



ELEMENT
SUSTAINABILITY

NORFOLK HOUSE, MANCHESTER

BREEAM REFURBISHMENT AND FIT- OUT 2014

OCTOBER 2025

REF: 2025.210



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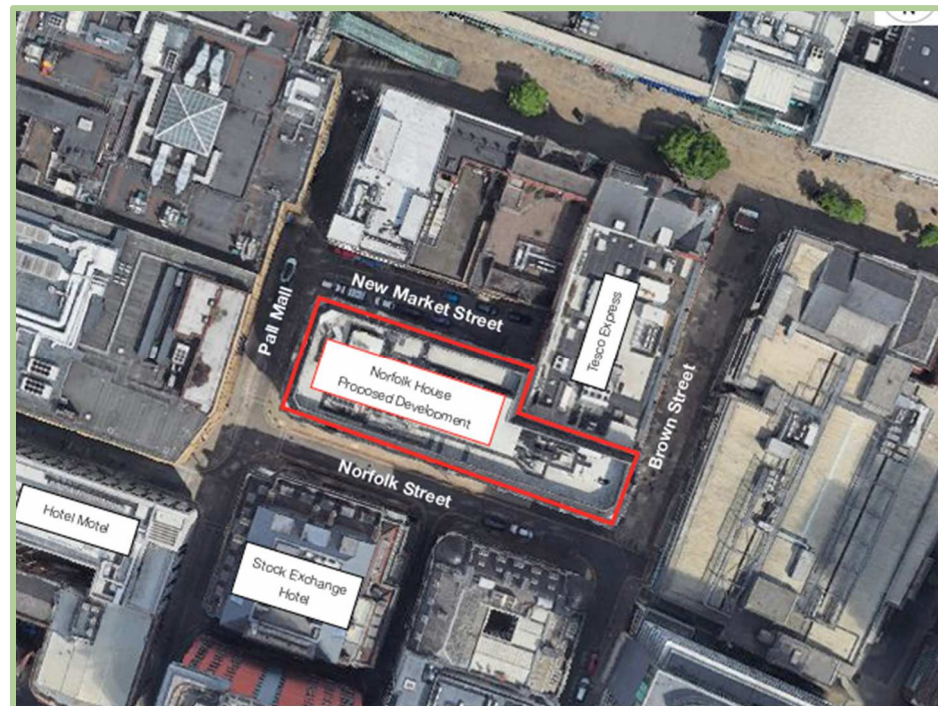


1.0 Introduction

Element Sustainability has been appointed to complete an assessment of the proposed development under the Building Research Establishment Environmental Assessment Methodology (BREEAM). This pre-assessment review report gives an indication of the expected BREEAM score and rating for the development that may be achieved when the final assessment is submitted to the Building Research Establishment (BRE), based on the information provided at this pre-assessment stage.

The proposed scheme involves changing the use class from offices to a hotel facility, providing rooms on five floors with amenities and F&B facilities at the ground floor.

Figure 1.1 – Proposed Development Site



2.0 Background to Sustainability Design and BREEAM

Sustainability is defined as the ability to meet the needs of today, without compromising the ability of future generations to provide for the needs of tomorrow¹. It can be described as the equilibrium between environmental and financial considerations, and the needs of the community, see Figure 2.1.

A truly sustainable development will achieve a balance between fit-for-purpose, value-for-money, and environmental impact and will achieve this via integration as part of a larger, sustainable community. BREEAM is a holistic assessment methodology that assesses, encourages and rewards environmental, social and economic sustainability throughout the built environment.

Figure 2.1 – Three Pillars of Sustainability



¹ World Commission on Environment and Development's 1987 Brundtland report 'Our Common Future'



3.0 BREEAM

The BREEAM UK Refurbishment and Fit Out 2014 scheme can be used to assess the environmental life cycle impacts of existing non-domestic buildings at the refurbishment and fit-out stages. 'Refurbishment' encompasses a wide range of works to improve the performance, function and overall condition of an existing building.

Buildings are assessed using a system of credits. The credits are grouped within the following categories:

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

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.

3.1 BREEAM Methodology

It is important to build a robust strategy for the BREEAM certification process into the project programme to ensure that the client's requirements can be achieved. It is recommended that a 'managed' assessment is undertaken.

The BREEAM UK Refurbishment and Fit Out 2014 scheme can be used to provide an environmental performance standard against which non-domestic refurbishment and fit-out projects in the UK can be assessed and achieve a BREEAM Refurbishment and Fit-out rating.

A BREEAM pre-assessment report has been prepared by a qualified and licensed BREEAM Accredited Professional and Assessor to demonstrate the feasibility of achieving the desired BREEAM ratings for the scheme. The initial pre-assessment report details the possible strategies to be employed.

3.1.1 Pre-Assessment Stage Review

A Pre-assessment review is important for assessment strategy. This review needs to be carried out as early as possible in the design process to ensure the project has a preferred strategy to achieving the required BREEAM rating that has been considered and agreed with the design and client team.



3.1.2 Design Stage Review

Design specifications are assessed for each individual building, before construction begins. A score rating is determined, and (subject to quality assurance) a Design Stage or Interim Certificate is awarded for the building. The BREEAM assessors can apply for assessment of a site, compile and submit a design report for assessment and monitor the assessment status online.

3.1.3 Post Construction Stage Review

The Post Construction Stage (PCS) assessment confirms that buildings have either been built to the Design Stage specifications or to (documented) variations from the Design Stage. Variations must be reassessed so that new scores and BREEAM levels can be calculated for each affected building. Where a Design Stage assessment has been undertaken, it is used to inform the PCS assessment.

3.1 BREEAM Rating Requirements

BREEAM rating benchmarks enable a client and all other stakeholders to compare the performance of a refurbishment or fit-out project with other BREEAM rated buildings, and the typical sustainability performance of a stock of existing non-domestic buildings in the UK. The BREEAM benchmark ratings are presented in Table 3.1 below.

Table 3.1 – BREEAM Rating Benchmarks (%)

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



3.2 BREEAM Category Weighting

An environmental weighting is applied to each of the above categories, as shown in Table 3.1 below, 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 weighting factors vary depending on whether the project is fully fitted, shell and core or shell only, and on the type of development under assessment.

Table 3.1 – BREEAM Weightings (%)

BREEAM Section	% Weighting
Management	14.5%
Health and Wellbeing	14.5%
Energy	17%
Water	7.5%
Materials	12.2%
Waste	8.8%
Land Use & Ecology	11.28%
Pollution	7.6%

3.3 Minimum Standards

The minimum standards for the BREEAM 'Very Good' rating are provided within Table 3.3 of this report and highlighted within the BREEAM Pre-Assessment Review Table 4.1. To achieve a particular level of performance the majority of BREEAM credits can be traded, i.e. non-compliance in one area can be offset through compliance in another to achieve the target BREEAM rating.

To ensure that performance against fundamental environmental issues is not overlooked in pursuit of a particular rating, BREEAM sets minimum standards of performance in key areas.



Table 3.3 - Minimum Standards

BREEAM RFO 2014 Issues	Minimum Standards for BREEAM for 'Very Good' rating
ENE 2: Energy Monitoring	One credit (First sub metering credit)
WAT 1: Water Consumption	One credit
WAT 2: Water Monitoring	Criterion 1 only
MAT 3: Responsible Sourcing of Materials	Criterion 1 only
WST 3: Operational Waste	One credit

3.4 RIBA Sensitive Credits

There are a number of BREEAM credits that need to be addressed at particular RIBA Stage. Under BREEAM RFO 2014 approximately 30% of the total credits available require actioning in RIBA Stage 2.

These credits have been highlighted in blue within the Pre-Assessment Review Table 4.1 below. A full outline of all the RIBA Stage sensitive credits is provided within Table 3.4.



Table 3.4 – RIBA Stage Sensitive Credits

	1. Preparation and Briefing	2. Concept Design	3. Spatial Co-ordination (Developed Design)	4. Technical Design	5. Manufacturing and Construction	6. Handover	7. Use
RIBA Stage	Mat 06 – Material Efficiency	Man 01 – Project Delivery Planning Man 01 – Stakeholder Consultation Man 01 – BREEAM AP Man 02 – Elemental LCC Hea 06 – Security Ene 04 – Passive Design Analysis Ene 04 – LZC Feasibility Study Tra 01 – Transport Assessment and Travel Plan Mat 03 – Sustainable Procurement Mat 06 – Material Efficiency Wst 01 – Pre-demolition Audit Wst 05 – Adaptation to Climate Change Wst 06 – Design for dis-assembly and Adaptability Le 02 – Identifying & Understanding the Risks and Opportunities for the Site Pol 03 – Flood Risk Assessment Pol 05 – Reduction of Noise Pollution	Man 01 – BREEAM AP (Developed Design) Hea 02 – Indoor Air Quality Plan Hea 05 – Acoustic Performance Mat 06 – Material Efficiency	Man 01 – Stakeholder Consultation Man 02 – Component Level LCC Options Appraisal Mat 01 – Building Life Cycle Assessment (LCA) Mat 06 – Material Efficiency Wst 05 – Adaptation to Climate Change Wst 06 – Design for dis-assembly and Adaptability	Man 03 – BREEAM AP (Site) Mat 06 – Material Efficiency	N/A	N/A



4.0 BREEAM Strategy and Targets

A BREEAM pre-assessment report has been prepared by a qualified and licensed BREEAM Accredited Professional to demonstrate the feasibility of achieving the desired BREEAM ratings for the new build scheme. The initial pre-assessment report details the possible strategies to be employed.

4.1 BREEAM Classification

The BREEAM assessment methodology applicable to this development is as follows:

- BREEAM Refurbishment & Fit Out (2014) (Other Building- **Other Building Hotel (Parts 2-4)**
 - ✗ Part 1 - Fabric
 - ✓ Part 2 – Core Services
 - ✓ Part 3 – Local Services
 - ✓ Part 4 – Interior Design

4.2 BREEAM Rating

A review of the current development proposals has been carried out against the BREEAM UK 2014 Refurbishment & Fit Out assessment methodology.

**It is anticipated that the scheme's design has the potential to score 59.04%
(minimum score level for BREEAM 'Very Good' rating is 55%).**

The rating obtained by using this BREEAM Pre-Assessment is for guidance only. The predicted ratings may differ from those obtained through a formal assessment, which will be carried out by an appropriately licensed BREEAM assessor or BREEAM Accredited Professional (AP). Advice should be sought from a licensed assessor at an early stage in a project to ensure the estimated rating will be obtained.

We recommend a score buffer of between 5% and 7% to allow for unexpected changes or compliance issues as the project progresses.



Within the Pre-assessments there may be issues which are outside of the current scope of works/specification. Attention must be paid to ALL credits listed within this report, to ensure the necessary measures required to achieve the associated credits are feasible, and if so, incorporated within specifications. It is sometimes the case that achievement of a particular BREEAM credit comes with a disproportionately increased cost, without offering equivalent advantages in functionality or sustainability. We would recommend that any such issues are identified early and that these issues are only incorporated within the design once a cost-benefit analysis has been carried out.

Table 4.1 below, provides full commentary on the BREEAM Strategy for the scheme.

Table 4.1 – Pre-Assessment Review

BREEAM Criteria					
Management					
Man 01 - Project brief and design					
	Credit	Available	Targeted	Potential	Criteria
1	Project delivery planning	1	0	1	<p>Credit Not Targeted POTENTIAL UPLIFT CREDIT AVAILABLE</p> <p>Responsibility: Project Manager / Design Team</p> <p>BREEAM CRITERIA A clear sustainability brief is developed prior to Concept Design which sets out:</p> <ul style="list-style-type: none"> a) Client requirements e.g. internal environmental conditions required b) Sustainability objectives and targets including target BREEAM rating, business objectives etc. c) Timescales and budget d) List of consultees and professional appointments that may be required e.g. Suitably Qualified Acoustician etc. e) Constraints for the project e.g. technical, legal, physical, environmental. <p>Prior to completion of the Concept Design (RIBA Stage 2 or equivalent), the project delivery stakeholders (see Relevant definitions) have met to identify and define their roles, responsibilities and contributions for each of the key phases of project delivery.</p>



					<p>In defining the roles and responsibilities for each key phase of the project, the following must be considered:</p> <ul style="list-style-type: none"> a. End user requirements b. Aims of the design and design strategy c. Particular installation and construction requirements/limitations d. Design and construction risk assessments e. Legislative requirements f. Procurement and supply chain g. Identifying and measuring project success in line with project brief objectives h. Occupiers' budget and technical expertise in maintaining any proposed systems i. Maintainability and adaptability of the proposals j. Requirements for the production of project and end user documentation k. Requirements for commissioning, training and aftercare support. <p>The project team demonstrate how the project delivery stakeholder contributions and the outcomes of the consultation process have influenced or changed the Initial Project Brief, including if appropriate, the Project Execution Plan, Communication Strategy, and the Concept Design.</p>
2	Stakeholder consultation (third party)	1	1	0	<p>Responsibility: Project Manager / Design Team</p> <p>BREEAM CRITERIA Prior to completion of the Concept Design, the design team consult with all interested parties (for example actual or intended building users, representative consultation group from the existing community, existing partnerships and networks that have knowledge of existing buildings of the same type, potential users of shared facilities) on matters that cover the minimum consultation content.</p> <p><u>Minimum Consultation Content:</u></p> <ul style="list-style-type: none"> 1. Functionality, build quality and impact (including aesthetics). 2. Provision of appropriate internal and external facilities (for future building occupants and visitors or users). 3. Management and operational implications.



					<p>4. Maintenance resources implications.</p> <p>5. Impacts on the local community, e.g. local traffic or transportation impact.</p> <p>6. Opportunities for shared use of facilities and infrastructure with the community or appropriate stakeholders.</p> <p>7. Compliance with statutory (national or local) consultation requirements.</p> <p>8. Energy use and sustainability measures.</p> <p>9. Implementing principles and processes that deliver an inclusive and accessible design.</p>
3	Sustainability Champion (design)	1	0	0	<p>Credit Not Targeted</p> <p>Responsibility: BREEAM AP</p> <p>BREEAM CRITERIA A Sustainability Champion has been appointed to facilitate the setting and achievement of BREEAM performance targets for the project. The design stage Sustainability Champion is appointed to perform this role during the feasibility stage (Stage 1, Preparation and Brief stage, as defined by the RIBA Plan of Work 2013 or equivalent).</p> <p>The defined BREEAM performance target(s) has been formally agreed (see Relevant definitions) between the client and design/project team no later than the Concept Design stage (RIBA Stage 2 or equivalent).</p> <p>To achieve this credit at the interim design stage assessment, the agreed BREEAM performance target(s) must be demonstrably achieved by the project design. This must be demonstrated via the BREEAM assessor's design stage assessment report.</p>
4	Sustainability Champion (monitoring progress)	1	0	0	<p>Credit Not Targeted</p> <p>Responsibility: BREEAM AP</p> <p>BREEAM CRITERIA The Sustainability Champion criteria above has been achieved.</p> <p>A Sustainability Champion is appointed to monitor progress against the agreed BREEAM performance target(s) throughout the design process and formally report progress to the client and design team.</p>



Man 02 - Life cycle cost and service planning					
	Credit	Available	Targeted	Potential	Criteria
1	Elemental LCC	2	0	0	<p>Credit Not Targeted</p> <p>Responsibility: QS / Cost Consultant</p> <p>BREEAM CRITERIA An outline, entire asset elemental life cycle cost (LCC) plan has been carried out at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) together with any design option appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:20081. The Elemental LCC plan:</p> <ul style="list-style-type: none"> a. An outline LCC plan has been undertaken for the project based on the building's basic structure and envelope, appraising a range of options and based on the life expectancy of the refurbished building, e.g. 20, 30, 50+ years. b. The servicing strategy for the project outlining services component over a 15 -year period, in the form of an 'elemental LCC Plan'. c. A fit-out strategy is developed outlining fit-out options over a 10-year period.
2	Component level LCC options appraisal	1	0	0	<p>Credit Not Targeted</p> <p>Responsibility: QS / Cost Consultant</p> <p>BREEAM CRITERIA A component level LCC plan has been developed by the end of Process Stage 4 (equivalent to Technical Design – RIBA Stage 4) in line with PD 156865:2008.</p> <p>Demonstrate, using appropriate examples provided by the design team, how the component level LCC plan has been used to influence building and systems design/specification to minimise life cycle costs and maximise critical value.</p>



3	Capital cost reporting	1	1	0	Responsibility: QS / Cost Consultant/Project Manager BREEAM CRITERIA Report the capital cost for the fit-out project in pounds per square metre of gross internal floor area (£k/m ²) as part of the submission to BRE.
Man 03 - Responsible construction practices					
	Credit	Available	Targeted	Potential	Criteria
Pre-req	Prerequisite - Legally harvested and traded timber		✓	✓	Responsibility: Main Contractor BREEAM CRITERIA Main contractor to ensure that all timber is legally harvested and trade timber.
1	Environmental management	1	1	0	Responsibility: Main Contractor BREEAM CRITERIA Main Contractor to operates ISO 14001; and, The principal contractor implements best practice pollution prevention policies and procedures on-site in accordance with Pollution Prevention Guidelines, Working at construction and demolition-sites: PPG6.
2	BREEAM AP (site)	1	1	0	Responsibility: BREEAM AP / Main Contractor BREEAM CRITERIA A Sustainability Champion is appointed to monitor the project to ensure ongoing compliance with the relevant sustainability performance/process criteria, and therefore BREEAM target(s), during the Construction, Handover and Close Out stages.
3	Responsible construction management	2	2	0	Responsibility: Main Contractor BREEAM CRITERIA The Main Contractor to register with CCS and provided a compliance report and certificate. <u>1no. credit</u> = Score of 27 and 9 within each section – Min. Standard for Excellent. <u>2no. credit</u> = Score of 35 and 11 within each section.



4	Monitoring of construction site impacts	2	2	0	<p>Responsibility: Main Contractor</p> <p>BREEAM CRITERIA First monitoring credit - Utility consumption Main Contractor sets targets, monitors and reports on energy and water consumption each month, based on site activities.</p> <p>Second monitoring credit - transportation of construction materials and waste Main Contractor monitors transport of materials from the factory gate to the building site, including any transport, intermediate storage and distribution; as well as Transport of construction waste from the construction gate to waste disposal processing/recovery centre gate.</p>
e1	Responsible construction management	1	0	1	<p>Credit Not Targeted POTENTIAL UPLIFT CREDIT AVAILABLE</p> <p>Responsibility: Main Contractor</p> <p>BREEAM CRITERIA In addition to meeting the criteria for two credits for considerate construction, the contractor achieves compliance with the criteria of the compliant scheme to an exemplary level of practice = Score of 39 and 13 within each section.</p>
Man 04 - Commissioning and handover					
	Credit	Available	Targeted	Potential	Criteria
1	Commissioning - testing schedule and responsibilities	1	1	0	<p>Responsibility: M&E and Main Contractor</p> <p>BREEAM CRITERIA BREEAM criteria: 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:</p> <ol style="list-style-type: none"> 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.



					<p>The schedule will identify the appropriate standards that all commissioning activities will be conducted in accordance with, such as current Building Regulations, BSRIA and CIBSE guidelines and/or other appropriate standards, where applicable. Where a building management system (BMS) is specified, refer to compliance note CN8 on BMS commissioning procedures.</p> <p>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.</p> <p>The principal contractor accounts for the commissioning and testing programme, responsibilities and criteria within their budget and main programme of works, allowing for the required time to complete all commissioning and testing activities prior to handover.</p>
2	Commissioning building services	1	1	0	<p>Responsibility: M&E and Main Contractor</p> <p>BREEAM CRITERIA</p> <p>Where work is being undertaken to upgrade, renovate or install new building services and systems.</p> <p>a. For complex building services and systems, this role must be carried out by a specialist commissioning manager who is appointed during the design stage (by either client or contractor) with responsibility for:</p> <ul style="list-style-type: none"> I. Undertaking design reviews and giving advice on suitability for ease of commissioning II. Providing commissioning management input to construction programming and during installation stages III. Management of commissioning, performance testing and handover/post-handover stages. <p>b. For simple building services, this role can be carried out by an appropriate project team member (see criterion 3), provided they are not involved in the general installation works for the building services system(s).</p>



3	Testing and Inspecting the Building Fabric	1	0	0	Not Applicable to a Part 2-4 Assessment
4	Handover	1	1	0	<p>Responsibility: Main Contractor and Design Team</p> <p>BREEAM CRITERIA A Building User Guide is developed or (where present) an existing Building User Guide is updated, prior to handover for distribution to the building occupiers and premises managers (see Man 04 Commissioning and handover), with a draft copy developed and discussed with users first (where the building occupants are known) to ensure the guide is most appropriate and useful to potential users.</p> <p>A training schedule is prepared for building occupiers/premises managers, timed appropriately around handover and proposed occupation plans.</p>
Man 05 - Aftercare					
	Credit	Available	Targeted	Potential	Criteria
1	Aftercare support	1	1	-	<p>Responsibility: Main Contractor</p> <p>BREEAM CRITERIA There is (or will be) operational infrastructure and resources in place to provide aftercare support to the building occupier(s), which includes the following as a minimum: a. 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: i. Introduce the aftercare team or individual to the aftercare support available, including the Building User Guide (where existing) and training schedule/content. ii. Present key information about features of the refurbished building including the design intent and how to use the building to ensure it operates as efficiently and effectively as possible (including the use of local services and controls and central services, as applicable).</p>



					<p>b. On-site facilities management training, to include a walkabout of the refurbished area of the building and introduction to, and familiarisation with the building systems, their controls and how to operate them in accordance with the design intent and operational demands.</p> <p>c. Initial aftercare support 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 (this could be more or less frequent depending on the complexity of the building and building operations).</p> <p>d. Longer term aftercare support provision for occupants for at least the first 12 months from occupation, e.g. a helpline, nominated individual or other appropriate system to support building users/management.</p> <p>There is (or will be) operational infrastructure and resources in place to coordinate the collection and monitoring of energy and water consumption data for a minimum of 12 months (for Part 4, where local metering is available and accessible), once the building is occupied. Discrepancies between actual and predicted performance should be identified, with a commitment to identify actions required to address any discrepancies such as adjusting systems and/or to develop/review operational policies to influence user behaviours accordingly.</p>
2	Seasonal Commissioning	1	1	-	<p>Responsibility: M&E and Main Contractor</p> <p>BREEAM CRITERIA</p> <p>The following seasonal commissioning activities will be completed over a minimum 12-month period, once the building becomes substantially occupied (except solar photovoltaics):</p> <p>a. Complex systems - Specialist Commissioning Manager:</p> <p>i. 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).</p> <p>ii. Where applicable, testing should also be carried out during periods of extreme (high or low) occupancy.</p> <p>iii. Interviews with building occupants (where they are affected by the complex services) to identify problems or concerns regarding the effectiveness of the systems.</p> <p>iv. Re-commissioning of systems (following any work needed to serve revised loads), and incorporating any revisions in operating procedures into the operations and maintenance (O&M) manuals.</p>



					<p>b. Simple systems (naturally ventilated) - external consultant/aftercare team/facilities manager:</p> <p>i. Review thermal comfort, ventilation, and lighting, at three, six and nine month intervals after initial occupation, either by measurement or occupant feedback.</p> <p>ii. Take all reasonable steps to re-commission systems following the review to take account of deficiencies identified and incorporate any relevant revisions in operating procedures into the O&M manuals.</p>
3	Post occupancy evaluation (POE)	1	1	-	<p>Responsibility: Client / Building Operator</p> <p>BREEAM CRITERIA</p> <p>The client or building occupier makes a commitment to carry out a post occupancy evaluation (POE) exercise one year after initial building occupation (see compliance note CN7). This is done to gain in-use performance feedback from building users to inform operational processes, including re-commissioning activities, and maintain or improve productivity, health, safety and comfort. The POE is carried out by an independent party (see Man 01 Project brief and design – Relevant definitions) and needs to cover:</p> <p>a. A review of the design intent and construction process (review of design, procurement, construction and handover processes).</p> <p>b. Feedback from a wide range of building users including facilities management on the design and environmental conditions of the building covering:</p> <p>i. Internal environmental conditions (light, noise, temperature, air quality)</p> <p>ii. Control, operation and maintenance</p> <p>iii. Facilities and amenities</p> <p>iv. Access and layout</p> <p>v. Other relevant issues.</p> <p>c. Sustainability performance (energy/water consumption, performance of any sustainable features or technologies, e.g. materials, renewable energy, rainwater harvesting etc.).</p> <p>The client or building occupier makes a commitment to carry out the appropriate dissemination of information on the building's post occupancy performance. This is done to share good practice and lessons learned and inform changes in user behaviour, building operational processes and procedures, and system controls.</p>



					This also provides advice on appropriate dissemination where the building or building information is commercially or security sensitive
4	Exemplary level criteria	1	1	-	<p>Responsibility: M&E and Main Contractor</p> <p>BREEAM CRITERIA The following outlines the exemplary level criteria to achieve one innovation credit for this BREEAM issue. There are, or will be, operational infrastructure and resources in place to coordinate the following activities at quarterly intervals for the first three years of building occupation: a. Collection of occupant satisfaction, energy consumption and (where available) water consumption data. b. Analysis of the data to check the building is performing as expected and make any necessary adjustments to systems controls or to inform building user behaviours. c. Setting targets and/or appropriate actions for reducing water and energy consumption and monitor progress towards these. d. Feedback any 'lessons learned' to the design team and developer for use in future projects. e. Provision of the actual annual building energy, water consumption (where available and accessible) and occupant satisfaction data to BRE for the purpose of future BREEAM performance benchmarking.</p>
Health & Wellbeing					
Hea 01 - Visual comfort					
	Credit	Available	Targeted	Potential	Criteria
1	Control of glare from sunlight	1	1	-	<p>Assessor Notes: Blinds are required in any office areas.</p> <p>Responsibility: Architect</p> <p>BREEAM CRITERIA The potential for disabling glare has been designed out of all relevant building areas using a glare control strategy, either through building form and layout and/or building design measures (see compliance note CN7). The glare control strategy avoids increasing lighting energy consumption, by ensuring that:</p>



					<p>a. The glare control system is designed to maximise daylight levels under all conditions while avoiding disabling glare in the workplace or other sensitive areas. The system should not inhibit daylight from entering the space under cloudy conditions, or when sunlight is not on the façade: AND</p> <p>b. The use or location of shading does not conflict with the operation of lighting control systems.</p>
2	Daylighting (building type dependent)	3	0	-	<p>CREDIT NOT SOUGHT</p> <p>BREEAM CRITERIA: OFFICE AREA ONLY</p> <p>Up to three credits are awarded on a sliding scale depending on the percentage of relevant building areas that comply with one of the following daylighting criteria:</p> <ul style="list-style-type: none"> a. The relevant building areas meet good practice daylight factor(s) and other criterion as outlined in Table 12 and Table 13 OR b. The relevant building areas meet good practice average and minimum point daylight illuminance criteria as outlined in Table 14 . <p>Two credits where daylighting provision, averaged over all relevant spaces, has improved after refurbishment or fit-out by 30% or more and there is a minimum glazing to floor area ratio of either:</p> <ul style="list-style-type: none"> a. 5% glass to floor area ratio for side windows; OR b. 2.5% glass to floor area ratio for roof lights; <p>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:</p> <ul style="list-style-type: none"> a. 5% glass to floor area ratio for side windows; OR b. 2.5% glass to floor area ratio for roof lights <p>AND</p> <ul style="list-style-type: none"> 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 Table 12 . 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 Table 12 . <p>OR</p>



					<p>b. At least 80% of the room has a view of sky from desk or table top height (0.85m in multi-residential buildings, 0.7m in other buildings) AND The room depth criterion $d/w + d/HW < 2/(1-RB)$ is satisfied</p>
3	View out	2	0	0	<p>CREDIT NOT SOUGHT</p> <p>Responsibility: Architect</p> <p>BREEAM CRITERIA - OFFICE AREA ONLY</p> <p>Two credits where 95% or one credit where 80% of the floor area in each relevant building area is within 7m of a wall which has a window or permanent opening that provides an adequate view out.</p> <p>The window/opening must be $\geq 20\%$ of the surrounding wall area (refer to Relevant definitions in the Additional information section). Where the room depth is greater than 7m, 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 1.</p> <p>In addition, the building type criteria in Table 15 are applicable to view out criteria.</p>
4	Internal and external lighting levels, zoning and control	1	1	0	<p>Responsibility: M&E</p> <p>BREEAM CRITERIA</p> <p>All external lighting located within the refurbishment or fit-out zone is designed to provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night. To demonstrate this, external lighting provided is specified in accordance with BS 5489-1:2013 Lighting of roads and public amenity areas³ and BS EN 12464-2:2014 Light and lighting - Lighting of work places - Part 2: Outdoor work places.</p>



Hea 02 - Indoor air quality					
	Credit	Available	Targeted	Potential	Criteria
1	Indoor air quality (IAQ) plan	1	1	0	<p>Responsibility: Design Team / Project Manager / Air Quality Specialist</p> <p>BREEAM CRITERIA An indoor air quality plan to be produced and implemented, with the objective of facilitating a process that leads to design, specification and installation decisions and actions that minimise indoor air pollution during the design, construction and occupation of the building. The indoor air quality plan must consider the following:</p> <ul style="list-style-type: none"> • Removal of contaminant sources • Dilution and control of contaminant sources • Procedures for pre-occupancy flush out • Protection of Heating Ventilation and Air Conditioning (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 • Commitments for maintaining indoor air quality in-use, e.g. maintenance and cleaning of the HVAC system, ductwork and filters.
2	Ventilation	1	0	0	<p>CREDIT NOT SOUGHT</p> <p>Responsibility: M&E</p> <p>BREEAM CRITERIA Refurbishment and fit-out works include measures to minimise the concentration and recirculation of pollutants in the building as follows: Provide fresh air into the building in accordance with the criteria of the relevant standard for ventilation. Design ventilation pathways to minimise the build-up of air pollutants in the building, as follows: In air conditioned and mixed mode buildings/spaces:</p>



					<p>i. The building's air intakes and exhausts are over 10m apart and intakes are over 20m from sources of external pollution; OR</p> <p>ii. The location of the building's air intakes and exhausts, in relation to each other and external sources of pollution, is designed in accordance with BS EN 13779:20071 Annex A2.</p> <p>Where present, HVAC systems must incorporate suitable filtration to minimise external air pollution, as defined in BS EN 13779:2007 Annex A3.</p> <p>Areas of the building subject to large and unpredictable or variable occupancy patterns have carbon dioxide (CO2) or air quality sensors specified and:</p> <p>a. In mechanical ventilated buildings/spaces: sensor(s) are linked to the mechanical ventilation system and provide demand-controlled ventilation to the space.</p> <p>b. In naturally ventilated buildings/spaces: sensors either have the ability to alert the building owner or manager when CO2 levels exceed the recommended set point, or are linked to controls with the ability to adjust the quantity of fresh air, i.e. automatic opening windows/roof vents.</p>
3	Emissions from building products	1	1	-	<p>Responsibility: M&E and Architect</p> <p>BREEAM CRITERIA:</p> <p>All decorative paints and varnishes specified meet the criteria in Table 20 7 of the BREEAM Technical Manual.</p> <p>At least five of the seven remaining product categories listed in Table 20 of the BREEAM Technical Manual meet the testing requirements and emission levels criteria for volatile organic compound (VOC) emissions (listed in the table).</p>
4	Post-construction indoor air quality measurement	-	-	-	<p>Credit Not Targeted</p> <p>Responsibility: Air Quality Tester / Main Contractor</p> <p>BREEAM CRITERIA:</p> <p>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).</p> <p>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.</p>



					<p>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, including re-measurement. The IAQ Plan should outline what remedial measures are appropriate depending on the severity and type of the non-compliance with prescribed limits. Such measures may include re-testing as a matter of 'best practice'.</p> <p>. The testing and measurement of the above pollutants are in accordance with the following standards where relevant: a. BS ISO 16000-4: 2011 Diffusive sampling of formaldehyde in air³ b. BS ISO 16000-6: 2011 VOCs in air by active sampling c. BS EN ISO 16017-2: 2003 VOCs - Indoor, ambient and workplace air by diffusive sampling⁵ d. BS ISO 16000-3: 2011⁶ Formaldehyde and other carbonyls in air by active sampling</p> <p>The measured concentration levels of formaldehyde ($\mu\text{g}/\text{m}^3$) and TVOC ($\mu\text{g}/\text{m}^3$) are reported, via the BREEAM Assessment Scoring and Reporting Tool.</p>
5	Potential for Natural Ventilation	1	0	0	<p>Credit Not Targeted</p> <p>Responsibility: M&E and Architect</p> <p>BREEAM CRITERIA:</p> <p>The building ventilation strategy is designed to be flexible and adaptable to potential building occupant needs and climatic scenarios. This can be demonstrated as follows:</p> <p>a. Occupied spaces of the building are designed to be capable of providing fresh air entirely via a natural ventilation strategy. The following are methods deemed to satisfy this criterion dependent upon the complexity of the proposed system:</p> <ul style="list-style-type: none"> i. Room depths are designed in accordance with CIBSE AM10 (section 2.4) to ensure effectiveness of any natural ventilation system. The openable window area in each occupied space is equivalent to 5% of the gross internal floor area of that room/floor plate; OR ii. The design demonstrates that the natural ventilation strategy provides adequate cross flow of air to maintain the required thermal comfort conditions and ventilation rates. This is demonstrated using ventilation design tool types that meet the requirements of CIBSE AM107 (or for education buildings by using the ClassVent tool).



					<p>b. For fit-out projects (Part 3 assessments), local services are designed to provide fresh air via a natural ventilation strategy and are appropriately designed according to the room depth in accordance with CIBSE AM10.</p> <p>The natural ventilation strategy is capable of providing at least two levels of user-control on the supply of fresh air to the occupied space.</p>
Hea 04 - Thermal comfort					
	Credit	Available	Targeted	Potential	Criteria
1	Thermal modelling	1	1	0	<p>Responsibility: M&E / Energy Modeller</p> <p>BREEAM CRITERIA -</p> <p>Thermal modelling has been carried out using software in accordance with CIBSE 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).</p> <p>The modelling demonstrates that:</p> <p>a. 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).</p> <p>b. For naturally ventilated/free running buildings:</p> <ol style="list-style-type: none"> 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. <p>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</p>



					<p>result of changes to internal layout, occupant density, additional equipment that may increase cooling loads etc.).</p> <p>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.</p>
2	Design for future thermal comfort	1	1	0	<p>Responsibility: M&E / Energy Modeller</p> <p>BREEAM CRITERIA - Criteria 1-4 are achieved.</p> <p>The thermal modelling demonstrates that the relevant requirements set out in criterion 3 are achieved for a projected climate change environment.</p> <p>Where thermal comfort criteria are not met for the projected climate change environment, the project team demonstrates how the building has been adapted, or designed to be easily adapted in the future using passive design solutions in order to subsequently meet the requirements under criterion 7.</p> <p>For air conditioned buildings, the PMV and PPD indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool</p>
3	Thermal zoning and controls	1	1	0	<p>Responsibility: M&E / Energy Modeller</p> <p>BREEAM CRITERIA - The thermal modelling analysis has informed the temperature control strategy for the building and its users. The strategy for proposed heating/cooling system(s) demonstrates that it has addressed the following:</p> <ul style="list-style-type: none"> a. Zones within the building and how the building services could efficiently and appropriately heat or cool these areas. For example consider the different requirements for the central core of a building compared with the external perimeter adjacent to the windows. b. Where specified, any new local cooling or heating services (or changes to existing services) are designed to ensure they do not conflict with core services (e.g. conflicts between two separate cooling systems, conflicts between core heating and locally provided cooling systems). c. The degree of occupant control required for these zones, based on discussions with the end user (or alternatively building type or use specific design guidance, case studies, feedback) considers: <ul style="list-style-type: none"> i. User knowledge of building services



					<ul style="list-style-type: none"> ii. Occupancy type, patterns and room functions (and therefore appropriate level of control required) iii. How the user is likely to operate or interact with the system(s), e.g. are they likely to open windows, access thermostatic radiator valves (TRV) on radiators, change air-conditioning settings etc. iv. The user expectations (this may differ in the summer and winter) and degree of individual control (i.e. obtaining the balance between occupant preferences, for example some occupants like fresh air and others dislike draughts). d. How the proposed systems will interact with each other (where there is more than one system) and how this may affect the thermal comfort of the building occupants. <p>The need or otherwise for an accessible building user actuated manual override for any automatic systems.</p>
Hea 05 - Acoustic performance					
	Credit	Available	Targeted	Potential	Criteria
1	Acoustic performance	4	1	0	<p>Responsibility: Acoustician</p> <p>BREEAM CRITERIA - The building meets the appropriate acoustic performance standards and testing requirements defined in the checklists and tables section which defines criteria for the acoustic principles (table of requirements provided separately) of:</p> <ul style="list-style-type: none"> • Sound insulation • Indoor ambient noise level • Reverberation times. <p>One credit Airborne sound insulation values are at least 3dB higher and impact sound insulation values are at least 3dB lower than the performance standards in the relevant Building Regulations or Standards.</p>



					<p>Three credits Airborne sound insulation values are at least 5dB higher and impact sound insulation values are at least 5dB lower than the performance standards in the relevant Building Regulations or Standards.</p> <p>Four credits Airborne sound insulation values are at least 8dB higher and impact sound insulation values are at least 8dB lower than the performance standards in the relevant Building Regulations or Standards.</p>
Hea 06 - Security					
	Credit	Available	Targeted	Potential	Criteria
1	Security of site and building	1	1	0	<p>BREEAM CRITERIA</p> <p>1) 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 purpose of the SNA will be to identify attributes of the proposal, site and surroundings which may influence the approach to security for the development.</p> <p>2) The SQSS develops a set of security controls and recommendations for incorporation into the proposals. Those controls and recommendations shall directly relate to the threats and assets identified in the preceding SNA.</p> <p>3) The controls and recommendations shall be incorporated into proposals and implemented in the as-built development. Any deviation from those controls and recommendations shall be justified and agreed with the SQSS.</p>



Energy					
Ene 01 - Reduction of energy use and carbon emissions					
	Credit	Available	Targeted	Potential	Criteria
1	Energy performance	15	9	0	<p>Responsibility: Energy Assessor / M&E</p> <p>POTENTIAL UPLIFT CREDIT AVAILABLE</p> <p>BREEAM CRITERIA - Option 1: Whole building energy model For projects that want to gain recognition for improvements made at the whole building level, using whole building energy modelling National Calculation Methodology (NCM) compliant software</p> <p>Calculate the Energy Performance Ratio for Non Domestic Refurbishment (EPRNDR) and compare with the benchmarks in Table 27 to determine the corresponding number of BREEAM credits.</p>
e1	Beyond zero net regulated carbon	3	0	0	CREDIT NOT SOUGHT
e2	Post-occupancy stage - Exemplary level criteria	2	0	0	CREDIT NOT SOUGHT
Ene 02 - Energy monitoring					
	Credit	Available	Targeted	Potential	Criteria
1	Sub-metering of end use categories	1	1	0	<p>Responsibility: M&E</p> <p>BREEAM CRITERIA 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.</p>



					<p>The energy consuming systems in buildings with a total useful floor area greater than 1,000m² are metered using an appropriate energy monitoring and management system.</p> <p>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.</p> <p>The end energy consuming uses are identifiable to the building users, for example through labelling or data outputs.</p> <p>Where applicable:</p> <ul style="list-style-type: none"> - Space heating - Domestic hot water heating - Humidification - Cooling - Ventilation, i.e. fans (major) - Pumps - Lighting - Small power - Renewable or low carbon systems (separately) - Controls - Other major energy consuming systems/plant, where appropriate.
2	Sub-metering of high energy load and tenancy areas	-	-	-	N/A For hotel buildings
Ene 03 - External Lighting					
	Credit	Available	Targeted	Potential	Criteria
1	External lighting	1	1	0	<p>Responsibility: M&E</p> <p>BREEAM CRITERIA</p> <p>The building has been designed to operate without the need for external lighting (which includes on the building, signs and at entrances).</p>



					<p>OR alternatively, where the building does have external lighting, one credit can be awarded as follows:</p> <p>The average initial luminous efficacy of the external light fittings within the construction zone is not less than 60 luminaire lumens per circuit Watt.</p> <p>All external light fittings are automatically controlled to prevent operation during daylight hours and have presence detection in areas of intermittent pedestrian traffic.</p>
Ene 04 - Low carbon design					
	Credit	Available	Targeted	Potential	Criteria
1	Passive design	1	0	0	<p>Credit Not Sought</p> <p>Responsibility: M&E/ Energy Modeller</p> <p>BREEAM CRITERIA</p> <p>Achieve the first credit Hea 04 Thermal comfort: One credit – Thermal modelling to demonstrate that the building design delivers appropriate thermal comfort levels in occupied spaces.</p> <p>The project team analyses the proposed building design and development during Concept Design to identify opportunities for the implementation of passive design measures/</p> <p>The building uses 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 and the analysis demonstrates a meaningful reduction in the total energy demand as a result.</p>
2	Free Cooling	1	0	0	<p>CREDIT NOT SOUGHT</p> <p>Responsibility: M&E</p> <p>The passive design analysis credit is achieved.</p> <p>The passive design analysis, carried out under criterion 2, includes an analysis of free cooling and identifies opportunities for the implementation of free cooling solutions. The building is naturally ventilated or uses any combination of the free cooling strategies listed in CN8.</p>



3	Low and zero carbon technologies	1	1	0	<p>Responsibility: M&E</p> <p>BREEAM CRITERIA Establish the most appropriate recognised local (on site or near site) low or zero carbon (LZC) energy sources for the building or development (see Scope of LZC systems and how they are assessed), based on the feasibility study. Specify local LZC technologies for the building or development in line with the feasibility study recommendations. Quantify the reduced regulated carbon dioxide (CO₂) emissions resulting from the feasibility study. An energy specialist (see Definitions) completes a feasibility study (see Low and zero carbon feasibility study) by the end of the Concept Design.</p>
Ene 06 - Energy efficient transportation systems					
	Credit	Available	Targeted	Potential	Criteria
1	Energy consumption	1	1	-	<p>BREEAM CRITERIA Where new lifts, escalators and/or moving walks (transportation types) are specified within refurbishment works:</p> <ul style="list-style-type: none"> a. An analysis of the transportation demand and usage patterns for the building has been carried out to determine the optimum number and size of lifts, escalators and/or moving walks. b. The energy consumption has been estimated in accordance with BS EN ISO 25745 Energy performance of lifts, escalators and moving walks, Part 2: Energy calculation and classification for lifts (elevators) and/or Part 3 - Energy calculation and classification of escalators and moving walks, for one of the following: <ul style="list-style-type: none"> i. At least two types of system (for each transportation type required); OR ii. An arrangement of systems (e.g. for lifts, hydraulic, traction, machine room-less lift (MRL)); OR iii. A system strategy which is 'fit for purpose'. c. The use of regenerative drives should be considered, subject to the requirements in CN6 d. The transportation system with the lowest energy consumption is specified through either b.i. or b.ii.).



2	Energy efficient features	2	2	-	Responsibility: M&E / Lift Consultant/ Supplier BREEAM CRITERIA Lifts For each newly specified lift, the following three energy efficient features are specified and for existing lifts within the project scope of influence, at least two of the following energy efficient features are specified: a. The lifts operate in a standby condition during off-peak periods. For example the power side of the lift controller and other operating equipment such as lift car lighting, user displays and ventilation fans switch off when the lift has been idle for a prescribed length of time. b. The lift car lighting and display lighting provides an average lamp efficacy, (across all fittings in the car) of >55 lamp lumens/circuit Watt. c. The lift uses a drive controller capable of variable speed, variable-voltage, and variable-frequency (VVVF) control of the drive motor. Where the use of regenerative drives is demonstrated to save energy, they are specified.
Ene 08 - Energy efficient equipment					
	Credit	Available	Targeted	Potential	Criteria
1	Energy efficient equipment	2	0	-	Credit Not Targeted
Transport					
Tra 01 - Transport assessment and travel plan					
	Credit	Available	Targeted	Potential	Criteria
1	Accessibility Index	5	5	0	Responsibility: M&E / Architect BREEAM CRITERIA 1) The public transport Accessibility Index (AI) for the assessed building is calculated and BREEAM credits awarded according to the building type. GMAL Score used – High score achieved for Manchester City Centre location



Tra 02 - Sustainable transport measures					
	Credit	Available	Targeted	Potential	Criteria
1	Proximity to Amenities	1	1	0	BREEAM CRITERIA: 1) Where a building is located within close proximity (500m) of, and accessible to, local amenities which are likely to be frequently required and used by building occupants, as outlined in Table 37. <ul style="list-style-type: none"> • Access to cash • Access to a recreation/leisure facility for fitness/sports • Appropriate food outlet
Tra 03 – Cyclist Facilities					
	Credit	Available	Targeted	Potential	Criteria
1	Cycle Storage and Facilities	2	0	0	CREDITS NOT TARGETED Responsibility: M&E / Architect BREEAM CRITERIA: Cycle Storage: 1) Compliant cycle storage spaces that meet the minimum levels set out in Table 38 (see Checklists and tables) are installed. 1 space per 10 staff Cycle Facilities: 1) At least two of the following types of compliant cyclist facilities have been provided for all building users see Relevant definitions for the scope of each compliant cyclist facility: <ul style="list-style-type: none"> a. Showers b. Changing facilities c. Lockers d. Drying spaces.



Tra 05 – Travel Plan					
	Credit	Available	Targeted	Potential	Criteria
1	Travel Plan	1	1	0	<p>Responsibility: Transport Consultant</p> <p>BREEAM CRITERIA:</p> <p>1) A travel plan has been developed as part of the feasibility and design stages.</p> <p>2) A site-specific travel assessment/statement has been undertaken to ensure the travel plan is structured to meet the needs of the particular site and covers the following (as a minimum):</p> <ul style="list-style-type: none"> a. Where relevant, existing travel patterns and opinions of existing building or site users towards cycling and walking so that constraints and opportunities can be identified. b. Travel patterns and transport impact of future building users. c. Current local environment for walkers and cyclists (accounting for visitors who may be accompanied by young children). d. Disabled access (accounting for varying levels of disability and visual impairment). e. Public transport links serving the site. f. Current facilities for cyclists. <p>3) 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 building's operation and use.</p> <p>4) 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 refurbishment or fit-out and be supported by the building's management in operation.</p>



Water					
Wat 01 - Water consumption					
	Credit	Available	Targeted	Potential	Criteria
1	Water consumption	5	3	0	<p>Responsibility: M&E / Architect</p> <p>BREEAM CRITERIA BREEAM Assessor Notes: 3no. credits targeted which requires a 40% improvement over the BRE's baseline performance. Flow rate examples can be provided to meet this requirement.</p> <p>BREEAM Criteria: An assessment of the efficiency of newly specified domestic water-consuming components. The efficiency of the following 'domestic scale' water-consuming components must be included in the assessment:</p> <ul style="list-style-type: none"> • WCs • Urinals • Taps (wash hand basins and where specified kitchen taps and waste disposal unit) • Showers • Baths • Dishwashers (domestic and commercial sized) • Washing machine (domestic and commercial or industrial sized)
e1	Water consumption	1	0	0	CREDIT NOT SOUGHT
Wat 02 - Water monitoring					
	Credit	Available	Targeted	Potential	Criteria
Pre-req	Prerequisite (Good to Outstanding)		✓	✓	<p>Responsibility: M&E / Architect</p> <p>BREEAM CRITERIA Specify a water meter on the mains water supply to each building. This includes instances where water is supplied via a borehole or other private source.</p>



1	Water monitoring	1	1	0	<p>Responsibility: M&E</p> <p>BREEAM CRITERIA The specification of a water meter on the mains water supply to each building; this includes instances where water is supplied via a borehole or other private source.</p> <p>Water-consuming plant or building areas, consuming 10% or more of the building's total water demand, are either fitted with easily accessible sub-meters or have water monitoring equipment integral to the plant or area.</p> <p>If the refurbishment or fit-out zone is within a building that is leasehold, the pulsed/digital water meter(s) for the refurbishment or fit-out zone must be connected to the incoming water supply for water using equipment in tenanted areas (see compliance note)</p>
Wat 03 - Water leak detection					
	Credit	Available	Targeted	Potential	Criteria
1	Leak detection system	1	1	0	<p>Responsibility: M&E</p> <p>BREEAM CRITERIA 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:</p> <ol style="list-style-type: none"> A permanent automated water leak detection system that alerts the building occupants to the leak OR an inbuilt automated diagnostic procedure for detecting leaks is installed. Activated when the flow of water passing through the water meter/data logger is at a flowrate 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 criteria. Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers
2	Flow control devices	1	0	0	CREDIT NOT SOUGHT



					Responsibility: M&E BREEAM CRITERIA Flow control devices that regulate the supply of water to each WC area/facility according to demand are installed (and therefore minimise water leaks and wastage from sanitary fitting networks).
Wat 04 - Water efficient equipment					
	Credit	Available	Targeted	Potential	Criteria
1	Water efficient equipment	1	1	0	NOT APPLICABLE TO THIS ASSESSMENT
Materials					
Mat 01 - Environmental impacts from construction products - Building life cycle assessment (LCA)					
	Credit	Available	Targeted	Potential	Criteria
1	Life Cycle Impact	6	3	3 Exemplary Level Credit	Responsibility: Architect / QS / M&E / LCA Consultant POTENTIAL ADDITIONAL CREDIT – LCA to be completed (additional fee) BREEAM CRITERIA The project uses a life cycle assessment (LCA) tool or undertakes a building information model life cycle assessment (BIM LCA) to measure the life cycle environmental impact of the refurbishment or fit-out works. The LCA covers new materials as relevant to the assessment parts listed in CN7 and indicated in the 'Materials assessment scope' section of the BREEAM Refurbishment and Fit-out Mat 01 calculator (Part B of the tool). The mandatory requirements identified in the 'Materials assessment tool, method and data' section of the BREEAM Refurbishment and Fit-out Mat 01 calculator have been met. A member of the project team completes the BREEAM Refurbishment and Fit-out Mat 01 calculator using parts A and B and determines a score based on the robustness of the LCA tool used (left side of the tool) and the scope of the assessment in terms of the materials specified that have been considered (right side of the tool)



					<p>Where the design team can demonstrate how the LCA has benefited the building in terms of measuring and reducing its environmental impact. See CN14</p> <p>Where the design team submit the LCA tool output (e.g. Building Information Model (BIM)) for assessing the building to BRE Global Limited (via the project's appointed BREEAM assessor) to inform future potential LCA benchmarking for BREEAM.</p>
Mat 03 - Responsible sourcing of construction products					
	Credit	Available	Targeted	Potential	Criteria
Pre-req	Prerequisite		✓	✓	<p>Responsibility: Main Contractor</p> <p>BREEAM CRITERIA All timber used on site will be sourced in accordance with the UK Government's Timber Procurement Policy.</p>
1	Enabling sustainable procurement	1	1	0	<p>Responsibility: Design Team (RIBA Stage 2) / Main Contractor (RIBA Stage 5)</p> <p>BREEAM CRITERIA The principal contractor sources materials for the project in accordance with a documented sustainable procurement plan. will cover the following as a minimum: 1.Risks and opportunities are identified against a broad range of social, environmental and economic issues. BS ISO 20400:2017 Sustainable procurement or BS 8903:2010 Principles and framework for procuring sustainably – Specification can be used as a guide to identify these issues. 2.Aims, objectives and targets to guide sustainable procurement activities. 3.The strategic assessment of sustainably sourced materials available locally and nationally. There should be a policy to procure materials locally where possible. 4.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.</p>



2	Measuring responsible sourcing	3	1	2	Responsibility: Design Team (Design) / Main Contractor (Construction) POTENTIAL UPLIFT CREDIT AVAILABLE BREEAM CRITERIA Key building materials are responsibly sourced to reduce environmental and socio-economic impacts. There will be a materials procurement workshop such that the Main Contractor achieves at least one of three available credits in this area.
Mat 04 - Insulation					
	Credit	Available	Targeted	Potential	Criteria
1	Embodied Impact of Insulation	1	1	0	Responsibility: Main Contractor BREEAM Criteria: Any new insulation specified for use within the following building elements must be assessed: <ul style="list-style-type: none"> - Building services The Insulation Index for the building fabric and services insulation is the same as or greater than 2.5.
Mat 05 - Designing for durability and resilience					
	Credit	Available	Targeted	Potential	Criteria
1	Protecting vulnerable parts of the building from damage/material degradation	1	1	0	Responsibility: Main Contractor BREEAM CRITERIA: <u>Protecting vulnerable parts of the building from damage</u> 1) 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: <ol style="list-style-type: none"> Protection from the effects of high pedestrian traffic in main entrances, public areas and thoroughfares (corridors, lifts, stairs, doors etc.). Protection against any internal vehicular/trolley movement within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas.



					c. Protection against, or prevention from, any potential vehicular collision where vehicular parking and manoeuvring occurs within 1m of the building façade for all car parking areas and within 2m for all delivery areas.
Mat 06 - Material efficiency					
	Credit	Available	Targeted	Potential	Criteria
1	Material efficiency	1	0	0	<p>Credit Not Targeted</p> <p>Responsibility: Design Team</p> <p>BREEAM CRITERIA Opportunities have been identified, and appropriate measures investigated and implemented within the scope of refurbishment or fit-out works, to optimise the use of materials through building design, procurement, refurbishment, maintenance and end of life. The above is carried out by the design/construction team in consultation with the relevant parties at each of the following RIBA stages:</p> <ul style="list-style-type: none"> a. Preparation and Brief b. Concept Design c. Developed Design d. Technical Design e. Construction.
Waste					
Wst 01 - Construction waste management					
	Credit	Available	Targeted	Potential	Criteria



1	Pre-refurbishment Audit	1	1	0	<p>Responsibility: Client / Design Team</p> <p>BREEAM CRITERIA</p> <p>The client shall ensure that a pre-refurbishment audit of all existing buildings, structures or hard surfaces within the scope of the refurbishment or fit-out zone is completed.</p> <p>The requirements for carrying out an appropriate pre-refurbishment audit are</p> <ul style="list-style-type: none"> a. The audit should be carried out at the Concept Design Stage (equivalent to RIBA stage 2) prior to strip-out or demolition works in order to use the audit results to guide the design, consideration of 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. b. The audit should be carried out by a competent person (see Relevant Definitions) who has appropriate knowledge of buildings, waste and options for the reuse and recycling of different waste streams. c. Actual waste arisings and waste management routes used should be compared with those forecast from the audit and barriers to achieving targets should be investigated. <p>The audit must be referenced in the Resource Management Plan (RMP) and cover:</p> <ul style="list-style-type: none"> d. Identification and quantification of the key materials where present on the project e. Potential applications and any related issues for the reuse and recycling of the key materials in accordance with the waste hierarchy. f. Identification of local reproprocessors or recyclers for recycling of materials g. Identification of overall recycling rate for all key materials h. Identification of reuse targets where appropriate. i. Identification of overall landfill diversion rate for all key materials.
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2	Reuse and direct recycling of materials	2	0	0	<p>CREDIT NOT SOUGHT</p> <p>BREEAM CRITERIA Where waste material types detailed in Table 64 of the BREEAM guidance are either directly re-used on-site or off-site or are sent back to the manufacturer for closed loop recycling One credit is achieved where 50% of the total available points for the waste material types detailed in Table 64, that are present on the project have been achieved. Two credits are achieved where 75% of the total available points for the waste material types detailed in Table 64, that are present on the project have been achieved.</p>
3	Construction resource efficiency	3	2	1	<p>Responsibility: Main Contractor</p> <p>POTENTIAL UPLIFT CREDIT AVAILABLE</p> <p>BREEAM CRITERIA Targets will be set within the Site Waste Management Plan, and procedures put in place, to ensure that less than 11.3 m³ / 3.5T per 100 m² (gross floor area) of non-hazardous construction waste will be produced on site.</p>
4	Diversion of resources from landfill	1	1	1	<p>Responsibility: Main Contractor</p> <p>BREEAM CRITERIA Targets and procedures will be put in place to ensure that over 85% by volume / 90% by weight of construction waste generated is diverted from landfill and that materials will be sorted into key waste groups.</p>
e1	Construction resource efficiency/Diversion of resources from landfill	1	0	0	<p>CREDIT NOT SOUGHT</p>



Wst 03 - Operational waste					
	Credit	Available	Targeted	Potential	Criteria
1	Operational waste	1	1	0	<p>Responsibility: Architect</p> <p>BREEAM CRITERIA Dedicated space(s) is provided for the segregation and storage of operational recyclable waste volumes generated by the assessed building/unit, its occupant(s) and activities. This space must be:</p> <ul style="list-style-type: none"> a. Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams b. Accessible to building occupants or facilities operators for the deposit of materials and collections by waste management contractors c. Of a capacity appropriate to the building type, size, number of units(if relevant) and predicted volumes of waste that will arise from daily/weekly operational activities and occupancy rates. <p>2. Where the consistent generation in volume of the appropriate operational waste streams is likely to exist, e.g. large amounts of packaging or compostable waste generated by the building's use and operation, the following facilities are provided:</p> <ul style="list-style-type: none"> a. Static waste compactor(s) or baler(s);situated in a service area or dedicated waste management space. b. Vessel(s)for composting suitable organic waste resulting from the building's daily operation and use; OR adequate space(s)for storing segregated food waste and compostable organic material prior to collection and delivery to an alternative composting facility. c. Where organic waste is to be stored/composted on-site, a water outlet is provided adjacent to or within the facility for cleaning and hygiene purposes.
Wst 05 – Adaptation to Climate Change					
	Credit	Available	Targeted	Potential	Criteria
1	Adaptation to Climate Change	-	-	-	CREDIT NOT APPLICABLE



Wst 06 - Functional adaptability					
	Credit	Available	Targeted	Potential	Criteria
1	Functional adaptability	1	1	0	<p>Responsibility: Architect /Structural / M&E</p> <p>BREEAM CRITERIA A building-specific functional adaptation strategy study has been undertaken by the client and design team by Concept Design (RIBA Stage 2 or equivalent), which includes recommendations for measures to be incorporated to facilitate future adaptation. This should consider:</p> <ul style="list-style-type: none"> - 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. <p>The extent of accessibility to local services, such as local power, data infrastructure etc.</p>
Le 02 – Protection of Ecological Features					
	Credit	Available	Targeted	Potential	Criteria
1	Protection of ecological features	-	-	-	NOT APPLICABLE NOT LANDSCAPED AREAS
Le 04 – Enhancing Site Ecology					
	Credit	Available	Targeted	Potential	Criteria
1	Enhancing Site Ecology	-	-	-	NOT APPLICABLE NOT LANDSCAPED AREAS



Le 05 – Long Term Impact on Biodiversity					
	Credit	Available	Targeted	Potential	Criteria
1	Long term impact on biodiversity	-	-	-	NOT APPLICABLE NOT LANDSCAPED AREAS
Pollution					
Pol 01 - Impact of refrigerants					
	Credit	Available	Targeted	Potential	Criteria
1	Impact of refrigerants	3	1	0	<p>Responsibility: M&E</p> <p>BREEAM CRITERIA</p> <p>Prerequisite All systems with electric compressors comply with the requirements of BS EN 378:2008 (parts 2 and 3). Refrigeration systems containing ammonia comply with the Institute of Refrigeration Ammonia Refrigeration Systems code of practice</p> <p>Impact of refrigerant Two credits The direct effect life cycle CO_{2e} equivalent emissions (DELCO) of <= 100 kgCO_{2e}/kW. For systems which provide cooling and heating, the worst performing output based on the lower of kW cooling output and kW heating output is used to complete the calculation. To calculate the DELCO refer to the relevant definitions in the Methodology below and Additional information sections. OR Refrigerants used have a Global Warming Potential (GWP) <= 10. OR</p> <p>One credit Systems using refrigerants have DELCO of <= 1000 kgCO_{2e}/kW cooling and heating capacity.</p> <p>One credit – Leak detection All systems are hermetically sealed or only use environmentally benign refrigerants. See Leak detection and Hermetically sealed systems OR Where the systems are not hermetically sealed. Systems have: A permanent automated refrigerant leak detection system, that is robust and tested and capable of continuously monitoring for leaks.</p>



					<p>OR</p> <p>An inbuilt automated diagnostic procedure for detecting leakage is enabled. In the event of a leak, the system must be capable of automatically responding and managing the remaining refrigerant charge to limit loss of refrigerant (see Automatic isolation and containment of refrigerant on).</p>
Pol 02 - Local air quality					
	Credit	Available	Targeted	Potential	Criteria
1	Local air quality	2	0	0	<p>Credit Not Targeted – All electric systems proposed</p> <p>Responsibility: M&E</p> <p>BREEAM CRITERIA Criteria linked to NOx Emissions and favours gas – Electric intense systems thought to be specified.</p>
Pol 04 - Reduction of night time light pollution					
	Credit	Available	Targeted	Potential	Criteria
1	Reduction of night time light pollution	1	1	0	<p>Responsibility: M&E</p> <p>BREEAM CRITERIA Where external lighting pollution has been eliminated through effective design that removes the need for external lighting without adversely affecting the safety and security of the site and its users. OR alternatively, where the building does have external lighting, one credit can be awarded as follows: The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the ILP Guidance notes for the reduction of obtrusive light, 20111. Buildings located in Scotland must comply with the light pollution criteria in the guidance note 'Controlling Light Pollution and Reducing Lighting Energy Consumption. This can be demonstrated via completion of the checklists in Annexes B and C of the guidance note by a relevant member of the design team.</p>



					<p>All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00.</p> <p>If safety or security lighting is provided and will be used between 23:00 and 07:00, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP's Guidance notes.</p> <p>Illuminated advertisements, where specified, must be designed in compliance with ILP PLG05 – The Brightness of Illuminated Advertisements³.</p>
Pol 05 - Reduction of noise pollution					
	Credit	Available	Targeted	Potential	Criteria
1	Reduction of noise pollution	1	1	0	<p>Responsibility: Acoustician</p> <p>BREEAM CRITERIA</p> <p>Where the building does have noise-sensitive areas or buildings within 800m radius of the site, one credit can be awarded as follows:</p> <p>Where a noise impact assessment in compliance with BS 7445 has been carried out and the following noise levels measured/determined:</p> <p>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.</p> <p>The rating noise level resulting from the new noise source.</p> <p>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.</p> <p>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.</p> <p>Where the noise source(s) from the proposed site/building is greater than the levels described in criterion 4, measures have been installed to attenuate the noise at its source to a level where it will comply with criterion 4.</p>

