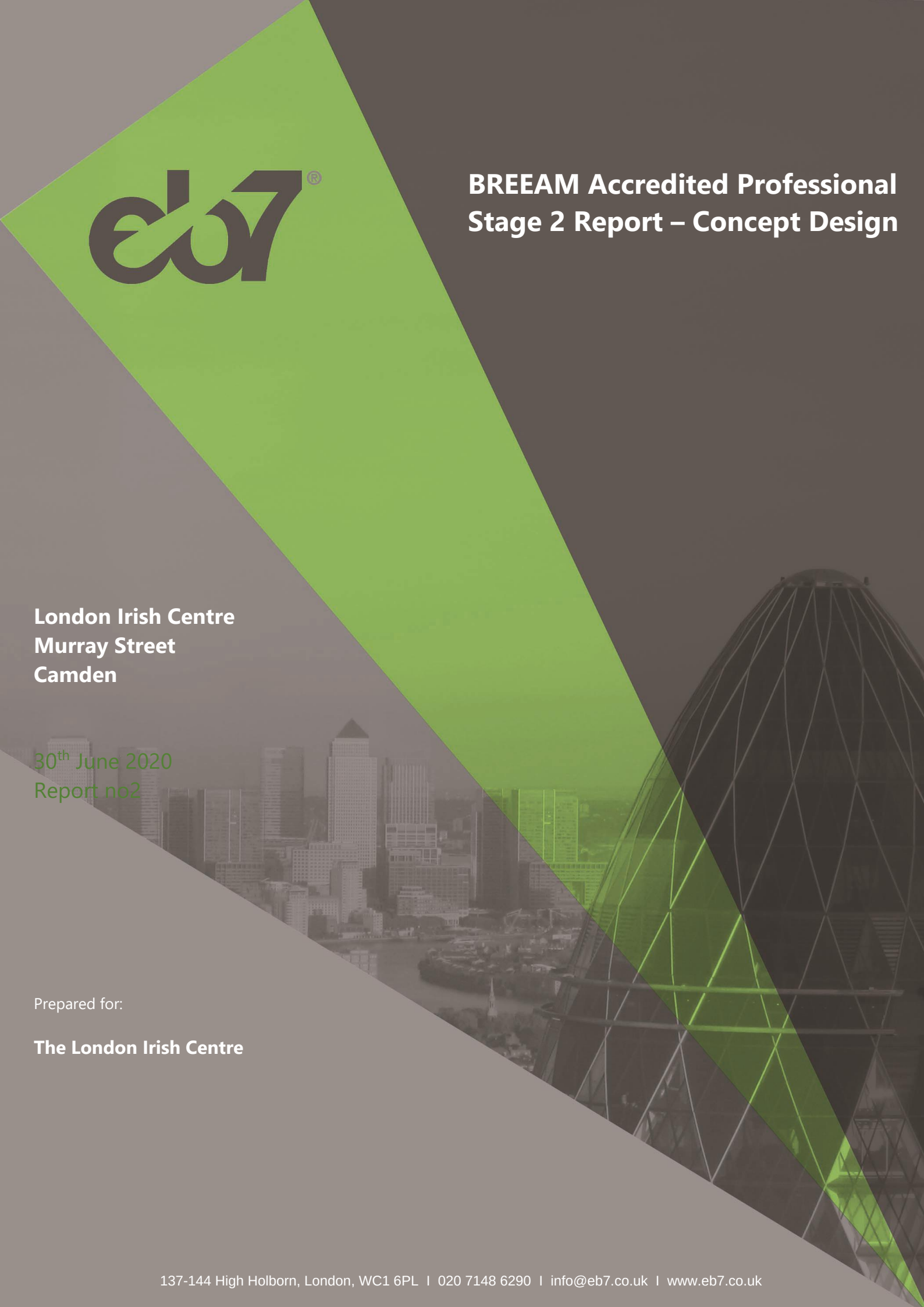
# BREEAM Accredited Professional Stage 2 Report – Concept Design



**London Irish Centre**
**Murray Street**
**Camden**

30th June 2020
Report no2

Prepared for:

**The London Irish Centre**

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# London Irish Centre

## BREEAM New Construction 2018 – BREEAM AP Report

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## 1.0 INTRODUCTION

The predicted BREEAM ratings for the proposed development are shown in Table 1.1 below.

Table 1.1

| Building Type | BREEAM Rating |
|---|---|
| **Non-residential Institution** | **73.15% - Excellent** |

The above projected scoring is based upon client brief to achieve the highest level of BREEAM rating for the proposed community centre accommodation development.

The client – The London Irish Centre are seeking to appoint a BREEAM Accredited Professional (AP) in order to receive the appropriate Stage 2 advice and report, as set out within the BREEAM New Construction 2018 manual below:-

***Prerequisite for BREEAM Advisory Professional credits (Concept and Developed Design)***

*8 The project team, including the client, formally agree strategic performance targets early in the design process, with the support of the BREEAM AP where appointed.*

***One credit - BREEAM AP (Concept Design)***

*9 Involve a BREEAM AP in the project at an appropriate time and level to:*
*9.a Work with the project team, including the client, to consider the links between BREEAM issues and assist them in maximising the project's overall performance against BREEAM, from their appointment and throughout Concept Design.*
*9.b Monitor progress against the performance targets (see Definitions on page 40 ) agreed under criterion 8 above throughout all stages after their appointment where decisions critically impact BREEAM performance.*
*9.c Proactively identify risks and opportunities related to the achievement of the targets agreed under criterion 8 above.*
*9.d Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets.*
9.e *Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team.*

This report has been prepared by eb7, on behalf of The London Irish Centre for the proposed redevelopment of the London Irish Centre, which involves the demolition of elements of the existing structure to be redeveloped with auditoria, exhibition spaces, offices and WCs/back of house areas.
eb7 Sustainability Limited has been appointed on 29th October 2019 to assist with the BREEAM New Construction 2018 assessment on the proposed development. eb7 and in particular the licensed assessors Rubina Singh & Neil Ingham has been trained by the BRE to be able to undertake BREEAM assessments as an Advisory Professional (AP).

## 2.0 BREEAM Overview

BREEAM schemes are an environmental assessment method for buildings. Each standard sets the best practice in environmental design and has become the de facto measure to describe a buildings environmental performance.

BREEAM has the following aims:

- To mitigate the impacts of buildings on the environment
- To enable buildings to be recognised according to their environmental benefits
- To provide a credible, environmental label for buildings
- To stimulate demand for sustainable buildings

BREEAM has the following objectives:

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

Credits are awarded over 10 categories of sustainability consisting of a number of issues, summarised in table 2.1 below.

Table 2.1: BREEAM UK New Construction 2018 environmental sections and assessment issues

| Management | Health & Wellbeing |
|---|---|
| • Project brief and design<br>• Life cycle cost and service life planning<br>• Responsible construction practices<br>• Commissioning and handover<br>• Aftercare | • Visual comfort<br>• Indoor air quality<br>• Thermal comfort<br>• Acoustic performance<br>• Security<br>• Safe and healthy surroundings |

| Energy | Transport |
|---|---|
| • Reduction of energy use and carbon emissions<br>• Energy monitoring<br>• External lighting<br>• Low carbon design<br>• Energy efficient cold storage<br>• Energy efficient transportation systems<br>• Energy efficient laboratory systems<br>• Energy efficient equipment | • Transport assessment and travel plan<br>• Sustainable transport measures |
| **Water** | **Materials** |
| • Water consumption<br>• Water monitoring<br>• Water leak detection<br>• Water efficient equipment | • Environmental impacts from construction products – Building life cycle assessment(LCA)<br>• Environmental impacts from construction products – Environmental Product Declarations (EPD)<br>• Responsible sourcing of construction products<br>• Designing for durability and resilience<br>• Material efficiency |
| **Waste** | **Land Use & Ecology** |
| • Construction waste management<br>• Use of recycled and sustainably sourced aggregates<br>• Operational waste<br>• Speculative finishes (Offices only)<br>• Adaptation to climate change<br>• Design for disassembly and adaptability | • Site selection<br>• Identifying and understanding the risks and opportunities for the project<br>• Managing negative impacts on ecology<br>• Change and enhancement of ecological value<br>• Long term ecological management and maintenance |
| **Pollution** | **Innovation** |
| • Impact of refrigerants<br>• Local air quality<br>• Flood and surface water management<br>• Reduction of night time light pollution<br>• Reduction of noise pollution | • Innovation |

**Scores and Rating**

There are four main elements that determine the building rating:-

1. **BREEAM rating benchmarks**

Table 2.2 below summarises the overall percentage score that is required to classify within each rating.

Table 2.2

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

2. **BREEAM environmental weightings**

Table 3.3 below outlines the environmental weightings that are adopted in each section to convert the credits awarded into an overall percentage score.

Table 2.3

| BREEAM Section | Weighting (%) Fully fitted out |
|---|---|
| Management | 11% |
| Health & Wellbeing | 14% |
| Energy | 16% |
| Transport | 10% |
| Water | 7% |
| Materials | 15% |
| Waste | 6% |
| Land Use & Ecology | 13% |
| Pollution | 8% |
| Innovation (additional) | 10% |

## 3. Minimum BREEAM standards

To achieve a BREEAM rating, the minimum percentage score must be achieved (table 3.2) and the minimum standards (number of credits) applicable to that rating level, table 3.4 below.

Table 2.4

| Minimum Standards by BREEAM Rating Level | | | | | |
|---|---|---|---|---|---|
| **BREEAM issue** | **Pass** | **Good** | **Very Good** | **Excellent** | **Outstanding** |
| Man 03: Responsible construction practices | None | None | None | One credit (responsible construction management) | Two credits (responsible construction management) |
| Man 04: Commissioning and handover | None | None | One credit (commissioning-test schedule and responsibilities) | One credit (commissioning-test schedule and responsibilities) | One credit (commissioning-test schedule and responsibilities) |
| Man 04: Commissioning and handover | None | None | Criterion 11 (Building User Guide) | Criterion 11 (Building User Guide) | Criterion 11 (Building User Guide) |
| Man 05: Aftercare | None | None | None | One credit (commissioning-implementation | One credit (commissioning-implementation |
| Ene 01: Reduction of energy use and carbon emissions | None | None | None | Four credits (Energy Performance) | Six credits (Energy Performance) and Four credits (Energy modelling and reporting) |
| Ene 02: Energy monitoring | None | None | One credit (First sub-metering credit) | One credit (First sub-metering credit) | One credit (First sub-metering credit) |
| Wat 01: Water consumption | None | One credit | One credit | One credit | Two credits |
| Wat 02: Water monitoring | None | Criterion 1 only | Criterion 1 only | Criterion 1 only | Criterion 1 only |
| Mat 03: Responsible sourcing of materials | Criterion 1 only | Criterion 1 only | Criterion 1 only | Criterion 1 only | Criterion 1 only |
| Wst 01: Construction waste management | None | None | None | None | One credit |
| Wst 03: Operational waste | None | None | None | One credit | One credit |

4. **BREEAM credits for innovation**

Innovation credits provide additional recognition for a building that innovates in the field of sustainable performance, above and beyond the level that is currently recognized and rewarded within standard BREEAM issues.

**Current Assessment – Design parameters**

For this 2018 pre-assessment, the following design parameters were used within the BREEAM Calculator Tool to commence the assessments:

- Scheme - BREEAM UK New Construction 2018
- Building Type – Non-residential Institution – Community Centre
- Project type – New Construction (fully fitted)

  - High-performance, engineered façade with optimised U-values and g-values;
  - Windows carefully designed to balance daylight, heat loss and heat gain;
  - Solar control measures;
  - Low air permeability of 3-5m3/(m2.h); (subject to Part L modelling).
  - Central plant with VRF heating and cooling
  - Heat pump (VRF) driven domestic hot water systems
  - Mechanical ventilation with heat recovery systems,
  - Low energy lighting (LED lighting throughout);
  - Energy efficient lighting controls;
  - Variable speed pumping;
  - BMS to efficiently control engineering systems

## 3.0 CONCEPT DESIGN STAGE 2 REPORT

### 3.1 Development Proposals

The project is being promoted by the London Irish Centre and is based upon the site of the existing London Irish Centre.

The London Irish Centre is located on the corners of Camden Square, Murray Street and Murray Mews within the London Borough of Camden. The community centre is spread over a group of buildings that adjoin the existing 19th century Villa's along Camden Square.

The scale of the existing buildings range from 3-4 storeys which conforms to the established building heights along the commercial section of Murray Street.

The proposed development is for the demolition of the buildings fronting onto Murray Street, to be replaced by a new part 3 storey/part 4 storey building as well as the introduction of additional floor space over the existing ground floor space at 1st and 2nd floors.

The newly created accommodation includes performance spaces, auditoria, offices circulation spaces, as well as stair/lift core, reception areas and toilets.

The new buildings will be linked back into the existing townhouses which will also accommodate further community spaces.

### 3.2 Client Aspirations

eb7 attended the formal Stage 2 design team meeting on 13th November 2019, in attendance with the architectural team, client and MEP consultant.

At the meeting the, it was highlighted that the client sought to consider the potential carbon neutrality of the project, and wished to minimise operational costs to enhance long terms viability and any potential incentives to do so.

#### 3.2.1 Carbon Neutral

The discussion related to 3 specific areas:-

*Regulated Emissions*

This relates to the carbon emission relating to the operation of the building as assessed under the building regulations – heating, cooling, ventilation, lighting and how water.

The approach to the MEP strategy would be key to reducing these emissions, as would the taking into account of the updated carbon footprint associated with grid based electricity; currently all but equivalent of that of electricity and still falling.

Thus a super-efficient electrical based HVAC solution would enable a low emissions now, which would then continue to reduce with the decarbonisation of the Grid continues.

Accordingly, the MEP approach will be to utilise VRF heat pump systems to condition the internal spaces as well as providing the domestic hot water (DHW). These same systems are also able to provide low carbon cooling to protect the long term future of the building in the face of a warming climate.

The design team were also encouraged to further reduce regulated emissions via passive design measures – improved fabric & glazing, air tightness, solar protection – glazing specification, shading, albedo etc. This will be demonstrated via the London Plan energy and sustainability report.

Finally, PV panels will be utilised to generate electricity on site to further reduce net emissions. It was noted that the knock-on effect of the new Grid based carbon footprint was to reduce the emissions off-setting impact of PV – however, long term running costs will be reduced via the electrical savings.

The London Plan has a formulae for the carbon cost of residual emissions from regulated energy use - £60/t per year of the lifespan of installed plant – assumed at 30 years. This off-set formulae may be an additional route to consider toward carbon neutrality.

*Unregulated Emissions*

Unregulated emissions relate to the power usage generally electrical, that is consumed for office equipment, PCs, food preparation etc that are not considered under the building regulations.

The current BREEAM methodology recognises that a building's modelled operational 'regulated' energy consumption may be used as a proxy for its unregulated energy demand, i.e. unregulated energy equals 100% of regulated energy.

So to go beyond zero carbon target for regulated emissions, further offset provisions would need to be considered if this issue is to be considered. There are third party organisations offering off-setting opportunities, but to date, they are not well regulated, nor audited as to the weather or not they achieve the required off-site carbon reductions.

BREEAM does deal with the issues of unregulated emissions and the client is encouraged to achieve the credits under Ene 08 and utilise energy efficient office equipment (Energy Star rated) and any white goods should be A+ rated

*Whole Building Carbon Cost*

The use of construction products leads to a wide range of environmental and social impacts across the life cycle through initial procurement, wastage, maintenance and replacement.

Taken together, construction products make a highly significant contribution to the overall life cycle impacts of a building. In some cases they may even outweigh operational impacts as noted above.

BREEAM 2018 has introduced the principle of the Life Cycle Assessments (LCA) for the both the projects construction and servicing products, requiring developers to consider 2/3 options for each utilising approved LCA assessment software.

At this early stage, it is designed to raise awareness and the client is encouraged to consider this option to do just that – to be aware of the carbon cost of the construction, and perhaps seek to reduce it.

### 3.2.2 Operational Costs

Although the use of VRF heat pump based systems are being introduced to reduce the carbon footprint of the London Irish Centre project, but equally, the efficiency of these systems also leads to much reduced running costs.

The passive design measures recommended above – reducing heating, cooling and lighting loads will further reduce long terms running costs; as will the use of energy efficient equipment.

The additional consideration here is long term operational costs – maintenance and replacement of building fabric & capital equipment be it HVAC, lighting of office and operational equipment; the client is encouraged to consider a life cycle costing exercise to ensure that the life cycle costing work within long term operational budgets.

### 3.2.3 Incentives

The Renewable Heat Incentive (RHI) was formally launched by the UK Government on 10th March 2011. The RHI will pay a tariff payment to renewable technologies that provide heat energy from a renewable source, with the payment relating to the kWh of heat energy provided e.g. if a property has a heat load of 20,000 kWh per annum, and it is 100% provided from a renewable source, then the tariff is paid against the 20,000kWh.
The Government decided on a two stage delivery - the first stage being for non-domestic schemes, commencing in July 2011, with domestic schemes introduced in April 2014.
A roof mounted PV array are proposed to generate electricity.

The RHI pays a tariff for the production of eligible heat from approved equipment. For non-domestic building, eligible heat used for the purpose of:

- Heating a space: heating rooms or other enclosed spaces within buildings, typically through the supply of hot liquid to heat emitters such as radiators and underfloor heating.
- Heating water: for direct use such as commercial and industrial hot water or use in schools and hospitals.

Air to water heat pumps are eligible to receive the RHI assuming:-

- They are not be designed to provide cooling.
- They must have a Coefficient of Performance (CoP) of at least 2.9 and a design SPF of at least 2.5.
- Must be able to measure the Seasonal Performance Factor (SPF) on an ongoing basis.
- Must not be designed to use heat in the air expelled from a building or directly from a process which generates heat. (i.e. exhaust air heat pumps)

So in the case of the London Irish Centre, if a MCS certified air to water heat pump is utilised stand alone to generate hot water for DHW and the heating of spaces (toilets, back of house areas etc) and is not connected in any way to heat pump cooling systems, then the metered output could attract the RHI

The current tariff for eligible heat from an ASHP is 2.75p/Kwh over 20 years.

**3.3 London Plan**

The proposal is located within one of the London Boroughs and will be expected to meet London Plan policies, specifically 5.2 and 5.3 and follow the Mayor's energy hierarchy when considering passive design measures.

The feasibility of linking to an existing planned Heat network in the proximity should be reviewed. Any opportunities to provide renewable energy on-site should also be maximised.

Any subsequent application will also be expected to achieve a minimum 35% reduction in baseline carbon emissions on site.

Any commercial floor space over 1000m$^2$ will need to submit a BREEAM assessment achieving a BREEAM excellent rating.

**3.4 BREEAM Strategy**

A BREEAM pre-assessment tracker at Section 7.0.

The following **Stage 2 issues** have been discussed with the client and reported in the attached BREEAM tracker

1. Man 01 - Project delivery planning – the need to document the project development and consultation process
2. Man 02 - Elemental LCC – as noted above, long terms building servicing and operational costs
3. Ene 04 - Low Carbon design – to develop a passive design strategy and report via the London Plan submission
4. Hea 06 - Security of site and building

5. Mat 01 - Environmental impact from construction products – Building Life Cycle assessment (LCA), and the input required to enable the client to consider the carbon impact of the project
6. Mat 06 - Material Efficiency
7. Wat 01 – rainwater and grey water harvesting to be utilised to reduce wholesome water use
8. Wst 01 - Construction waste management and contractor obligations
9. Wst 06 - Design for disassembly and adaptability
10. Le 02 - Identifying and understanding the risks and opportunities for the project via a formal report from an ecologist
11. Pol 01 – the effects of the use of refrigerants for the overall scoring

The report takes the form of a tracker document and details:-

- Target scoring as per the agreed strategy from the initial design team meeting
- Summary details of the design stage requirements
- Specific advice for project team and any required actions
- A section to identify the individual responsibility for meeting the required actions within the project team members

Where felt appropriate, and if any sections require specific reference to the compliance requirements contained with the BREEAM technical manual, then the Section Details are reproduced under 4.0 (below), for the guidance of The London Irish Centre and/or the project team.

## 4.0 SECTION DETAILS

It is considered that the below detailed BREEAM matters should be taken on board at this early stage of design development

**Man 02 - Elemental LCC – currently agreed as a reserve matter**

1. A competent person (see Definitions on the next page) carries out an outline, entire asset LCC plan at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) together with any design options appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865: 2008(6).
2. The elemental LCC plan:
2.a Provides an indication of future replacement costs over a period of analysis as required by the client (e.g. 20, 30, 50 or 60 years);
2.b Includes service life, maintenance and operation cost estimates.
The study period should ideally be agreed by the client, in line with the design life expectancy of the building. However, where the life expectancy of the building is not yet formally agreed (due to being at very early design stages), the default design life of 60 years should be used for modelling purposes (in line with the UK default).
3. Demonstrate, using appropriate examples provided by the design team, how the elemental LCC plan has been used to influence building and systems design and specification to minimise life cycle costs and maximise critical value.

**Ene 04 – Low Carbon Design**

**Passive design**

1. 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.
2. The project team analyses the proposed building design and development during Concept Design to identify opportunities for the implementation of passive design measures.
3. Implement passive design measures to reduce the total heating, cooling, mechanical ventilation, lighting loads and energy consumption in line with the passive design analysis findings.
4. Quantify the reduced total energy demand and carbon dioxide ($CO_2$-eq) emissions resulting from the passive design measures.

**Free cooling**

5. Achieve the passive design analysis credit.
6. Include a free cooling analysis in the passive design analysis carried out under criterion 2.
7. Identify opportunities for the implementation of free cooling solutions.
8. The building is naturally ventilated or uses any combination of the free cooling strategies listed in the BREEAM manual

**Low and zero carbon technologies**

9. An energy specialist completes a feasibility study by the end of Concept Design.
10. Establish the most appropriate recognised local (on-site or near-site) low and zero carbon (LZC) energy sources for the building or development, based on the feasibility study.
11. Specify local LZC technologies for the building or development in line with the feasibility study recommendations. 12 Quantify the reduced regulated carbon dioxide ($CO_2$-eq) emissions resulting from the feasibility study.

## Hea 06 – Security of site and building

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.
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.
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.

## Mat 01 – Environmental impact from construction products – Building Life Cycle assessment (LCA) – currently not considered as a target

**Option appraisal during Concept Design (all building types)**

4. During Concept Design, identify opportunities for reducing environmental impacts as follows:
4.a Carry out building LCA options appraisal of 2 to 4 significantly different superstructure design options
4.b Use a building LCA tool that is recognised by BREEAM (as suitable for assessing superstructure during Concept Design) according to the methodology
4.c For each design option, fulfil the same functional requirements specified by the client and all statutory requirements (to ensure functional equivalency).
4.d Integrate the LCA options appraisal activity within the wider design decision-making process. Record this in an options appraisal summary document.
4.e Record the following in the Mat 01/02 Results Submission Tool: The differences between the design options; the design option selected by the client to be progressed beyond Concept Design; the reasons for selecting it and the reasons for not selecting the other design options.
4.f Submit the Mat 01/02 Results Submission Tool to BRE at the end of Concept Design, and before planning permission is applied for (that includes external material or product specifications).

**Options appraisal during Technical Design**

5. During Technical Design identify opportunities for reducing environmental impacts as follows:
5.a Carry out building LCA options appraisal of 2 to 3 significantly different superstructure design options (based on the selected Concept Design option and as applicable to the Technical Design stage)

Use a building LCA tool that is recognised by BREEAM (as suitable for assessing superstructure during Technical Design) according to the methodology
5.c As criteria 4.c to 4.e above . Where an options appraisal summary document was produced during Concept Design, update it to include the Technical Design options.
5.d Submit the Mat 01/02 Results Submission Tool to BRE at the end of Technical Design.
Where a project has not achieved criteria 3 and 4, criterion 5 may still be achieved.

**Substructure and hard landscaping options appraisal during Concept Design (all building types)**

6. Criteria 3 and 4 are achieved.
7. During Concept Design identify opportunities for reducing environmental impacts as follows:
7.a Carry out building LCA options appraisal of a combined total of at least six significantly different substructure or hard landscaping design options (at least two shall be substructure and at least two shall be hard landscaping).
7.b Using a building LCA tool that is recognised by BREEAM (as suitable for assessing substructure and hard landscaping during Concept Design) according to the methodology (see Methodology below).
7.c As criteria 4.c to 4.f on the previous page.

## Wst 06 – Design for disassembly and adaptability

**Design for disassembly and functional adaptability – recommendations**

1. Conduct a study to explore the ease of disassembly and the functional adaptation potential of different design scenarios by the end of Concept Design.
2. Develop recommendations or solutions (see Methodology below) based on the study, during or prior to Concept Design, that aim to enable and facilitate disassembly and functional adaptation.

**Disassembly and functional adaptability – implementation**

3. Achieve criteria 1 and 2
4. Provide an update, during Technical Design, on:
4.a How the recommendations or solutions proposed by Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing to the assessor.
4.b Changes to the recommendations and solutions during the development of the Technical Design.

5. Produce a building adaptability and disassembly guide to communicate the characteristics allowing functional adaptability and disassembly to prospective tenants.

**Functional adaptation strategy study**

The study must consider the following as a minimum:
– Feasibility: The likelihood to contain multiple or alternative building uses, area functions and different tenancies over the expected life cycle, e.g. related to the structural design of the building.
– Accessibility: Design aspects that facilitate the replacement of all major plant within the life of the building, e.g. panels in floors and walls that can be removed without affecting the structure, providing lifting beams and hoists. Accessibility also involves access to local services, such as local power, data infrastructure etc.
– Versatility: The degree of adaptability of the internal environment to accommodate changes in working practices.
– Adaptability: The potential of the building ventilation strategy to adapt to future building occupant needs and climatic scenarios.
– Convertibility: The degree of adaptability of the internal physical space and external shell to accommodate changes of in-use.
– Expandability: The potential for the building to be extended, horizontally or vertically.
– 'Refurbishment potential': The potential for major refurbishment, including replacing the façade.

**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:
– 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 or vertical

## 5.0 BREEAM ASSESSMENT

The subsequent attachment highlights the BREEAM credits that have been targeted for the London Irish Centre development, and provides the corresponding BREEAM percentage scores.

Additionally, there are a number of other credits as listed below that can be targeted to maintain the highest level of rating required :-

1. Man 03 - Responsible construction practices – ensuring the appointed contractor carries ISO14001 accreditation and using AP services during construction
2. Man 04 – Testing and inspecting building fabric by undertaking a thermographic survey to detect faults in thermal bridging and remediating.
3. Hea 01 - Visual comfort – façade design and use of blinds
4. Hea 02 - Indoor air quality – to consider pre-occupancy testing
5. Hea 06 - Security
6. Ene 01 - Reduction of energy use and carbon emissions – to look at various options to ensure the energy efficiency is optimised
7. Mat 03 - Responsible sourcing of construction products to optimise the use of environmentally friendly products
8. Wst 01 - Construction waste management – keeping waste arising to an absolute minimum – reducing transport emissions and recycling costs.
9. Wst 05 - Adaptation to climate change - to further reduce potential fabric impacts and long term running costs
10. LE 02 - Identifying and understanding the risks and opportunities for the project via the appointment of an ecologist to look at site enhancements

This concept stage assessment and report at Section 7.0 represents the performance of the building at the early design stage of the assessment, prior to detailed design/planning and before the beginning of operations on site. Certification at this stage does not, therefore, represent the buildings final 'as built' BREEAM performance.

However, adoption of the above noted points could lead to an overall BREEAM score in excess of 80%, close to an Outstanding rating.

## 6.0 CONCLUSIONS

Taking on the guidance for the advisory professional, the Developer and Principle Contractor will commit to achieving the required score with the above recommendations incorporated into the specification. As a result, the London Irish Centre will enjoy reduced operating and life cycle costs due to the enhancement over and above current Building Regulations and built in features designed to reduce environmental impact and greenhouse gases.

Overall the carbon footprint of the scheme will be minimised along with its Ecological impact. All stakeholders involved stand to benefit as a result of the assessment and recommendations.

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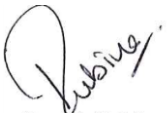

**Prepared** **Date** 30th June 2020

**Checked** **Date** 30th June 2020

## 7.0 BREEAM TRACKER AND REPORT

# BREEAM NEW CONSTRUCTION 2018

**London Irish Centre**
BREEAM NEW CONSTRUCTION 2018 Other - Non-residential Institution

**Target : Excellent 73.15**

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| | Category | Assessment Issues | Compliance Requirements | BREEAM User Guide | Definite | Possible | Not Targeting | Max Credits Available | Pre-assessment Stage 16.10.19 | Action/Responsible person | Tracker |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Management | Man 1 - Project brief and Design | **Project delivery planning** (1 credit) | 1. Prior to completion of the Concept Design, the project delivery stakeholders to identify and define for each key phase of project delivery:<br>1.a Roles<br>1.b Responsibilities<br>1.c Contributions.<br>2. Consider each one of the following items when defining roles, responsibilities and contributions for each key phase of the project:<br>2.a End user requirements<br>2.b Aims of the design and design strategy<br>2.c Particular installation and construction requirements or limitations<br>2.d Occupiers' budget and technical expertise in maintaining any proposed systems<br>2.e Maintainability and adaptability of the proposals<br>2.f Operational energy<br>2.g Requirements for the production of project and end user documentation<br>2.h Requirements for commissioning, training and aftercare support.<br>3. The project team demonstrates how the project delivery stakeholders' contributions and the consultation process outcomes influence the following:<br>3.a Initial Project Brief<br>3.b Project Execution Plan<br>3.c Communication Strategy<br>3.d Concept Design. | 1 to 3 | 1 | | | 1 | Stakeholder consultation has taken place during early design stages, defining roles and responsibilities of the project team and demonstrating how the consultation process has influenced the overall design<br><br>Significant evidence of this process is in place including design teams meeting minutes, letter of appointment and the ongoing identification of needs - acousticians, ecology,etc | Project Team | |
| | | **Stakeholder Consultation (Interested Parties)** (1 credit) | 4. Prior to completion of the Concept Design, the design team consult with all interested parties on matters that cover the minimum consultation content.<br>5. Demonstrate how the stakeholder contributions and consultation exercise outcomes influence the Initial Project Brief and Concept Design.<br>6. Prior to completion of the detailed design (RIBA Stage 4, Technical Design or equivalent), all interested parties give and receive consultation feedback. | 4 to 6 | 1 | | | 1 | Relevant interested parties (e.g. intended building users, FM staff, representative consultation group from existing community, existing partnerships and networks) have been consulted by the design team | Project Team | |
| | | **BREEAM AP (Concept Design)** (1 credit ) | **Prerequisite**:<br>8. The project team, including the client, formally agree strategic performance targets early in the design process<br><br>9. Involve a BREEAM AP in the project at an appropriate time and level to:<br>9.a Work with the project team, including the client, to consider the links between BREEAM issues and assist them in maximising the project's overall performance against BREEAM, from their appointment and throughout Concept Design.<br>9.b Monitor progress against the performance targets agreed throughout all stages after their appointment where decisions critically impact BREEAM performance.<br>9.c Proactively identify risks and opportunities related to the achievement of the targets agreed under criterion 8.<br>9.d Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets.<br>9.e Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team. | 8,9 | 1 | | | 1 | Team to appoint BREEAM AP to offer the required design stage advice to ensure the most appropropriate BREEAM score is achived given proejct budget and delivery timescales<br><br>eb7 appointed at concept stage | eb7 | |
| | | **BREEAM AP (Developed Design)** (1 credit ) | 10. Criteria 8 and 9 above are achieved.<br>11. Involve the BREEAM AP in the project at an appropriate time and level to:<br>11.a Work with the project team, including the client, to consider the links between BREEAM issues and to assist them in maximising the project's overall performance against BREEAM throughout Developed Design.<br>11.b Monitor progress against the performance targets agreed under throughout all stages where decisions critically impact the specification and tendering process and the BREEAM performance.<br>11.c Proactively identify risks and opportunities related to the achievement of the targets.<br>11.d Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets.<br>11.e Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team. | 10,11 | 1 | | | 1 | | BREEAM AP | |
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| | Man 2 | **Elemental Life Cycle Costing** (2 credits) | 1. A competent person carries out an outline, entire asset LCC plan at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) together with any design options appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865: 2008(6).<br>2. The elemental LCC plan:<br>2.a Provides an indication of future replacement costs over a period of analysis as required by the client (e.g. 20, 30, 50 or 60 years);<br>2.b Includes service life, maintenance and operation cost estimates.<br>3. Demonstrate, using appropriate examples provided by the design team, how the elemental LCC plan has been used to influence building and systems design and specification to minimise life cycle costs and maximise critical value. | 1 to 3 | | 2 | | 2 | The developer is to commission Elemental Life Cycle Costing in accordance with relevant standards and demonstrate how the LCC plan has influenced the building and systems design and specification | QS | |

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| **Man 2 - Life cycle cost and service life planning** | **Component level LCC plan** (1 credit) | 4. A competent person develops a component level LCC options appraisal by the end of Process Stage 4 (equivalent to Technical Design – RIBA Stage 4) in line with PD 156865: 2008. The component level LCC includes :<br>4.a Envelope, e.g. cladding, windows, or roofing<br>4.b Services, e.g. heat source, cooling source, or controls<br>4.c Finishes, e.g. walls, floors or ceilings<br>4.d External spaces, e.g. alternative hard landscaping, boundary protection.<br>5. Demonstrate, using appropriate examples provided by the design team, how the component level LCC options appraisal has been used to influence building and systems design and specification to minimise life cycle costs and maximise critical value. | 4,5 | | | 1 | 1 | **Issue not targeted** | | |
| | **Capital cost reporting** (1 credit) | 6. Report the capital cost for the building in pounds per square metre of gross internal floor area (£k/ m²) as part of the submission to BRE | 6 | 1 | | | 1 | The developer will publish data on project costing | Client | |
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| **Man 3 - Responsible Construction Practices** | **Prerequisite** | 1. All timber and timber-based products used during the construction process of the project are 'legally harvested and traded timber' | 1 | | | Y | | **Mandatory**-Ensure all timber and timber based products will be legally sourced in line with FCS/PEFC including site timber | Contractor | |
| | **Environmental management - EMS System** (1 credit) | 3. All parties who at any stage manage the construction site (e.g. the principal contractor, the demolition contractor) operate an EMS covering their main operations.<br>The EMS must:<br>3.a Be third party certified, to ISO 14001: 2015(10), EMAS (EU Eco Management and Audit Scheme) or equivalent standard;<br>OR<br>3.b In compliance with BS 8555: 2016(11) have:<br>3.b.i Appropriate structure<br>3.b.ii Reached implementation stage phase four 'implementation and operation of the environmental management system'<br>3.b.iii Completed defined phase audits one to four.<br>4. All parties who at any point manage the construction site (e.g. the principal contractor, the demolition contractor) implement best practice pollution prevention policies and procedures on site in accordance with Working at construction and demolition sites: PPG6, Pollution Prevention Guidelines(12). | 3,4 | 1 | | | 1 | Principal contractor to operate an EMS to be third party certified to ISO 14001: 2015(10) or equivalent standard and implement best practice pollution and prevention policies in line with the required standards<br><br>**It is recommended that the contractor would need to be ISO14001 registered** | Contractor | |
| | **BREEAM AP (Site)** (1 credit) | **Prerequisite**:<br>5. The client and the contractor formally agree performance targets.<br><br>6. Involve a BREEAM AP in the project at an appropriate time and level to:<br>6.a Work with the project team, including the client, to consider the links between BREEAM issues and assist them in achieving and if possible going beyond the design intent, to maximise the project's performance against the agreed performance targets throughout the Construction, Handover and Close Out stages.<br>6.b Monitor construction progress against the performance targets agreed throughout all stages where decisions critically impact BREEAM performance.<br>6.c Proactively identify risks and opportunities related to the procurement and construction process and the achievement of the targets agreed.<br>6.d Provide feedback to the constructors and the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets.<br>6.e Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team and the provision to the assessor. | 5,6 | 1 | | | 1 | **Issue in reserve** | | |
| | **Responsible construction management** (up to 2 credits) | The principal contractor evaluates the risks (on site and off site), plans and implements actions to minimise the identified risks including Vehicle movement, Pollution management, Tidiness, Health & Wellbeing, Security process, Training and awareness feedback, Monitoring & reporting<br><br>**One credit**<br>7. Achieve items listed as required for one credit in Table 4.1 Responsible construction management items (Refer to Table 4.1 of the BREEAM manual)<br><br>**Two credits**<br>8. Achieve criterion 7 above<br>9. Achieve six additional items in Table 4.1 Responsible construction management items (Refer to Table 4.1 of the BREEAM manual) | 7 to 9 | 2 | | | 2 | Principal contractor to evaluate risks from construction activities and implement suitable actions to minimise the identified risks as outlined in Table 4.1 Responsible construction management items<br><br>**see Contractor Obligations** | Contractor | |
| | **Monitoring of construction-site impacts** (up to 2 credits) | 10. Assign responsibility to an individual for monitoring, recording and reporting energy use, water consumption and transportation data (where measured) resulting from all on-site construction processes (and dedicated off-site manufacturing) throughout the build programme. To ensure the robust collection of information, this individual must have the appropriate authority and responsibility to request and access the data required. Where appointed, the BREEAM AP could perform this role | 10 to 22 | 2 | | | 2 | Principal contractor to monitor and report energy use and water consumption from on-site construction activities, as well as transport of materials and waste to and from site<br><br>**see Contractor Obligations** | Contractor | |

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| | **Man 4 - Commissioning and Handover**<br>**Minimum Standards- commissioning-test schedule and responsibilities** | **Commissioning testing schedule and Responsibilities**<br>**(1 credit)** | 1. Prepare a schedule of commissioning and testing. The schedule identifies and includes a suitable timescale for commissioning and re-commissioning of all complex and non-complex building services and control systems and for testing and inspecting building fabric.<br>2. The schedule identifies the appropriate standards for all commissioning activities to be conducted, where applicable, in accordance with Current Building Regulations, BSRIA guidelines(16), CIBSE guidelines(17), Other appropriate standards<br>3. Where a building management system (BMS) is specified:<br>3.a Carry out commissioning of air and water systems when all control devices are installed, wired and functional<br>3.b Include physical measurements of room temperatures, off-coil temperatures and other key parameters, as appropriate, in commissioning results<br>3.cThe BMS or controls installation should be running in auto with satisfactory internal conditions prior to handover<br>3.d All BMS schematics and graphics (if BMS is present) are fully installed and functional to user interface prior to handover<br>3.e Fully train the occupier or facilities team in the operation of the system.<br>4. Appoint an appropriate project team member to monitor and programme pre-commissioning, commissioning and testing. Where necessary include re-commissioning activities on behalf of the client.<br>5. The principal contractor accounts for the commissioning and testing programme, responsibilities and criteria within their budget and the main programme of works. | 1 to 5 | 1 | | | 1 | Appropriate project team member is to schedule commissioning including optimal timescales and appropriate testing and commissioning of all building services systems including BMS in line with best practice including inspecting, testing, identifying and rectifying defects via an appropriate method | MEP | |
| | | **Commissioning - design and preparation**<br>**(1 credit)** | 6. Achieve criteria 1 to 5<br>7. During the design stage, the client or the principal contractor appoints an appropriate project team member , provided they are not involved in the general installation works for the building services systems, with responsibility for:<br>7.a Undertaking design reviews and giving advice on suitability for ease of commissioning.<br>7.b Providing commissioning management input to construction programming and during installation stages.<br>7.c Management of commissioning, performance testing and handover or post-handover stages.<br>For buildings with complex building services and systems, this role needs to be carried out by a specialist commissioning manager. | 6,7 | 1 | | | 1 | | | |
| | | **Testing and inspecting building fabric**<br>**(1 credit)** | 8. Achieve criteria 1 to 5<br>9.The commissioning and testing schedule and responsibilities credit is achieved.<br>Complete post-construction testing and inspection to quality-assure the integrity of the building fabric, including continuity of insulation, avoidance of thermal bridging and air leakage paths (this is through airtightness testing and a thermographic survey). A suitably qualified professional undertakes the survey and testing in accordance with the appropriate standard.<br>10. Rectify any defects identified during post-construction testing and inspection prior to building handover and close out. Any remedial work must meet the required performance characteristics for the building or element as defined at the design stage. | 8 to 10 | | 1 | | 1 | Thermographic survey and air-tightness testing to be carried out in line with the appropriate standards and any defects identified to be rectified during post-construction testing and inspection<br>**Issue kept in reserve** | Contractor | |
| | | **Handover**<br>**(1 credit)** | 11. Prior to handover, develop two building user guides<br>11.a A non-technical user guide for distribution to the building occupiers.<br>11.b A technical user guide for the premises facilities managers.<br>A draft copy is developed and discussed with users first (where the building occupants are known) to ensure the guide is most appropriate and useful to potential users.<br>12. Prepare two training schedules timed appropriately around handover and proposed occupation plans for the following users:<br>12.a A non-technical training schedule for the building occupiers.<br>12.b A technical training schedule for the premises facilities managers. | 11,12 | 1 | | | 1 | Principal Contractor to provide a non-technical & technical user guide and two training schedules for the building occupiers and premises facilities manager timed appropriately around handover and proposed occupation.<br><br>**See contractor obligations** | Contractor | |
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| | | **Aftercare support**<br>**(1 credit)** | 1. Provide aftercare support to the building occupiers through having in place operational infrastructure and resources.<br>1.a A meeting between the aftercare support team or individual, and the building occupier or management team (prior to initial occupation, or as soon as possible thereafter) to:<br>1.a.i Introduce the aftercare support available, including the content of the building user guide (where it exists) and training schedule.<br>1.a.ii Present key information on the building including the design intent and how to use the building to ensure it operates as efficiently and effectively as possible.<br>1.b On-site facilities management training including:<br>1.b.i a walkabout of the building<br>AND<br>1.b.ii introduction to and familiarisation with the building systems, their controls and how to operate them in accordance with the design intent and operational demands.<br>1.c Provide initial aftercare support for at least the first month of building occupation, e.g. weekly attendance on-site, to support building users and management (the level of frequency will depend on the complexity of the building and building operations).<br>1.d Provide longer term aftercare support for occupiers for at least the first 12 months from occupation, e.g. a helpline, nominated individual or other appropriate system to support building users and management.<br>2. Establish operational infrastructure and resources to coordinate the collection and monitoring of energy and water consumption data for a minimum of 12 months, once the building is substantially occupied. This facilitates analysis of discrepancies between actual and predicted performance, with a view to adjusting systems and user behaviours accordingly. | 1, 2 | 1 | | | 1 | Commitment by developer and contractor to put in place the necessary infrastructure and resources to provide aftercare support to the building occupier or management team and establish operational infrastructure to coordinate the collection and monitoring of energy and water consumption data for a minimum of 12 months, once the building is substantially occupied.<br><br>**eb7 have provided draft Head of Terms of Agreement for review** | Contractor | |

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| | **Man 5 - Aftercare** | **Commissioning implementation**<br>(1 credit) | 3. Complete the following commissioning activities over a minimum 12-month period, once the building becomes substantially occupied:<br>3.a Complex systems: The specialist commissioning manager will:<br>3.a.i Identify changes made by the owner or operator that might have caused impaired or improved performance.<br>3.a.ii Test all building services under full load conditions, i.e. heating equipment in mid-winter, cooling and ventilation equipment in mid-summer and under part load conditions (spring and autumn).<br>3.a.iii Where applicable, carry out testing during periods of extreme (high or low) occupancy.<br>3.a.iv Interview building occupants (where they are affected by the complex services) to identify problems or concerns regarding the effectiveness of the systems.<br>3.a.v Produce monthly reports comparing sub-metered energy performance to the predicted one.<br>3.a.vi Identify inefficiencies and areas in need of improvement.<br>3.a.vii Re-commission systems (following any work needed to serve revised loads), and incorporate any revisions in operating procedures into the operations and maintenance (O&M) manuals.<br>3.b Simple systems (naturally ventilated): The external consultant, aftercare team or facilities manager will:<br>3.i Review thermal comfort, ventilation, and lighting, at three, six and nine month intervals after initial occupation, either by measurement or occupant feedback.<br>3.ii Identify deficiencies and areas in need of improvement.<br>3.iii Re-commission systems and incorporate any relevant revisions in operating procedures into the O&M manuals. | 3 | 1 | | | 1 | Specialist Commissioning Manager or External consultant to undertake commissioning activities over a min 12 month period for the complex/ simple building systems proposed once the building becomes substantially occupied<br><br>**eb7 have provided draft Head of Terms of Agreement for review** | Specialist Commissioning Manager | |
| | | **Post occupancy evaluation**<br>(1 credit) | 4. The client or building occupier makes a commitment to carry out a post-occupancy evaluation (POE) exercise one year after initial building occupation.<br>5.a A review of the design intent and construction process (review of design, procurement, construction and handover processes).<br>5.b Feedback from a wide range of building users including facilities management on the design and environmental conditions of the building covering:<br>5.b.i Internal environmental conditions (light, noise, temperature, air quality)<br>5.b.ii Control, operation and maintenance<br>5.b.iii Facilities and amenities<br>5.b.iv Access and layout<br>5.b.v Energy and water consumption<br>5.b.vi Other relevant issues, where appropriate<br>6. The independent party provides a report with lessons learned to the client and building occupiers.<br>7. The client or building occupier commits funds to pay for the POE in advance. This requires an independent party to be appointed to carry out the POE as described in criterion 5. Evidence of the appointment of the independent party and schedule of responsibilities which fulfils the BREEAM criteria are acceptable to demonstrate compliance. | 4 to 7 | 1 | | | 1 | The developer, in cooperation with the building occupier will commit to carrying out a post occupancy evaluation (POE) exercise one year after initial building occupation<br><br>**eb7 have provided draft Head of Terms of Agreement for review** | Specialist Commissioning Manager | |
| | **SECTION CREDIT SCORE** | | | | **8.381** | **2.095** | **0.524** | **21** | | | |
| **Health & Wellbeing** | | **Control of glare from sunlight**<br>(1 credit) | 1. Identify areas at risk of glare using a glare control assessment. The glare control assessment also justifies any areas deemed not at risk of glare.<br>2.A glare control strategy designs out potential glare in all relevant building areas where risk has been identified. This should be achieved through building form and layout or building design measures.<br>3.The glare control strategy does not increase energy consumption used for lighting. This is achieved by:<br>3.a Maximising daylight levels in all weather, cloudy or sunny AND<br>3.b Ensuring the use or location of shading does not conflict with the operation of lighting control systems. | 1 to 3 | 1 | | | 1 | A glare control assessment is used to determine the areas of the building that are at risk of glare. Compliant shading measures are specified in all relevant areas to avoid potential glare. Also, ensure glare control strategy does not increase energy consumption used for lighting<br><br>**Blinds to be installed for glare control in all relevant areas.** | Specification | |
| | | **Daylighting**<br>(up to 2 credits - building type dependent) | 4. Daylighting criteria have been met using either of the following options:<br>4a The relevant building areas meet good practice daylight factors and other criteria as outlined in Table 5.1 and Table 5.2 (Refer to Table 5.1 and Table 5.2 of the BREEAM manual)<br>4.b The relevant building areas meet good practice average and minimum point daylight illuminance criteria as outlined in Table 5.3 (Refer to Table 5.3 of the BREEAM manual)<br>Additional alternative route for healthcare building types only:<br>4.cThe relevant building areas meet the median daylight factors and minimum daylight factors in Table 5.4 (Refer to Table 5.4 of the BREEAM manual) | Other Building | | | 1 | 1 | **Issue not targeted** | | |
| | | **View out**<br>(1 credit ) | 5. 95% of the floor area in 95% of spaces for each relevant building area is within 8 m of an external wall which has a window or permanent opening that provides adequate view out<br>6. The window/opening must be ≥ 20% of the surrounding wall area. 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 82061<br>7. In addition, the building type criteria in Table 5.6 are applicable to view out criteria.(Refer to Table 5.6 of the BREEAM manual) | 5 to 7 | | | 1 | 1 | **Issue not targeted** | | |

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| **Hea 01 - Visual Comfort** | **Internal and external lighting, zoning & control** (1 credit) | **Internal Lighting**<br>8. Internal lighting in all relevant areas of the building is designed to provide illuminance (lux) levels and colouring rendering index in accordance with the SLL Code for Lighting 2012 (33) and any other relevant industry standard. Internal lighting should be appropriate to the tasks undertaken, accounting for building user concentration and comfort levels.<br>9. For areas where computer screens are regularly used, the lighting design complies with CIBSE Lighting Guide 7(34) sections 2.4, 2.13 to 2.15, 2.20, and 6.10 to 6.20.<br>9.a Limits to the luminance of the luminaires to avoid screen reflections.<br>9.b Any area where a surface is used to reflect light in to a space, such as uplighting, the recommendations refer to the luminance of the lit ceiling rather than the luminaire; a design team calculation is usually required to demonstrate this.<br>9.c Recommendations for direct lighting, ceiling illuminance, and average wall illuminance.<br><br>**External Lighting**<br>10. All external lighting located within the construction zone is specified in accordance with BS 5489-1:2013 Code for the practice for the design of road lighting. Lighting of roads and public amenity areas (35) and BS EN 12464-2:2014 (36) Light and lighting - Lighting of work places - Part 2: Outdoor work places. External lighting should provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night.<br>11. Where no external light fittings are specified (either separate from or mounted on the external building façade or roof), the criteria relating to external lighting do not apply and the credit can be awarded on the basis of compliance with Internal lighting criteria<br><br>**Zoning & Occupant Control**<br>12. Internal lighting is zoned to allow for occupant control. Zoning is in accordance with the criteria below for relevant areas present within the building:<br>12.a In office areas, zones of no more than four workplaces<br>12.b Workstations adjacent to windows or atria and other building areas separately zoned and controlled<br>12.c Seminar and lecture rooms: zoned for presentation and audience areas<br>12.d Library spaces: separate zoning of stacks, reading and counter areas<br>12.e Teaching space or demonstration area<br>12.f Whiteboard or display screen<br>12.g Auditoria: zoning of seating areas, circulation space and lectern area<br>12.h Dining, restaurant, café areas: separate zoning of servery and seating or dining areas<br>12.i Retail: separate zoning of display and counter areas<br>12j Bar areas: separate zoning of bar and seating areas<br>12.k Wards or bedded areas: zoned lighting control for individual bed spaces and control for staff over groups of bed spaces<br>12.l Treatment areas, dayrooms, waiting areas: zoning of seating and activity areas and circulation space with controls accessible to staff.<br>Areas used for teaching, seminar or lecture purposes have lighting controls provided in accordance with CIBSE Lighting Guide 5 (37)<br>In addition, the building type criteria in Table 5.7 (Refer to Table 5.7 of the BREEAM manual) | 8 to 12 | 1 | | | 1 | Internal lighting to be designed in accordance with the relevant standards including areas where computer screens are regularly used and lighting to be appropriately zoned for occupant control<br><br>External lighting to be additionally designed in line with the relevant standards and provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night. | M&E Consultant | |
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| **Hea 02 - Indoor Air Quality** | **Prerequisite** | 1. A site-specific indoor air quality plan has been produced and implemented.<br>The plan must be produced no later than the end of Concept Design. The objective of the plan is to facilitate a process that leads to design, specification and installation decisions and actions that minimise indoor air pollution during occupation of the building. An indoor air quality plan has been produced considering the following:<br>1.a Removal of contaminant sources<br>1.b Dilution and control of contaminant sources<br>1.c Procedures for pre-occupancy flush out<br>1.d Third party testing and analysis<br>1.e Maintaining indoor air quality in-us | 1 | 1 | | | | A site specific Indoor Air Quality Plan is to be commissioned by the developers outlining actions/recommendations to minimise indoor air pollution during occupation | Contractor | |
| | **Ventilation** (1 credit) | 2. The building has been designed to minimise the indoor concentration and recirculation of pollutants in the building as follows:<br>2.a Provide fresh air into the building in accordance with the criteria of the relevant standard for ventilation<br>2.b Ventilation pathways are designed to minimise the ingress and build-up of air pollutants inside the building<br>2.c Where present, HVAC systems must incorporate suitable filtration to minimise external air pollution, as defined in BS EN 13779:2007 Annex A3(46). The specified filters should achieve a minimum Indoor Air Quality of IDA2<br>2.d Areas of the building subject to large and unpredictable or variable occupancy patterns have carbon dioxide ($CO_2$) or air quality sensors specified and:<br>2.d.i In mechanically ventilated buildings or spaces: sensors are linked to the mechanical ventilation system and provide demand-controlled ventilation to the space<br>2.d.ii In naturally ventilated buildings or spaces: sensors either have the ability to alert the building owner or manager when $CO_2$ 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 or roof vents<br>2.e For naturally ventilated or mixed mode buildings, the design demonstrates that the ventilation strategy provides adequate cross flow of air to maintain the required thermal comfort conditions and ventilation rates in accordance with CIBSE AM10(47). | 2 to 5 | 1 | | | 1 | Implementing robust means of ventilation design for naturally ventilated OR air-conditioned and mixed mode buildings in accordance with relevant standards. Areas of the building subject to large and unpredictable or variable occupancy patterns have carbon dioxide ($CO_2$) or air quality sensors specified | M&E Consultant | |
| | **Emissions from construction products** (up to 2 credits) | **One credit**<br>3. Three out of the five product types meet the emission limits, testing requirements and any additional requirements listed in Table 5.11 (Refer to Table 5.11 of the BREEAM manual) Where wood-based products are not one of three selected product types, all wood-based products used for internal fixtures and fittings must be tested and classified as formaldehyde E1 class as a minimum.<br><br>**Two Credits**<br>4. All of the product types listed meet the emission limits, testing requirements and any additional requirements listed in Table 5.11 (Refer to Table 5.11 of the BREEAM manual) | 6,7 | 1 | 1 | | 2 | Construction products listed within Table 5.11: Emission criteria by product type meet the emission limits, testing requirements and any additional requirements stated<br><br>**See Contractor obligations** | Contractor | |

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| | **Post-construction indoor air quality measurement**<br>**(1 credit)** | 5. The formaldehyde concentration in indoor air is measured post construction (but pre-occupancy) and does not exceed 100 µg/ m³ averaged over 30 minutes (World Health Organization guidelines for indoor air quality: Selected pollutants, 2010 (58)<br>6. The formaldehyde sampling and analysis is performed in accordance with ISO 16000-2 (59) and ISO 16000-3 (60).<br>7. The total volatile organic compound (TVOC) concentration in indoor air is measured post construction (but pre-occupancy) and does not exceed 500 µg/ m³over 8 hours.<br>8. The TVOC sampling and analysis is performed in accordance with ISO 16000-5 (61) and ISO 16000 6 (62) or ISO 16017-1 (63).<br>9. Where levels are found to exceed these limits, the project team confirms the measures that have, or will be, undertaken in accordance with the IAQ plan, to reduce the TVOC and formaldehyde levels to within the above limits.<br>10. The measured concentration levels of formaldehyde (µg/ m³) and TVOC (µg/ m³) are reported, via the BREEAM Scoring and Reporting Tool. | 5 to 10 | | | 1 | 1 | **Issue not targeted** | | |
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| | | | | | | | | **SECTION CREDIT SCORE** | | |
| **Hea 04 - Thermal Comfort** | **Thermal Modelling**<br>**(1 credit)** | 1. Thermal modelling has been carried out using software in accordance with CIBSE AM111 Building Energy and Environmental Modelling<br>2. The software used to carry out the simulation at the detailed design stage provides full dynamic thermal analysis<br>3. The modelling demonstrates that:<br>3.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(79), Table 1.5; or other appropriate industry standard (where this sets a higher or more appropriate requirement or level for the building type)<br>3.b For naturally ventilated buildings:<br>3.b.i 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 or level for the building type)<br>3.b.ii The building is designed to limit the risk of overheating, in accordance with the adaptive comfort methodology outlined in either of the following standards as appropriate; CIBSE TM52: The limits of thermal comfort: avoiding overheating in European buildings(80) or CIBSE TM59: Design methodology for the assessment of overheating risk in homes(81)<br>4. 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. | 1 to 4 | 1 | | | 1 | Full dynamic thermal modelling to be undertaken in accordance with CIBSE AM11 standards and demonstrating compliance with criteria set out in CIBSE Guide A Environmental design(79), Table 1.5; or other appropriate industry standard and limiting risk of overheating in accordance with CIBSE TM52: The limits of thermal comfort: avoiding overheating in European buildings(80) | MEP | |
| | **Design for future thermal comfort**<br>**(1 credit)** | 5. Criteria 1 to 4 are achieved.<br>6. The thermal modelling demonstrates that the relevant requirements set out in criterion 3 above are achieved for a projected climate change environment.<br>7. Where criterion 6 above is not met, the project team demonstrates how the building has been adapted, or designed to be easily adapted in future using passive design solutions in order to subsequently meet the requirements under criterion 6 above<br>8. For air-conditioned buildings, the PMV and PPD indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool. | 5 to 8 | 1 | | | 1 | Full dynamic thermal modelling to be undertaken in line with Thermal modelling criteria above including allowance for projected climate change environment | | |
| | **Thermal zoning and controls**<br>**(1 credit)** | 9. Criteria 1 above to 4 above are achieved.<br>10 The thermal modelling analysis has informed the temperature control strategy for the building and its users.<br>11 The strategy for proposed heating or cooling systems demonstrates that it has addressed the following:<br>11.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.<br>11.b The degree of occupant control required for these zones. This is based on discussions with the end user (or alternatively building type or use specific design guidance, case studies, feedback) and considers:<br>11.b.i User knowledge of building services<br>11.b.ii Occupancy type, patterns and room functions (and therefore appropriate level of control required)<br>11.b.iii How the user is likely to operate or interact with the systems, e.g. are they likely to open windows, access thermostatic radiator valves (TRV) on radiators, change air-conditioning settings etc.<br>11.b.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)<br>11.c 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<br>11.d The need or otherwise for an accessible building user actuated manual override for any automatic systems. | 9 to 11 | 1 | | | 1 | The thermal modelling analysis has informed the temperature control strategy for the building and its users. | | |
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| **Hea 05 - Acoustic Performance** | **Acoustic performance**<br>**(up to 3 credits)** | **Up to three credits - Acoustic performance**<br>For all building types, except Residential institutions (short term and long term stay), which have four credits available below.<br>1 .The building meets the appropriate acoustic performance standards and testing requirements defined in the relevant table below. (Refer to Table 5.14 to 5.17 of the BREEAM manual)<br>These tables define criteria for the acoustic principles of:<br>1.a Sound insulation<br>1.b Indoor ambient noise level<br>1.c Room acoustics.<br>OR<br>2. A suitably qualified acoustician (SQA) is appointed to define a bespoke set of performance requirements for all function areas in the building. The bespoke performance requirements use the three acoustic principles defined in criterion Hea 05 Acoustic performance - Criterion 1 above, setting out the performance requirements for each and the testing regime required. | Other Building | 3 | | | 3 | The building meets the appropriate acoustic performance standards and testing requirements defined within the Tables 5.14 to 5.17. A suitably qualified acoustician is to be appointed to define a bespoke set of performance requirements for all function areas in the building | Suitably Qualified Acoustician | |
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| | **Hea 06 - Security** | **Security of site and building** (1 credit) | 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 .<br>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.<br>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. | 1 to 3 | 1 | | | 1 | A Suitably Qualified Security Specialist (SQSS) conducts an evidence-based Security Needs Assessment for the project and recommendations to be incorporated within the proposal | Security Consultant | |
| | | | | | | | | | | |
| | **Hea 07 - Safe and healthy surroundings** | **Safe access** (1 credit) | Where external site areas form part of the assessed development the following apply:<br>1 . Dedicated and safe cycle paths are provided from the site entrance to any cycle storage, and connect to offsite cycle paths where applicable.<br>2. Dedicated and safe footpaths are provided on and around the site providing suitable links for the following:<br>2.a The site entrance to the building entrance,<br>2.b Car parks (where present) to the building entrance<br>2.c The building to outdoor space<br>2.d Connecting to off-site paths where applicable.<br>3 Pedestrian drop-off areas are designed off, or adjoining to, the access road and should provide direct access to other footpaths.<br>Where vehicle delivery access and drop-off areas form part of the assessed development, the following apply:<br>4. Delivery areas are not accessed through general parking areas and do not cross or share the following:<br>4.a pedestrian and cyclist paths<br>4.b outside amenity areas accessible to building users and general public.<br>5. There is a dedicated parking or waiting area for goods vehicles with appropriate separation from the manoeuvring area and staff and visitor car parking.<br>6. Parking and turning areas are designed for simple manoeuvring according to the type of delivery vehicle likely to access the site, thus avoiding the need for repeated shunting. | 1 to 6 | 1 | | | 1 | The project offers dedicated and safe access for pedestrians and cyclists within the project development and separate access for delivery goods with dedicated parking and waiting areas | Architect | |
| | | **Outside space** (1 credit) | 7. There is an outside space providing building users with an external amenity area. | 7 | 1 | | | 1 | An external amenity area proposed within the design<br>Drawings indicate community gardens | | |
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| | **SECTION CREDIT SCORE** | | | | **11.529** | **0.824** | **2.471** | **17** | | |
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| **Energy** | **Ene 01 - Reduction of CO2 Emissions** | **Energy Performance** (up to 9 credits) | 1. Calculate an Energy Performance Ratio for New Construction (EPR NC). Compare the EPR NC achieved with the benchmarks in Table 6.1 and award the corresponding number of BREEAM credits. (Refer to Table 6.1 of the BREEAM manual) | 1 | 5 | | 4 | 9 | SBEM modelling to be undertaken and relevant outputs generated to inform the Energy Performance Ratio for New Construction (EPR NC) for the project | Energy Consultant | |
| | | **Prediction of operational energy consumption** | **Prerequisite**<br>2. Prior to completion of the Concept Design, relevant members of the design team hold a preliminary design workshop focusing on operational energy performance.<br><br>Energy modelling and reporting<br>3. Undertake additional energy modelling during the design and post-construction stage to generate predicted operational energy consumption figures<br>4. Report predicted energy consumption targets by end use, design assumptions and input data.<br>5. Carry out a risk assessment to highlight any significant design, technical, and process risks that should be monitored and managed throughout the construction and commissioning process. | 2 to 5 | 4 | | | 4 | Carry out additional energy modelling during design and post-construction stages to generate predicted operational energy consumption figures along with a risk assessment of any significant design, technical and process risks | | |
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| | **Ene 02 - energy Monitoring**<br><br>**Minimum Standards-First Sub-metering credit** | **Sub-metering of end-use categories** (1 credit) | 1. Install energy metering systems so that at least 90% of the estimated annual energy consumption of each fuel is assigned to the end-use categories.<br>2. Meter the energy consumption in buildings according to the total useful floor area:<br>2.a If the area is greater than 1,000 m², by end-use category with an appropriate energy monitoring and management system.<br>2.b If the area is less than 1,000 m², use either:<br>2.b.i an energy monitoring and management system or<br>2.b.ii separate accessible energy sub-meters with pulsed or other open protocol communication outputs, for future connection to an energy monitoring and management system<br>3. Building users can identify the energy consuming end uses, for example through labelling or data outputs. | 1 to 3 | 1 | | | 1 | Appropriate energy metering systems to be installed for each fuel type assigned to end-use category outlined below:-<br>1. Space heating<br>2. Domestic hot water heating<br>3. Humidification<br>4. Cooling<br>5. Ventilation, i.e. fans (major)<br>6. Pumps<br>7. Lighting<br>8. Small power<br>9. Renewable or low carbon systems (separately)<br>10. Controls<br>Meters to be clearly labelled and accessible for building users | MEP | |
| | | **Sub-metering of high energy load and tenancy areas** (1 credit) | 4. Monitor a significant majority of the energy supply with:<br>4.a An accessible energy monitoring and management system for:<br>4.a.i tenanted areas or<br>4.a.ii relevant function areas or departments in single occupancy buildings.<br>OR<br>4.b Separate accessible energy sub-meters with pulsed or other open protocol communication outputs for future connection to an energy monitoring and management system for:<br>4.b.i tenanted areas or<br>4.b.ii relevant function areas or departments in single occupancy buildings.<br>5. Sub-meter per floor plate in large single occupancy or single-tenancy buildings with one homogeneous function, for example hotel bedrooms, offices. | 4,5 | 1 | | | 1 | Relevant tenanted/ function areas to be separately metered within the building<br><br>**Individual submeter for the kitchen area?** | | |
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| **Ene 03 - External lighting** | **External Lighting** (1 credit) | 1. No external lighting (which includes lighting on the building, at entrances and signs).<br>OR<br>2 External light fittings within the construction zone with:<br>2.a Average initial luminous efficacy of not less than 70 luminaire lumens per circuit Watt<br>2.b Automatic control to prevent operation during daylight hours<br>2.c Presence detection in areas of intermittent pedestrian traffic. | 1,2 | 1 | | | 1 | External lighting to be low energy and controlled by time switch or daylight control and presence detection in areas of intermittent pedestrian traffic | MEP | |
| | | | | | | | | | | |
| **Ene 04 - Low Carbon Design** | **Passive design analysis** (1 credit) | 1. Achieve the first credit Assessment scope - One credit - Thermal modelling to demonstrate that the building design delivers appropriate thermal comfort levels in occupied spaces.<br>2. The project team analyses the proposed building design and development during Concept Design to identify opportunities for the implementation of passive design measures.<br>3 Implement passive design measures to reduce the total heating, cooling, mechanical ventilation, lighting loads and energy consumption in line with the passive design analysis findings.<br>4. Quantify the reduced total energy demand and carbon dioxide ($CO_2$) emissions resulting from the passive design measures. | 1 to 4 | 1 | | | 1 | The first credit under Hea 04-Thermal modelling is achieved<br>Thereafter, the design team have considered appropriate passive design strategies that will be incorporated into the final design and report on reduction in $CO_2$ emissions<br><br>**London Plan Energy and Sustainability Statement** | MEP | |
| | **Free Cooling** (1 credit) | 5. Achieve the passive design analysis credit.<br>6. Include a free cooling analysis in the passive design analysis carried out under criterion2.<br>7. Identify opportunities for the implementation of free cooling solutions.<br>8. The building is naturally ventilated or uses any combination of the free cooling strategies listed in Free cooling analysis | 5 to 8 | | 1 | | 1 | Include a free cooling analysis in the passive design analysis carried out for the project and incorporate relevant free cooling strategies within the design | | |
| | **Low or zero carbon technologies** (1 credit) | 9. An energy specialist completes a feasibility study by the end of Concept Design.<br>10. Establish the most appropriate recognised local (on-site or near-site) low or zero carbon (LZC) energy sources for the building or development, based on the feasibility study.<br>11. Specify local LZC technologies for the building or development in line with the feasibility study recommendations.<br>12. Quantify the reduced regulated carbon dioxide ($CO_2$) emissions resulting from the feasibility study. | 9 to 12 | **1** | | | 1 | An LZC feasibility study has also been commissioned and the appropriate technology will be utilised to further reduce carbon emissions | | |
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| **Ene 05 - Energy Efficient Cold Storage** | **Refrigeration Energy Consumption** (1 credit) | 1. Design, install and commission the refrigeration system:<br>1.a In accordance with the Code of Conduct for carbon reduction in the refrigeration retail sector(124) and BS EN 378-2:2016(125).<br>1.b Using robust and tested refrigeration systems or components included on the Enhanced Capital Allowance (ECA) Energy Technology Product List (ETPL)(126) or an equivalent list<br>2. Commission the refrigeration plant in compliance with the commissioning criteria in BREEAM issue Man 04 Commissioning and handover | 1 and 2 | | | 0 | 0 | **Issue not applicable** | | |
| | **Indirect Greenhouse gas emissions** (1 credit) | 3. Achieve criteria 1 and 2.<br>4. Demonstrate a saving in indirect greenhouse gas emissions ($CO_2$-eq) from the installed refrigeration system over the course of its operational life. | 3 and 4 | | | 0 | 0 | | | |
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| **Ene 06- Energy Efficient Transportation Systems** | **Energy consumption** (1 credit) | 1. For specified lifts, escalators or moving walks (transportation types):<br>1.a Analyse the transportation demand and usage patterns for the building to determine the optimum number and size of lifts, escalators or moving walks<br>1.b Calculate the energy consumption in accordance with BS EN ISO 25745 Part 2(131) or Part 3(132) for one of the following:<br>1.b.i At least two types of system for each transportation type required OR<br>1.b.ii An arrangement of systems, for example for lift systems, hydraulic, traction, machine room-less lift (MRL) OR<br>1.b.iii A system strategy that is 'fit for purpose'<br>1.c Consider the use of regenerative drives, subject to the requirements in Regenerative drives below<br>1.d Specify the transportation system with the lowest energy consumption. | 1 | 1 | | | 1 | The developers will undertake an analysis of different lifts, escalators or moving walks specified to determine optimum alternatives<br><br>The selected lift system will also incorporate energy efficient systems within the design | Lift Supplier | |
| | **Energy efficient feature -** (2 credits) | 2. Achieve criterion 1 above<br>3. Specify the following three energy efficient features for each lift:<br>3.a A standby condition for off-peak periods<br>3.b The lift car lighting and display lighting provides an average luminous efficacy across all fittings in the car of > 70 luminaire lumens per circuit Watt<br>3.c Use of a drive controller capable of variable speed, variable-voltage, and variable-frequency (VVVF) control of the drive motor.<br>4. Specify regenerative drives where their use is demonstrated to save energy. | 2 to 4 | 2 | | | 2 | | | |

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| | **Ene 07** - **Energy Efficient Laboratory Systems** | **Design Specification** (1 credit) | Engage with the client during the preparation of the initial project brief to determine occupant requirements and define laboratory performance criteria. Performance criteria will include, but not be limited to:<br>1.a Description of purpose<br>1.b Occupant or process activities<br>1.c Containment requirements and standards<br>1.d Interaction between systems<br>1.e Flexibility and adaptability of laboratory facilities.<br>1.f Any other specific requirements (for example, requirements relevant to ventilation, heating or cooling).<br>2. Size the services system equipment (including ventilation supply and extract) correctly<br>3. Demonstrate the minimised energy demand of the laboratory facilities resulting from the achievement of the defined design performance criteria.<br>Laboratory containment devices and containment areas (criteria only applicable to buildings containing these facilities)<br>4 For ducted fume cupboards specified:<br>4.a Demonstrate that the average design air flow rate is no greater than 0.16 $m^3/s$ per linear metre (internal width) of fume cupboard workspace<br>4.b Measure the volume flow rate in the exhaust duct (at the boundary of the laboratory) to take account of reductions in (inward) volume flow rate from fume cupboard leakage<br>4.c Demonstrate that a reduction in air flow does not compromise the defined performance criteria and does not increase the health and safety risk to future building occupants. | 1 to 3 | | | 0 | 0 | **Not Applicable** | | |
| | | **Best practice energy efficient measures** (up to 4 credits) | If the laboratory area accounts for at least 10% of the total building floor area<br>5. Achieve criteria 1 to 4 above (or criteria 1 to 3 above where there are no ducted fume cupboards).<br>6. Design, specify and install laboratory plant and systems to promote energy efficiency. Demonstrate compliance with items in Table 6.4 below (Refer to Table 6.4 of the BREEAM manual)<br>6.a Up to 2 credits: laboratory areas ) account for at least 10% (but less than 25%) of the total building floor area OR<br>6.b Up to 4 credits: laboratory areas account for 25% or more of the total building floor area.<br>7. Demonstrate by calculations or modelling that the chosen measures have a reasonably significant effect on the total energy consumption of the laboratory, i.e. 2% reduction or greater.<br>8. Demonstrate that the energy efficient measures specified do not compromise the defined performance criteria, and do not increase the health and safety risk to future building occupants. | 5 to 8 | | | 0 | 0 | | | |
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| | **Ene 08** - **Energy Efficient Equipment** | **Energy Efficient Equipment** (2 credits) | 1. Identify the building's unregulated energy consuming loads. Estimate their contribution to the total annual unregulated energy consumption of the building, assuming a typical or standard specification.<br>2. Identify the systems or processes that use a significant proportion of the total annual unregulated energy consumption of the building.<br>3. Demonstrate a meaningful reduction in the total annual unregulated energy consumption of the building.<br>Table 6.5 lists some examples of significant contributors to unregulated energy consumption, and the associated criteria. If additional significant contributors, not listed in the table, will be specified, the design team should justify how a meaningful reduction will be achieved for these contributors. (Refer to Table 6.5 of the BREEAM manual) | 1 to 3 | 2 | | | 2 | Project team to identify all unregulated energy consuming loads within the building and estimate their contribution to the total annual unregulated consumption thereby demonstrating a meaningful reduction in energy consumption<br><br>**Kitchen - TM50**? | Kitchen Specialist | |
| | **SECTION CREDIT SCORE** | | | | **12.667** | **0.667** | **2.667** | **24** | | |
| **Transport** | **Tra 01** - **Transport assessment and travel plan** | **Travel plan** (2 credits) | 1. During the feasibility and design stages, develop a travel plan based on a site-specific travel assessment or statement.<br>2. The site-specific travel assessment or statement covers as a minimum:<br>2.a Existing travel patterns and opinions of existing building or site users towards cycling and walking, identifying constraints and opportunities, if relevant<br>2.b Travel patterns and transport impact of future building users<br>2.c Current local environment for walkers and cyclists (accounting for visitors who may be accompanied by young children)<br>2.d Reporting of the number and type of existing accessible amenities, see Table 7.1, within 500m of the site (Refer to Table 7.1 of the BREEAM manual)<br>2.e Disabled access (accounting for varying levels of disability and visual impairment)<br>2.f Calculation of the existing public transport Accessibility Index (AI),<br>2.g Current facilities for cyclists<br>3. The travel plan includes proposals to increase or improve sustainable modes of transport and movement of people and goods during the building's operation and use, see Methodology on the next page.<br>4. If the occupier is known, involve them in the development of the travel plan.<br>5. Demonstrate that the travel plan will be implemented post construction and be supported by the building's management in operation. | 1 to 5 | 2 | | | 2 | The design team are to develop and publish a travel plan specific to the assessed building and its users and demonstrate that the travel plan will be implemented post-construction | Client | |
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| | **Tra 02** - **Sustainable transport measures** | **Transport options implementation** (10 credits) | **Prerequisite**<br>1. Achieve the Tra 01 Transport assessment and travel plan credits.<br>2. Identify the sustainable transport measures, listed in Table 7.4 (Refer to Table 7.1 of the BREEAM manual)<br>3. Award credits according to the Accessible Index (AI) of the project, and the total number of points achieved for the options implemented, listed in Table 7.3 (Refer to Table 7.3 of the BREEAM manual) | 1 to 3 | 7 | | 3 | 10 | Achieve the Tra 01 Transport assessment and travel plan credits.<br>Team to identify sustainable transport measures proposed as outlined within Table 7.4:Sustainable public, private and active transport measures<br><br>PTAL indicates AI of 11.4 | Client | |
| | **SECTION CREDIT SCORE** | | | | **7.500** | **0.000** | **2.500** | **12** | | |

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| Water | **Wat 01 - Water Consumption**<br>**Minimum Standards- 1 credit** | **Water Consumption**<br>**(upto 5 credits)** | 1. Use the BREEAM Wat 01 calculator to assess the efficiency of the domestic water-consuming components.<br>2. Use the standard Wat 01 method to compare the water consumption (litres/person/day) for the assessed building against a baseline performance. Award BREEAM credits based upon Table 8.1 . Where it is not possible to use the standard method, complete the assessment using the alternative Wat 01 method (Refer to Table 8.1 of the BREEAM manual)<br>3. If a greywater or rainwater system is specified, use its yield in L/person/day to offset potable water demand from components.<br>4. If a greywater or rainwater system is specified and installed:<br>4.a Greywater systems in compliance with BS 8525-1:2010 Greywater systems - Part 1 Code of Practice (157).<br>4.b Rainwater systems in compliance with BS 8515:2009+A1:2013 Rainwater harvesting systems - Code of practice(158). | 1 to 4 | 3 | | 2 | 5 | Team to assess the efficiency of the domestic water-consuming components against the baseline performance via BREEAM Wat 01 calculator | Specification | |
| | | | | | | | | | | | |
| | **Wat 02 - Water Monitoring**<br>**Minimum Standards-criterion 1 only** | **Water Monitoring**<br>**(1 credit)** | 1. 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.<br>2. For water-consuming plant or building areas consuming 10% or more of the building's total water demand:<br>2.a Fit easily accessible sub-meters OR<br>2.b Install water monitoring equipment integral to the plant or area.<br>3 For each meter (main and sub):<br>3.a Install a pulsed or other open protocol communication output AND<br>3.b Connect it to an appropriate utility monitoring and management system, e.g. a building management system (BMS), for the monitoring of water consumption. If there is no BMS system in operation at Post-Construction stage, award credits provided that the system used enables connection when the BMS becomes operational.<br>4. In buildings with swimming pools, or large water tanks and aquariums, fit separate sub-meters on the water supply of the above and any associated changing facilities (toilets, showers etc.) irrespective of their water consumption levels.<br>5. In buildings containing laboratories, fit a separate water meter on the water supply to any process or cooling loop for 'plumbed-in' laboratory process equipment, irrespective of their water consumption levels. | 1 to 5 | 1 | | | 1 | Pulsed water meter to be installed on main supply to each building or appropriate utility monitoring and management systems with sub-meters installed for water-consuming plant or building areas consuming 10% or more of the building's total water demand | M&E Specification | |
| | | | | | | | | | | | |
| | **Wat 03 - Water Leak Detection & Prevention** | **Leak Detection Systems**<br>**(1 credit)** | 1. Install a leak detection system capable of detecting a major water leak:<br>1.a On the utilities water supply within the buildings, to detect any major leaks within the buildings AND<br>1.b Between the buildings and the utilities water supply, to detect any major leaks between the utilities supply and the buildings under assessment.<br>2. The leak detection system is:<br>2.a A permanent automated water leak detection system that alerts the building occupants to the leak OR an inbuilt automated diagnostic procedure for detecting leaks<br>2.b Activated when the flow of water passing through the water meter or data logger is at a flow rate above a pre-set maximum for a pre-set period of time. This usually involves installing a system which detects higher than normal flow rates at meters or sub-meters. It does not necessarily require a system that directly detects water leakage along part or the whole length of the water supply system<br>2.c Able to identify different flow and therefore leakage rates, e.g. continuous, high or low level, over set time periods. Although high and low level leakage rates are not specified, the leak detection equipment installed must have the flexibility to distinguish between different flow rates to enable it to be programmed to suit the building type and owner's or occupier's usage patterns.<br>2.d Programmable to suit the owner's or occupier's water consumption criteria<br>2.e Where applicable, designed to avoid false alarms caused by normal operation of large water consuming plant such as chillers | 1 | 1 | | | 1 | A compliant water leak detection is to be installed on the main supply within the buildings and between the buildings and the utilities water supply to detect any major leaks | M&E Specification | |
| | | **Flow Control devices**<br>**(1 credit)** | 3. Install flow control devices that regulate the water supply to each WC area or sanitary facility according to demand, in order to minimise undetected wastage and leaks from sanitary fittings and supply pipework. | 2 | 1 | | | 1 | Solenoid control of the water supply to common area toilet blocks is to be installed | | |
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| | **Wat 04 - Water Efficient Equipment** | **Water Efficient Equipment**<br>**(1 credit)** | 1. Identify all water demands from uses other than those listed under Assessment scope - Table 8.1 that could be realistically mitigated or reduced. (Refer to Table 8.1 of the BREEAM manual)<br>Where there is no water demand from uses other than domestic-scale, sanitary use components in the building, this issue is not applicable.<br>2. Identify systems or processes to reduce the relevant water demand, and establish, through either good practice design or specification, a demonstrable reduction in the total water demand of the building. | 1,2 | 1 | | | 1 | Reduce use of wholesome water for irrigation | MEP | |
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| | **SECTION CREDIT SCORE** | | | | **5.444** | **0.000** | **1.556** | **9** | | | |

**Materials**

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| **Mat 01** - **Environmental impacts from construction products - Building life cycle assessment** | **Superstructure** (upto 6 credits) | **Comparison with the BREEAM benchmark during Concept Design (offices, industrial and retail buildings only)**<br>Superstructure (offices, industrial and retail buildings<br>1 During the Concept Design, demonstrate the environmental performance of the building as follows:<br>1.a Carry out a building LCA on of the superstructure design using either the BREEAM Simplified Building LCA tool or an IMPACT Compliant LCA tool according to the methodology<br>1.b Submit the Mat 01/02 Results Submission Tool to BRE at the end of Concept Design, and before planning permission is applied for (that includes external material or product specifications). | Building type dependant- Education | | 2 | 4 | 6 | Carry out building LCA options appraisal of 2 to 4 significantly different superstructure design options during Concept Design and Technical Design stages<br>**Issue kept in reserve** | Principal Contractor/Tender/ Specification |
| | | **Comparison with the BREEAM benchmark during Technical Design (offices, industrial and retail buildings only)**<br>2 During Technical Design, demonstrate the environmental performance of the building as follows:<br>2.a As criterion 1.a<br>2.b Submit the Mat 01/02 Results Submission Tool to BRE at the end of Technical Design.<br>Where a project has not achieved criterion 1, criterion 2 may still be achieved. | | | | | | | |
| | | **Option appraisal during Concept Design (all building types)**<br>4. During Concept Design, identify opportunities for reducing environmental impacts as follows:<br>4.a Carry out building LCA options appraisal of 2 to 4 significantly different superstructure design options<br>4.b Use a building LCA tool that is recognised by BREEAM (as suitable for assessing superstructure during Concept Design) according to the methodology<br>4.c For each design option, fulfil the same functional requirements specified by the client and all statutory requirements (to ensure functional equivalency). | | | | | | | |
| | | **Options appraisal during Technical Design (all building types)**<br>5. During Technical Design identify opportunities for reducing environmental impacts as follows:<br>5.a Carry out building LCA options appraisal of 2 to 3 significantly different superstructure design options (based on the selected Concept Design option and as applicable to the Technical Design stage,<br>5.b Use a building LCA tool that is recognised by BREEAM (as suitable for assessing superstructure during Technical Design) according to the methodology<br>5.c As criteria 4.c to 4.e above. Where an options appraisal summary document was produced during Concept Design, update it to include the Technical Design options.<br>5.d Submit the Mat 01/02 Results Submission Tool to BRE at the end of Technical Design | | | | | | | |
| | **Substructure and hard landscaping options appraisal during Concept Design (all building types)** (1 credit) | 6. Criteria 3 and 4 are achieved.<br>7. During Concept Design identify opportunities for reducing environmental impacts as follows:<br>7.a Carry out building LCA options appraisal of a combined total of at least six significantly different substructure or hard landscaping design options (at least two shall be substructure and at least two shall be hard landscaping).<br>7.b Using a building LCA tool that is recognised by BREEAM (as suitable for assessing substructure and hard landscaping during Concept Design) according to the methodology<br>7.c As criteria 4.c to 4.f above | | | | 1 | 1 | Carry out building LCA options appraisal of a combined total of at least six significantly different substructure or hard landscaping design options<br>**Issue not targeted** | |
| | | | | | | | | | |
| **Mat 02** - **Environmental impacts from construction products - Environmental Product Declarations (EPD)** | **Specification of products with a recognised environmental product declaration (EPD)** (1 credit) | 1. Specify construction products with EPD that achieve a total EPD points score of at least 20 (Refer to the Methodology section of the BREEAM manual)<br>2. Enter the details of each EPD into the Mat 01/02 Results Submission Tool, including the material category classification. The Mat 01/02 Results Submission Tool will verify the EPD points score and credit award. | 1,2 | 1 | | | 1 | Specify construction products with EPD that achieve a total EPD points score of at least 20, according to the BREEAM Methodology | Principal Contractor/Tender/ Specification |
| | | | | | | | | | |
| **Mat 03** - **Responsible Sourcing of Materials**<br>**Minimum Standards-criterion 1 only** | **Prerequisite** | 1. All timber and timber-based products used on the project are legally harvested and traded timber as per the UK Government's Timber Procurement Policy (TPP) | 1 | Y | | | Y | **Mandatory** -Ensure all Timber and timber based products will to be legally sourced in line with FCS/PEFC including Site Timber | Principal Contractor/Tender/ Specification |
| | **Enabling sustainable procurement** (1 credit) | 2. A sustainable procurement plan must be used by the design team to guide specification towards sustainable construction products. The plan must:<br>2.a Be in place before Concept Design.<br>2.b Include sustainability aims, objectives and strategic targets to guide procurement activities. Note: targets do not need to be achieved for the credit to be awarded but justification must be provided for targets that are not achieved.<br>2.c Include a requirement for assessing the potential to procure construction products locally. There must be a policy to procure construction products locally where possible.<br>2.d Include details of procedures in place to check and verify the effective implementation of the sustainable procurement plan.<br>In addition, if the plan is applied to several sites or adopted at an organisational level it must:<br>2.e Identify the risks and opportunities of procurement against a broad range of social, environmental and economic issues following the process set out in BS ISO 20400:2017(170). | 2 | 1 | | | 1 | Design team to prepare a sustainable procurement plan in line with criteria requirements<br>**See Contractor obligations** | |
| | **Measuring responsible sourcing** (up to 3 credits) | 3. Use the Mat 03 calculator tool and methodology to determine the number of credits achieved for the construction products specified or procured. Credits are awarded in proportion to the scope of the assessment and the number of points achieved, as set out in Table 9.10. (Refer to Table 9.10 of the BREEAM manual) | 3 | 2 | | 1 | 3 | The design team will actively source materials from suppliers capable of confirming BREEAM recognised responsible sourcing certifications scheme (RSCS) certification or environmental management system (EMS) certification | |

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| **Mat 05** - **Designing for durability & resilience** | **Protecting vulnerable parts of the building from damage** | 1. Protection measures are incorporated into the building's design and construction to reduce damage to the building's fabric or materials in case of accidental or malicious damage occurring. These measures must provide protection against:<br>1.a Negative impacts of high user numbers in relevant areas of the building (e.g. corridors, lifts, stairs, doors etc.).<br>1.b Damage from any vehicle or trolley movements within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas.<br>1.c External building fabric damage by a vehicle. Protection where parking or manoeuvring areas are within 1 metre of the building façade and where delivery areas or routes are within 2. metres of the façade, i.e. specifying bollards or protection rails.<br>1.d Potential malicious damage to building materials and finishes, in public and common areas where appropriate. | 1 to 4 | 1 | | | 1 | The design team will provide drawings to show areas of vulnerability and durability & protection measures - high pedestrian use, trolleys & wheelchairs, protection for building against vehicle movements etc, and also incorporate design features to protect the building from material degradation due to environmental factors | Architect | |
| | **Protecting exposed parts of the building from material degradation**<br>**(1 credit)** | 2. Key exposed building elements have been designed and specified to limit long and short term degradation due to environmental factors. This can be demonstrated through one of the following:<br>2.a The element or product achieving an appropriate quality or durability standard or design guide, see Table 9.14 (Refer to Table 9.14 of the BREEAM manual). If none are available, use BS 7543:2015(172) as the default appropriate standard<br>OR<br>2.b A detailed assessment of the element's resilience when exposed to the applicable material degradation and environmental factors.<br>3. Include convenient access to the roof and façade for cost-effective cleaning, replacement and repair in the building's design.<br>4. Design the roof and façade to prevent water damage, ingress and detrimental ponding. | | | | | | | | |
| **Mat 06** - **Material Efficiency** | **Material Efficiency**<br>**(1 credit)** | 1. At the Preparation and Brief and Concept Design stages, set targets and report on opportunities and methods to optimise the use of materials. These must be done for each of the following stages. (Refer to Table 9.15 of the BREEAM manual)<br>1.a Preparation and Brief<br>1.b Concept Design<br>1.c Developed Design<br>1.d Technical Design<br>1.e Construction<br>2. Develop and record the implementation of material efficiency, see Table 9.15, during:<br>2.a Developed Design<br>2.b Technical Design<br>2.c Construction<br>3. Report the targets and actual material efficiencies achieved. | 1 to 3 | 1 | | | 1 | Design team to develop material effieincy strategy, to be developed through the design stages and report on same. | | |
| **SECTION CREDIT SCORE** | | | | **6.429** | **2.143** | **6.429** | **14** | | | |
| **Waste** | | | | | | | | | | |
| **Wst 01** - **Construction Waste Management** | **Pre-demolition audit**<br>**(1 credit)** | 1. Complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition. This must be used to determine whether refurbishment or reuse is feasible and, in the case of demolition, to maximise the recovery of material for subsequent high grade or value applications. The audit must cover the content of Pre-demolition audit scope and:<br>1.a Be carried out at Concept Design stage (RIBA Stage 2) by a competent person prior to strip-out or demolition works<br>1.b Guide the design, consider materials for reuse and set targets for waste management<br>1.c Engage all contractors in the process of maximising high grade reuse and recycling opportunities<br>1.d Compare actual waste arisings and waste management routes used with those forecast and investigate significant deviations from planned targets.<br>2. Make reference to the audit in the resource management plan (RMP) | 1,2 | 1 | | | 1 | Require copy of pre-demolition audit | Architect | |
| | **Construction waste resource efficiency**<br>**(up to 3 credits)** | 3. Prepare a compliant Resource Management Plan (RMP) covering:<br>3.a Non-hazardous waste materials (from on-site construction and dedicated off-site manufacture or fabrication, including demolition and excavation waste<br>3.b Accurate data records on waste arisings and waste management routes.<br>4. Meet or improve upon the benchmarks in Table 10.1 for non-hazardous construction waste, excluding demolition and excavation waste. (Refer to Table 10.1 of the BREEAM manual) | 3,4 | 2 | 1 | | 3 | A compliant Resource Management Plan to be developed covering non-hazardous waste materials and recording data from waste arisings. Additionally meet or improve the resource efficiency benchmarks set in Table 10.1 Construction waste resource efficiency benchmarks **See Contractor Obligations** | Contractor | |
| | **Diversion of resources from landfill**<br>**(1 credit)** | 5. Meet, where applicable, the diversion from landfill benchmarks in Table 10.2 for non-hazardous construction waste and demolition and excavation waste generated.(Refer to Table 10.2 of the BREEAM manual)<br>6. Sort waste materials into separate key waste groups as per Table 10.3 on page 249, either on-site or through a licensed contractor for recovery.(Refer to Table 10.3of the BREEAM manual) | 5,6 | 1 | | | 1 | Meet the diversion from landfill benchmarks outlined in Table 10.2 Diversion from landfill benchmarks and sort waste materials into separate key waste groups as per Table 10.3 Construction waste groups | Contractor | |
| **Wst 02** - **Use of recycled and sustainably sourced aggregates Fully** | **Pre-requisite** | 1. If demolition occurs on site, to encourage the reuse of site-won material on site, complete a pre-demolition audit of any existing buildings, structures or hard surfaces in accordance with Assessment scope - Wst 01 Pre-demolition audit | 1 to 6 | | | 1 | 1 | **Issue not targeted** | | |
| | **Project Sustainable Aggregate Points**<br>**(1 credit)** | 2. Identify all aggregate uses and types on the project Table 10.5 and Table 10.6 (Refer to Table 10.5 and Table 10.6 of the BREEAM manual)<br>3. Determine the quantity in tonnes for each identified use and aggregate type.<br>4. Identify the region in which the aggregate source is located.<br>5. Calculate the distance in kilometres travelled by all aggregates by transport type.<br>6. Enter the information into the BREEAM Wst 02 calculator to calculate the Project Sustainable Aggregate points. | | | | | | | | |

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| | **Wst 03** - **Operational Waste** | **Operational Waste** (1 credit) | 1. Provide a dedicated space for the segregation and storage of operational recyclable waste generated. The space is:<br>1.a Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams<br>1.b Accessible to building occupants or facilities operators for the deposit of materials and collections by waste management contractors<br>1.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 or weekly operational activities and occupancy rates.<br>2. For consistent and large amounts of operational waste generated, provide:<br>2.a Static waste compactors or balers; situated in a service area or dedicated waste management space<br>2.b Vessels for composting suitable organic waste OR adequate spaces for storing segregated food waste and compostable organic material for collection and delivery to an alternative composting facility<br>2.c A water outlet provided adjacent to or within the facility for cleaning and hygiene purposes where organic waste is to be stored or composted on site. | 1,2 | 1 | | | 1 | Dedicated and clearly labelled waste storage area proposed for the segregation, storage and collection of recyclable waste in an accessible location and of a capacity appropriate to building type and predicted volumes of waste arising as per strategy agreed with the Local Council | Architect | |
| | **Wst 04** - **Speculative finishes (Offices only)** | **Speculative Floor and Ceiling finishes** (1 credit) | 1. For tenanted areas, where the future occupant is not known and carpets or other floor or ceiling finishes are installed, these must be limited to a show area only.<br>2. Only install floor and ceiling finishes selected by the known occupant of a development. Alternatively, where only ceiling finishes and no carpets are installed, the building owner confirms that the first tenants will not be permitted to make substantial alterations to the ceiling finishes | 1,2 | | | 0 | 0 | **Issue not applicable** | | |
| | **Wst 05** - **Adaptation to Climate Change** | **Resilience of structure, fabric, building services and renewables installation** (1 credit) | 1. Conduct a climate change adaptation strategy appraisal using:<br>1.a A systematic risk assessment to identify the impact of expected extreme weather conditions arising from climate change on the building over its projected life cycle. The assessment covers the installation of building services and renewable systems, as well as structural and fabric resilience aspects and includes:<br>1.a.i Hazard identification<br>1.a.ii Hazard assessment<br>1.a.iii Risk estimation<br>1.a.iv Risk evaluation<br>1.a.v Risk management.<br>2. Develop recommendations or solutions based on the climate change adaptation strategy appraisal, before or during Concept Design, that aim to mitigate the identified impact.<br>3. Provide an update during Technical Design demonstrating how the recommendations or solutions proposed at Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing by the assessor. | 1 to 3 | | | 1 | 1 | **Issue not targeted** | | |
| | **Wst 06** - **Design for disassembly and adaptability** | **Design for disassembly and functional adaptability - recommendations** (1 credit) | 1. Conduct a study to explore the ease of disassembly and the functional adaptation potential of different design scenarios by the end of Concept Design.<br>2. Develop recommendations or solutions based on the study (criterion 1 above), during or prior to Concept Design, that aim to enable and facilitate disassembly and functional adaptation. | 1,2 | 1 | | | 1 | A building-specific functional adaption potential study undertaken to explore the ease of disassembly and the functional adaptation potential of design scenarios and develop recommendations to facilitate disassembly and function adaptability<br><br>A further study to be undertaken to describe how recommendations have been implemented where practical and cost effective - produce a building adaptability and disassembly guide for future tenants | Architect | |
| | | **Disassembly and functional adaptability – implementation** (1 credit) | 3. Achieve criteria 1 and 2<br>4. Provide an update, during Technical Design, on:<br>4.a How the recommendations or solutions proposed by Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing to the assessor.<br>4.b Changes to the recommendations and solutions during the development of the Technical Design.<br>5. Produce a building adaptability and disassembly guide to communicate the characteristics allowing functional adaptability and disassembly to prospective tenants. | 3 to 5 | 1 | | | 1 | | | |
| | **SECTION CREDIT SCORE** | | | | **4.200** | **0.600** | **1.200** | **10** | | | |
| **Land Use & Ecology** | **LE 01** - **Site Selection** | **Previously Occupied Land** (1 credit) | 1 At least 75% of the proposed development's footprint is on an area of land which has previously been occupied | 1 | 1 | | | 1 | Site is 100% previously developed | | |
| | | **Contaminated Land** (1 credit) | 2. A contaminated land professional's site investigation, risk assessment and appraisal has deemed land within the site to be affected by contamination. The site investigation, risk assessment and appraisal have identified:<br>2.a The degree of contamination<br>2.b The contaminant sources or types<br>2.c The options for remediating sources of contamination which present an unacceptable risk.<br>3. The client or principal contractor confirms that remediation of the site will be carried out in accordance with the remediation strategy and its implementation plan as recommended by the contaminated land professional | 2,3 | | 1 | | 1 | Contamination Study to be undertaken by suitable person and assessment made accordingly - credit considered unlikely | Land Specialist/ Client | |

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| **LE 02** - **Identifying and understanding the risks and opportunities for the project** | Prerequisite - Assessment route selection | 1. An assessment route for the project has been determined using BREEAM Guidance Note GN34 BREEAM Ecological Risk Evaluation Checklist.<br>2. The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site | 1,2 | | | Y | | An assessment route has been determined and client/contractor confirms to compliance against relevant standards | Client/Contractor | |
| | **Survey and evaluation**<br>**(1 credit)** | **Route 1**<br>3. Completion of the BREEAM Ecological Risk Evaluation Checklist indicates Assessment route 1 can be used as the assessment<br><br>**Route 2**<br>4. An appropriate individual is appointed at a project stage that ensures early involvement in site configuration and, where necessary, can influence strategic planning decisions.<br>5. Prior to the completion of the preparation and brief, an appropriate level of survey and evaluation (see Assessment route 2: For sites where complex ecological systems are likely to be present) has been carried out to determine the ecological baseline of the site, taking account of the zone of influence to establish:<br>5.a Current and potential ecological value and condition of the site, and related areas within the zone of influence.<br>5.b Direct and indirect risks to current ecological value<br>5.c Capacity and feasibility for enhancement of the ecological value of the site and, where relevant, areas within the zone of influence.<br>6. Data are collated and shared with project team to inform the site preparation, design or construction works. | 3 to 6 | 1 | | | 1 | Requires appointment of ecologist to undertake report and the report finding are to be implemented<br><br>**Ecologist to be appointed** | Suitably Qualified Ecologist/Contractor | |
| | **Determining the ecological outcomes for the site (Routes 1 and 2)**<br>**(1 credit)** | (Routes 1 and 2)<br>7. Survey and evaluation criteria (criteria 3–6 above) relevant to the chosen route have been achieved.<br>8. During Concept Design, the project team liaise and collaborate with representative stakeholders to identify and consider ecological outcome for the sites (appropriate to the scale and type of development) for the project.<br>9. When determining the ecological outcome for the site, this must involve the identification, appraisal and selection of specific solutions and measures sufficiently early to influence key project planning decisions. This must be done in accordance with the following hierarchy of action:<br>9.a avoidance<br>9.b protection<br>9.c reduction or limitation of negative impacts<br>9.d on site compensation and,<br>9.e enhancement, considering the capacity and feasibility within the site, or where viable, off-site.<br>10. Following this the optimal ecological outcome for the site is selected after liaising with representative stakeholders and the project team. | 7 to 10 | 1 | | | 1 | Requires appointment of ecologist to undertake report and the report finding are to be implemented<br><br>**Ecologist to be appointed** | Suitably Qualified Ecologist/Contractor | |
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| **LE 03** - **Managing negative impacts on ecology** | **Prerequisite – Identification and understanding the risks and opportunities for the site** | 1. LE 02 has been achieved.<br>2. The client or contractor has confirmed that compliance is monitored against all relevant UK, and EU or International legislation relating to the ecology of the site | 1,2 | | | Y | | The client/contractor confirms to compliance against relevant standards | Client/Contractor | |
| | **Planning, liaison, implementation and data**<br>**(1 credit)** | 3. Roles and responsibilities have been clearly defined, allocated and implemented to support successful delivery of project outcomes at an early enough stage to influence the concept design or design brief.<br>4. Site preparation and construction works have been planned for and are implemented at an early project stage to optimise benefits and outputs.<br>5. The project team liaising and collaborating with representative stakeholders, taking into consideration data collated and shared, have implemented solutions, and measures have been selected during site preparation and construction works. | 3 to 5 | 1 | | | 1 | Site preparation and construction works have been planned for and are implemented at an early project stage | Client/Contractor | |
| | **Managing negative impacts of the project**<br>**(up to 2 credits)** | **Route 1**<br>6. Negative impacts from site preparation and construction works have been managed according to the hierarchy (see Methodology) and no net impact has resulted.<br><br>**Route 2**<br>7 Negative impacts from site preparation and construction works have been managed according to the hierarchy (see Assessment route 2: For sites where complex ecological systems are likely to be present) and<br>either:<br>7.a No overall loss of ecological value has occurred (2 credits)<br>OR<br>7.b The loss of ecological value has been limited as far as possible (1 credit) | 6,7 | 2 | | | 2 | Requires appointment of ecologist to undertake report and the report finding are to be implemented<br><br>**Ecologist to be appointed** | Suitably Qualified Ecologist/Contractor | |

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| | **LE 04** - **Change and enhancement of ecological value** | **Prerequisite - Identifying and understanding the risks and opportunities for the project** | 1. LE 03 has been achieved. Including the following, specific to the aims of this issue:<br>1.a Roles and responsibilities have been clearly defined, allocated and implemented to support successful delivery of project outcomes.<br>1.b Site preparation and construction works have been planned for and implemented at a stage that is sufficiently early in the project to optimise benefits and outputs.<br>2. The client or contractor confirms compliance is monitored against all relevant UK, EU or international legislation relating to the ecology of the site | 1,2 | | | Y | | The client/contractor confirms to compliance against relevant standards | Client/Contractor | |
| | | **Liaison, implementation and data collation**<br>**(1 credit)** | **Route 2**<br>5 The project team liaising and collaborating with representative stakeholders, taking into consideration data collated and shared, have implemented the solutions and measures selected in a way that enhances ecological value in the following order:<br>5.a On site, and where this is not feasible<br>5.b Off site within the zone of influence | 5 | 1 | | | 1 | The project team has implemented the solutions and measures to enhance the ecological value | Client/Contractor | |
| | | **Enhancement of ecology**<br>**(up to 3 credits)** | **Route 1**<br>3. The project team liaising and collaborating with representative stakeholders, taking into consideration data collated and shared, have implemented solutions and measures based on recommendations from recognised 'local' ecological expertise, specialist input and guidance to inform the adoption of locally relevant ecological solutions and measures which enhance the site.<br>4. Data collated is provided to the local environmental records centres nearest to, or relevant for, the site.<br><br>**Route 2**<br>6. Credits are awarded on a scale of 1 to 3, based on the calculation of the change in ecological value occurring as a result of the project. This must be calculated in accordance with the process set out in either GN 35 - BREEAM, CEEQUAL, HQM Ecology Assessment Issues – Route 1 or GN 36 - BREEAM, CEEQUAL, HQM Ecology Assessment | 3 to 6 | 2 | 1 | | 3 | Requires appointment of ecologist to undertake report and the report finding are to be implemented<br><br>**Ecologist to be appointed - see contractor obligations** | Suitably Qualified Ecologist/Contractor | |
| | | | | | | | | | | |
| | **LE 05** - **Long term ecology management and maintenance** | **Prerequisite - Roles and responsibilities, implementation, statutory obligations** | 1. The client or contractor has confirmed that compliance is being monitored against all relevant UK, EU and international standards relating to the ecology of the site.<br>2. Where pursued, LE 04 has been achieved, including the following specific aims of this issue:<br>2.a Roles and responsibilities have been clearly defined, allocated and implemented to support successful delivery of project outcomes.<br>2.b Site preparation and construction works have been planned for and implemented at a stage that is sufficiently early in the project to optimise benefits and outputs. | 1,2 | | | Y | | The client/contractor confirms to compliance against relevant standards | Client/Contractor | |
| | | **Planning, liaison, data, monitoring and review management and maintenance**<br>**(1 credit)** | 3. The project team liaise and collaborate with representative stakeholders, taking into consideration data collated and shared, on solutions and measures implemented to:<br>3.a monitor and review implementation and the effectiveness<br>3.b develop and review management and maintenance solutions, actions or measures.<br>4. In support of the above and to help ensure their continued relevance over the period of the project the following should be considered:<br>4.a Monitoring and reporting of on the ecological outcomes for site implemented at the design and construction stage<br>4.b Monitoring and reporting of outcomes and successes from the project<br>4.c Arrangements for the ongoing management of landscape and habitat connected to the project (on and, where relevant, off site)<br>4.d Maintaining the ecological value of the site and its relationship or connection to its zone of influence<br>4.e Maintaining the site in line with the any sustainability linked activities, e.g. ecosystems benefits (LE 02).<br>4.f Remedial or other management actions are carried out which relate to those identified in LE 02, LE 03 and LE 04.<br>5. As part of the tenant or building owner information supplied, include a section on Ecology and Biodiversity to inform the owner or occupant of local ecological features, value and biodiversity on or near the site. | 3 to 5 | 1 | | | 1 | The project team liaise and collaborate with representative stakeholders, taking into consideration data collated and shared, on solutions and measures implemented<br><br>**Ecologist to be appointed** | Suitably Qualified Ecologist/Contractor | |
| | | **Landscape and ecology management plan (or similar) development**<br>**(1 credit)** | 6. Landscape and ecology management plan, or similar, is developed in accordance with BS 42020:2013(210) covering as a minimum the first five years after project completion and includes:<br>6.a Actions and responsibilities, prior to handover, to give to relevant individuals<br>6.b The ecological value and condition of the site over the development life.<br>6.c Identification of opportunities for ongoing alignment with activities external to the development project and which supports the aims of BREEAM's Strategic Ecology Framework<br>6.d Identification and guidance s to trigger appropriate remedial actions to address previously unforeseen impacts<br>6.e Clearly defined and allocated roles and responsibilities.<br>7. The landscape and management plan or similar is updated as appropriate to support maintenance of the ecological value of the site. | 6,7 | 1 | | | 1 | Requires appointment of ecologist to undertake report and the report finding are to be implemented<br><br>**Ecologist to be appointed** | Suitably Qualified Ecologist/Contractor | |
| | | | | | | | | | | |
| | **SECTION CREDIT SCORE** | | | | **11.000** | **2.000** | **0.000** | **13** | | | |
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| **Pollution** | | **Pre-requisite** | 2. All systems (with electric compressors) must comply with the requirements of BS EN 378:2008 (parts 2 and 3) and where refrigeration systems containing ammonia are installed, the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice | 2 | | | Y | Y | | | |

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| **Pol 01** - **Impact of Refrigerants** | **Impact of refrigerant** (1 to2 credits) | **Two credits**<br>3. The direct effect life cycle $CO_2$ equivalent emissions (DELC) of ≤ 100 $CO_2$-eq/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.<br>OR<br>4. All refrigerants used have a global warming potential (GWP) ≤ 10.<br><br>OR<br>**One credit**<br>5. Systems using refrigerants have a DELC of ≤ 1000 kg$CO_2$-eq/kW cooling and heating capacity | 3 to 5 | 1 | 1 | | 2 | **Assumes use of A/C in HVAC spec** | M&E Specification | |
| | **Leak detection** (1 credit) | 6. All systems are hermetically sealed or only use environmentally benign refrigerants<br>OR<br>7. Where the systems are not hermetically sealed:<br>7.a Systems have:<br>7.a.i A permanent automated refrigerant leak detection system, that is robust and tested, and capable of continuously monitoring for leaks.<br>OR<br>7.a.ii An inbuilt automated diagnostic procedure for detecting leakage is enabled.<br>7.b 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 | 6,7 | | | 1 | 1 | | | |
| | | | | | | | | | | |
| **Pol 02** - **Local air quality** | **NOx Emissions** (upto 2 credits) | 1. All heating and hot water is supplied by non-combustion systems. For example, only powered by electricity.<br>OR alternatively;<br>2. Emissions from all installed combustion plant that provide space heating and domestic hot water do not exceed the levels set in Table 12.4 and Table 12.5 of the manual. The measurements must be provided by manufacturers, following the labelling requirements of the European directive 2009/125/EC. No credits can be awarded for Pol 02 if any of the combustion appliances are not covered in Table 12.4 below and Table 12.5 (Refer to Table 12.4 and 12.5 of the BREEAM manual)<br>3. Emissions from all installed combustion plant that provide space heating and domestic hot water do not exceed the levels set in Table 1.21 and Table 1.22 | 1 to 3 | 2 | | | 2 | **assumes electrical systems for heatin, coolimg and DHW** | M&E Specification | |
| | | | | | | | | | | |
| | **Prerequisite** | 1. An appropriate consultant is appointed to carry out and demonstrate the development's compliance with all criteria. | 1 | | | Y | | Client to appoint appropriate consultant | Client | |
| | **Flood risk** (1 to 2 credits) | **Two credits - Low flood risk**<br>2. A site-specific flood risk assessment (FRA) confirms the development is in a flood zone that is defined as having a low annual probability of flooding. The FRA takes all current and future sources of flooding into consideration<br><br>**One credit - Medium or high flood risk**<br>3. A site-specific FRA confirms the development is in a flood zone that is defined as having a medium or high annual probability of flooding and is not in a functional floodplain. To increase the resilience and resistance of the development to flooding, one of the following must be achieved:<br>4.a The ground level of the building and access to both the building and the site, are designed (or zoned) so they are at least 600 mm above the design flood level of the site's flood zone<br>4.b The final design of the building and the wider site reflects the recommendations made by an appropriate consultant in accordance with the hierarchy approach outlined in section 5 of BS 8533:2017 (218) | 2 to 4 | 2 | | | 2 | Site specific FRA required to demonstrate site in Flood Zone 1 | Hydrologist | |
| | | **Pre-requisite**<br>5. Surface water run-off design solutions must be bespoke, i.e. they must take account of the specific site requirements and natural or man-made environment of and surrounding the site. The priority levels detailed in the Methodology must be followed, with justification given by the appropriate consultant where water is allowed to leave the site.<br><br>**One credit - Surface Water Run-Off - Rate**<br>6. Drainage measures are specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) shows a 30% improvement for the developed site compared with the pre-developed site. This should comply at the 1-year and 100-year return period events.<br>7. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Sustainable Drainage Systems (SuDS) are in place.<br>8. Calculations include an allowance for climate change. This should be made in accordance with current best practice planning guidance | | 1 | | | 1 | | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| | **Pol 03 - Flood and surface water management** | **Surface water run-off** (2 credits) | **One credit - Surface Water Run-Off - Volume**<br>9. Flooding of property will not occur in the event of local drainage system failure (caused either by extreme rainfall or a lack of maintenance); AND<br>EITHER<br>10. Drainage design measures are specified so that the post-development run-off volume, over the development lifetime, is no greater than it would have been prior to the assessed site's development. This must be for the 100-year 6-hour event, including an allowance for climate change<br>11. Any additional predicted volume of run-off for this event is prevented from leaving the site by using infiltration or other SuDS techniques.<br>OR (only where criteria 10 and 11 cannot be achieved):<br>12. Justification from the appropriate consultant indicating why the above criteria cannot be achieved, i.e. where infiltration or other SuDS techniques are not technically viable options.<br>13. Drainage design measures are specified so that the post-development peak rate of run-off is reduced to the limiting discharge. The limiting discharge is defined as the highest flow rate from the following options:<br>13.a The pre-development one-year peak flow rate<br>13.b The mean annual flow rate (Qbar)<br>13.c 2L/s/ha.<br>For the one-year peak flow rate, the one-year return period event criterion applies.<br>14. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS are in place.<br>15. For either option, above calculations must include an allowance for climate change; this should be made in accordance with current best practice planning guidance. | 5 to 15 | 1 | | | 1 | Assumed run-off no greater than pre-development, but will require hydrologists report to confirm | Hydrologist | |
| | | **Minimising water course pollution** (1 credit) | 16. There is no discharge from the developed site for rainfall up to 5 mm (confirmed by the appropriate consultant).<br>17. Areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate SuDS techniques.<br>18. Areas with a high risk of contamination or spillage of substances, such as petrol and oil, have separators (or an equivalent system) are installed in surface water drainage systems.<br>19. Chemical or liquid gas storage areas have a means of containment fitted to the site drainage system (i.e. shutoff valves). This is to prevent the escape of chemicals to natural watercourses in the event of a spillage or bunding failure.<br>20. All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as the SuDS manual(219) and other relevant industry best practice. They must be bespoke solutions taking account of the specific site requirements and natural or man-made environment of and surrounding the site.<br>21. A comprehensive and up to date drainage plan of the site will be made available for the building or site occupiers.<br>22. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place.<br>23. All external storage and delivery areas are designed and detailed in accordance with the current best practice planning guidance. | 16 to 23 | | 1 | | 1 | **Reserve issue** | Appropriate Consultant/Hydrologist | |
| | **Pol 04 - Reduction of Night Time Light Pollution** | **Reduction in Night Time Light Pollution** (1 credit) | 1. External lighting pollution has been eliminated through effective design that removes the need for external lighting. This does not adversely affect the safety and security of the site and its users.<br>OR alternatively, where the building does have external lighting, one credit can be awarded as follows:<br>2. The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the Institution of Lighting Professionals (ILP) Guidance notes for the reduction of obtrusive light, 2011(226).<br>3. All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00.<br>4. 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 ILPguidance notes.<br>5 Illuminated advertisements are designed in compliance with ILP PLG05 The Brightness of Illuminated Advertisements.(227). | 1 to 5 | 1 | | | 1 | External lighting to be designed to ILE guidance to avoid night time pollution<br><br>Automated switch off required between 2300 - 0700 hrs.<br><br>Safety or Security lighting if installed to comply with the appropriate standard | M&E Specification | |
| | **Pol 05 - Reduction of Noise Pollution** | **Reduction in Noise Pollution** (1 credit) | 1. There are no noise-sensitive areas within the assessed building or within 800 m radius of the assessed site.<br>OR<br>2. Where there are noise-sensitive areas within the assessed building or noise-sensitive areas within 800 m radius of the assessed site, a noise impact assessment compliant with BS 4142:2014(227) is commissioned. Noise levels must be measured or determined for:<br>2.a Existing background noise levels:<br>2.a.i at the nearest or most exposed noise-sensitive development to the proposed assessed site<br>2.a.ii including existing plant on a building, where the assessed development is an extension to the building<br>2.b Noise rating level from the assessed building.<br>3. The noise impact assessment must be carried out by a suitably qualified acoustic consultant.<br>4. The noise level from the assessed building, as measured in the locality of the nearest or most exposed noise sensitive development, must be at least 5dB lower than the background noise throughout the day and night.<br>5. If the noise sources from the assessed building are 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 the criterion. | 1 to 5 | 1 | | | 1 | An acoustician will take appropriate measurements and advise upon measures to reduce the likelihood of disturbance arising as a result of noise from fixed installations on the development | Suitably Qualified Acoustician | |
| | **SECTION CREDIT SCORE** | | | | **6.000** | **1.333** | **0.667** | **12** | | | |
| **Innovation** | **Man 01** | | | | 0 | 0 | 1 | 1 | | | |
| | **Man 03** | | | | 0 | 0 | 1 | 1 | | | |
| | **Hea 01** | | | | 0 | 0 | 1 | 1 | | | |
| | **Hea 02** | | | | 0 | 0 | 1 | 1 | | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| **AS** | | | | 0 | 0 | 1 | 1 | | | |
| **Ene 01** | | | | 0 | 0 | 1 | 1 | | | |
| **Wat 01** | | | | 0 | 0 | 1 | 1 | | | |
| **Mat 01** | | | | 0 | 0 | 1 | 1 | | | |
| **Mat 03** | | | | 0 | 0 | 1 | 1 | | | |
| **Wst 01** | | | | 0 | 0 | 1 | 1 | | | |
| **Wst 02** | | | | 0 | 0 | 1 | 1 | | | |
| **Wst 05** | | | | 0 | 0 | 1 | 1 | | | |
| **AS** | | | | 0 | 0 | 1 | 1 | | | |
| **Pol 03** | Simple Buildings Only | | | 0 | 0 | 1 | 1 | | | |
| **SECTION CREDIT SCORE (MAX 10)** | | | | **0.000** | **0.000** | **14.000** | **10** | | | |

**Summary**

| | Definite | Possible | Not Available | Max Credits Available |
|---|---|---|---|---|
| Management | 8.38 | 2.10 | 0.52 | 22.00 |
| Health & Wellbeing | 11.53 | 0.82 | 2.47 | 17.00 |
| Energy | 12.67 | 0.67 | 2.67 | 24.00 |
| Transport | 7.50 | 0.00 | 2.50 | 12.00 |
| Water | 5.44 | 0.00 | 1.56 | 9.00 |
| Materials | 6.43 | 2.14 | 6.43 | 14.00 |
| Waste | 4.20 | 0.60 | 1.20 | 10.00 |
| Land Use & Ecology | 11.00 | 2.00 | 0.00 | 13.00 |
| Pollution | 6.00 | 1.33 | 0.67 | 12.00 |
| Innovation | 0.00 | 0.00 | 14.00 | 10.00 |
| **Totals** | **73.15** | **9.66** | **32.01** | **143** |

Credit information required
Partial credit info received
Credit not targeted
Credit completed
Potential additional credits