rating that the development can achieve based on the individual credits targeted by the design team.

The results presented are indicative only of the potential performance achievable for the assessed building. The results do not represent a formal certified BREEAM assessment or rating and must not be communicated as such.

2. BREEAM Refurbishment and Fit-out 2014

BREEAM Refurbishment and Fit-out 2014 is an environmental performance standard against which the refurbishment or fit-out of 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 Refurbishment and Fit-out 2014 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 2014 rating benchmarks

Minimum Standards

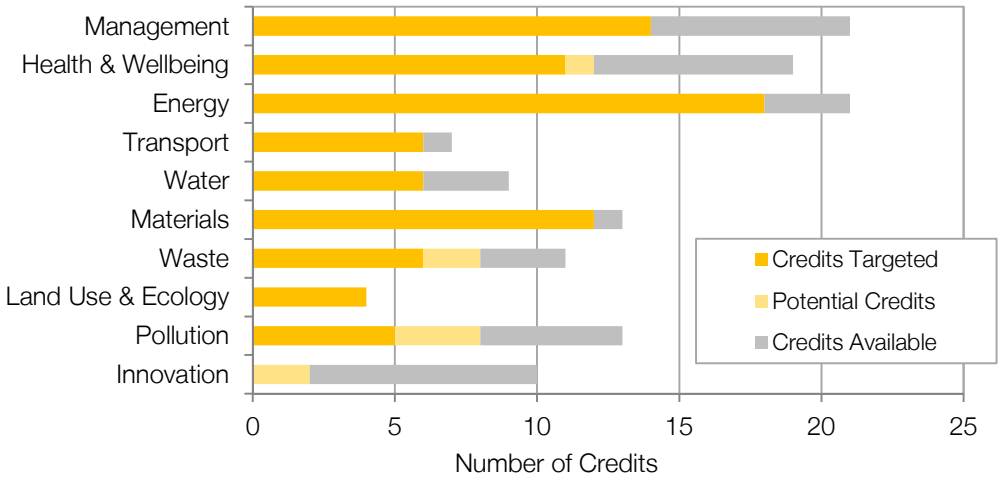
In order to achieve particular benchmark scores, there is a minimum performance requirement within the BREEAM scheme. The minimum performance requirements are detailed in the table below and a project cannot achieve a particular rating unless the minimum requirements have been met, irrespective of the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

BREEAM Credit	Minimum Standards by Rating Level				
	Pass	Good	Very Good	Excellent	Outstanding
Man 03: Responsible Construction Practices	Criterion 2 only	Criterion 2 only	Criterion 2 only	Criterion 2 One credit (Considerate Construction)	Criterion 2 Two credits (Considerate Construction)
Man 04: Commissioning and Handover	-	-	-	Criterion 9 (Building User Guide)	Criterion 9 (Building User Guide)
Man 5: Aftercare	-	-	-	Parts 2 and 3 only: 1 Credit (Seasonal Commissioning)	Parts 2 and 3 only: 1 Credit (Seasonal Commissioning)
Ene 01: Reduction of Energy Use and Carbon Emissions	-	-	-	Parts 1,2,3 and 4 (full assessments): 6 credits, varies for other assessment types	Parts 1,2,3 and 4 (full assessments): 10 credits, varies for other assessment types
Ene 02: Energy Monitoring	-	-	Parts 2,3 and 4: 1 Credit (1st Sub-metering credit)	Parts 2,3 and 4: 1 Credit (1st Sub-metering credit)	Parts 2,3 and 4: 1 Credit (1st Sub-metering credit)
Wat 01: Water Consumption	-	1 Credit (where applicable)	1 Credit (where applicable)	1 Credit (where applicable)	2 Credit (where applicable)
Wat 02: Water Monitoring	-	Parts 2,3 and 4: Criterion 1 only	Parts 2,3 and 4: Criterion 1 only	Parts 2,3 and 4: Criterion 1 only	Parts 2,3 and 4: Criterion 1 only
Mat 03: Responsible Sourcing	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only	Criterion 1 only
Wst 01: Construction Waste Management	-	-	-	-	1 Credit
Wst 03: Operational Waste	-	-	-	1 Credit	1 Credit

Table 2.2 - Minimum BREEAM Refurbishment and Fit Out 2014 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	21	14	66.7%	14.10%	9.40
Health & Wellbeing	19	11	57.9%	15.23%	8.82
Energy	21	18	85.7%	14.21%	12.18
Transport	7	6	85.7%	5.48%	4.70
Water	9	6	66.7%	7.05%	4.70
Materials	13	12	92.3%	14.69%	13.56
Waste	11	6	54.5%	8.08%	4.41
Land Use & Ecology	4	4	100.0%	9.40%	9.40
Pollution	13	5	38.5%	11.75%	4.52
Innovation	10	0	0.0%	10.00%	0.00
Target BREEAM Score			71.68		
Target BREEAM Rating			Excellent		
Potential BREEAM Score			78.66		
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 a Excellent rating on the BREEAM Refurbishment and Fit-out 2014 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 Project Brief and Design					
Compliant roles and responsibilities established in accordance with details in Appendix A1	0.67	Targeted	0.67	The design team have met from Stage 2 to identify and define their roles, responsibilities and contributions for each of the key phases of project delivery.	Architect / Client
Third party consultation activities undertaken in line with requirements in Appendix A1	0.67	Targeted	0.67	Third party consultation has been carried out in line with the BREEAM requirements. Comments have been reviewed and will inform the design where appropriate. Consultees will be provided with feedback.	Architect / Client
BREEAM AP appointed at or before RIBA Stage 1 and a target rating contractually agreed before RIBA Stage 2. To achieve the credit at the Design Stage Assessment the agreed performance targets must be demonstrably achieved by the project design and demonstrated via the BREEAM Assessor's Design Stage report.	0.67	Not Achievable	0.00	Credit not sought	
BREEAM AP involved and reports on progress through RIBA Stages 2 to 4. The BREEAM AP will monitor against agreed targets throughout the design process and formally report the progress. The previous credit must be achieved to receive this credit.	0.67	Not Achievable	0.00		
Man 02 Life Cycle Cost and Service Life Planning					
A Concept Design stage elemental LCC analysis commissioned in line with requirements in Appendix A2	0.67	Not Achievable	0.00	These credits are not being targeted due to the cost of carrying out a compliant LCC analysis.	Client / QS
	0.67	Not Achievable	0.00		
A component level LCC plan has been developed by the end RIBA Stage 4 in line with requirements in Appendix A2	0.67	Not Achievable	0.00		
The capital cost of the building will be reported in £k/m2 via the BREEAM Assessment Scoring and Reporting tool	0.67	Targeted	0.67	The capital cost of the project will be reported.	Contractor
Man 03 Responsible Construction Practices					
All timber and timber based products used on the project are FSC compliant		Targeted		All timber will be responsibly sourced.	Contractor
The Principle Contractor operates an environmental management system (EMS) covering their main operations and implement best practice pollution prevention policies (air & water pollution). The EMS must meet the criteria stated in Appendix A3	0.67	Targeted	0.67	The contractor must operate an EMS (ISO 14001 or equivalent) and implement best practice pollution prevention policies and procedures on-site in accordance with Pollution Prevention Guidelines, Working at construction and demolition-sites: PPG6	Contractor
Sustainability Champion monitors and reports progress through RIBA Stages 5 to 6	0.67	Targeted	0.67	A suitable Sustainability Champion will be located on site to monitor the project through stages 5 and 6.	Contractor
CCS Score 25 - 34 (score of 5 in each section)	0.67	Targeted	0.67	The contractor will be expected to achieve 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)	0.67	Targeted	0.67		
Site energy and water consumption recorded / monitored See Appendix A3 for details of the requirements.	0.67	Targeted	0.67	All site energy, water and transport of materials and waste shall be monitored and reported. The principal contractor will be expected to carry out these site activities during the construction stages of the project.	Contractor
Transport of construction materials and waste metered / monitored See Appendix A3 for details of the requirements.	0.67	Targeted	0.67		

Man 04 Commissioning and Handover					
Commissioning and testing of building services to CIBSE, BSRIA regs, monitored on behalf of the client by an appropriate person. Refer to Appendix A4 for detailed requirements	0.67	Targeted	0.67	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.	M&E / Contractor
For complex systems, a specialist commissioning agent must be appointed during the design stage. Refer to Appendix A4 for detailed requirements	0.67	Targeted	0.67	A specialist commissioning manager will be appointed during the design stage to provide design advice regarding commissioning.	Contractor
Thermographic survey conducted and any defects must be rectified. See Appendix A4 for details	0.67	Not Achievable	0.00	This credit will not be targeted due to the high cost of compliance. It could be targeted later on if additional credits were required.	Client / Contractor to appoint specialist
A Building User Guide (BUG) is provided to occupants. Refer to Appendix A4 for detailed contents requirements A training schedule has also been prepared for building occupiers/premise managers. Refer to Appendix A4 for detailed contents requirements	0.67	Targeted	0.67	A BREEAM compliant BUG will be developed for the building. There will be a schedule of training identified for relevant building occupiers/premises managers.	Contractor
Man 05 Aftercare					
Commitment to provide aftercare support to building occupants for 12 months post occupation, in accordance with requirements in Appendix A5	0.67	Targeted	0.67	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 A5 for details.	Contractor / Client
Seasonal commissioning of building services over 12 months post occupation. See Appendix A5	0.67	Targeted	0.67	The contractor will be required to undertake seasonal commissioning responsibilities, these will be completed over a minimum 12 month period.	M&E / Contractor
Post occupancy evaluation (POE) is undertaken by a third party. Refer to Appendix A5 for detailed requirements	0.67	Not Achievable	0.00	The Post Occupancy Evaluation credit is not currently targeted. If this were required, a third party POE should be carried out 12 months after occupation and a case study produced to share good practice and lessons learned and inform changes in-user behaviour, building operational processes and system controls.	Client

Health & Wellbeing					
Criteria	**Available Score**	**Status**	**Target Score**	**Pre-Assessment Stage Assumptions**	**Responsibility**
Hea 01 Visual Comfort					
Glare Control (e.g. blinds/external shading) fitted to windows in occupied rooms.	0.80	Targeted	0.80	There will be a method to control glare in all occupied rooms/areas (e.g. blinds, brise soleil but curtains are non compliant).	Architect
Daylighting Shall meet the requirements for at least one credit for the retail and office spaces as per the good practice daylight factor(s) or good practice average and minimum point daylight illuminance criteria. See Appendix B1	0.80	Targeted	0.80	It is expected that 1 credit might be achievable. Daylight analysis will be need be carried out to confirm the credits available.	M&E
	0.80	Potential	0.00		
	0.80	Not Achievable	0.00		
View Out 80% of the floor area space in the relevant building area is within 7m of a wall which has a window or permanent opening that provides an adequate view out.	0.80	Not Achievable	0.00	This credit is not achievable.	Architect
95% of floor area in the relevant buildings is within 7m of a wall which has a window or permanent opening that provides an adequate view out. See Appendix B1	0.80	Not Achievable	0.00		
Internal / external lighting specified to SLL and CIBSE standards and adequately zoned and controlled. Refer to Appendix B1 for detailed requirements	0.80	Targeted	0.80	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.	M&E

Hea 02 Indoor Air Quality					
An indoor air quality plan is developed. Refer to Appendix B2 for detailed requirements	0.80	Targeted	0.80	An air quality plan would need to be developed for this credit to be targeted.	M&E
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 - CO2 sensors are provided for high/variable occupancy areas	0.80	Not Achievable	0.00	This credit cannot be targeted as the building is within 10m of a road.	
All decorative paints and varnishes and 5 of the 8 remaining products assessed must meet the criteria specified in Appendix B2	0.80	Targeted	0.80	VOCs - all paints and varnishes would need to meet the VOC emission level targets. All of the remaining assessed product types would also need to meet the requirements.	Architect
An air quality plan is developed & formaldehyde and VOC levels measured post construction and indoor air quality. See Appendix B2 for full details	0.80	Not Achievable	0.00	This credit is not being sought.	
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)	0.80	Targeted	0.80	All occupied spaces would have an openable window (openable area is at least 5% of the NIFA for the room). Alternatively compliance can be achieved if recommendations from CIBSE AM10 are met.	M&E
Hea 04 Thermal Comfort					
Thermal modelling is carried out using software in accordance with CIBSE AM11 and confirms comfort levels meet CIBSE Guide A by providing ISO 7730:2005 figures. See Appendix B4 for full details	0.80	Targeted	0.80	Thermal modelling would need to be carried out and it is expected that the design would demonstrate summer comfort levels are within CIBSE Guide A can be met.	M&E
Hea 05 Acoustic Performance					
Sound Insulation - The sound insualtion between acoustically sensitive rooms and other occupied areas complies with the performance criteria given in Section 7 of BS 8233:2014	0.80	Targeted	0.80	An acoustician will be appointed to ensure Indoor ambient noise levels comply with the relevant criteria and All relevant rooms will be designed to meet the British Standards, as per the Acoustician's report. 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.	Acoustician
Internal Indoor Ambient Noise Levels - Achieve indoor ambient noise levels that comply with the design ranges given in Section 7 of BS 8233:2014	0.80	Targeted	0.80		
Reverberation - Acoustic environment (control of reverberation, sound absorption and speech transmission index): Achieve the requirements relating to sound absorption and reverberation times, where applicable, set out in Section 7 of BS 8233:2014	0.80	Targeted	0.80		
Hea 06 Safety and Security					
A Suitably Qualified Security Specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) during or prior to Concept Design (RIBA Stage 2 or equivalent). The SQSS produces a set of recommendations and solutions to ensure the design of the development is planned, designed and specified to address the issues identified in the preceding SNA.	0.80	Targeted	0.80	The design team will consult with a SQSS and implement all recommendations made.	Architect

Energy					
Criteria	**Available Score**	**Status**	**Target Score**	**Pre-Assessment Stage Assumptions**	**Responsibility**
Ene 01 Reduction of Energy Use and Carbon Emissions					
Energy Performance Ratio for Non Domestic refurbishment (EPR NDR) (Based the EPRNDR achieved):				As a minimum, the Energy Performance Ratio should be more than 0.751, based on the energy consumption and carbon emissions performance of the development. The whole building energy score is calculated by undertaking building energy modelling to generate building energy performance data that is in turn used to: a. Determine the potential for improvement by comparing the existing building performance to the average performance of the existing building stock b. Determine how much of the potential for improvement will be achieved by undertaking the proposed refurbishment works	M&E
0.06	0.68	Targeted	0.68		
0.12	0.68	Targeted	0.68		
0.18	0.68	Targeted	0.68		
0.24	0.68	Targeted	0.68		
0.30	0.68	Targeted	0.68		
0.36	0.68	Targeted	0.68		
0.42	0.68	Targeted	0.68		
0.48	0.68	Targeted	0.68		
0.54	0.68	Targeted	0.68		
0.60	0.68	Targeted	0.68		
0.66	0.68	Targeted	0.68		
0.72	0.68	Targeted	0.68		

Ene 02 Energy Monitoring					
Energy metering systems are installed that enable at least 90% of the estimated annual energy consumption of each fuel to be assigned to the various end-use categories of energy consuming systems.	0.68	Targeted	0.68	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 Heating c. Humidification d. Cooling e. Ventilation i.e. fans (major) f. Pumps g. Lighting h. Small Power (lighting and small power can be on the same sub-meter where supplies taken at each floor/department) i. Renewable or Low Carbon Systems (separately) j. Controls h. Other major energy-consuming items where appropriate	M&E
Separate tenanted areas or building function areas/floor plates have energy consumption separately metered through either accessible sub-meters or accessible BEMS	0.68	Targeted	0.68	Separate tenanted areas or building function areas/floor plates will be separately metered.	M&E
Ene 03 External Lighting					
The building has been designed to operate without the need for any external lighting Or 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	0.68	Targeted	0.68	The average initial luminous efficacy of the external light fittings within the construction zone will be not less than 60 luminaire lumens per circuit Watt. All external light fittings will be automatically controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian traffic.	M&E
Ene 04 Low Carbon Design					
Analysis of the proposed building design/development before RIBA Stage 2 is undertaken to identify opportunities for passive design solutions BREEAM issue Hea 04 Thermal Comfort has to have been achieved. See Appendix C3.	0.68	Targeted	0.68	The building will use passive design measures to reduce the total heating, cooling, mechanical ventilation and lighting loads and energy consumption in line with the findings of the passive design analysis which demonstrates a meaningful reduction in the total energy demand as a result.	M&E
The building utilises a free cooling strategy and the first credit within the BREEAM issue Ene 04 Passive Design Analysis has been achieved	0.68	Targeted	0.68	There will be a natural ventilation strategy, therefore free cooling is allowed for.	M&E
Feasibility study carried out and implemented, covering points listed in Appendix C3 before RIBA Stage 2 The feasibility study shows that a meaningful reduction (generally at least 5%) in regulated CO2 in line with the requirements of Appendix C3	0.68	Targeted	0.68	An LZC feasibiity study will be carried out and the findings implemented.	M&E

Transport					
Criteria	**Available Score**	**Status**	**Target Score**	**Pre-Assessment Stage Assumptions**	**Responsibility**
Tra 01 Sustainable Transport Solutions					
Credits are awarded based on the public transport Accessibility Index (AI). The AI is determined by the information in the BREEAM Tra 01 calculator.	0.78	Targeted	0.78	The Transport for London PTAL (relating to access to public transport) shows an Accessibility Index of 59.92 for the site, which equates to 3 credits being achieved.	P&M / Architect
	0.78	Targeted	0.78		
	0.78	Targeted	0.78		
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	0.78	Targeted	0.78	The building is within 500m of a: - Grocery shop or food shop - Cash machine	P&M / Architect
Tra 03 Cyclist Facilities					
Adequate provision of compliant cycle storage cyclist facilities See Appendix D2 for full requirements	0.78	Targeted	0.78	1 bicycle space per 10 staff (minus 50% for good PTAL) cycle spaces will be covered and secure.	Architect
At least two of the following cyclist facilities have been provided: - Showers - Changing facilities - Lockers - Drying spaces The first credit in BREEAM Issue Tra 03 Cyclist Facilities has been achieved	0.78	Not Achievable	0.00	This credit is not being targeted.	Architect

Tra 05 Travel Plan					
Compliant travel plan developed at feasibility stage and implemented. See Appendix D2 for full details	0.78	Targeted	0.78	A BREEAM compliant travel plan will be developed.	Client

Water					
Criteria	**Available Score**	**Status**	**Target Score**	**Pre-Assessment Stage Assumptions**	**Responsibility**
Wat 01 Water Consumption					
The efficiency of newly specified domestic scale water-consuming components and measures specified to retrofit existing devices shows an improvement over notional baseline of 12.5% (Based on BREEAM calculation taking into account flow rates/ consumption of sanitary ware & appliances)	0.78	Targeted	0.78	The following flow rates will be used as guidance to achieve more than a 40% improvement: WC - 4 litre effective flush volume Urinal - 1.5 litre/bowl/hour WHB taps - 4.5 l/min Showers - 6 l/min Baths - 140 litres to overflow Kitchen taps - 7.3 l/min Commercial sized dishwashers - 5 l/rack Commercial sized washing machines - 7.5 l/kg	M&E / Architect / P&M
Improvement over notional baseline of 25%	0.78	Targeted	0.78		
Improvement over notional baseline of 40%	0.78	Targeted	0.78		
Improvement over notional baseline of 50%	0.78	Not Achievable	0.00		
Improvement over notional baseline of 55%	0.78	Not Achievable	0.00		
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.	M&E
The specification of a water meter on the mains water supply to each building. AND 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 if there is an existing BMS any new build must be connected to the existing BMS	0.78	Targeted	0.78	An assessment will be carried out to determine if there is any water-consuming plant or building areas, consuming 10% or more of the building's total water demand. If present, these will be fitted with a sub-meter as required. All meters to be labelled and pulsed to allow connection to a BMS.	M&E
Wat 03 Water Leak Detection					
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	0.78	Targeted	0.78	A BREEAM compliant leak detection system will be installed on the mains incoming water supply.	M&E
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	0.78	Targeted	0.78	Flow control devices (e.g. linked to a PIR) will be provided in the WC areas of the new building.	M&E

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: - External walls - Windows - Roof - Upper Floor Slab - Internal Walls - Floor finishes The score is calculated using a BREEAM calculation methodology.	1.13	Targeted	1.13	The build ups of each element have not yet been determined, however they will be specified to have high Green Guide ratings where possible. In order to further boost the potential credits here, products with Environmental Product Declarations (EPDs) will be preferentially specified.	Architect
	1.13	Targeted	1.13		
	1.13	Targeted	1.13		
	1.13	Targeted	1.13		
	1.13	Targeted	1.13		
	1.13	Targeted	1.13		

Mat 03 Responsible Sourcing of Materials					
All timber and timber based products used are 'legally harvested and traded'		Targeted		All timber used on site will be responsibly and legally sourced. The appointed contractor must be responsible for establishing a sustainable procurement plan and ensuring that materials for major building elements are responsibly sourced (i.e. FSC timber, BES6001 etc) to achieve at least 3 credits.	Contactor
All materials for the project are sourced in accordance with a documented sustainable procurement plan	1.13	Targeted	1.13		
Construction materials are responsibly sourced in line with requirements in Appendix F1. Responsible sourcing tier level % of available points achieved - 18%	1.13	Targeted	1.13		
Responsible sourcing tier level % of available points achieved - 36%	1.13	Targeted	1.13		
Responsible sourcing tier level % of available points achieved - 54%	1.13	Not Achievable	0.00		
Mat 04 Insulation					
The (BREEAM) Insulation Index for new insulation is ≥2.5 based on the Green Guide rating and thermal performance for insulation within: - External walls - Ground floor - Roof - Building services AND The Insulation Index for the building fabric and services insulations is the same as or greater than 2.5.	1.13	Targeted	1.13	Insulation will be specified to achieve a sufficient score based on the Green Guide rating for the products.	M&E
Mat 05 Design for Durability and Resilience					
The design incorporates suitable durability and protection measures or design features/solutions to prevent damage to the vulnerable parts of the internal and external building and landscaping elements as follows: - Protection from the effects of high pedestrian traffic in main entrances/public areas/thoroughfares - Protection against any internal vehicular/trolley movement within 1m of the internal building fabric - Protection against, or prevention from, any potential vehicular collision (within 1m of the external building façade for car parking areas and 2m for delivery areas) AND Existing applicable building elements are surveyed to identify material degradation including an assessment to grade any degradation effects. Design and specification measures are developed to repair and protect existing elements according to the severity of any degradation affects. Newly specified materials or newly constructed elements within scope of refurbishment works incorporate appropriate design and specification measures to limit material degradation due to environmental factors See Appendix F2 for methodology of assessment.	1.13	Targeted	1.13	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. An analysis will be carried out to ensure that the exposed parts of the building are protected from material degradation. The design team must provide a compliant survey detailing how risk from environmental factors has been minimised. This will include an survey from design team of existing applicable building elements to identify elements where material degradation effects are evident, the severity of any affects, and appropriate design and specification measures that have been considered to protect and limit environmental degradation.	Architect
Mat 06 Material Efficiency					
Opportunities and appropriate measures have been identified, investigated and implemented, to optimise the use of materials in building design, procurement, refurbishment, maintenance and end of life across RIBA Stages 1-5. See Appendix F3 for methodology of assessment.	1.13	Targeted	1.13	Opportunities will be identified and assessed at all RIBA stages in order to maximise the material efficiency of the project.	Architect

Waste					
Criteria	Available Score	Status	Target Score	Pre-Assessment Stage Assumptions	Responsibility
Wst 01 Construction Waste Management					
A pre-refurbishment audit is undertaken of all existing buildings, structures or hard surfaces within the scope of the refurbishment or fit-out zone. See Appendix G1 for full details	0.73	Targeted	0.73	A pre-refurbishment audit will be undertaken and be has been referenced in the resource management plan.	Contractor
Reuse and direct recycling of materials Where 50% of the total available points for the waste materials detailed in Appendix G1 that are present have been achieved on the project.	0.73	Not Achievable	0.00	It is assumed that these credits will be too difficult to achieve as they requie either reuse or close loop recycling of products removed from site. This is currently highly dependant on nearby facilities.	Contractor
OR Where 75% of the total available points for the waste materials detailed in Appendix G1 that are present have been achieved.	0.73	Not Achievable	0.00		Contractor
A Resource Management Plan (RMP) is developed and the amount of waste generated per 100m2 = 11.3m3 / 3.5 tonnes	0.73	Targeted	0.73	A compliant RMP 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. They will also be expected to divert waste from landfill to achieve the last credit. Further review will be required once the contractor is appointed and final details of the landscaping are confirmed.	Contractor
Amount of waste generated per 100m2 = 4.5m3 / 1.2 tonnes	0.73	Potential	0.00		
Amount of waste generated per 100m2 = 2.1m3 / 0.4 tonnes	0.73	Not Achievable	0.00		
Waste diverted from landfill - Refurbishment/fit-out 85 / 90% or demolition 90 / 95%	0.73	Targeted	0.73		
Wst 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 G2 for full details	0.73	Potential	0.00	The contractor will investigate the possibility of using recycled and/or secondary aggregate. This would need to be specified to 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
Wst 03 Operational Waste					
Provision of labelled dedicated storage facilities for a building's operational-related recyclable waste Appropriate capacity to the building type, size and number of units (if relevant and predicted volumes of 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 are provided and where significant packaging waste, a compactor/baler is provided	0.73	Targeted	0.73	There is 530.2m2 of floor space, therefore a total of 2m2 space will be provided for the storage of recyclable waste in addition to space provided for the general waste. There will also be a vessel(s) for collecting the organic waste resulting from the restaurant, a suitable storage space shall be provided to accommodate the food waste bin(s).	Architect
Wst 05 Adaptation to Climate Change					
A Climate Change Adaptation Strategy Appraisal for the structural and fabric resilience will be undertaken by the end of Concept Design (RIBA Stage 2 or equivalent). See Appendix G3 for details.	0.73	Targeted	0.73	The design team will undertake a climate change adaptation strategy.	Architect
Wst 06 Functional Adaptability					
A building-specific functional adaptation strategy study has been undertaken by Concept Design (RIBA Stage 2 or equivalent). AND Functional adaptation measures have been adopted in the design by Technical Design (RIBA Stage 4). See Appendix G4 for details.	0.73	Targeted	0.73	The design team will undertake a functional adaptation strategy.	Architect

Land Use & Ecology					
Criteria	Available Score	Status	Target Score	Pre-Assessment Stage Assumptions	Responsibility
LE 02 Protection of Ecological Features					
Any existing features of ecological value within and surrounding the refurbishment or fit out zone and site boundary area are adequately protected from damage during clearance, site preparation and refurbishment or fit out activities in line with BS42020: 2013.	2.35	Targeted	2.35	There are no existing ecological features as such this credit is awarded by default.	Ecologist

LE 04 Enhancing Site Ecology					
A suitably qualified ecologist (SQE) has been appointed by the Preparation and Brief Stage (RIBA Stage 1 or equivalent) to report on enhancing and protecting the ecology of the site and their recommendations are implemented by the Concept Design Stage (RIBA Stage 2 or equivalent)	2.35	Targeted	2.35	An ecology report will be developed with the aim to enhance the site ecology. The design team will also be required to follow and implement any recommendations proposed by the ecologist.	Ecologist
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	2.35	Targeted	2.35	The ecologist will advise on how to meet all mandatory ecological requirements and on suitable additional criteria for the design team to implement. The design team will then aim to follow a minimum of 4 of the additional criteria detailed in Appendix H1.	Ecologist / Contractor
Adopt 4 of the additional criteria detailed in Appendix H1	2.35	Targeted	2.35		Ecologist / Contractor

Pollution					
Criteria	**Available Score**	**Status**	**Target Score**	**Pre-Assessment Stage Assumptions**	**Responsibility**
Pol 01 Impact of Refrigerants					
Building does not require the use of refrigerants within its installed plant / systems	2.71	Not Achievable	0.00	The building does use refrigerants and it is to be confirmed whether these have a DELC CO2e of less than 1000 kgCO2e/kW. Where systems are specified with electric compressors, they must comply with the requirements set out in BS EN 378:2008 (Parts 2 and 3) Further details of the type of systems and refrigerants in use are required. A leak detection system for the refrigerants will not be provided.	M&E
All systems (with electric compressors) must comply with the requirements set out in BS EN 378:2008 (Parts 2 and 3)		Potential			
Systems using refrigerants have Direct Effect Life Cycle CO_2 equivalent emissions (DELC CO_2e) of ≤100 kgCO2e/kW cooling capacity OR Refrigerants used have a Global Warming Potential (GWP) ≤10	1.81	Potential	0.00		
Systems using refrigerants have DELC CO2e of ≤1000 kgCO2e/kW cooling/heating capacity	0.90	Potential	0.00		
BREEAM compliant refrigerant leak detection and containment. Refer to Appendix J1 for full details	0.90	Not Achievable	0.00		
Pol 02 NOx Emissions					
NOx space heating and hot water <100mg/kWh	0.90	Not Achievable	0.00	These credits are not achievable given that the proposed heating system is provided by a VRF.	M&E
NOx space heating and hot water <70mg/kWh	0.90	Not Achievable	0.00		
NOx space heating and hot water <40mg/kWh	0.90	Not Achievable	0.00		

Pol 03 Flood Risk Management and Reducing Surface Water Run-off					
Low Flood Risk Zone Where flood maps from the appropriate statutory body confirm the refurbishment or fit-out is situated in a flood zone that is defined as having a low annual probability of flooding OR The project meets requirements for avoiding flooding in accordance with the checklist in Appendix J2. Medium/High Flood Risk Zone Where flood maps from the appropriate statutory body confirm the refurbishment or fit-out is situated in a medium or high flood risk zone. AND A site specific Flood Risk Assessment (FRA) has been undertaken. This takes into account all current and future sources of flooding into consideration. See Appendix J2 for further details.	1.81	Targeted	1.81	An FRA is to carried out, the site is in a Flood Zone 1, so it is expected these credits will be achieved.	Infrastructure
There is no increase in the impermeable surfaces as a result of the refurbishment works OR Where there is an increase in the impermeable surface as a result of the refurbishment works then criteria set out in Appendix J2 are met.	0.90	Targeted	0.90	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
An appropriate consultant has been used to design an appropriate drainage strategy for the site. See Appendix J2 for full details.	0.90	Not Achievable	0.00		
There is no discharge from the developed site (includes new and existing hard landscaping and buildings) for rainfall up to 5mm AND Measures are implemented to minimise water course pollution in line with requirements in Appendix J2	0.90	Not Achievable	0.00	This credit is not being targeted.	Infrastructure
Pol 04 Reduction of Night Time Light Pollution					
Where external lighting pollution has been eliminated through effective design removing the need for external lighting OR It is designed in accordance with ILP Guidance and provided with a time switch to allow lighting to be switched off between 2300hrs and 0700hrs	0.90	Targeted	0.90	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.	M&E
Pol 05 Reduction of Noise Pollution					
Where there are or will be no noise-sensitive areas or buildings within 800m radius of the assessed development OR Where the development does have noise-sensitive areas or buildings within 800m then a noise impact assessment in compliance with BS 7445 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	0.90	Targeted	0.90	An acoustician will be appointed and is expected to confirm this credit can be achieved.	Acoustician

Innovation					
Criteria	**Available Score**	**Status**	**Target Score**	**Pre-Assessment Stage Assumptions**	**Responsibility**
Man 03 Responsible Construction Practices					
Achieve a CCS score of 40+	1.00	Potential	0.00	The contractor will investigate the potential of a CCS score of 40+.	Contractor
Man 05 Aftercare					
Commitment or contract for the FM or equivalent to undertake certain tasks at quarterly intervals for the first 3 years after occupation	1.00	Not Achievable	0.00	To achieve this credit, there will need to 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.	Contractor
Hea 01 Visual Comfort					
Exemplary level daylight factor achieved	1.00	Not Achievable	0.00	This credit is not being targeted.	M&E
Hea 02 Indoor Air Quality					
All assessed products meet the VOC standards required. Exemplary formaldehyde emission levels have been reached (0.006mg/m3)	1.00	Not Achievable	0.00	This credit is not being targeted.	M&E
All assessed products meet the VOC standards required. Exemplary formaldehyde emission levels have been reached (0.001mg/m3)	1.00	Not Achievable	0.00	This credit is not being targeted.	M&E
Ene 01 Reduction of CO_2 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.	M&E
	1.00	Not Achievable	0.00		
	1.00	Not Achievable	0.00		
	1.00	Not Achievable	0.00		
	1.00	Not Achievable	0.00		
Wat 01 Water Consumption					
65% Improvement over notional baseline	1.00	Not Achievable	0.00	This credit is not being targeted.	Architect
Mat 01 Environmental Impact of Materials					
Exemplary analysis of the environmental impact of the building materials has been undertaken. See Appendix F1 for requirements.	1.00	Potential	0.00	As per Mat 01	M&E
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 100m2 - 1.4m3 / 0.3 tonnes AND Waste diverted from landfill - Refurbishment/fit-out 95 / 97% or demolition 95 / 97%	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. AND Contributing recycled or secondary aggregate must not be transported more than 30km by road transport	1.00	Not Achievable	0.00	This credit is not being targeted.	Structures / Contractor
Wst 05 Adaptation to Climate Change					
See Appendix G1 for credit requirements	1.00	Not Achievable	0.00	This credit is not being targeted.	Structures / Contractor
Pol 03 Flood Risk Management and Reducing Surface Water Run-off					
Where all run-off from the developed site is managed on-site using source control. See Appendix J2 for full details.	1.00	Not Achievable	0.00	This credit is not being targeted.	M&E

5. Conclusion

This BREEAM Refurbishment and Fit-out 2014 pre-assessment report demonstrates that a Very Good rating can be achieved, with a score of 71.68%, based on the credits targeted by the design team.

The following credits are marked as 'potential' and should be confirmed by the relevant design team member as soon as possible:

- Man 03 - Responsible Construction Practices
- Mat 01 - Environmental Impact of Materials
- Wst 01 - Construction Waste Management
- Wst 02 - Recycled Aggregates
- Pol 01 - Impact of Refrigerants

The score provides a small buffer above the 70% threshold for an Excellent rating.

Achieving the targeted BREEAM credits through the design and post construction stages will require rigorous adherence to the credit criteria, which are very prescriptive. As some details for full compliance may not be included in this summary report, it is essential for the design team to remain in contact with the assessor as the project develops to confirm that all specifications are in line with the pre-assessment.

Design Stage and Post Construction Stage assessments will be required and the reports and compliant evidence submitted to the BRE for certification.

Appendices

Appendix A - Management
- A1: Man 01 - Project Brief and Design
- A2: Man 02 - Life Cycle Cost and Service Life Planning
- A3: Man 03 - Responsible Construction Practices
- A4: Man 04 - Commissioning and Handover
- A5: Man 05 - Aftercare

Appendix B - Health & Wellbeing
- B1: Hea 01 - Visual Comfort
- B2: Hea 02 - Indoor Air Quality
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Appendix C - Energy
- C1: Ene 02 - Energy Monitoring
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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 01 - Environmental Impact of Materials
- F2: Mat 03 - Responsible Sourcing of Materials
- F3: Mat 05 - Design for Durability and Resilience

Appendix G - Waste
- G1: Wst 02 - Recycled Aggregates
- G2: Wst 05 - Adaptation to Climate Change
- G3: Wst 06 - Functional Adaptability

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
- J3: Pol 05 - Reduction of Noise Pollution

Appendix A - Management

A1: MAN 01 – Project Brief and Design

Stakeholder Consultation (Project Delivery)

- A project brief is developed prior to Concept Design which sets out:
  - Client requirements
  - Project objectives and targets including target BREEAM rating, business objectives etc
  - Timescales and budget
  - Constraints for the project e.g. technical, legal, physical and environmental
- Prior to completion of the Concept Design (RIBA Stage 2 or equivalent), the project delivery stakeholders have met to identify and define their roles, responsibilities and contributions for each of the key phases of project delivery.
- 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 a meeting to identify and define their roles, responsibilities and contributions during the following key phases:
  - Concept Design
  - Developed Design
  - Technical Design
  - Construction
  - Handover and Close Out
  - In-Use Occupation
- In defining the roles and responsibilities for each key phase of the project, the following must be considered:
  - End user requirements
  - Aims of the design and design strategy
  - Particular instillation and construction requirements
  - Occupiers budget and technical expertise in maintaining any proposed systems
  - Manageability and adaptability of any proposals
  - Production of documentation
  - Commissioning, training and aftercare
  - Occupiers budget and technical expertise in maintaining any proposed systems
  - Maintainability and adaptability of the proposals
  - Requirements for the production of project and end user documentation
  - Requirements for commissioning, training and aftercare support

Stakeholder Consultation (Third Party)

- Must be undertaken prior to the completion of Concept Stage (RIBA Stage 2 or equivalent)
- All relevant third party stakeholders have been consulted by the design team and as a minimum the consultation must include the following information:

- Functionality, build quality and impact
- 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 (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
- Inclusive and accessible design.

In the case of educational building types, minimum content also includes:

- How the building/grounds could best be designed to facilitate learning and provide a range of social spaces appropriate to the needs of pupils, students and other users

In the case of building types containing technical areas or functions, e.g. laboratories, workshops etc., minimum content also includes:

- The end users broad requirements for such facilities, including appropriate sizing, optimisation and integration of equipment and systems.

- The project must demonstrates how the stakeholder contributions and outcomes of the consultation exercise have influenced or changed the Initial Project Brief and Concept Design.
- All consultation feedback has been given to, and received by, all relevant parties by the Technical Design Stage (RIBA Stage 4).
- Relevant third parties include the following:
  - Actual/intended building users (if known) including facilities management (FM) staff or those responsible for the day-to-day operation of the building and grounds.
  - Existing partnerships and networks that have knowledge of, and experience working on, existing buildings of the same type.
  - Potential users of any shared facilities, e.g. operators of clubs and community groups.

    AND the following where relevant:
  - For change of use projects and public buildings, a representative consultation group from the existing community.
  - 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).
  - Specialist service and maintenance contractors/representatives where the building function has particular technical requirements in complex environments, e.g. buildings containing laboratories.

A2: MAN 02 – Life Cycle Cost and Service Life Planning

Elemental Life Cycle Cost (LCC)

- An elemental life cycle cost (LCC) analysis has been carried out, at Concept Design (RIBA Stage 2 or equivalent) together with any design option appraisals in line with PD 156865:2008
- The LCC analysis should show:
    - An outline LCC plan for the project based on the building's basic structure and envelope, appraising a range of options and based on multiple cash flow scenarios e.g. 20, 30, 50+ years
    - The fabric and servicing strategy for the project outlining services component and fit-out options (if applicable) over a 15-year period, in the form of an 'elemental LCC Plan'
    - A fit-out strategy is developed outlining fit-out options over a 10 year period.

Component Level LCC Plan

- A component level LCC plan has been developed by the end of Technical Design (RIBA Stage 4 or equivalent) in line with PD 156865:2008 and includes the following component types (where present):

Applicability	Building Components
Part 1 assessments, including components within scope of works	Envelope: e.g. cladding, windows, and/or roofing
Parts 2 & 3 assessments including newly specified local and core services	Newly specified local & or core service equipment: e.g. boiler, air-conditioning, air handling unit, and/or controls
Parts 1-4, where finishes are within the scope of works	Finishes e.g. walls, partitions, floors and/or ceilings
Where external spaces are within scope of works	External spaces e.g. alternative hard landscaping, boundary protection

- Demonstrate how the component level LCC plan has been used to influence the building and systems design/specification to minimise life cycle costs and maximise critical value

Capital Cost Reporting

- Report the capital cost for the building in pounds per square metre (£k/ m^2), via the BREEAM Assessment Scoring and Reporting tool, Assessment Issue Scoring tab, Management section

A3: MAN 03 – Responsible Construction Practices

Environmental Management

- The EMS must be either:
    - Third party certified, to ISO 14001/EMAS or equivalent standard; or
    - Be structurally compliant with BS 8555:2003 and has reached phase four of the implementation stage, and has completed phase audits one to four, as defined in BS 8555.

- The principal contractor implemented best practice pollution prevention policies and procedures on-site in accordance with Pollution Prevention Guidelines, Working at construction and demolition-sites: PPG6.

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:
    - Where Part 1 is being assessed materials used in major building elements, including insulation materials
    - Where Part 2 is being assessed, materials used for core services
    - Where undertaking a comprehensive refurbishment including fit-out with a combination of Parts 1-4, materials used for major building elements, services and interior fit-out
    - Where within scope ground works and landscaping materials
    - Where undertaking a Part 3&4 only assessment, materials used in the fit-out are included with the exception of small scale and low value refurbishment of fit-out projects where the credit is not applicable
- 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)

A4: MAN 04 – Commissioning and Handover

Commissioning and Testing Schedule Responsibilities

- There is a schedule of commissioning and testing that identifies appropriate commissioning required for the scope of works that includes a suitable timescale for commissioning and re-commissioning of all relevant works carried out. Commissioning should be carried out where changes are being made to the following:
    - Building services (including both complex and non-complex systems)
    - Building services control systems (including Building Management Systems)
    - Changes to the building fabric that will affect thermal performance
- The schedule will identify appropriate standards that all commissioning activities will be conducted in accordance with e.g. current Building Regulations, BSRIA and CIBSE.
- An appropriate project team member(s) is appointed to monitor and programme pre-commissioning, commissioning, testing and, where necessary, re-commissioning activities on behalf of the client.
- Principal contractor accounts for the commissioning and testing programme, responsibilities and criteria within their budget and main programme works, allowing for the required time to complete all commissioning and testing activities prior to handover.

Commissioning Building Services

- The first Man 04 credit must be achieved
- For projects where work is being undertaken to upgrade, renovate or install new building services and systems. For complex building services and systems, a specialist commissioning agent appointed during the design stage with responsibility for:

  - Undertaking design reviews and giving advice on suitability for ease of commissioning
  - Providing commissioning management
  - Management of commissioning, performance testing and handover/post-handover stages
- For simple building services, this role can be carried out by an appropriate project team member provided they are not involved in the general installation works for the building services system(s).

Testing and Inspecting Building Fabric

- Projects where the fabric of the building is being upgraded, the integrity of the building fabric, including continuity of insulation, avoidance of thermal bridging and air leakage paths is quality assure through completion of a thermographic survey and/or air tightness testing as well as carrying out a visual inspection ate appropriate times during the refurbishment.
- Any defects identified via the post construction inspections are rectified prior to building handover and close out. Any remedial work must meet the required performance characteristics for the building/element.

Handover

- The (Building User Guide) BUG is developed prior to handover for building occupiers and premises managers
- The training schedule contains the following as minimum content:
  - The design intent of the refurbishment/fit-out works
  - The available aftercare provision and aftercare team main contact(s), including any scheduled seasonal commissioning and post occupancy evaluation
  - Introduction and demonstration of, installed systems and key features (e.g. building management systems, controls and their interfaces)
  - Introduction to the Building User Guide and other relevant building documentation, (e.g. design data, technical guides, maintenance strategy etc)
  - Maintenance requirements, including any maintenance contracts and regimes in place.

A5: MAN 05 – Aftercare

Aftercare

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

- A meeting programmed to occur between the aftercare team/individual and the building occupier management (prior to initial occupation, or as soon as possible thereafter) to:
  - Introduce the aftercare team or individual to the aftercare support team available, including Building User Guide (where existing) and training schedule content.
  - Present key information about the building the design intent and how to use the building to ensure it operates as efficiently and effectively as possible
- On-site facilities management training, to include a walkabout of the building and introduction and familiarization with the building systems, their controls and how to operate them in accordance with the design intent and operational demand.
- Initial aftercare provision for at least the first month of building occupation, e.g. on site attendance on a weekly basis to support building users and management and to conduct a walk-around to examine how the refurbished area of the building is being used/operated to

identify any issues that need to be communicated to building users/facilities managers (depending on the complexity of the building and building operations).

- Longer term after care e.g. a helpline, nominated individual or other appropriate sys-tem to support building users for at least the first 12 months of occupation

There must be operational infrastructure and resources in place to co-ordinate the collection and monitoring of energy and water consumption data for a minimum of 12 months, once the building is occupied. This is done to facilitate analysis of discrepancies between actual and predicted performance, with a view to adjusting systems and/or user behaviours accordingly.

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.
- 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.

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) should include:
    - 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 about the building and its performance 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

Daylight

Relevant building areas meet good practice daylight(s) and other criterion as outlined in the two tables below:

Building/area type	Average daylight factor required	Minimum area (m2) to comply)			Other requirements
		1 credit	2 credits	3 credits	
Education buildings					
Pre-schools, schools, further education-occupied spaces	2%	40%	60%	80%	Either (a) OR (b) and (c) in table below
Higher education-occupied spaces	2%	30%	45%	60%	
Healthcare Buildings					
Staff and public areas	2%	40%	60%	80%	Either (a) OR (b) and (c) in table below
Occupied patients' areas (dayrooms, wards) and consulting rooms	3%	40%	60%	80%	
Multi-Residential Buildings					
Kitchen	2%	40%	60%	80%	Either (a) OR (b) and (c) in table below
Living rooms, dining rooms, studies (including home office)	2%	40%	60%	80%	
Non-residential or communal occupied spaces	2%	40%	60%	80%	
Retail Buildings					
Sales areas	-	17.5%	25%	35%	Point daylight factors of 2% or more
Other occupied areas	2%	40%	60%	80%	Either (a) OR (b) and (c) in table below
Courts, Industrial, Office, Prison Buildings and all Other Buildings types					
Cells and custody cells	1.5%	40%	60%	80%	N/A
Internal association or atrium area (prison buildings only)	3%	40%	60%	80%	Either a uniformity ratio of at least 0.7 OR a minimum point daylight factor 2.1%
Patient care spaces	3%	40%	60%	80%	Either (a) OR (b) and

Teaching, lecture and seminar spaces	2%	40%	60%	80%	(c) in table below
All occupied spaces, unless indicated in BREEAM definitions	2%	40%	60%	80%	

Daylighting Uniformity criteria

Ref	Criteria
(a)	A uniformity ratio of at least 0.3 or a minimum point daylight factor of at least 0.3 times the relevant average daylight factor value in the above table. Spaces with glazed roofs, such as atria, must achieve a uniformity ratio of at least 0.7 or a minimum point daylight factor of at least 0.7 times the relevant average daylight factor value in the above table.
(b)	At least 80% of the room has a view of sky from desk or table top height (0.85m in a multi-residential buildings, 0.7m in other buildings).
(c)	The room depth criterion d/w + d/HW<2/(1-RB) is satisfied Where: d=room depth w=room width HW=windows head height from floor level RB=average reflectance of surfaces in the rear half of the room

Relevant building areas meet good practice average and minimum point daylight illuminance criteria as outlined in the table below:

Area type	Minimum area (m2) to comply)			Average daylight illuminance (averaged over entire space)	Minimum daylight illuminance at worst lit point
	1 credit	2 credits	3 credits		
Education buildings					
Pre-schools, schools, further education-occupied spaces	40%	60%	80%	At least 300 lux for 2000hrs per year or more	At least 90 lux for 2000hrs per year or more
Higher education-occupied spaces	30%	45%	60%		
Healthcare buildings					
Staff and public areas	40%	60%	80%	At least 300 lux for 2000hrs per year or more	At least 90 lux for 2000hrs per year or more
Occupied patients' areas (dayrooms, wards) and consulting rooms	40%	60%	80%	At least 300 lux for 2650hrs per year or more	At least 90 lux for 2650hrs per year or more
Multi-Residential buildings					
Kitchen	50%	75%	100%	At least 100 lux for 3450hrs per year or more	At least 30 lux for 3450hrs per year or more
Living rooms, dining rooms, studies (including		-	-		

home office)					
Non-residential or communal occupied spaces	40%	60%	80%	At least 200 lux for 2650hrs per year or more	At least 60 lux for 2650hrs per year or more
Retails buildings					
Sales areas	17.5%	25%	35%	At least 200 lux point daylight illuminances for 2650hrs per year or more	
Other occupied areas	40%	60%	80%	At least 200 lux for 2650hrs per year or more	At least 60 lux for 2650hrs per year or more
Courts, Industrial, Office, Prison Buildings and all Other Buildings types					
Cells and custody cells	40%	60%	80%	At least 100 lux for 3150hrs per year or more	-
Internal association or atrium area (prison buildings only)	40%	60%	80%	At least 300 lux for 3150hrs per year or more	At least 210 lux for 2650hrs per year or more
Patient care spaces	40%	60%	80%		
Teaching, lecture and seminar spaces	40%	60%	80%	At least 300 lux for 2000hrs per year or more	At least 90 lux for 2000hrs per year or more
All occupied spaces, unless indicated in BREEAM definitions	40%	60%	80%	At least 300 lux for 2000hrs per year or more	At least 90 lux for 2000hrs per year or more

Two credits where daylighting provision, average over all relevant spaces, has improved after refurbished or fit-out by 30% or more and there is a minimum glazing to floor area ratio of either:

- 5% glass to floor area ratio for side windows; OR
- 2.5% glass to floor area ratio for roof lights

One credit where daylighting provision averaged over all relevant spaces, has improved after refurbishment or fit out by 15% or more and there is a minimum glazing to floor area ratio of either

- 5% glass to floor area ratio for side windows; OR
- 2.% glass to floor area ratio for roof lights

View out

Up to two credits can be awarded, depending on the percentage of relevant building areas as below:

- One credit can be awarded where 80% of the floor area 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 ≥ 20% of the surrounding wall area.
- Two credits can be awarded where 95% of the floor area within relevant building areas are within 7m of a wall which has a window or permanent opening that provides an adequate view out.

- 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

- All fluorescent and compact fluorescent lamps are fitted with high frequency ballasts
- Illuminance (lux) levels in all internal relevant building areas of the building are specified in accordance with the SLL Code for Lighting 2012 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. (Manufacturer' 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.

External lighting

- Illuminance levels for lighting in all external areas within the construction zone are specified in accordance with BS5489-1:2013 Lighting of roads and public amenity areas and BS EN 12464-2:2014 Light and lighting – Lighting of work places – Part 2: Outdoor work places

Zoning & Occupant 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,
- Wards or bedded areas: zoned for lighting control for individual bed spaces and control for staff over groups of bed spaces
- Treatment areas, dayrooms, 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.

B2: Hea 02 – Indoor Air Quality

Indoor 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
- Protection of HVAC systems from sources of pollution during refurbishment/fit-out works e.g. dust
- Procedures for protecting the indoor air quality of areas outside of the refurbishment or fit-out zone that may be affected by the refurbishment/fit-out works
- Procedures for identifying and implementing third party testing and analysis required to ascertain that the contaminant sources have been removed effectively before occupancy
- Maintaining indoor air quality in-use e.g. maintenance and cleaning of the HVAC system, ductwork and filters

VOC Emission requirements

The criteria to be met are as follows:

- All decorative paints and varnishes must meet the requirements listed in the table below
- At least five of the eight remaining product categories listed in the table below 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.

Reference	Product	Requirements
A	Paints and Varnishes	
	Performance requirements	VOC content limit
	Compliant performance standard	EU Directive 2004/42/CE ('Paints Directive')
	Compliant testing standard	BS EN ISO 11890-2:2013 – Paints and varnishes – Determination of VOC content, Part 2 – Gas
	Manufacturer also to confirm	Paint to be fungal and algal resistant in wet areas e.g. bathrooms, kitchens, utility rooms
B	Wood panels (including particleboard, fibreboard including medium density fibre board (MDF), oriented strand board (OSB), cement-bonded particleboard, plywood, solid wood panel and acoustic board)	
	Option 1	
	Performance requirements	Formaldehyde E1 class
	Compliant performance standard	BS EN 13986:2004 Wood-based panels for use in construction - Characteristics evaluation of conformity and marking
	Compliant testing	BS EN 717-1:2004 Wood-based panels – Determination of

	standard	formaldehyde release - Part 1: Formaldehyde emission by the chamber method
	Manufacturer also to confirm	The absence of prohibited wood preservatives/biocides.
	Option 2	
	Performance requirements	Formaldehyde level of 0.1mg/m3
	Compliant performance standard	1. BS EN ISO 16000-9:2006 Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method. OR 2. Standard method for the testing and evaluation of volatile organic chemical emissions from indoor sources using environmental chambers, version 1.1 - Emission testing method for California Specification 01350, Californian Department for Public Health, 2010. Note: For either method the resultant emission/surface area obtained from the chamber test method must be extrapolated to predict what the emissions would be in theoretical model room (as detailed in the standard) and this extrapolated emission rate compared with the required formaldehyde level of 0.1mg/m3.
	Manufacturer also to confirm	The absence of prohibited wood preservatives/biocides.
C	Timber Structures (e.g. glue laminated timber)	
	Option 1	
	Performance requirements	Formaldehyde E1 Class
	Compliant performance standard	BE EN 14080:2005 Timber structures - Glues laminated timber - Requirements
	Compliant testing standard	BS EN 717-1:2004 Wood-based panels – Determination of formaldehyde release - Part 1: Formaldehyde emission by the chamber method
	Option 2	
	Performance requirements	As category B Option 2.
	Compliant testing standard	As category B Option 2.
D	Wood flooring (e.g. parquet)	
	Option 1	
	Performance requirements	Formaldehyde E1 Class
	Compliant performance standard	BS EN 14342:2005+A1:2008 Wood flooring - Characteristics, evaluation of conformity and marking
	Compliant testing standard	BS EN 717-1:2004 Wood-based panels – Determination of formaldehyde release - Part 1: Formaldehyde emission by the chamber method
	Option 2	
	Performance requirements	As category B Option 2.
	Compliant testing standard	As category B Option 2.

E	**Resilient textile and laminated floor coverings (e.g. vinyl, linoleum, cork, rubber, carpet, laminated wood flooring)**	
	Performance requirements	Option 1 - Formaldehyde E1 Class
	Compliant performance standard	BS EN 14041:2006 Resilient, textile and laminate floor coverings - Essential characteristics
	Compliant testing standard	BS EN 717-1:2004 Wood-based panels – Determination of formaldehyde release - Part 1: Formaldehyde emission by the chamber method
	Option 2	
	Performance requirements	As category B Option 2.
	Compliant testing standard	As category B Option 2.
F	**Suspended ceiling tiles**	
	Performance requirements	Formaldehyde E1 Class
	Compliant performance standard	BS EN 13964:2004+A1:2006 Suspended ceilings - Requirements and test methods
	Compliant testing standard	BS EN 717-1:2004 Wood-based panels – Determination of formaldehyde release - Part 1: Formaldehyde emission by the chamber method
	Option 2	
	Performance requirements	As category B Option 2.
	Compliant testing standard	As category B Option 2.
G	**Flooring adhesives**	
	Performance requirements	Carcinogenic or sensitising volatile substances are substantially absent
	Compliant performance standard	BS EN 13999-1:2013 Adhesives - Short term method for measuring the emission properties of low-solvent or solvent-free adhesives after application - Part 1: General procedure
	Compliant testing standard	1. BS EN 13999-1:2013 Adhesives - Short term method for measuring the emission properties of low-solvent or solvent-free adhesives after application - Part 1: General procedure 2. BS EN 13999-2:2013 Adhesives - Short term method for measuring the emission properties of low-solvent or solvent-free adhesives after application - Part 2: Determination of volatile organic compounds 3. BS EN 13999-3:2007+A1:2009 Adhesives - Short term method for measuring the emission properties of low-solvent or solvent-free adhesives after application - Part 3: Determination of volatile aldehydes 4. BS EN 13999-4:2007+A1:2009 Adhesives - Short term method for measuring the emission properties of low-solvent or solvent-free adhesives after application - Part 4: Determination of volatile diisocyanates
H	**Wall Coverings**	
	Performance	- Vinyl chloride monomer (VCM) content

	requirements	- Formaldehyde level - Migration of heavy metals
	Compliant performance standard	1. BS EN 233:1999 Wall coverings in roll form - Specification for finished wallpapers, wall vinyls and plastic wall coverings 2. BS EN 234:1997 Wall coverings in roll form - Specification for wall coverings for subsequent decoration 3. BS EN 259-1:2001 Wall coverings in roll form - Heavy duty wall coverings - Part 1: Specifications
	Compliant testing standard	BS EN 12149:1998 – Wall coverings in roll form. Determination of migration of heavy metals and certain other elements, of vinyl chloride monomer and of formaldehyde release

Table – 8: VOC criteria by product type

- An exemption is provided for historic buildings where there is an explicit requirement from the Local Authority conservation officer or the national conservation body (i.e. English Heritage, Historic Scotland, CADW in Wales and NIEA:HBU in Northern Ireland) to use specific paints and varnishes that may contain a high level of VOCs and come under the Volatile Organic Compounds in Paints, Vanishes and Vehicle Refinishing Products Regulations 2012. This is allowable for grade I and II* listed buildings in England and Wales and grade A and B+ listed buildings in Scotland and Northern Ireland. In all cases procedures should be in place to ensure the building is flushed out for a sufficient period prior to occupation and ventilated adequately in order to reduce risks with VOCs in accordance with criteria 1 and 2.

VOC and Formaldehyde testing requirements

- The formaldehyde concentration level is measured post construction (but pre-occupancy) and is found to be less than or equal to 100µg/averaged over 30 minutes (WHO guidelines for indoor air quality: Selected pollutants, 2010).
- The total volatile organic compound (TVOC) concentration level is measured post construction (but pre-occupancy) and found to be less than 300µg/over 8 hours, in line with the building regulation requirements.
- Where VOC and formaldehyde levels are found to exceed the limits defined in criteria 8 and 9, the project team confirms the measures that have, or will be taken, in accordance with the IAQ plan, to reduce the levels to within these limits.
    - The testing and measurement of the above pollutants are in accordance with the following standards where relevant:
    - BS ISO 16000-4: 2011 Diffusive sampling of formaldehyde in air
    - BS ISO 16000-6: 2011 VOCs in air by active sampling
    - BS EN ISO 16017-2: 2003 VOCs - Indoor, ambient and workplace air by passive sampling
    - BS ISO 16000-3: 2011 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 Assessment Scoring and Reporting Tool.

B3: Hea 04 Thermal Comfort

Thermal modelling

- Thermal modelling has been carried out using software in accordance with CIBSE AM11 Building Energy and Environmental Modelling.
- The software used to carry out the simulation at the detailed design stage provides full dynamic thermal analysis. For smaller and more basic building designs with less complex heating or cooling systems, an alternative less complex means of analysis may be appropriate (such methodologies must still be in accordance with CIBSE AM11).
- The modelling demonstrates that:
    - For air conditioned buildings, summer and winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design, Table 1.5; or other appropriate industry standard (where this sets a higher or more appropriate requirement/level for the building type).
    - For naturally ventilated/free running buildings:
        - Winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design, Table 1.5; or other appropriate industry standard (where this sets a higher or more appropriate requirement/level for the building type).
        - The building is designed to limit the risk of overheating, in accordance with the adaptive comfort methodology outlined in CIBSE TM52: The limits of thermal comfort: avoiding overheating in European buildings.
- Where undertaking a Part 4 assessment a competent person (e.g. chartered building services engineer) must assess the suitability of existing building services and controls to identify any changes that may be required as a result of fit-out works (e.g. as a result of changes to internal layout, occupant density, additional equipment that may increase cooling loads etc)
- For air conditioned buildings, the PMV (predicted mean vote) and PPD (predicted percentage of dissatisfied) indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool.

B4: Hea 06 Safety and Security

Safe Access

- A Suitably Qualified Security Specialist (SQSS) conducts and evidence based Security Needs Assessment (SNA) during or prior to Concept Design (RIBA Stage 2)
- The SQSS develops a set of recommendations or solutions during or prior to Concept Design (RIBA Stage 2). These recommendations or solutions aim to ensure that the design of buildings, public and private car parks and public or amenity space are planned, designed and specified to address the issues identified in the preceding SNA
- The recommendations or solutions proposed by the SQSS are implemented

Appendix C - Energy

C1: Ene 02 – Energy Monitoring

- Energy metering systems are installed that enable at least 90% of the estimated annual energy consumption of each fuel to be assigned to the various end-use categories of energy consuming systems.

- Energy consuming systems in buildings with a total useful floor area greater than 1,000m^2 are metered using an appropriate energy monitoring and management system.
- The systems in smaller buildings are metered either with an energy monitoring and management system or with separate accessible energy sub-meters with pulsed or other open protocol communication outputs, to enable future connection to an energy monitoring and management system
- The end energy consuming uses are identifiable to the building users, for example through labelling or data outputs
- 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 or other open protocol communication outputs to enable future connection to a BEMS:
    - Space Heating
    - Domestic Hot Water Heating
    - Humidification
    - Cooling
    - Fans (major)
    - Pumps
    - Lighting
    - Small Power (lighting and small power can be on the same sub-meter where supplies are taken at each floor/department)
    - Renewable or Low Carbon Systems (separately)
    - Controls
    - Other major energy-consuming items where appropriate
- An accessible energy monitoring and management system or separate accessible energy sub-meters with pulsed or other open protocol communication outputs to enable future connection to an energy monitoring and management systems are provided. They cover a significant majority of the energy supply to tenanted areas or, in the case of single occupancy buildings, relevant function areas or departments within the building/unit

C2: Ene 03 – External Lighting

The average initial luminous efficacy of external light fittings within the construction zone is not less than 60 luminaire lumens per circuit Watt

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:

C3: Ene 04 – Low Carbon Design

Passive Design

The passive design measures reduce the total heating, cooling, mechanical ventilation, lighting loads and energy consumptions in line with the passive design analysis. The analysis demonstrates a meaningful reduction in total energy demand. As a guide, the installation should contribute at least 5% of overall building energy demand and/or CO_2 emissions. The analysis should cover the following:

- Site location

- Site weather
- Microclimate
- Building layout
- Building orientation
- Building form
- Building fabric
- Thermal mass or other fabric thermal storage
- Building occupancy type
- Daylighting strategy
- Ventilation strategy
- Adaptation to climate change

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)

Feasibility Study

The feasibility study has been carried out by the completion of the Concept Design Stage (RIBA Stage 2 or equivalent) and 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.

As a guide, the installation should contribute at least 5% of overall building energy demand and/or CO_2 emissions.

Under some circumstances an LZC feasibility study may be undertaken however due to listed building consent and/or planning conditions in a conservation area, there may be no

recommendations that can be implemented. In this situation, this is still compliant provided it can be demonstrated that a wide range of options have been considered with consultation input from the local authority conservation officer, e.g. locating LZCs out of public view, use of screens etc. and the report contains evidence to support these findings.

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.

Compliant showers:

- Provision of one shower for every 10 cycle storage spaces, subject to a minimum provision of one shower.
- Any building providing eight showers or more will comply regardless of the number of cycle storage spaces provided.
- Both male and female users must be catered for i.e. either separate showers within shared gender-specific facilities (required provision split 50-50) or single shower cubicles and changing space for mixed use.
- The showers do not need to be dedicated to cyclists and can be those shared with other users/uses.

Compliant changing facilities:

- Appropriately sized for the likely/required number of users. The assessor should use their judgement to determine whether the changing area is appropriately sized given the number of cycle storage spaces or showers provided.
- Changing areas must include adequate space and facilities to hang or store clothing and equipment while changing or showering, e.g. bench seat and/or hooks.
- Toilet/shower cubicles cannot be counted as changing facilities.

Complaint 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.
- The lockers are sized appropriately for the storage of a cyclist's equipment.

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 to encourage the use of sustainable modes of transport and movement of people and goods during the operations and user.
- If the occupier is known, they must be involved in the development of the travel plan and they must confirm that the travel plan will be implemented post construction and supported by the building management in operation.
- The following measures could be considered as part of the travel plan for the development:
    - 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
    - Financial incentives and benefits for walking, cycling or car sharing
    - Providing information in lobby areas about public transport or car sharing made available
    - Improved safe access for pedestrians and cyclists as a feasible and within scope for the existing site (for all types of user regardless of the level of the mobility or visual impairment) via improved lighting, way-marking and signage for cyclist and pedestrian routes to adjoining routes, transport nodes and amenities and provision of new or improved crossing points for pedestrians and cyclists
    - Providing suitable taxi drop-off/waiting areas.
    - Improved lighting, landscaping and shelter to make pedestrian and public transport waiting areas pleasant

Appendix E – Water

E1: Wat 03 – Water Leak Detection and Prevention

Leak detection system

A leak detection system which is capable of detecting a major water leak on the mains water supply within the building and between the building and the utilities water meter is installed. The leak detection system must be:

- A permanent automated water leak detection system that alerts the building occupants to the leak OR an in-built automated diagnostic procedure for detecting leaks is installed.
- 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

Flow control devices that regulate the supply of water to each WC area/facility according to demand are installed. 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 pre-set 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.

Appendix F - Materials

F1: Mat 01 - Environmental Impact of Materials

Relevant elements

1. Part 1 includes elements of the fabric and structure including:
    a. External walls (envelope, structure and finishes)
    b. External windows and roof lights
    c. Structural frame
    d. Basements/retaining walls (including excavations)
    e. Upper floors (including horizontal structure)
    f. Roof (including coverings)
    g. Stairs
    h. External solar shading devices, access structures etc.
    i. Ground/lowest floor
2. Part 2 and 3 includes elements used for core and local services including:
    a. Heat source, space heating, air conditioning and ventilation
    b. Communication, security and control systems
    c. Electrical installations
    d. Fire and lightning protection
    e. Lift and conveyor installations/systems
    f. Water and waste installations
    g. Sanitary installations
3. Part 4 includes interior fit-out elements s including:
    a. Internal floor finishes (including access floors)
    b. Internal ceiling finishes (incl. suspended/access ceilings)
    c. Internal walls and partitions
    d. Internal wall finishes
    e. Internal windows
    f. Internal doors
    g. Furniture (desks, chairs, display cabinets, shelving)
    h. Fittings (shop fittings, railings, screens, gutters, vents, air grilles)

F2: Mat 03 - Responsible Sourcing of Materials

Sustainable Procurement Plan

A plan that sets out a clear framework for the responsible sourcing of materials to guide procurement throughout a project and by all involved in the specification and procurement of construction materials. The plan may be prepared and adopted at an organisational level or be site/project specific and for the purposes of BREEAM compliance, will cover the following as a minimum:

- Risks and opportunities are identified against a broad range of social, environmental and economic issues. BS 8902:2009 Responsible sourcing sector certification schemes for construction products- Specification can be used as a guide to identify these issues.
- Aims, objectives and targets to guide sustainable procurement activities.
- The strategic assessment of sustainably sourced materials available locally and nationally. There should be a policy to procure materials locally where possible.
- Procedures are in place to check and verify that the sustainable procurement plan is being implemented/adhered to on individual projects. These could include setting out measurement criteria, methodology and performance indicators to assess progress and demonstrate success.

Responsible Sourcing

Location/use categories to be included in assessment:

- External wall (e.g. bricks, blocks)
- External wall finishes (plastering, cladding, render, internal dry lining, wall coverings etc.)
- Insulation
- Roof (structure)
- Roof finishes (e.g. tiles, cladding systems, etc.)
- Upper floors (mezzanines)
- Floor (structure)
- Flooring finishes (including coatings)
- Internal partitions / internal walls (structure)
- Internal partitions / internal walls (finishes, wall coverings)
- Ceiling (structure)
- Ceiling finishes (including coatings)
- External / internal doors/ windows
- Staircases / ramps
- Fittings (shop fittings, railings, screens, gutters, vents , air grilles)
- Furniture (desks, chairs, display cabinets, shelving)
- Building services (equipment, distribution systems)
- Hard landscaping
- Other

Applicable materials within above elements:

- Timber/timber-based products
- Concrete/cementitious
- Metal
- Stone/aggregate
- Clay based (pavers, blocks, bricks, roof tiles, etc.)
- Gypsum
- Glass
- Plastic, polymer, resin, paint, chemicals and bituminous
- Animal fibre/skin
- Other

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 10 being the best and 1 the worst.

Responsible Sourcing & Tiers		
Scheme	Certification level/scope	Tier level
BRE Global, BES6001 Product /Standard certification	All ratings	5
Timber FSC / PEFC / SFI	Chain of custody certification	5
Environmental Management System (EMS) (certified)	Key process and supply chain extraction process4	2
Environmental Management System	Key process	1

(EMS) (certified)		
Re-used materials	-	10

Table D1-1

F3: Mat 05 – Design for Durability and Resilience

Protecting vulnerable parts of the building from damage

The building incorporates suitable durability and protection measures or designed features/solutions to prevent damage to vulnerable parts of the internal and external building and landscaping elements. This must include, but is not necessarily limited to:

- Protection from the effects of high pedestrian traffic in main entrances, public areas and thoroughfares (corridors, lifts, stairs, doors etc).
- Protection against, or prevention from, any potential vehicular collision where vehicular parking and manoeuvring occurs within 1m of the external building façade for all car parking areas and within 2m for all delivery areas

Protecting exposed parts of the building from material degradation

- Existing applicable building elements have been surveyed to identify whether material degradation effects are evident including an assessment to grade the severity of any degradation effects. Design and specification measures have been developed to repair and protect existing elements according to the severity of any degradation affects. Where it is not feasible to implement measures to limit material degradation, justification should be provided
- Newly specified materials or newly constructed elements (e.g. new external wall) within the scope of refurbishment works incorporate appropriate design and specification measures to limit material degradation due to environmental factors
- For listed buildings and buildings in a conservation area, measures to protect vulnerable parts of the building and limit material degradation should be based on the measures that are feasible within the scope of any heritage requirements that may be explicitly required by the relevant conservation authority. This should consider the range of options that may be feasible in order to demonstrate compliance with justification provided, including reference to documentary evidence to verify any restrictions that are in place that prevent compliance with any durability measures.

The relevant building elements incorporate appropriate design and specification measures to limit material degradation due to environmental factors listed below:

- Identify from the list of applicable building elements below the elements that are appropriate to the building being assessed:
    - Foundation/substructure/lowest floor/retaining walls
    - External walls
    - Roof/balconies
    - Glazing: windows, skylights
    - External doors
    - Railings/balusters (where exposed to external environment)
    - Cladding (where exposed to external environment)
    - Staircase/ramps (where exposed to external environment)
    - Hard landscaping
- Establish from the environmental factors list below those factors that are likely to cause material degradation effects in the identified applicable building elements:
    - <u>Environmental agents, including:</u>
    - Solar radiation

  - Temperature variation
  - Water/moisture
  - Wind
  - Precipitation, e.g. rain and snow
  - Extreme weather conditions: high wind speeds, flooding, driving rain, snow
    Biological agents, including:
  - Vegetation
  - Pests, insects
  - Pollutants, including:
  - Air contaminants
  - Ground contaminants
- Confirm the design and specification measures in place to limit degradation effects.
- Material degradation effects (includes, but not necessarily limited to the following)
  - Corrosion
  - Dimensional change, e.g. swelling or shrinkage
  - Fading/discolouration
  - Rotting
  - Leaching
  - Blistering
  - Melting
  - Salt crystallisation
  - Abrasion

F4: Mat 06 – Material Efficiency

- The process of undertaking a building project to enable the most efficient use of materials over the life cycle of the building and its components. This includes using fewer materials, reusing existing demolition/strip-out materials and, where appropriate, procuring materials with higher levels of recycled content. It may also include the adoption of alternative means of design/construction that result in lower materials usage and lower wastage levels including off-site manufacture and use of pre-assembled service pods.

- Opportunities have been identified, and appropriate measures investigated and will be implemented/have been implemented, to optimise the use of materials in building design, procurement, construction, maintenance and the end of life

- This investigation has been carried out or will be carried out by the design/construction team in consultation with the relevant parties at each of the following RIBA stages:
  - Preparation and Brief
  - Concept Design
  - Developed Design
  - Technical Design
  - Construction

Examples of useful information to help in the optimisation of materials use at different RIBA Plan of Work stages

RIBA Stage	Information / actions	Output
0. Strategic Definition		Strategic brief to include section on material efficiency which identifies client aspirations and objectives
1.	Include information from:	Project brief including

Preparation and Brief	• Pre-refurbishment audit to identify potential reuse opportunities on and off-site (Wst 1) • Waste forecasts • Assessment of site constraints that may influence material efficiency • Other project specific feasibility studies.	Initial resource management plan • Project targets (waste arisings, percentage reuse, percentage recycled content) • Roles and responsibilities.
2. Concept Design	• Designing out waste workshop/discussions output (follow WRAP 5 principles of designing out waste) • Development of improved forecasts of types and amounts of waste • Engagement with contractors to investigate waste reduction activities • Prioritisation of ideas.	Expanded project brief summarising activities relating to material efficiency.
3. Developed Design	• Incorporation of selected ideas into drawings and outline specifications • Assessment of savings in material quantities.	Resource management plan updated to include accurate waste forecasts, opportunities to design out waste and increase reclaimed content.
4. Technical Design	• Engagement with contractors, subcontractors and suppliers • Consultations with planning or building regulation authorities.	• Report with final options from previous statements and reasons for inclusion/exclusions • Updated resource management plan including waste forecasts, design decisions.
5. Construction		• Updated resource management plan to include actual waste arisings and performance against targets (linked to Wst 1).

Appendix G - Waste

G1: Wst 01 – Construction waste management

Pre-refurbishment audit

The client shall ensure that a pre-refurbishment audit of all existing buildings, structures or hard surfaces within scope of the refurbishment or fit-out zone is completed.

The requirements for carrying out an appropriate pre-refurbishment audit are:

- The audit should be carried out at the Concept Design Stage (equivalent to RIBA stage 2) before the appointment of demolition or strip-out contractors in order to use the audit results to guide the design, considering materials that can be reused and to set targets for waste management and ensure all contractors are engaged in the process of maximising high grade reuse and recycling opportunities.
- The audit should be carried out by a competent person who is independent of the project, has appropriate knowledge of buildings, waste and options for the re-use and recycling of different waste streams
- Actual waste arising and waste management routes used should be compared with those forecast from the audit and barriers to achieving targets should be investigated.

The audit must be referenced in the resource management plan and cover:

- Identification and quantification of the key materials where present on the project (see Table - 65)
- Potential applications and any related issues for the reuse and recycling of the key materials in accordance with the waste hierarchy
- Identification of local reprocessors or recyclers for recycling of materials
- Identification of overall recycling rate for all key materials
- Identification of reuse targets where appropriate.
- Identification of overall landfill diversion rate for all key materials.

Re-use and direct recycling of materials

- Where 50% of the waste material types detailed in Table - 64, that are present on the project, are either reused on or off-site, or directly recycled on or off-site via a specialised materials re-processer or manufacturer.
- Two credits are awarded where 75% of the waste material types detailed in the table below.

Material	Options for reuse or direct recycling
Inert materials (excluding soil)	- On-site or off-site reuse in original form e.g. bricks, roof tiles, paving slabs, kerbs, cills - Recycling and reuse on site e.g. crushing bricks and reusing for hardstandings, backfill - Off-site recycling via exempt/licensed sites able to recycle materials
New and used metal materials	- On-site or off-site reuse of metal material in original form - Off-site direct recycling of metal via a metals re-processor
Composite materials (materials which	- On-site or off-site reuse in original form

include more than one material type often bonded together)	
New and used plasterboard (including all used plasterboard from demolition phase/offcuts/unused boards)	- On-site reuse in original form - Off-site reuse of unused/undamaged plasterboard on other construction or refurbishment projects - Off-site reuse options for unused or undamaged plasterboard – e.g. local community scheme, surplus construction material trading, charities - Plasterboard manufacturer take-back schemes e.g. collection of bagged offcuts or unused boards - Collection by specialist plasterboard recycler
Furniture	- On-site reuse in original form - Off-site reuse options – e.g. local community schemes, local charities, schools, etc - Direct recovery of segregated materials via a specialist materials re-processor e.g. metal furniture sent to a metals re-processor, timber furniture sent to a specialist wood recycler
Timber products (All sawn soft/hard wood only – no board products e.g. MDF/chipboard etc)	- On-site reuse of timber on the project - Off-site reuse via another project, National/local community wood reuse/recycling scheme - Off-site direct recycling via a specialist timber recycler
New and used mineral fibre ceiling panels and tiles	- Off-site recycling via a national or local ceiling panel or tile recycling service or manufacturer for closed loop recycling (see Relevant definition).
Vinyl floor coverings (uplifted vinyl flooring and post-installation off-cuts)	- Off-site direct recycling via a national or local vinyl flooring recycling service or manufacturer for closed loop recycling
Used carpet tiles (good reusable condition)	- On-site reuse of carpet tiles - Off-site reuse or recycling via a specialist carpet tile recycler or manufacturer for closed loop recycling
Packaging materials (all timber, cardboard & plastic)	- Repatriation of wooden pallets from product suppliers for direct reuse - On-site segregation of cardboard and plastic for collection by specialist re-processor
New and unused insulation board (foam board only e.g. EPS, XPS, ISO, COMP. Not mineral fibre)	- Onsite or off-site reuse of new and unused insulation board on other construction/refurbishment projects, local community schemes, charities - Resale of insulation board via surplus construction material trading companies

	- Collection by specialist insulation board recycler or manufacturer for closed loop recycling
Fixtures and fittings	- On-site or off-site reuse in original form e.g. sinks, doors, gates

G2: 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
Bound		
Structural frame	15%	30%
Bitumen or hydraulically bound base, binder, and surface courses for paved areas and roads	30%	75%
Building foundations	20%	35%
Concrete road surfaces	15%	45%
Unbound		
Pipe bedding	100%	N/A
Granular fill and capping (see Compliance notes)	100%	N/A

The recycled or secondary aggregates are EITHER:

- Construction, demolition and excavation waste obtained on-site or off-site OR
- Secondary aggregates obtained from a non-construction post-consumer industrial by-product source.

<u>Secondary aggregates</u>

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

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

G3: Was 05 – Adaptation to Climate Change

Adaptation to climate change – structural and fabric resilience

Conduct a climate change adaptation strategy appraisal for structural and fabric resilience by the end of Concept Design (RIBA Stage 2), in accordance with the assessment structure laid out below.

Carry out a systematic (structural and fabric resilience specific) risk assessment to identify and evaluate the impact on the building overs its projected life cycle from expected extreme weather conditions arising from climate change and, where feasible, mitigate against these impacts. The assessment should cover the following stages:

- Hazard identification
    - Review the evidence/information from the relevant bodies to identify and understand the expected impacts of increased extreme weather events climate change for on the building
    - Identify likely hazards
- Hazard assessment
    - Identify the scale of hazards identified
- Risk estimation. This should identify the risk presented by these hazards to the building and the likely impact of the hazards taking into account the following aspects as a minimum:
    - Structural stability
    - Structural robustness
    - Weather proofing and detailing
    - Material durability
    - Health and safety of building occupants and other
    - Impact on building contents and business continuity
- Risk evaluation
    - Evaluate the potential impact of these risks on the building
    - Determine the tolerable risk threshold
    - Check the sensitivity of the risk assessment
    - Identify areas where the risks are unacceptable in health and safety, life cycle assessment and financial terms
- Risk management
    - Identify risk reduction measures
    - Mitigate the hazards as far as is practically feasible
    - Adapt the design/specification to incorporate the measures identified by the risk assessment in the final design

Innovation Credit

For this credit it to be achieved the following credits must also have also been achieved:

- Wst 05 - Adaptation to Climate Change
- Hea 04 – Thermal Comfort – criterion 6 of the second credit
- Ene 01 – Reduction of Energy Use and Carbon Emissions – at least eight credits must have been achieved
- Ene 04 – Low Carbon Design – the passive design analysis credit has been achieved
- Wat 01 – Water Consumption – minimum of three credits must have been achieved

- Mat 05 – Design for Durability and Resilience – criterion 2 to material degradation must have been achieved
- Pol 3 – Surface Water Run-Off – a minimum of one credit has been achieved for Flood risk and two credits have been achieved for surface water run-off

G5: Was 06 - Functional Adaptability

- A building-specific functional adaptation strategy study has been undertaken by the client and design team by Concept Design (RIBA Stage 2), which includes recommendations for measures to be incorporated to facilitate future adaptation.
- Functional adaptation measures (see Table below) have been adopted in the design by the Technical Design Stage (RIBA Stage 4) in accordance with the functional adaptation strategy recommendations, where practical and cost effective. Omissions have been justified in writing to the assessor.

	Accessibility	Spatial Adaptability	Expandability
Part 1: Fabric and Structure - External Walls - Cladding - Ground and first floor - Roof	Use of products or systems which allow easy replacements	Location of structural components within the floor space	Provision to add extensions or alterations to increase building capacity
Parts 2 and 3: Core and Local Services - Mechanical and electrical - Plumbing - Stairs and Lifts - Fire	Inclusion of facilities management requirements and CDM feedback for future operational needs		Provision of capacity in infrastructure to enable future expansion and adaptation
Part 4: Interior Design - Finishes - Floors - Interior walls - Connections	Use of products or systems which allow easy replacements	Layout in standardised grids Use of inherent finishes to allow easy replacement Use of standardised material sizes	Identifying or recognising potential future functional requirements Efficient use of space to allow for any increase in occupancy

Functional adaptation strategy study

This should consider:

- The potential for major refurbishment, including replacing the façade.
- Design aspects that facilitate the replacement of all major plant within the life of the building, e.g. panels in floors/walls that can be removed without affecting the structure, providing lifting beams and hoists.
- The degree of adaptability of the internal environment to accommodate changes in working practices.
- The degree of adaptability of the internal physical space and external shell to accommodate change in-use.

- The extent of accessibility to local services, such as local power, data infrastructure etc.

Functional adaptation implementation

The implementation will be specific to the building and scope of the project, but information should be made available to the assessor covering:

- The feasibility for multiple/alternative building uses and area functions, e.g. related to structural design of the building.
- Options for multiple building uses and area functions based on design details, e.g. modularity.
- Routes and methods for major plant replacement, e.g. networks and connections have flexibility and capacity for expansion.
- Accessibility for local plant and service distribution routes, e.g. detailed information on building conduits and connections infrastructure.
- The potential for the building to be extended, horizontally and/or vertically.

Appendix H – Land Use & Ecology

H1: LE05 – Long term impact on biodiversity

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.

Additional measures for the improvement of long term biodiversity

- 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, on-going 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 have a permanent automated refrigerant leak detection system installed; OR where an in-built automated diagnostic procedure for detecting leakage is installed. In all instances a robust and tested refrigerant leak detection system must be installed and must be capable of continuously monitoring for leaks
- The system must be capable of automatically isolating and containing the remaining refrigerant(s) charge in response to a leak detection incident.

J2: Pol 03 – Surface Water Runoff

Flood Risk Management

Low Flood Risk

The checklist below shows the requirements for avoidance of flooding.

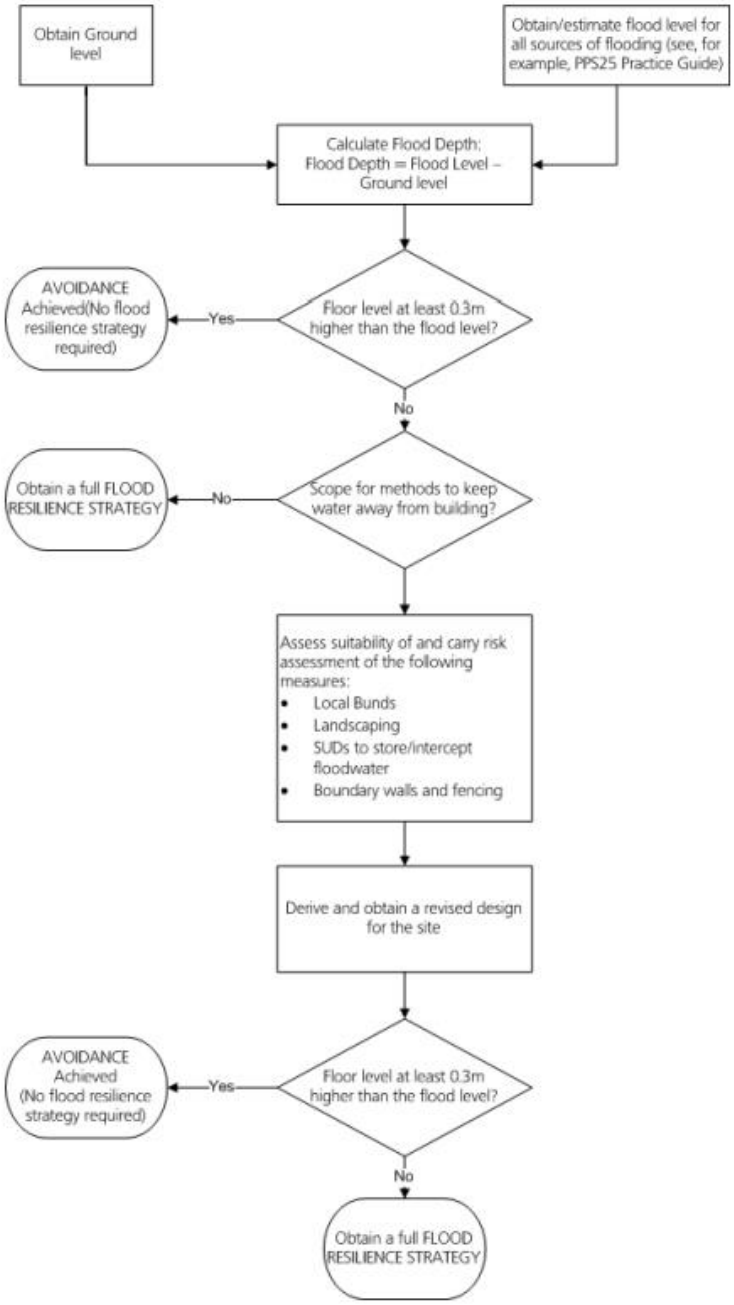
Medium/High Flood Risk

The criteria below must be met

- Where the refurbishment or fit-out zone achieves avoidance from flooding through either:
    - The refurbishment and fit-out zone is located entirely on the first floor or above and a flood emergency plan has been developed in accordance with 'Would your business stay afloat? A Guide to preparing your business for flooding', Environment Agency, 2011

      OR
    - As a result of the building's floor level or measures to keep water away, the building is defined as achieving avoidance from flooding by following the checklist below.
- Where avoidance is not possible the credits can be achieved where full flood resilience/resistance strategy is implemented for the building's scope of work in accordance with recommendations made by a Suitably Qualified Building Professional.
    - Part 1: Fabric – using flood resilient materials and flood protection measures for the building fabric, e.g. waterproof materials, impermeable membranes, flood barriers, safe access/exit points in the event of a flood etc.
    - Part 2: Core services – core services and associated infrastructure (including equipment and vulnerable pipes/ducts/cables etc.) should be located/specified so as to protect services from flooding damage, e.g. location/routing/height, protection of building apertures (such as intakes/extracts/ventilation), non-return valves etc.
    - Part 3: Local services – the location/height of local services such as sockets, vents etc. and the location of the wiring/pipework/ductwork in relation to the flood level and other measures to protect local services.
    - Part 4: Interior – the proposed function of spaces that are below the flood level (e.g. sacrificial spaces) should be limited to those which are not susceptible to flood damage, and the resilience of materials used for partitions, walls, floors, ceiling finishes, furniture and fittings and the location of equipment in relation to the flood level, e.g. avoid storing flood sensitive materials and functions in spaces that are

below the flood level.



Checklist : Achieving avoidance from flooding

Surface water run-off

Neutral impact on surface water

- Where there is an increase in impermeable surfaces as a result of the refurbishment works then the following must be met:
    - Hard standing areas - where there is an extension or increase in the hardstanding areas and hence an increase in the total impermeable area as a result of the refurbishment works, the hardstanding area must be permeable or be provided with on-site SuDS to allow full infiltration of the additional volume, to achieve the same end result. The permeable hardstanding must include all pavements and public rights of way, car parks, driveways and non-adoptable roads, but exclude

footpaths that cross soft landscaped areas which will drain onto a naturally permeable surface.

- Building extension - where there is an increase in building footprint, extending onto any previously permeable surfaces, the additional run-off caused by the area of the new extension must be managed on-site using an appropriate SuDS technique for rainfall depths up to 5mm.

Reducing run-off

- Either of the following criteria are met:
  - There is a decrease in the impermeable area by 50% or more, from the pre-existing impermeable hard surfaces; OR
  - Where run-off as a result of the refurbishment is managed on-site using source control achieving the following requirements:
    - The peak rate of run-off as a result of the refurbishment for the 1 in 100 year event has been reduced by 50% from the existing site.
    - The total volume of run-off discharged into the watercourses and sewers as a result of the refurbishment, for a 1 in 100 year event of 6 hour duration has been reduced by 50%.
    - An allowance for climate change must be included for all of the above calculations; this should be made in accordance with current best practice planning guidance.

Minimising watercourse pollution

- There is no discharge from the developed site for rainfall up to 5mm as confirmed by the Appropriate Consultant.
- Where suitable pollution prevention measures are put in place (or already exist) for the different sources of pollution present on the assessed site
- A comprehensive and up-to date drainage plan of the site will be made available for the building/site occupiers.
- Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place.

Exemplary requirements

The following must be achieved to confirm compliance:

- Peak run-off as a result of the refurbishment for the 1 in 1 year event is reduced to zero
- The peak rate of run-off as a result of the refurbishment for the 1 in 100 year event is reduced to zero
- There is no volume of run-off discharged into the watercourses and sewers as a result of the refurbishment, for a 1 in 100 year event of 6 hour duration
- An allowance for climate change must be included for all of the above calculations, in accordance with current best practice national planning guidance
- Where an appropriately qualified professional has been employed to provide the above calculations and design an appropriate drainage strategy for the site, ensuring all above criteria are achieved.

J3: Pol 05 - Reduction of Noise Pollution

Where the building has noise-sensitive areas or buildings within 800m radius of the site:

- A noise impact assessment in compliance with BS 7445 has been carried out and the following noise levels measured/determined:
    - Existing background noise levels at the nearest or most exposed noise-sensitive development to the proposed development or at a location where background conditions can be argued to be similar.
    - The rating noise level resulting from the new noise source through the use of calculations or scale model predictions.
- The noise impact assessment must be carried out by a suitably qualified acoustic consultant holding a recognised acoustic qualification and membership of an appropriate professional body.
- The noise level from the proposed site/building, as measured in the locality of the nearest or most exposed noise-sensitive development, is a difference no greater than +5dB during the day (07:00 to 23:00) and +3dB at night (23:00 to 07:00) compared to the background noise level.
- Where the noise source(s) from the proposed site/building is greater than the levels described in item 3, measures have been installed to attenuate the noise at its source to a level where it will comply with item 3.

*Suitably qualified acoustician (SQA)

An individual achieving all the following items can be considered to be 'suitably qualified' for the purposes of a BREEAM assessment:

- Holds a degree, PhD or equivalent qualification in acoustics/sound testing.
- Has a minimum of three years relevant experience (within the last five years). Such experience must clearly demonstrate a practical understanding of factors affecting acoustics in relation to construction and the built environment; including, acting in an advisory capacity to provide recommendations for suitable acoustic performance levels and mitigation measures.
- An individual who holds a recognised acoustic qualification and membership of an appropriate professional body. The primary professional body for acoustics in the UK is the Institute of Acoustics.

Where a suitably qualified acoustician is verifying the acoustic measurements/calculations carried out by another acoustician who does not meet the SQA requirements, they must, as a minimum, have read and reviewed the report and confirm in writing that they have found it to:

- Represent sound industry practice
- Be appropriate given the building being assessed and scope of works proposed
- Avoid invalid, biased and exaggerated recommendations.

Additionally, written confirmation from the third party verifier that they comply with the definition of a Suitably Qualified Acoustician is required.