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Albert Bridge House. Manchester.
Oval Real Estate Ltd.

SUSTAINABILITY
STAGE 2 REPORT
ENVIRONMENTAL STANDARDS STATEMENT
REVISION 01 – 06 OCTOBER 2022

STAGE 2

Audit sheet.

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Executive summary

This Environmental Standards Statement (ESS) concerns the Albert Bridge House project in Manchester. The project involves, "*demolition of the existing building complex and the construction of a mixed use development comprising an office building of up to 19 storeys, with ground floor commercial, leisure, food and drink uses and, a residential building up to 45 storeys with basement car parking, cycle parking, landscaping and public realm, servicing and access arrangements, highways alterations and other associated works*".

The ESS covers various headline sustainability themes set out according to the proposed development's location, relevant national and local policy along with client aspirations.

Sustainability Policy

Key national and local policy documents relevant to this development are summarised in section 2 and include the following :

- Approved Documents Part L, F and O 2021
- Future Homes and Buildings Standard 2025
- Heat and Buildings Strategy
- Manchester Core Strategy
- Places for Everyone Joint Development Plan
- 5-Year Environment Plan for Greater Manchester

Sustainability Proposals

Specific sustainability themes have been discussed against the policies outlined in Manchester's Core Strategy to provide a holistic overview of the proposals. In many cases, these themes overlap with BREEAM and WELL. The project is intended to deliver a "best in class" sustainable development in support of Greater Manchester's target to be net zero by 2038 and Oval Real Estate's own ESG objectives.

The mixed-use development is expected to contribute to sustainability in a broader sense through provision of:

- A high-density, well connected city-centre development
- Minimal on-site parking and high-quality cycle facilities
- High-quality accessible public realm and landscaping, re-activating the area and providing opportunity for improvements to local biodiversity through the retention of existing trees and planting of additional trees
- Integration of sustainable urban drainage (SuDS) to mitigate flood risk

Environmental Assessment Methods

The commercial building at Albert Bridge House is targeting a BREEAM rating of "Outstanding" under the BREEAM 2018 New Construction scheme (shell and core), which requires a score of at least 85% and compliance with certain minimum standards.

The principles of the WELL Building Standard are being adopted to provide a Platinum 'enabled' building for the core/base build as a minimum, with consideration being given to full certification during the next stage.

The Home Quality Mark was created by the BRE in March 2015, in response to the Government's withdrawal of the Code for Sustainable Homes as part of the Housing Standards Review (April 2015). Further consideration will be given to the applicability of this five star rating system for the residential units at Albert Bridge House during the next stage.

Operational Energy Performance

Part L was introduced to set minimum performance targets for building fabric and engineering systems to help improve energy efficiency in buildings. Part L was never intended to be used as a design tool, however local authorities and BREEAM are informed by the outcome of Part L2A calculations resulting in it being used in this way.

There is a well-known performance gap between Part L outcomes and the real-life building. This is because the Part L approach uses standardised usage profiles, occupancy densities, ventilation levels, lighting levels etc. and does not account for small power loads – meaning power for server(s), computer(s) and lift(s), electric vehicle charging and external lighting are all excluded.

Office developments generally have a greater demand for space cooling due to the quantity of people, lighting and ICT equipment. The key to achieving operational net zero carbon is to target the performance of the façade, building fabric and maximise passive ventilation to reduce energy demand. This approach can help to reduce unwanted solar heat gain in summer, reduce heat losses in winter and provide good levels of natural light to reduce the need for artificial lighting. Introducing passive ventilation will help to reduce the requirement for cooling during the mid-season and summer months.

Creating a bespoke simulation model allows for complete flexibility on all input data i.e. number of people, hours of use, small power density, engineering system performance etc. Undertaking operational energy modelling early in the design process can help inform the design and steer it towards a truly low energy outcome.

The Better Buildings Partnership have introduced the 'Design for Performance' (DfP) initiative to the UK which is based on the highly successful National Australian Built Environment Rating System (NABERS). This rating system is based on operational energy modelling and continues into operation i.e. annual energy consumption is measured and reported. This approach has helped office development in Australia drive energy efficiency and has set a benchmark for energy consumption in office buildings. Taking an approach based on DfP for Albert Bridge House will help influence the façade performance and engineering systems as well as identify large energy consumers in the building.

Albert Bridge House is aiming to achieve a minimum 5* rating under NABERS, with an aspiration to achieve 6*.

Embodied Carbon

The embodied carbon emissions form a significant part of the overall carbon impact of a building. Historically focus has been on operational energy and carbon, however with many local authorities, including the Greater Manchester Combined Authority, setting targets for net zero carbon development – studies are required to demonstrate how much embodied carbon is within the building including mitigation measured on reducing the overall embodied carbon emissions. A high-level analysis of embodied carbon, commensurate with the project stage, has been completed to provide an initial estimate of embodied carbon and an indication of potential carbon hot spots. This suggests that the project is on track to align with Manchester's Roadmap to Net Zero Carbon, with the initial estimation of upfront embodied carbon emissions being less than 600kgCO_{2e}/m^2.

1. Introduction

The proposed site is currently occupied by Albert Bridge House; an 18-storey office block constructed in 1959 within the St Mary's Parsonage strategic regeneration framework, near Spinningfields in central Manchester.

The new Albert Bridge House will provide 19 storeys of speculative office space with each floor plate stepping back to provide amenity terraces and greenery. A new residential tower is proposed alongside to provide a mix of 1, 2 and 3 bed apartments over 45 storeys. Both buildings will provide opportunities for ground floor retail, commercial space and secure cycle storage and changing facilities. Building services will be located in the basement and on the roof-top as necessary.

Figure 1 Proposed CGI views, aerial (SEW Architects)

In support of Greater Manchester's target to be net zero by 2038 and Oval Real Estate's own ESG objectives, the proposals are intended to deliver a "best in class" sustainable development.

The commercial building is targeting the following sustainability standards in an effort to be net zero carbon:

- NABERS 5* rating as a minimum, with an aspiration to achieve 6*
- BREEAM New Construction 2018 "Outstanding" rating
- WELL Enabled Platinum, with the aspiration for a certified 'Core' building

The Home Quality Mark is being reviewed for its applicability to the residential units, should a rating system be required for this demise.

Additionally, an assessment of embodied carbon has been completed to benchmark performance. Optioneering will be developed during the next stage to inform the design and support the BREEAM target.

The mixed-use development is expected to contribute to sustainability in a broader sense through provision of:

- A high-density, well connected city-centre development
- Minimal on-site parking and high-quality cycle facilities
- High-quality accessible public realm and landscaping, re-activating the area and providing opportunity for improvements to local biodiversity through the retention of existing trees and planting of additional trees
- Integration of sustainable urban drainage (SuDS) to mitigate flood risk

2. Sustainability Policy

2.1 National Policy

Key policy documents relating to sustainable development are summarised below to guide the project team.

2.1.1 Approved Document Part L 2021: Conservation of fuel and power

Part L of the Building Regulations is the mechanism by which government is driving reductions in the regulated CO_2 emissions from new buildings. The residential building will be required to comply with Part L1A and the commercial demise with Part L2A of Approved Document Part L 2021 (ADL 2021) which was enforced on 15th June 2022.

The main updates under ADL 2021 are as follows:

- It is now significantly more challenging to achieve compliance with fossil fuel heating, therefore an all-electric heat pump strategy is likely to be the preferred solution
- A varying carbon factor associated with grid electricity is 73% lower on average than ADL 2013
- A new non-domestic building will deliver a 27% reduction in CO_2 emissions on average across the new-build non-domestic building mix relative to ADL 2013
- A primary energy target has been introduced and the Fabric Energy Efficiency target retained

2.1.1.1 Approved Document F (England), 2021: Ventilation

Approved Document F was last fully updated in 2010, with amendments in 2013. Volume 1 applies to dwellings and Volume 2 applies to non-domestic buildings. The main updates for both are provided below:

- The whole dwelling ventilation rates per bedroom have increased by nearly 50%, compared to ADF 2010
- New guidance on performance-based ventilation standards will allow designers to assess ventilation strategies against individual volatile organic compounds as an alternative route to using a total VOC limit
- Air quality monitors (e.g. CO_2 monitors) are required to be installed in offices; in rooms where "singing, loud speech or aerobic exercise or other aerosol generating activities" take place; in rooms "where members of the public are likely to gather"; and in rooms that are maintained at both low temperatures and humidities
- Occupiable rooms in offices require outdoor air to be supplied at the greater of 10 l/s per person or 1 $l/s.m^2$
- Common spaces in offices (including circulation spaces) require either natural ventilation openings of at least 1/50th of the floor area, or a mechanical supply of outdoor air at a minimum rate of 0.5 $l/s.m^2$
- Amended guidance on recirculating systems states that systems should be capable of operating in a mode that prevents the recirculation of air between different spaces, rooms, or zones, unless suitable filtering or cleaning systems are in place

2.1.2 Approved Document O (England), 2021: Overheating

In December 2021, the government published a new Approved Document O, Overheating, to support a new Building Regulations (England) Requirement O1: Overheating mitigation. This subject was previously only tackled through provisions in Approved Documents L and F. The new requirements include the need for overheating to be considered in all new residential buildings in England.

Previously, Building Regulations had rudimentary methodologies to assess overheating in new dwellings (Part L1A Criterion 3). The new Approved Document aims to incorporate a formalised and more detailed approach to the assessment of and mitigation against overheating in new homes.

2.1.3 Future Homes and Buildings Standard 2025

The Government consulted on the forthcoming changes to the Building Regulations for non-domestic buildings between January and April 2021; a similar consultation for homes was held between October 2019 and February 2020. Together, these consultations have shaped the 2021 changes which provide an interim step prior to the full Future Homes and Buildings Standards which will be consulted on in 2023 and implemented in 2025.

The Future Buildings Standard 2025[1] is expected to deliver the following for new non-domestic buildings:

- Highly efficient new non-domestic buildings which use low-carbon heat and have the best fabric standards possible; no further energy retrofit work will be necessary to enable these buildings to become zero-carbon ready as the electricity grid continues to decarbonise

2.1.4 Heat and Buildings Strategy

Released in October 2021 as a stepping stone to the Future Homes and Buildings Standard 2025, the Government's Heat and Buildings Strategy outlines the mechanisms required to reduce the cost of low-carbon heating technologies to support transition away from fossil fuels.

All privately rented commercial buildings are required to have minimum EPC band B by 2030 in England and Wales. Further, all commercial buildings >1,000 m^2 will require an operational energy assessment, completed as part of the Part L2a 2021 update. The building log book should include a forecast of the building's actual energy use (kWh/year) broken down by fuel type, including all metered energy uses and unregulated loads. The forecast may be determined using design calculations, energy benchmarks, an energy forecasting methodology such as CIBSE's TM54 or any other building modelling or spreadsheet tools.

2.1.5 National Planning Policy Framework

The updated National Planning Policy Framework (NPPF) was published in July 2021 and has superseded all Planning Policy Statements (PPS) and Planning Policy Guidance (PPG) documents, with the exception of PPS10 (Waste). The NPPF sets out the Government's strategy on the delivery of sustainable development.

The NPPF places responsibility for policy making with the Local Planning Authority, who shall communicate their policies through Local Plans and facilitate the creation of Neighbourhood Plans. The NPPF states that there is a presumption in favour of sustainable development.

The following is extracted from paragraph 11 of the NPPF:

"Plans and decisions should apply a presumption in favour of sustainable development.

For plan-making this means that:

a. plans should positively seek opportunities to meet the development needs of their area, and be sufficiently flexible to adapt to rapid change;

b. strategic policies should, as a minimum, provide for objectively assessed needs for housing and other uses, as well as any needs that cannot be met within neighbouring areas , unless:

   i. the application of policies in this Framework that protect areas or assets of particular importance provides a strong reason for restricting the overall scale, type or distribution of development in the plan area; or

   ii. any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole.

For decision-taking this means:

a. approving development proposals that accord with an up-to-date development plan without delay; or

b. where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless:

   i. the application of policies in this Framework that protect areas or assets of particular importance provides a clear reason for refusing the development proposed; or

   ii. any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole."

[1] https://www.gov.uk/government/consultations/the-future-buildings-standard

In respect of energy policy contained within the NPPF, paragraph 155 sets out that:

"To help increase the use and supply of renewable and low carbon energy and heat, plans should:

a. provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);

b. consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and

c. identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers."

2.2 Local Policy

2.2.1 Manchester Core Strategy 2021-2027[2]

Manchester's Core Strategy outlines the adopted Manchester City Council policies for selected sustainability themes including:

- Energy and CO_2
- Water and flood risk
- Materials
- Waste
- Transport
- Pollution
- Ecology and biodiversity
- Community

While these topics are discussed in turn in section 3, they are expected to be supplemented by the Joint Development Plan (Places for Everyone – see section 2.2.2) when it is approved later in 2022.

2.2.2 Places for Everyone

Nine of the ten councils in Greater Manchester have submitted the Places for Everyone[3] Joint Development Plan to the Secretary of State for Levelling Up, Housing and Communities for independent review. Assuming the plan is approved, it sets out a framework for sustainable, inclusive growth across the nine districts. Of particular reference to the proposed development, the plan sets out the following strategic objectives:

- Objective 2: prioritise the use of brownfield land
- Objective 4: Focus development in the Core Growth Area (Manchester city centre) and improve sustainable and active travel access
- Objective 6: Focus new development within 800m of sustainable transport hubs and ensure it is designed to encourage and enable active and sustainable travel
- Objective 7: promote carbon neutrality of new development by 2028, reduce car dependency, facilitate provision of infrastructure for cleaner vehicles and improve energy efficiency and generation of renewable and low carbon energy
- Objective 8: Enhance special landscapes, green infrastructure, biodiversity and geodiversity. Promote the role of green space in climate resilience and reducing flood risk

Policy JP-S 2 Carbon and Energy includes an expectation that, up to 2028, new development will follow the energy hierarchy to achieve operational net zero carbon. From 2028 onwards, the development will seek to achieve net zero carbon 'in construction' too.

2.2.3 5-Year Environment Plan for Greater Manchester

The Greater Manchester Combined Authority (GMCA) set an ambitious target to be a zero-carbon city by 2038. As part of this plan, the Greater Manchester Spatial Framework sets out plans for all new development to be zero carbon by 2028.

Included in the five-year plan are a number of key items, including, but not limited to; increasing local renewable electricity generation, increasing the diversity and flexibility of energy supply and decarbonising how buildings are heated (serviced). These items encourage passive design and a shift away from fossil fuels to service buildings. The five-year plan also notes that new developments should seek to generate 20% onsite / renewable energy generation.

Additionally, the strategy includes a clean air plan to help tackle poor air quality – safeguarding Manchester residents from high levels of Nitrogen Dioxide (NO_2).

2.3 Local Ambition

2.3.1 Manchester Climate Change Agency – A Roadmap to Net Zero Carbon New Buildings in Manchester

The Manchester Climate Change Partnership, including Manchester City Council, has agreed the Manchester Climate Change Framework 2020-25[4] which includes a recommendation for all new development to be zero carbon from 2023. A Task Group, supported by the UK Green Building Council, has developed, "A Roadmap to Net Zero Carbon New Buildings in Manchester[5]" to provide guidance on how zero carbon should be defined for new buildings in Manchester and how this ambition could be implemented. This paper outlines the following key recommendations:

- A 'Manchester Standard' for Net Zero Carbon New Buildings should be adopted by the Manchester Climate Change Partnership, which is considered by Manchester City Council for application in planning policy, public procurement and by developers and clients who wish to demonstrate voluntary leadership ahead of policy requirements.
- All new development should be net zero carbon in operation from 2023, without use of offsetting or a Carbon Tax.
- All new development should deliver a significant reduction in embodied carbon in construction from 2023, with more stringent requirements introduced in future.

The focus of the Roadmap is to detail the Manchester Standard and the steps to implement it. The following targets are proposed for non-domestic buildings:

- Reducing energy demand:
  - New office development should target an Energy Use Intensity of <75kWh/m^2/yr GIA from 2023, with future uplift set out in advance e.g. <55kWh/m^2/yr from 2028.
  - At the design stage, demonstrate adherence to a design-for-performance methodology e.g. NABERS UK.
- Reducing embodied carbon:
  - Calculate whole life carbon emissions through a nationally recognised methodology and demonstrate actions taken to reduce lifecycle carbon.
  - New office developments should target <600kgCO_{2e}/m^2 upfront embodied carbon (RICS Modules A1-A5) with future uplift set out in advance e.g. <350kgCO_{2e}/m^2 from 2028 excluding sequestration.
- Measuring in-use performance:
  - Principles of soft landings to be followed and a recognised performance gap/ assured performance tool used to minimise gap between design aspiration and the completed development. The effectiveness of measures will be reviewed and ratified as part of the post-completion discharge of conditions. For office buildings, Display Energy Certificates and/or NABERS UK can be used to demonstrate the differing responsibilities and performance of landlord and tenant.

[2] https://www.manchester.gov.uk/downloads/download/4964/core_strategy_development_plan

[3] https://www.greatermanchester-ca.gov.uk/media/4838/places-for-everyone.pdf

[4] https://www.manchesterclimate.com/sites/default/files/Manchester%20Climate%20Change%20Framework%202020-25.pdf

[5] https://www.manchesterclimate.com/sites/default/files/Roadmap%20to%20Net%20Zero%20Carbon%20-%20Report.pdf

  - All developments shall put in place a recognised monitoring regime to allow the assessment of energy use, indoor air quality and overheating risk.
- Low-carbon energy supply:
  - New development should not have any onsite combustion of fossil fuel.
  - All developments shall assess the viability for onsite renewable generation. For developments with SE/SW facing roof(s), a minimum 40% solar technologies installation as a percentage of building footprint area shall be met unless it can be clearly demonstrated that this is not practically viable.
  - All developments shall match their total annual energy demand through a combination of investment in renewable generation capacity or a 15-year minimum renewable energy PPA, energy storage and smart controls.

3. Sustainability Proposals aligned to Greater Manchester Policy

In addition to specific project targets relating to ADL 2021, NABERS, BREEAM and WELL, the proposed development is expected to align with the local policies that are outlined below.

3.1 Energy and CO_2 emissions

3.1.1 MCC Adopted Policy Summary

The following table summarises the adopted MCC policies for energy.

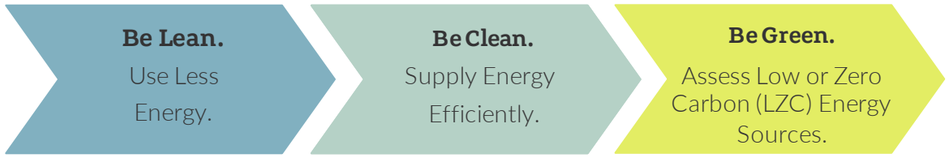
Table 1 MCC policies relating to energy

	Policy Reference	Target
Energy and CO_2	CS Policy EN4	All development must follow the principle of the Energy Hierarchy, being designed: – to reduce the need for energy through design features that provide passive heating, natural lighting and cooling – to reduce the need for energy through energy efficient features such as improved insulation and glazing – to meet residual energy requirements through the use of low or zero carbon energy generating technologies In addition: – Wherever possible new development and retrofit projects, including energy generation plant, must be located and designed in a manner that allows advantage to be taken of opportunities for low and zero carbon energy supplies – Where possible new development and retrofit projects will be used as a mechanism to help improve energy efficiency and provide low and zero carbon energy supplies to existing buildings – Where appropriate new development and retrofit projects will be required to connect to and/or make contributions to low or zero carbon energy schemes and/or to incorporate provision to enable future connection to any existing/potential decentralised energy schemes – The use of building materials with low embodied carbon in new development and refurbishment schemes
	CS Policy EN5	The proposed development is located within the Regional Centre, a strategic area indicated on the key diagram, which is expected to have a major role to play in achieving an increase in the level of decentralised, low and zero carbon energy supplies available. Where investment or development is being undertaken into or adjacent to a public building/asset or district heating network, full consideration shall be given to the potential role that these can have in providing an anchor load within a decentralised energy network or in creating opportunities for CO_2 reduction funded by contributions.
	CS Policy EN6	An Energy Statement is required to demonstrate compliance with Part L in line with the energy hierarchy and, for electricity intense buildings i.e. commercial buildings with a high proportion of emissions from electricity use (>45kgCO_2/m^2), a minimum +10% increase on Part L 2010. Where the CO_2 emissions reduction required under any future revision to Part L of the building regulations becomes greater than 10%, the reduction under building regulations would apply.
	CS Policy EN7	– Proposals must take account of potential opportunities to source heat from adjoining developments or nearby heating networks. – Heating and cooling systems will have capability of connecting to the decentralised heating network.
	SPDPG Section 4.5 (Superseded)	Section 4.5 of the SPDPG 2007 document identifies that a 25% betterment of Part L will be required. This document has been superseded by the CS 2012 document and therefore the policy requirement of CS EN6 will be targeted.
	SPDPG Section 4.6 (Superseded)	Section 4.6 of the SPDPG 2007 document identifies that a level of 20% of the final energy demand be provided on site by renewable energy systems.

3.1.2 Approach

Albert Bridge House will have a reduced impact on climate change by reducing CO_2 emissions associated with energy use. The energy and CO_2 emissions appraisal has been based on the following approach

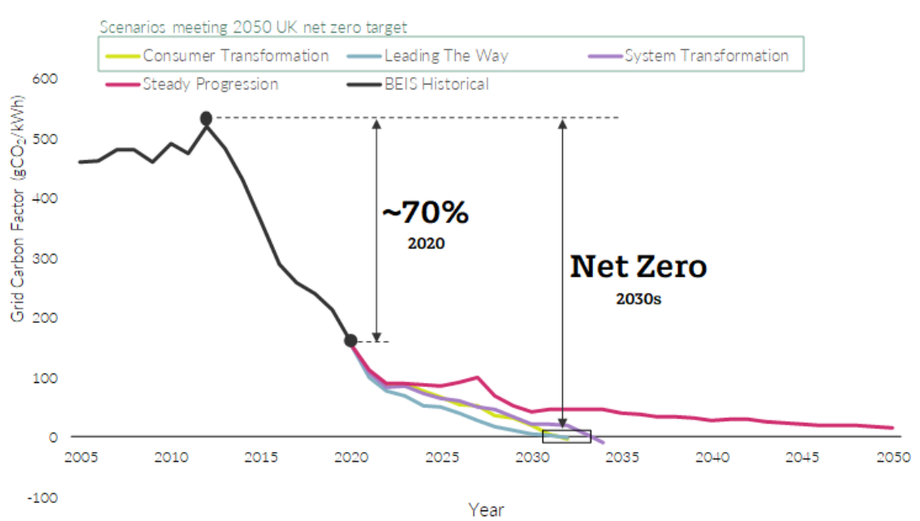
Figure 2 Energy Hierarchy



Manchester Core Policy EN6 states that a 15% improvement over Part L 2010 should be achieved where feasible. The proposed development has been assessed against Part L 2021. The energy strategy [REP-2324490-05-VW-20221006-Energy-Rev01] indicates that the proposed development achieves a 10.60% reduction over the Part L 2021 baseline, far exceeding this policy.

The decarbonisation of the grid has resulted in the carbon intensity of mains gas being higher than for electricity, and therefore strengthening the argument that building services strategies moving forward should be electric led to support the development's zero-carbon ambitions. The chart below illustrates the current and predicted carbon intensities of the national grid from 2005 up to 2050.

Figure 3 Decarbonisation of the National Grid



3.2 Water and flood risk

3.2.1 MCC Adopted Policy Summary

The following table summarises the adopted MCC policies for water and flood risk.

Table 2 MCC policies relating to water and flood risk

	Policy Reference	Target
Water	CS Policy EN14	– Limit the risk and impact of flooding. – Limit increases in surface water runoff.
	CS Policy EN17	– Ensure no decreases to water quality. – Minimise surface water runoff. – Open any culverted watercourses.
	PDPG Section 4.9 (Superseded)	– Provide SUDS to management surface water runoff. – Minimise increases in impermeable surfaces. – Prepare FRA for areas at risk of flooding.
	SPDPG Section 4.15 (Superseded)	– Protection of existing species, wildlife and habitats. – Mitigate impact.
Flood Risk	CS Policy EN14	– Limit the risk and impact of flooding. – Limit increases in surface water runoff
	CS Policy EN17	– Ensure no decreases to water quality. – Minimise surface water runoff. – Open any culverted watercourses.
	SPDPG Section 4.9 (Superseded)	– Provide SUDS to management surface water runoff. – Minimise increases in impermeable surfaces. – Prepare FRA for areas at risk of flooding.

3.2.2 Approach

The main priorities of the MCC policies do not relate to water conservation issues, but instead encourage no increase in surface water runoff and relate to preventing pollution from entering watercourses. The proposed development will aim to reduce the overall consumption of water within the building, in order to limit the resource requirements and ensure that any future impact of water scarcity is limited by the features within the scheme.

The proposed strategy will be water efficient, incorporating measures to reduce potable water consumption through efficient fixtures, and careful management strategies.

The following measures for water have been identified and will be implemented:

Water Efficiency Measures
Consideration has been given to water efficiency in order to meet the requirements of the Building Regulations Part G (2013) as a minimum. The following water consumption levels will be achieved in order to reduce consumption and align with BREEAM targets:
- Dual flush WC cistern with an effective flush volume of 4.5 litres or less with appropriate guidance or symbols to instruct the user on the operation;
- Best practice flow rate taps in both kitchen and sanitary areas; and,
- Showers with flow rates: 9-12 litres/min

Water Efficiency Measures
Consideration has been given to water efficiency in order to meet the requirements of the Building Regulations Part G (2013) as a minimum. The following water consumption levels will be achieved in order to reduce consumption and align with BREEAM targets:
- Dual flush WC cistern with an effective flush volume of 4.5 litres or less with appropriate guidance or symbols to instruct the user on the operation;
- Best practice flow rate taps in both kitchen and sanitary areas; and,
- Showers with flow rates: 9-12 litres/min

Major Leak Detection Systems (landlord)
A leak detection system capable of detecting a major water leak on the main water supply will be included within the building and between the building and the utilities water meter.

Sub-Metering
Water meters will be installed on the mains water supply for each dwelling with a pulsed output to enable connection to a 'Building Management System' (BMS) for the monitoring of water consumption. Each retail unit will have separate sub-meter.

Further information about flood risk can be found in the separate Flood Risk Assessment.

3.3 Materials

3.3.1 MCC Adopted Policy Summary

The following table summarises the adopted MCC policies for materials.

Table 3 MCC policies relating to materials

Policy Reference		Target
Materials	CS EN19	– Require all developers to identify consistency with the waste hierarchy. – Provide a project waste management plan. – Promote innovation in order to make progress towards a closed loop waste management system. – Provide accessible facilities.
	CS EN20	– Encourage the efficient use of minerals and promote the use of secondary/recycled aggregates, wherever possible as an alternative to primary extraction and identify and safe guard sites for its storage, processing and transfer. (See also Waste Policy EN19.) – Encourage and safeguard the sustainable transport of minerals, including by use of rail, wherever possible. – Ensure that any adverse environmental impacts of storage, processing and transfer on neighbouring uses are minimised.
	SPDPG Section 4.10, 4.11 and 4.12 (Superseded)	– Ensure waste management and recycling is provided. – Include for a waste management strategy for the development proposals.
	SPDPG Section 4.13 (Superseded)	– Site Waste Management plans to identify resource efficiency though construction.
	CS EN19	– Require all developers to identify consistency with the waste hierarchy. – Provide a project waste management plan. – Promote innovation in order to make progress towards a closed loop waste management system. – Provide accessible facilities.

3.3.2 Approach

Different structural options have been considered through design development and some of these have been appraised for embodied carbon (see section5).

During the next stage, this assessment will be further refined and consideration given to minimising material quantities and selecting materials with low embodied energy potentially through reclamation or high levels of recycled content.

All materials, where viable, will additionally be procured through sustainable sources and products will be preferred with environmental certification such as BES6001 and ISO14001 certified supply chains.

The proposed development will achieve the following:

- Timber to be sourced from sustainable sources accredited by the FSC
- Materials specified highly from the Green Guide to Specification and products certified with ISO14001 and BES6001.

Robust materials will also be specified to enable a long life with low maintenance.

The following opportunities to improve the sustainability of material selection have been identified and will be implemented:

Material Sourcing
Where feasible, the proposed development will endeavour to source materials locally. This will assist in reducing the embodied carbon of the materials by limiting transportation related emissions and would support the local economy.

Maximise Recycled Content of Materials
A number of materials used commercially in the UK construction industry are manufactured using materials recycled from post-consumer waste. A detailed analysis of the materials available in the UK is outlined on the WRAP website and the 'National Building Specification' (NBS) 'Greenspec' website. The design will endeavour to utilise materials with low embodied impacts.

The Green Guide to Specification
Materials used will be reviewed using the BRE's online 'Green Guide to Specification' (www.bre.co.uk/greenguide) in order to maximise the proportion of materials which are A rated, and minimise materials with the lowest ratings (E).

Responsibly Sourced, Certified Timber
The buildings will only use timber from a temperate, well managed source or manufactured from recycled timber waste. Timber certified by the 'Forest Stewardship Council' (FSC) contains a product-specific chain of custody number confirming that the timber used in the manufacture of the product originates from a sustainably managed source. 100% of the timber used to be FSC/PEFC certified.

Zero ODP and GWP Insulation
Preference will be given to insulation materials such as rock wool and mineral wool, which are manufactured to have an 'Ozone Depletion Potential' (ODP) of zero, and low 'Global Warming Potential' (GWP), while still giving consideration to thermal performance and fitness for purpose.

Low solvent / low VOC paints
Paints and other materials with high levels of Volatile Organic Compounds (VOCs) can emit organic compounds long after the building has been completed. These chemicals which are inhaled by the building occupants are considered to be a contributing factor in sick building syndrome, leading to nausea and headaches. The scheme will, as far as possible, use internal materials that have a low solvent / low VOC content.

Zero Formaldehyde MDF
'Medium Density Fibreboard' (MDF) is a timber panel product that can be manufactured with new or recycled timber. Typically MDF is manufactured using Formaldehyde, which is hazardous to health. However, MDF can be manufactured without the use of Formaldehyde and the development will use zero Formaldehyde MDF as far as practically possible.

3.4 Waste

3.4.1 MCC Adopted Policy Summary

The following table summarises the adopted MCC policies for waste.

Table 4 MCC policies relating to waste

Policy Reference		Target
Waste	CS EN19	– Require all developers to identify consistency with the waste hierarchy. – Provide a project waste management plan. – Promote innovation in order to make progress towards a closed loop waste management system. – Provide accessible facilities.
	CS EN20	– Encourage the efficient use of minerals and promote the use of secondary/recycled aggregates, wherever possible as an alternative to primary extraction and identify and safe guard sites for its storage, processing and transfer. (See also Waste Policy EN19.) – Encourage and safeguard the sustainable transport of minerals, including by use of rail, wherever possible. – Ensure that any adverse environmental impacts of storage, processing and transfer on neighbouring uses are minimised.
	SPDPG Section 4.10, 4.11 and 4.12 (Superseded)	– Ensure waste management and recycling is provided. – Include for a waste management strategy for the development proposals.
	SPDPG Section 4.13 (Superseded)	– Site Waste Management plans to identify resource efficiency though construction.
	CS EN19	– Require all developers to identify consistency with the waste hierarchy. – Provide a project waste management plan. – Promote innovation in order to make progress towards a closed loop waste management system. – Provide accessible facilities.

3.4.2 Approach

A pre-demolition audit of the existing building will be conducted prior to its demolition to identify any materials that could be salvaged for re-use on site or elsewhere and reduce the requirement for virgin materials to be used for aggregates and other such applications. Waste that can be reused will be processed through an approved waste management contractor and reused and recycled where possible. A Resource Management Plan will be developed early on in the project development in order to identify the most appropriate way to reduce waste and encourage recycling through construction.

During construction, careful waste management procedures will be put in place during construction and on into operation to reduce the amount (volume and mass) of waste sent to landfill during the lifetime of the building. The principles of the waste hierarchy will be applied at each stage.

The development itself will be likely to produce moderate waste volumes through operation due to the users of the offices. However, to encourage or move towards closed loop waste management, suitable waste storage and facilities will be provided for the tenants. This will allow for segregation of recyclable and non-recyclable general waste.

The selection of materials will also consider end of life and recyclability. Materials that can be salvaged at the end of life will be incorporated wherever possible to reduce the instances of waste produced in the future.

The following opportunities to reduce waste have been identified and will be implemented at the proposed development.

Re-Use of Materials

The material use strategy for the proposed development will minimise the environmental impact. A key component of this strategy is the re-use of existing materials. It is intended that material will be recovered during any demolition process and reused during construction. A pre-demolition audit will identify those elements that are applicable for reuse or recycling.

Minimisation of Demolition & Construction Waste

The contractor will be required to produce a 'Site Waste Management Plan' (SWMP) to define measures for how to minimise the volume of waste arising from any demolition and all construction activities sent to landfill. Performance of the contractor waste reduction and their environmental impact in this regard will make up an element of tender process.

Off-site Construction

Off-site modular construction will be considered where possible, which would allow less waste to be produced on-site as the construction method takes on a form of an assembly of components. Features may include bathroom pods, stair-core components or upper floor elements although further opportunities will be sought through design and construction.

Operational Waste

The buildings will be provided with sufficient bin storage capacity to allow for storage of recyclable and non-recyclable waste streams.

The building users will manually transfer waste to a central waste storage area that is in an appropriate location for collection by MCC or another waste management contractor. The waste store will be designed in accordance with BS5906 (waste management in buildings), generally using 1,100 litre bins.

3.5 Transport

3.5.1 MCC Adopted Policy Summary

The following table summarises the adopted MCC policies for transport.

Table 5 MCC policies relating to transport

Policy Reference		Target
Transport	CS CC5	– Provide access to public transport and sustainable modes of accessing the proposed development. – Promote sustainable modes of transport including walking and cycling. – Provide storage and facilities for cyclists/walkers.
	CS SP1	– Encourage sustainable transport and facilitate sustainable transport.
	CS T1	– Provide suitable alternative to car transportation. – Promote regeneration and access to jobs. – Improve access to transportation services. – Improve pedestrian routes. – Improve access to cycle facilities. – Facilitate modes of transport that are low carbon.

3.5.2 Approach

Most building users are anticipated to arrive at the building on foot, by bike or via public transport given the excellent local and national public transportation links close by and the facilities proposed within the building itself. Car parking is not provided.

The basement level has been designed to provide secure cycle storage and cyclist facilities to encourage active travel and the site's city-centre location offers easy access to extensive public transport links via bus, tram and train.

The following measures for sustainable transport have been identified and will be implemented:

Public Transport
The proposed development benefits from excellent access to local bus, train and tramline routes. There is good access to local and national transport destinations that will allow sustainable transport for visitor and commuter transport, from and to the site.

Cyclist and pedestrian Facilities
The proposed development will be provided with secure cycle storage for tenants.

3.6 Pollution

3.6.1 MCC Adopted Policy Summary

The following table summarises the adopted MCC policies for pollution.

Table 6 MCC policies relating to pollution

Policy Reference		Target
Pollution	CS DM1	– Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise.
	CS Policy EN14	– Limit the risk and impact of flooding. – Limit increases in surface water runoff.
	CS Policy EN17	– Ensure no decreases to water quality. – Minimise surface water runoff. – Open any culverted watercourses.
	SPDPG Section 4.9 (Superseded)	– Provide SUDS to management surface water runoff. – Minimise increases in impermeable surfaces. – Prepare FRA for areas at risk of flooding.

3.6.2 Approach

Any remediation strategy that may be required is subject to a ground investigation survey. Internal air pollution will be minimised internally through careful selection of finishing products.

The building services design will additionally be carefully considered to enable the indoor environment to be free of pollutants. Building services plant will be selected based on efficient and ultra-low emissions of NOx SOx and COx (where applicable), and will not substantially contribute to local air pollution. No gas combustion devices will be installed on site thereby contributing significantly towards the aims of the Greater Manchester Clean Air Plan.

Noise pollution from the fixed building services plant will be assessed by an acoustic consultant. Noise likely to cause complaint will be mitigated to ensure no increase the overall background noise levels. The following measures to control pollution have been identified and will be implemented:

Light Pollution
Potential sources of light pollution as a result of the new build will be mitigated through measures such as night-time dimming of lights (where appropriate), and selection of luminaires to distribute light downwards.

NO_x Emissions & Air Quality
To minimise potential air quality effects, the scheme will utilise a strategy which mitigates the need for onsite combustion plant and will help to minimise emissions of Nitrous Oxide (NO_x) and Particulate Matter (PM).

Waste Storage
Adequate waste storage facilities will be provided with capacity to allow storage of non-recyclable and recyclable waste, preventing odour pollution from the site.

Noise impacts
Noise impacts will be assessed by a suitably qualified acoustician, noise levels likely to cause complaint will be mitigated thought the incorporation of acoustic barriers or other insulation.

3.7 Ecology and Biodiversity

3.7.1 MCC Adopted Policy Summary

The following table summarises the adopted MCC policies for ecology and biodiversity.

Table 7 MCC policies relating to ecology and biodiversity

Policy Reference		Target
Ecology & Biodiversity	CS EN9	– Encourage green infrastructure where possible.
	CS EN10 / EN11 / EN12	– Maintain levels of open, sports and recreation spaces.
	CS EN13	– No impact on the Green Belt.
	CS EN15	– Encourage features to ensure no loss of biodiversity. – Maintain or enhance sites with specific designations or value. – Justify any adverse effects on ecology. – Provide suitable mitigation and compensation.
	SPDPG Section 4.15 (Superseded)	– Protection of existing species, wildlife and habitats. Mitigate impact.

3.7.2 Approach

The site is not generally expected to be of high ecological value, except for the riverfront boundary. Mitigation and enhancement measures will be developed once the ecological baseline has been established.

The commercial building design incorporates terraces on most floors where the staggered plan provides space. Most of these outside areas can be utilised for planting to improve local biodiversity and user well-being. Points are available under the WELL assessment for plants that produce food such as herbs, fruit and vegetables.

The appointed ecologist will provide further advice on site ecology and biodiversity including recommended planting species to encourage local wildlife. The ecologist will be required to prepare a landscape and habitat management plan setting out procedures for managing new ecological habitats created on the site for at least five years post completion.

The following measures relate to ecology and biodiversity which have been identified for further consideration:

Native Planting
Native plants and species of benefit to local biodiversity will be selected to create and restore native ecosystems. This will also involve the selection of plants that don't require irrigation and that thrive on available rainwater.

Environmental Effects
The scheme will aim to record no environmental incidents on-site. Examples of environmental incidents include pollution or contamination of ground and water sources through paint, oil or cement powder spillage.

Tree Planting
The development will aim to introduce planting where space permits. If possible, green wall systems could be considered for inclusion in the design.

3.8 Community

3.8.1 MCC Adopted Policy Summary

The following table summarises the adopted MCC policies for community.

Table 8 MCC policies relating to community

Policy Reference		Target
Community	CS EN1	– Design facilities that will fit the local character of the development site.
	CS EN10 / EN11 / EN12	– Maintain levels of open, sports and recreation space.
	CS EN13	– No impact on the Green Belt.

3.8.2 Approach

The project team aims to engage with the local community throughout design, construction and operation to deliver a sustainable development, built for purpose.

By engaging with communities and stakeholders in a meaningful and transparent manner as early in the development life cycle as possible, the developer aims to be a 'good neighbour' and a positive influence in the community.

The following measures for community engagement and facilities have been identified for further consideration:

Local Employment
The scheme will seek to boost the local economy by using local business and suppliers wherever possible. The team has been encouraged to prepare a sustainable procurement plan for the development that will identify ways to sustainably, responsibly and locally procure.

Improving Existing Sites
The development will re-vitalise the area and improve the quality of both townscape and public realm, making efficient use of land in this location. The development will provide new office space to support the growing demand in Manchester city centre.

Considerate Construction Scheme
The contractor will be required to operate under the Considerate Constructors Scheme to ensure good neighbourliness and environmental awareness during construction. The contractor will be required to achieve a best practice score under the assessment.

4. Operational Energy Performance

The Better Buildings Partnership have recently introduced the 'Design for Performance' (DfP) initiative to the UK. Based on the highly successful National Australian Built Environment Rating System (NABERS), this scheme has succeeded in allowing office developments in Australia to achieve highly energy efficient system design, with increasingly aspirational benchmarks for Landlord energy consumption in office buildings being set.

Focussing solely on office developments, the scheme sets out an approach to assessing a development's operational energy output through analysing those areas which are under landlord control. This helps building owners, investors and managers to quantify the operational energy output of their development, as well as make standardised comparisons against other similar buildings that have taken part in the scheme.

The Design for Performance, or NABERS, rating system uses operational energy modelling from early design stages to assess the intended output of the proposed development's Landlord energy consumption and how this can be modified to allow for a more energy efficient design.

This model will be completed as part of the next stage of works in line with the typical NABERS approach shown in Table 9 below.

The building is then assessed in operation, i.e. annual energy consumption is measured and reported, to determine how close to the intended design the development performs and whether or not the ratings target has been achieved.

Table 9 Typical NABERS approach

RIBA Stage 2	RIBA Stage 3	RIBA Stage 4
– Workshop with whole design team – Façade analysis to optimise cooling load and daylight – Mixed mode ventilation review – Provide initial advice on suitable low energy systems – Advocate for best practice design to ensure low energy operation e.g. ensure straight ductwork, independent systems for servers – Challenge design brief – Advise for tenant energy reduction	– Preparations for the Independent Design Review (IDR) – Undertake energy modelling to evaluate a baseline score and NABERS rating – Reporting requirements – Off Axis scenarios – Metering alignment – Modelling margin – IDR information required – Rating Achievement Plan	– IDR comments response – Finalise control strategy – Final report issue (meeting reporting requirements)

4.1 NABERS - Design for Performance

Design for Performance (DfP) is an emerging industry initiative that aims to improve the energy performance of the office sector in the UK by setting energy targets, in energy consumed per square meter (kWh/m^2), measured during actual operation. Advanced energy modelling (beyond standard Part L compliance tools) is utilised during design to better understand anticipated building performance, and the final detailed model is then used to enhance commissioning and building optimisation.

In theory, the scheme aims to reduce the energy intensity of commercial developments through comprehensive modelling of energy, water, waste and indoor environments within early stages of design. In practice, this decreases the gap between expected operational energy outcome and reality, as it allows for further refinement of system efficiencies and type.

Buildings are then ranked based on performance, with each ranking lasting only 12 months to ensure a continuous review of building output is undertaken annually. This allows for healthy competition between market leaders, alongside ensuring that the buildings work for both the landlords and the tenants.

Using the NABERS scheme, office buildings across Australia have observed an average reduction of 36% in energy intensity within their buildings since 2010.

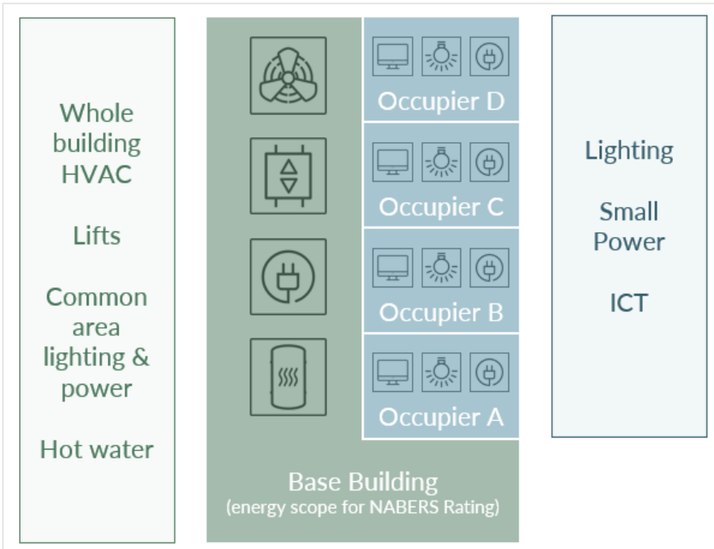
4.1.1 Proposed development Target

The proposed development is targeting a minimum NABERS 5* rating with an aspiration to achieve a 6* rating. Using an initial approximate Net Internal Area (NIA) of 44,800m^2, in the Design for Performance/NABERS reverse calculator, means reducing the operational energy consumption of the Landlord areas to approximately 68kWh/m^2/yr for 5* and 34kWh/m^2/yr for 6*.

Figure 4 Star rating under the NABERS scheme

Figure 5 details the scope of the assessment, demonstrating how important it is to scrutinise the Landlord energy consumption to ensure the base-build allows for the most energy efficient design before the Tenant loads are added on top.

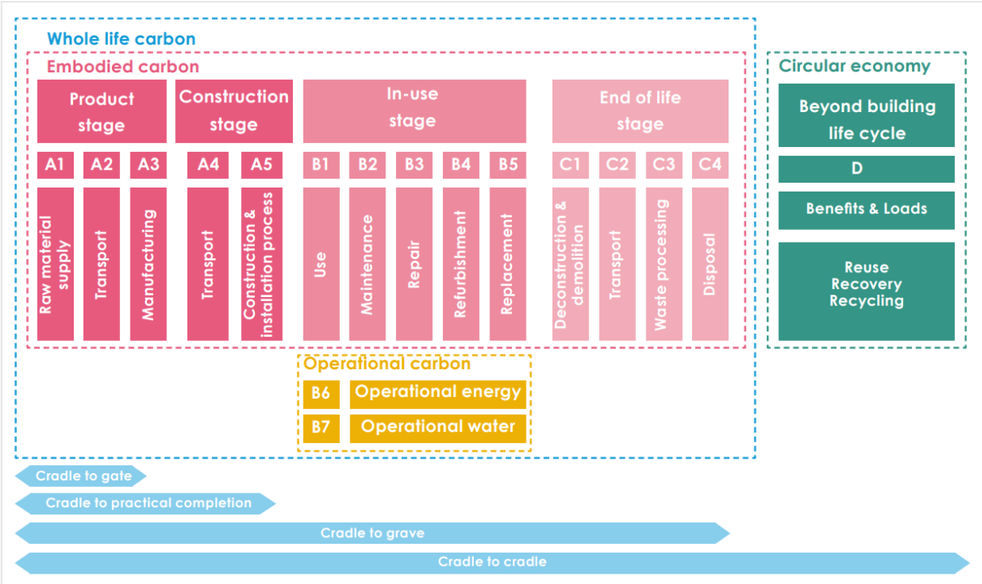
Figure 5 Scope of energy demands included in NABERS assessment for the base building



5. Embodied Carbon

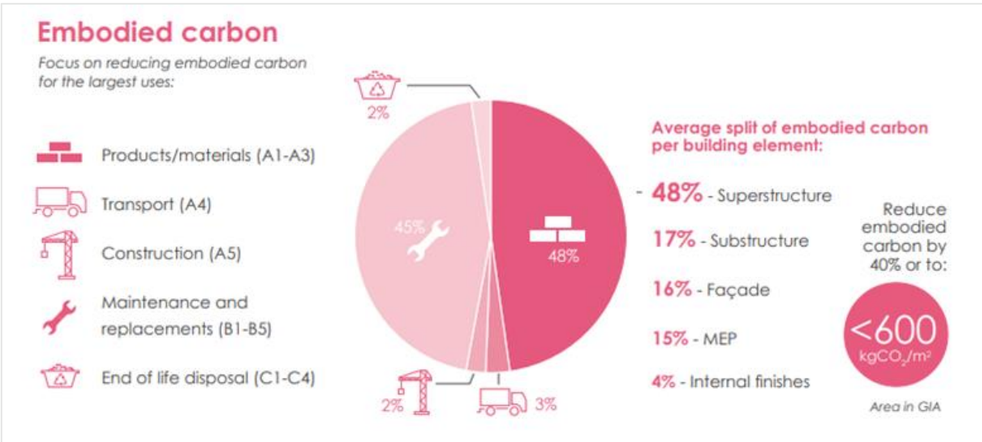
Embodied carbon emissions refer to the carbon contained within the building materials, through manufacture and transport. Embodied carbon typically accounts for over 50% of the total carbon emissions of a building, but this proportion is expected to increase as the national grid decarbonises resulting in reduced operational emissions. Figure 6 below details the different stages of assessment.

Figure 6 System Boundary: EN 15978:2011 Display of modular information for the different stages of the building assessment (LETI)



To align with Manchester's Roadmap to Net Zero Carbon, the proposed development should target an upfront embodied carbon of <600kgCO_{2e}/m^2 (Lifecycle modules A1-A5). Figure 7 provides an indication as to how this might break down across the different building elements.

Figure 7 Embodied carbon emissions (LETI)



An initial embodied carbon model has been built within OneClick LCA, using Carbon Designer. Figure 8 indicates the difference in importance of carbon in the upfront carbon lifecycle modules. Modules A1-A3 can clearly be seen to be the major proportion of the carbon, with modules A4 and A5 of much lower importance.

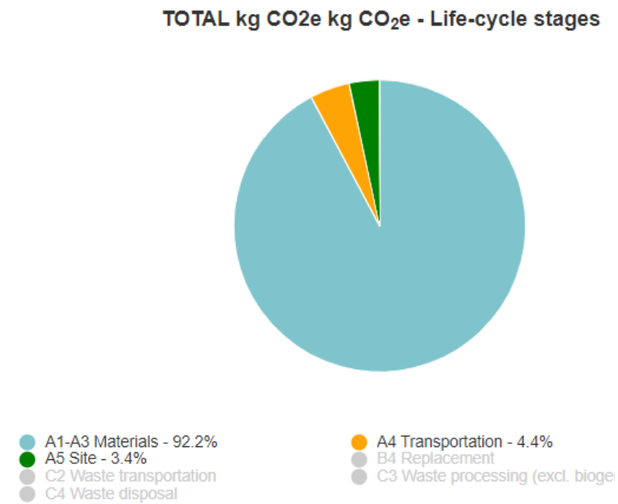


Figure 8 Embodied carbon by life cycle stages

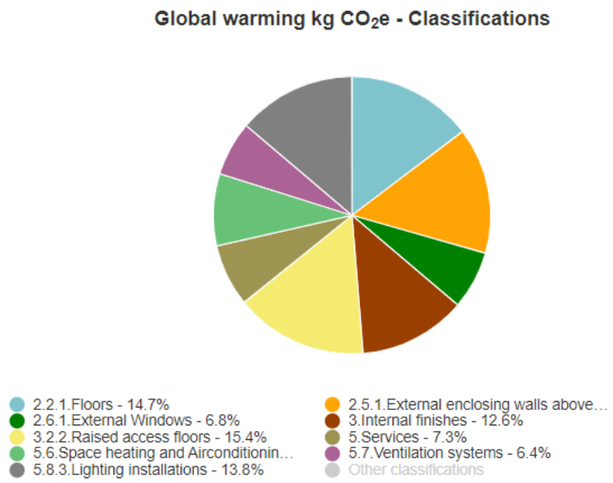


Figure 9 Embodied carbon by building element

Figure 9 indicates the building element carbon hotspots for the project, with floors, constructed primarily of concrete and rebar, and external walls forming major elements of the carbon. At this early design stage, resource efficiency should be prioritised to ensure that the structural design minimises the volume of materials used. It should be noted this pie charts consider the 60-year whole life impacts.

5.1 Preliminary results of life cycle analysis

The Embodied Carbon of the development has been assessed, with results displayed below:

Table 10 Preliminary results from the first round of modelling

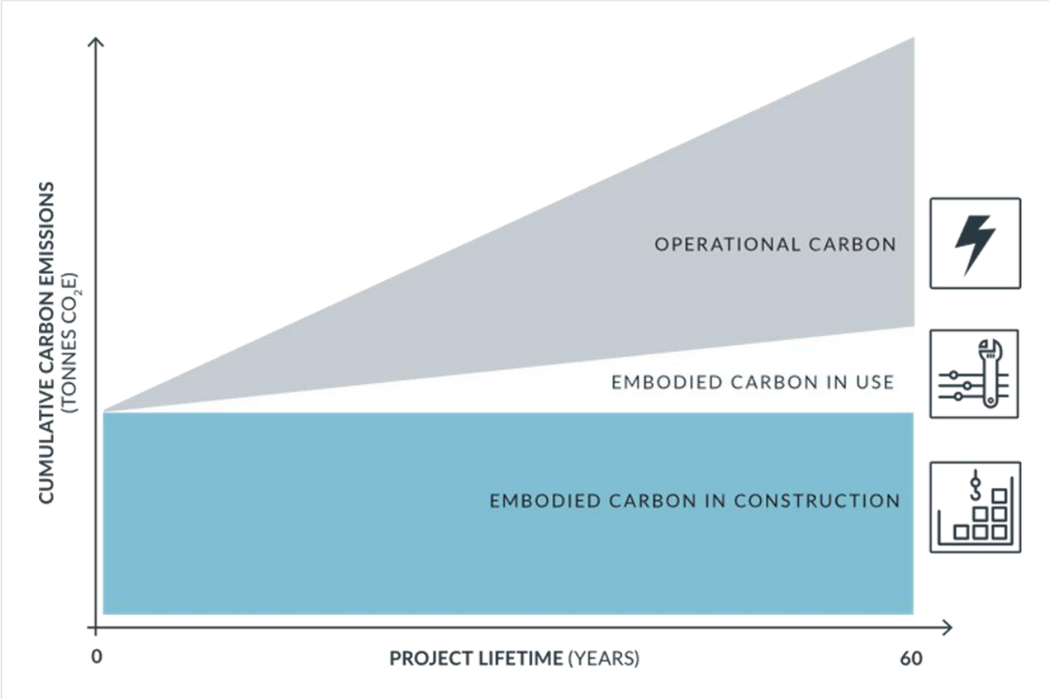
Section	Result category	Global warming kg CO_{2e}	Acidification kg SO_{2e}	Eutrophication kg PO_{2e}	Ozone depletion potential kg CFC11e	Formation of ozone of lower atmosphere kg Ethene	Non-hazardous waste disposed kg
A1-A3	Construction Materials	16,925,846	95,189	18,930	1	6,445	4,813,465
A4	Transportation to site	801,425	1,169	249	0	49	2,010
A5	Construction/installation process	1,405,176	5,083	3,081	0	172	372,875
A5a	Site operations & site waste handling	1,405,176	5,083	3,081	0	172	372,875
B4-B5	Material replacement and refurbishment	15,047,067	100,200	23,435	1	7,307	11,397,747
B4-B5a	Material replacement - materials	13,892,367	98,638	22,681	1	7,177	8,395,498
B4-B5b	Material replacement - transport	483,887	500	109	0	7	338
B4-B5c	Material replacement - waste	670,813	1,061	645	0	123	3,001,910
C1-C4	End of life	645,440	1,754	458	0	58	1,382,576

Total Upfront Carbon emissions (lifecycle modules A1-A5) are currently forecast to be 20,537,622kg. This equates to a carbon intensity of 466 $kgCO_{2e}/m^2$. The initial estimate indicates that upfront carbon would be below the target of <600$kgCo_{2e}/m^2$. Although, due to the lack of specific design information at this stage, this estimate is expected to be conservative and throughout design, resource efficiency and low carbon material choice should be prioritised. To further understand the embodied carbon implications of the current design, material information should be provided to the LCA practitioner to allow refinement the model.

5.2 Whole Life Carbon

Whole carbon refers to the sum of the operational and embodied carbon emissions over the life of the building. With an aspiration to be net zero carbon, both operational and embodied emissions must be addressed during the concept stage and developed through design and construction. Following the guidance provided on the operational energy approach and targeting key elements of the structure will provide significant steps towards net zero carbon.

Figure 10 Whole life carbon



5.2.1 Carbon offsets

It will be difficult to achieve a totally zero whole life carbon development, therefore carbon offsets such as afforestation, creation of off-site solar/ wind farms should be considered. Reducing operational and embodied carbon will result in a lower investment in carbon offsets.

6. Environmental Assessment Methods

A number of environmental assessment methods are applicable to the proposed development, with BREEAM and WELL being prioritised during stage 2. Others, including the Home Quality Mark for the residential tower, will be considered further during the next stage.

6.1 BREEAM

Founded in 1990, the Building Research Establishment's Environmental Assessment Method (BREEAM) is the most commonly adopted environmental assessment method for developments in the U.K. BREEAM takes a holistic approach to sustainability, awarding credits across nine categories and for innovation.

Albert Bridge House is targeting a minimum BREEAM rating of "Outstanding" under the BREEAM 2018 New Construction scheme (shell and core), which requires a score of at least 85%. A buffer of ~3-5% is advisable to allow for changes during design development and/or performance targets being missed during the construction stage. A pre-assessment exercise has been completed by a BREEAM Accredited Professional (AP) and the preliminary strategy suggests that a score of 85.69% could be targeted, with the potential for 96.15%, using BREEAM New Construction 2018 Offices (shell and core) criteria. Further information can be found in the BREEAM pre-assessment report included in Appendix A.

6.2 LEED

Leadership in Energy and Environmental Design (LEED) was developed by the U.S. Green Building Council as a tool for the assessment and improvement in the sustainability performance of new buildings. It is globally recognised environmental standard that can be applied internationally, including in the U.K. The latest version of LEED, version 4, was released in 2013. Buildings can be rated as LEED certified, silver, gold or platinum.

Figure 11 LEED v4 certification levels (courtesy: USGBC)

40 points	50 points	60 points	80 points
U.S. GREEN BUILDING COUNCIL LEED CERTIFIED USGBC	U.S. GREEN BUILDING COUNCIL LEED SILVER USGBC	U.S. GREEN BUILDING COUNCIL LEED GOLD USGBC	U.S. GREEN BUILDING COUNCIL LEED PLATINUM USGBC

Like BREEAM, LEED scoring is founded on a series of pre-requisites and credits that are assessed across six sections:

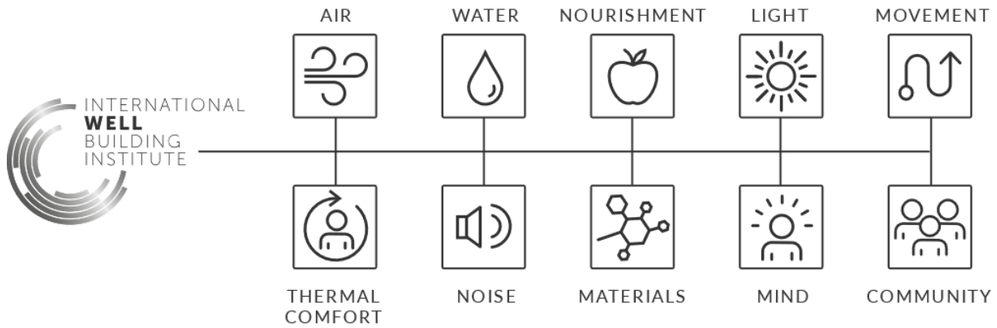
2. Location and Transportation
3. Sustainable Sites
4. Water Efficiency
5. Energy and Atmosphere
6. Materials and Resources
7. Indoor Environmental Quality

To date, the development has not been assessed against LEED because it is arguably not as widely recognised in the UK market as BREEAM.

6.3 WELL Building Standard

WELL is the first standard of its kind to focus solely on the health and wellbeing of the building occupants. Established in 2014, and revised in May 2018, WELL v2 is structured around 10 concepts, based on a holistic view of health, not only a state of being free of disease, but also of the enjoyment of productive lives from which we derive happiness and satisfaction.

Figure 12 Ten WELL Concepts (International WELL Building Institute (IWBI))

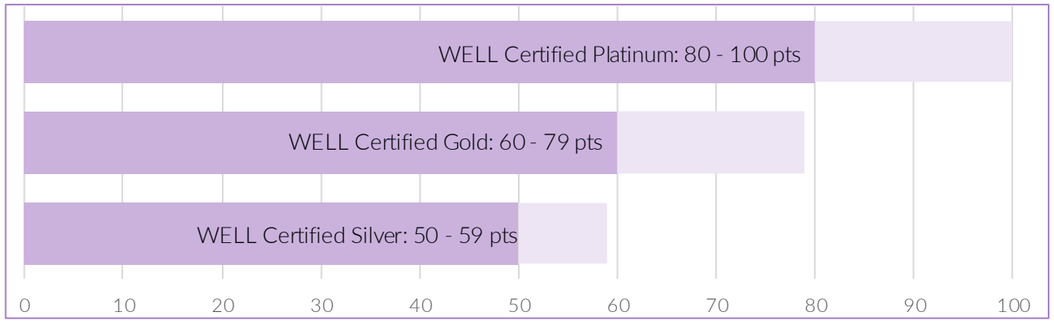


Over 100 features are included within the WELL Standard, categorised as either:

- Preconditions – necessary for 'baseline' WELL certification; OR
- Optimisations – optional additional enhancements

Together, these determine the level of certification above baseline certification. There are 24 Preconditions that need to be achieved, and 98 Optimisations to choose from. The required number of Optimisations depends on both the level of certification targeted and the project type, as outlined below in Figure 13.

Figure 13 WELL Core scoring and certification levels (IWBI)



BREEAM and WELL overlap in some assessment areas, meaning that the certain aspects of the building design can achieve credits under both schemes. Under WELL, criteria that is, 'equivalent' to BREEAM will automatically achieve points in both assessments; while criteria that is, 'aligned' will typically require minimal additional effort to secure the points. This overlap is referred to as the Crosswalk, as discussed in the WELL pre-assessment.

The development could be assessed under WELL Whole Building, to assess the full scope of the project design and construction along with operational aspects, however a WELL Core assessment is considered to be more appropriate given that the owner will occupy <25% gross floor area with the remainder being tenanted.

Figure 14 highlights the different aspects of the build that are covered by WELL depending on the approach taken.

Figure 14 WELL Base Build vs Tenant Fit Out

Shell & Core

AIR
01 Fundamental Air Quality
02 Smoke-Free Environment
03 Ventilation Effectiveness
04 Construction Pollution
05 Enhanced Air Quality
06 Enhanced Ventilation
07 Operable Windows
09 Pollution Infiltration Management
10 Combustion Minimisation
11 Sources Separation
12 Air Filtration
13 Active VOC Control
14 Microbe and Mould Control

WATER
01 Fundamental Water Quality
02 Water Contaminants
03 Legionella Control
04 Enhanced Water Quality
05 Water Quality consistency
07 Moisture Management
08 Handwashing

NOURISHMENT*
01 Fruits & Vegetables
02 Nutritional Transparency
13 Local Food Environment

LIGHT
01 Light Exposure & Education
02 Visual Lighting Design

MOVEMENT
01 Active Buildings and Communities
02 Visual and Physical Ergonomics
03 Movement Network and Circulation
04 Active Commuter and Occupant Support
05 Site Planning and Selection
09 Exterior Active Design

THERMAL COMFORT
01 Thermal Performance
02 Enhanced Thermal Performance
05 Radiant Thermal Comfort
07 Humidity Control

SOUND
01 Sound Mapping
02 Maximum Noise Levels
03 Sound Barriers
05 Sound Masking

MATERIALS
01 Fundamental Material Precautions
02 Hazardous Material Abatement
05 In-Place Management
06 Site Remediation
08 Hazardous Material Reduction
09 Cleaning Products and Protocol
10 Volatile Compound Reduction
11 Long-Term Emission Control
12 Short-Term Emission Control
13 Enhanced Material Precaution
14 Material Transparency

MIND
01 Mental Health Promotion
02 Access to Nature
09 Enhanced Access to Nature

COMMUNITY
01 Health and Wellness Awareness
02 Integrative Design
03 Occupant Survey
13 Accessibility & Universal Design
14 Bathroom Accommodation

INNOVATIONS
01 Innovate WELL
02 WELL Accredited Professional
05 Green Building Rating Systems

*Where F&B provided

Cat A

As per Shell & Core but also:

LIGHT
03 Circadian Lighting Design
04 Glare Control
05 Enhanced Daylight Access
06 Visual Balance
07 Electric Light Quality
08 Occupant Control of Lighting Environments

MOVEMENT
07 Active Furnishings

THERMAL COMFORT
03 Thermal Zoning
04 Individual Thermal Comfort
06 Thermal Comfort Monitoring

SOUND
03 Sound Barriers
04 Sound Absorption

MATERIALS
13 Enhanced Material Precaution
14 Material Transparency

Cat B / Tenant

As per Cat A but also:

AIR
08 Air Quality Monitoring and Awareness

WATER
06 Drinking Water Promotion

NOURISHMENT*
03 Refined Ingredients
04 Food Advertising
05 Artificial Ingredients
06 Portion Sizes
07 Nutrition Education
08 Mindful Eating
09 Special Diet
10 Food Preparation
11 Responsible Food Sourcing
12 Food Production

LIGHT
08 Occupant Control of Lighting

MOVEMENT
06 Physical Activity Opportunities
08 Physical Activity Spaces & Equipment
10 Enhanced Ergonomics
11 Physical Activity Promotion
12 Self-Monitoring

THERMAL COMFORT
04 Individual Thermal Comfort
05 Radiant Thermal Comfort

MATERIALS
03 Outdoor Structures
04 Waste Management
07 Pesticide Use

MIND
03 Mental Health Support
04 Mental Health Education
05 Stress Support
06 Restorative Opportunities
07 Restorative Spaces
08 Restorative Programming
10 Focus Support
11 Sleep Support
12 Business Travel
13 Tobacco Prevention and Cessation
14 Opioid Emergency Response Plan

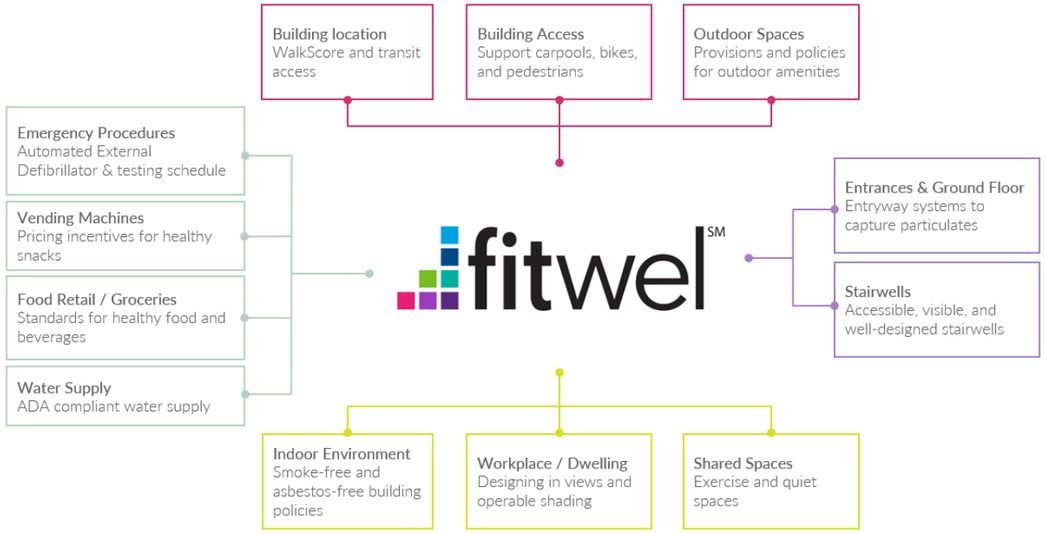
COMMUNITY
04 Enhanced Occupant Survey
05 Health Services & Benefits
06 Health Promotion
07 Community Immunity
08 New Parent Support
09 New Mother Support
10 Family Support
11 Civic Engagement
12 Organizational Transparency
15 Emergency Preparedness
16 Community Access & Engagement

INNOVATIONS
03 Educate WELL
04 Gateways to Wellness

6.4 Fitwel Standard

Fitwel was developed by the Centre for Active Design (CfAD) who maintain the scheme and, ultimately, approve the assessment for certification. Like the other assessment schemes discussed in this section, a qualified assessor is embedded in the design team to advise on compliance and sign off evidence. The Fitwel standard seeks to provide a cost-effective approach to incorporating health and wellbeing measures through >55 design and operational strategies, based around 7 impact categories linked to robust scientific evidence.

Figure 15 Key themes from Fitwel



The assessment can be applied at site-level, for community and commercial sites; or building-level for offices and apartments. The assessment can be further scoped to cover the base build, single or multi-tenant units and/or interiors for workplaces.

Fitwel is sometimes considered easier to implement than WELL because the scheme is more focused on policies and non-technical aspects of design, all of the strategies are optional/ flexible and there are no mandatory requirements except minimum 90 points for 1 star rating.

Table 11 Fitwel ratings

★	★★	★★
90 – 104 points	105 – 124 points	125 – 144 points
Building achieves a basic level of health promotion by incorporating evidence-based design and policy strategies that support the physical, mental, and social health of its occupants.	Building achieves an intermediate level of health promotion by incorporating evidence-based design and policy strategies that support the physical, mental, and social health of its occupants.	The highest level achievable. Building incorporates an exemplary number of evidence-based design and policy strategies that support the physical, mental, and social health of its occupants.

Further consideration will be given to the applicability of Fitwel at Albert Bridge House during the next stage.

6.5 Home Quality Mark

The Home Quality Mark (HQM) provides a rating system for new homes to promote quality construction and sustainable design, enabling future homeowners to benchmark their property. This voluntary standard was created by the BRE in March 2015, in response to the Government's withdrawal of the Code for Sustainable Homes as part of the Housing Standards Review (April 2015). The five star rating system was designed to be easily recognised and understood by tenants and buyers but, 7 years since its launch, it is unclear how well known HQM actually is in the marketplace.

The HQM assessment comprises three key sections:

1. Our Surroundings – the ability of homes to work with current and future surroundings
2. My Home – the provision of living spaces that are comfortable, healthy, cost effective and have reduced harmful effects on the environment.
3. Delivery – delivering construction quality; encouraging the designer, builder, client and house-holder to cooperate and share knowledge, encouraging the developer team to support occupiers following handover.

HQM ratings are awarded based on the number of credits achieved from the 500 available, as shown in Figure 16 below. Current schemes are targeting 3.5 or 4 stars; viewing the higher ratings as too onerous.

Figure 16 HQM ratings and associated scores

Star rating	1 Star	1½ Star	2 Star	2½ Star	3 Star	3½ Star	4 Star	4½ Star	5 Star
Threshold	Minimum requirements only	90	100	120	150	190	240	300	400
Percentage		18%	20%	24%	30%	38%	48%	60%	80%

Credits are awarded for performance against a number of recognisable themes that are categorised within these key sections. Each individual credit is evenly weighted, with the weighting of each section determined by the number of credits achievable.

Further consideration will be given to the applicability of HQM at Albert Bridge House during the next stage.

6.6 Ska Rating

The Ska rating scheme is a points based assessment scheme for the refurbishment and fit out of offices, retail and higher education buildings. The system operates in a similar way to BREEAM, but with a greater emphasis on scoping assessment elements in and out to suit the scope of works. As such, this light touch assessment is generally better suited to smaller scale fit outs associated with A1 and A3 fit out types.

Given the relatively low profile of the scheme, it is not recommended that this is used for the more significant fit out activities likely to be associated with the commercial office fit outs.

Further consideration can be given to Ska during the next stage if additional accreditation is sought for the commercial building beyond BREEAM and WELL.

Summary

This Environmental Standards Statement covers various headline sustainability themes set out according to the proposed development's location, relevant national and local policy, along with client aspirations.

The development is expected to comply with all relevant national and local policy, as outlined in sections 2 and 3. Further, it is subject to the latest version of the Building Regulations (2021) which will reflect the lower operational carbon emissions expected from an all-electric scheme. The NABERS target will drive operational energy efficiency with a detailed model being prepared during the next stage.

The initial estimation of upfront embodied carbon emissions is less than 600kgCO_{2e}/m^2, which suggests that the project is on track to align with Manchester's Roadmap to Net Zero Carbon. The precise figure will fluctuate throughout the design development as more information is made available for assessment and different options are tested.

There are several options for sustainable certification at the proposed development. The commercial building is targeting a minimum BREEAM rating of "Outstanding" and compliance with the WELL building standard using the 'core' criteria tailored for a speculative office development. The residential building could be assessed using the Home Quality Mark, WELL or Fitwel criteria. The most appropriate method(s) will be determined during the next stage in response to the emerging design and taking account of views from project stakeholders.

In summary, the project ambitions are expected to be achieved during the next stage following further design development and collaboration.

Appendix A BREEAM Pre-Assessment

HOARE LEA

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SUSTAINABILITY
BREEAM NEW CONSTRUCTION 2018
PRE-ASSESSMENT REPORT
REVISION 3.0 – 06 OCTOBER 2022

Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
0.0	04/04/2022	Initial Issue for workshop	DM	SS	JRF
1.0	08/04/2022	Updated following pre-assessment	DM	VW	JRF
2.0	12/09/2022	Stage 2 draft issue	V.Wall		JRF
3.0	06/10/2022	Stage 2 issue	V.Wall	S.Stephenson	J. Ford

This document has been prepared for Oval Real Estate only and solely for the purposes expressly defined herein. We owe no duty of care to any third parties in respect of its content. Therefore, unless expressly agreed by us in signed writing, we hereby exclude all liability to third parties, including liability for negligence, save only for liabilities that cannot be so excluded by operation of applicable law. The consequences of climate change and the effects of future changes in climatic conditions cannot be accurately predicted. This report has been based solely on the specific design assumptions and criteria stated herein.

Project number: 23/24490
Document reference: REP-2324490-5A-VW-20221006-BREEAM NC2018 Pre-assessment report-Rev03.docx

BREEAM Audit box

BRE registration number	BREEAM-0095-1707
Licensed assessor	Vanessa Wall
Assessor support	-
BREEAM scheme	New Construction Offices
BREEAM scheme version	2018
Assessment stage	Pre-Assessment
Technical manual version	SD5078 Issue 3.0
Tier code (internal use only)	Tier 3

BREEAM Credit filtering box

Building type and sub-group	Office, Office - General office building
Building floor area	>20,000
Designed to be untreated?	No
Building services (heating)	Air system
Building services (cooling)	Air-conditioning
Commercial cold storage systems	No
Transportation systems	Yes
Laboratory (type, area and size)	No laboratories
Fume cupboards / containment devices	No
Unregulated water uses	Yes
External areas?	Yes
Statutory requirements impacting outdoor space?	No
Unregulated energy load	Yes
Post occupancy ENE01 credits targeted?	No

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1. Executive summary

This report provides an indicative BREEAM 2018 New Construction pre-assessment for the office element of the proposed Albert Bridge House development.

The development falls under the BREEAM New Construction Offices category and a Shell and core assessment has been conducted. The proposed development is targeting a BREEAM 'Outstanding' rating as a minimum.

The current anticipated baseline score is 85.69%, equivalent to a BREEAM 'Outstanding' rating, with a difference between the minimum required score for a BREEAM 'Outstanding' rating of 85% of 0.69%.

A number of potential credits have also been identified that if included within the assessment strategy could result in the building achieving a potential score of 96.15%, equivalent to a BREEAM 'Outstanding' rating with a difference of 11.15% above the minimum required score.

Between 3-5% of these potential credits should be added to the baseline score to provide a margin over the minimum required score, providing contingency for design changes and potential constraints identified during the construction stage. The particular potential credits that could be targeted to increase the baseline score will be agreed in the next stage.

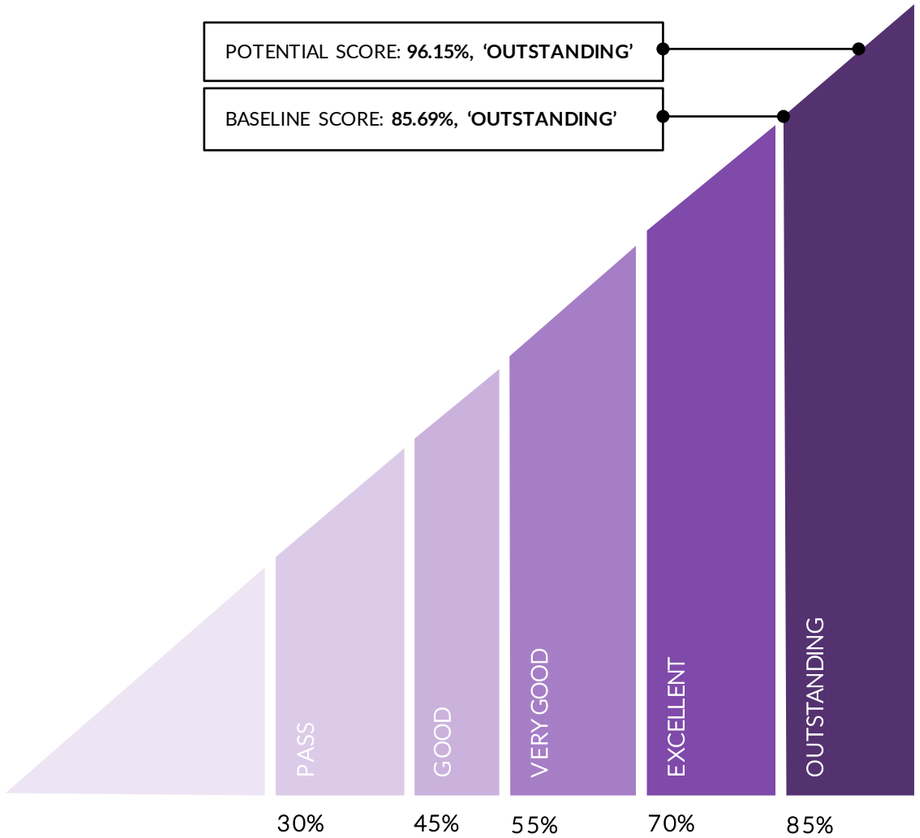


Figure 1: BREEAM 2018 Scale and Anticipated Performance Scores.

2. BREEAM Pre-Assessment

2.1 Introduction

This report relates to the office element of the proposed Albert Bridge House development in Manchester. The building has been registered under the BREEAM 2018 scheme and assessed using the New Construction Offices criteria. The building is currently considered to be most suitable to be assessed using a Shell and core assessment type. The assessment will be targeting a BREEAM 'Outstanding' rating as a minimum.

2.2 Initial Pre-Assessment

This initial pre-assessment has been carried out independently by a qualified BREEAM assessor and reviewed with the project design team during BREEAM workshops held 4th and 7th April 2022. This report sets out a route to achieving the target rating, and highlights the design team members responsible for each credit issue. Credits currently included in the credit score should continue to be reviewed by the design team, and each team member is expected to provide feedback regarding credits under their responsibility, identifying any relevant issues. Once additional comments have been raised by the project team, the report and the predicted scores will be updated.

The following predicted scores have been calculated based upon experience with similar buildings and Hoare Lea's current understanding of the proposed development:

- Baseline score / rating: 85.69% equivalent to a BREEAM 'Outstanding' rating.
- Potential score / rating: 96.15% equivalent to a BREEAM 'Outstanding' rating.

The following potential credits have been identified that allow a BREEAM 'Outstanding' rating to be achieved:

- HEA01-04 Internal Lighting Levels and Controls
- HEA06-02 Security of the Site and Building
- ENE01 Reduction of Energy and CO_2
- WAT01 Water Consumption
- MAT01 Building Life Cycle assessment
- MAT02 Environmental Impacts from Construction Products
- MAT03 Responsible Sourcing
- WST01-02 Construction Resource Efficiency
- WST01 Resource Management Plan
- LE04 Enhancement of Ecology (Route 2)
- POL01 Impact of Refrigerants DELC

Refer to Appendix B for detailed credit requirements.

3. Summary Score Sheet

The summary table below highlights the list of targeted credits for the current BREEAM 2018 pre-assessment. Mandatory credits to achieve a 'Very Good' rating and above are highlighted by **(M_v).** Additional mandatory credits for an 'Excellent' or 'Outstanding' rating are highlighted by **(M_e) and (M_o)** respectively. Exemplary (innovation) credits are written in brackets; e.g. (+1).

Table 1: BREEAM Target Summary.

Category	Issue	Credits		
		Available	Targeted	Potential
Management	Man 01: Project brief and design	4	4	-
	Man 02: Lifecycle cost and service life planning	4	4	-
	Man 03: Responsible construction practices (M_e), (M_o)	6	6	-
	Man 04: Commissioning and handover (M_e), (M_o)	4	4	-
	Man 05: Aftercare (M_e), (M_o)	-	-	-
Health & Wellbeing	Hea 01: Visual comfort	4	0	+1
	Hea 02: Indoor air quality	1	1	-
	Hea 04: Thermal comfort	2	2	-
	Hea 05: Acoustic performance	1	1	-
	Hea 06: Security	1	1	-
	Hea 07 Safe and healthy surroundings	2	2	-
Energy	Ene 01: Reduction of energy use and carbon emissions (M_e) (M_o)	13	10	+1
	Ene 02: Energy monitoring (M) (M_e) (M_o)	2	2	-
	Ene 03: External lighting	1	1	-
	Ene 04: Low carbon design	3	2	-
	Ene 05: Energy efficient cold storage	-	-	-
	Ene 06: Energy efficient transportation systems	2	2	-
	Ene 07 Energy efficient laboratory systems	-	-	-
	Ene 08: Energy efficient equipment	-	-	-
Transport	Tra 01: Transport assessment and travel plan	2	2	-
	Tra 02: Sustainable transport measures	10	10	-
Water	Wat 01: Water consumption (M_v) (M_e) (M_o)	5	3	+1
	Wat 02: Water monitoring (M_v) (M_e) (M_o)	1	1	-
	Wat 03: Water leak detection	2	2	-
	Wat 04: Water efficient equipment	1	1	-
Materials	Mat 01: Environmental impacts from construction products - Building life cycle assessment	7	5	+1
	Mat 02: Environmental impacts from construction products	1	0	+1
	Mat 03: Responsible sourcing of construction products (M_v) (M_e) (M_o)	4	2	+1
	Mat 05: Designing for durability and resilience	1	1	-
	Mat 06: Material efficiency	1	1	-
Waste	Wst 01: Construction waste management (M_o)	5	4	+1
	Wst 02: Use of recycled and sustainably sourced aggregates	1	0	-
	Wst 03: Operational waste (M_e), (M_o)	1	1	-
	Wst 04 Speculative finishes	1	1	-
	Wst 05: Adaptation to climate change	1	1	-
	Wst 06: Design for disassembly and adaptability	2	2	-
Land Use and Ecology	LE 01: Site Selection	2	2	-
	LE 02: Identifying and understanding the risks and opportunities for the project	2	2	-
	LE 03: Managing negative impacts on ecology	3	3	-
	LE 04: Change and enhancement of ecological value	4	3	+1
	LE 05: Long term ecology management and maintenance	2	2	-
Pollution	Pol 01: Impact of refrigerants	3	2	+1
	Pol 02: Local air quality	2	2	-
	Pol 03: Flood and surface water management	5	4	-
	Pol 04: Reduction of night time light pollution	1	1	-
	Pol 05: Reduction of noise pollution	1	1	-
Innovation	Inn 01: Approved innovation and exemplary level credits	15	3	+2
	Targeted weighted score rating:	85.69%, 'Outstanding'		
	Potential weighted score rating:	96.15%, 'Outstanding'		

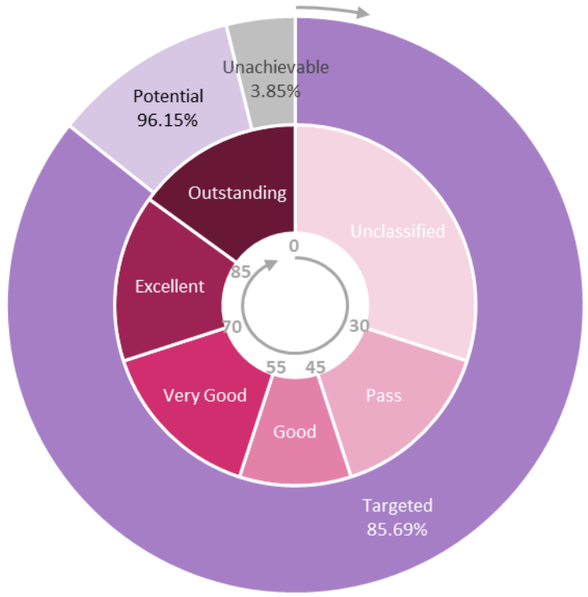
4. Conclusion

Based upon an initial credit review with the project design team, it is anticipated that the Proposed Development could achieve a score of 85.69%, equivalent to a BREEAM 'Outstanding' rating.

Additional potential credits have also been identified which, if targeted, could results in a higher BREEAM performance score and rating; 96.15%, equivalent to a BREEAM 'Outstanding'. The potential credits include the following credit issues:

- HEA01-04 Internal Lighting Levels and Controls
- HEA06-02 Security of the Site and Building
- ENE01 Reduction of Energy and CO_2
- WAT01 Water Consumption
- MAT01 Building Life Cycle assessment
- MAT02 Environmental Impacts from Construction Products
- MAT03 Responsible Sourcing
- WST01-02 Construction Resource Efficiency
- WST01 Resource Management Plan
- LE04 Enhancement of Ecology (Route 2)
- POL01 Impact of Refrigerants DELC

Figure 2 outlines the Proposed Development scores in each category. It also outlines where potential credits could be targeted to increase the assessment score and rating.



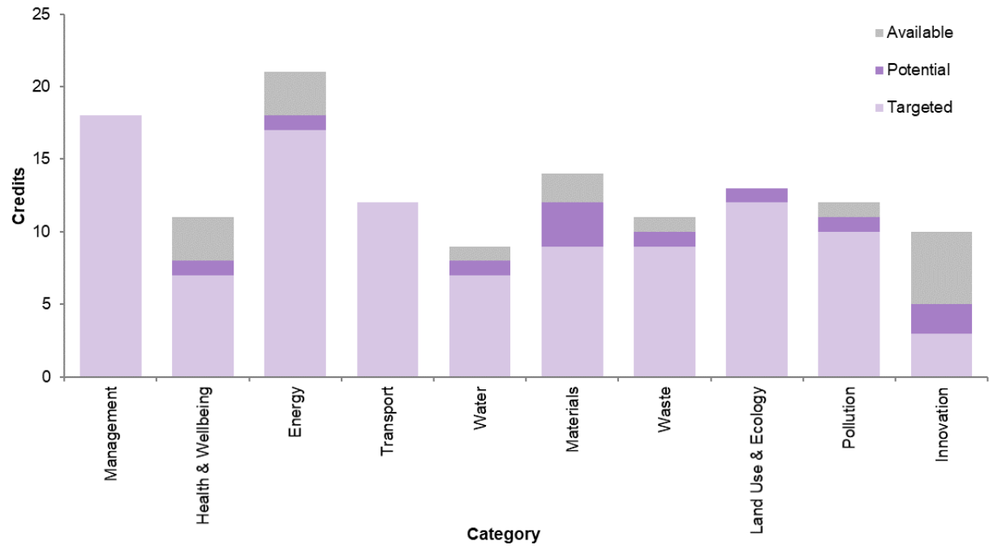


Figure 2: BREEAM Performance Summary and Targeted Credits.

5. Appendix A: Early Action Credits

5.1 Project brief stage

Under the BREEAM, there are a number of credits that are time critical and require early action by the design team in order for the credits to be achieved. For these credits, the actions required prior to end of RIBA Stages 1 and 2; and the members of the design team responsible for these are listed below:

Credit Issues	RIBA Stage 1 Actions	Owner
Man 01 Project brief and design	– First credit: Stakeholder consultation: By the end of Stage 1 – definition and engagement of key stakeholders (incl. team member with significant construction experience) and their roles and responsibilities. – Third Credit: Sustainability champion to be appointed to facilitate the setting and achievement of BREEAM performance targets for the project by Stage 2.	Project Manager BREEAM AP
Ene 07 Energy efficiency laboratory systems	– Client engagement during preparation of the brief to determine occupant requirements and define laboratory performance criteria.	Client.
Mat 06 Material efficiency	Consult with relevant design team members to identify and implement measures for efficient use of materials throughout all key stages. Suggested actions include: – Provide details outlining activities relating to material efficiency. – Provide drawings or building integrated model (BIM), calculations showing reduction of material use through design. – Collate meeting notes, construction programme, and responsibilities schedule (indicating parties consulted).	Planning Consultant
LE 04 Enhancing site ecology	The ecologist must be appointed by RIBA Stage 1 to carry out initial surveys, and subsequently provide recommendations in a report at RIBA Stage 2.	Ecologist
LE 05 Long term impact on biodiversity		

Table 3: BREEAM 2018 Early Action Credits (RIBA Stage 1)

5.2 Concept design stage

Credit Issues	RIBA Stages 2 Actions	Owner
Man 01 Project brief and design	– First credit: Develop roles, responsibilities and contributions schedule detailing relevant roles throughout the project. – Second credit: Stakeholder consultation by completion of Concept Design. – Advisory professional: BREEAM performance targets to be formally agreed between the client and design/project team no later than Concept Design stage (RIBA Stage 2).	Planning Consultant Client BREEAM AP
Man 02: Life cycle costing and service life planning	– An elemental level Life Cycle Cost (LCC) analysis has been carried out based on the proposals developed during RIBA Work Stage 2.	Cost Consultant
Hea 02 Indoor air quality	– Production of an indoor air quality plan (this is a prerequisite item and may block several related credits being achieved).	Air Quality MEP
Hea 06 Security	– Appoint Suitability Qualified Security Specialist (SQSS) to conduct a Security Needs Assessment (SNA).	Architect SQSS
Ene 01 Prediction of operational energy consumption	– Prior to completion of the concept design, relevant members of the design team hold a preliminary design workshop focusing on operational energy performance.	Sustainability MEP
Ene 04 Low carbon design	– Carry out a passive design analysis and a renewable energy systems feasibility study.	MEP Sustainability Consultant
Mat 01 Environmental impacts from construction products - Building life cycle assessment	– Conduct outline design LCA assessment and options appraisal. This LCA must be submitted to BRE Global prior to planning application submission.	Architect Civil and structural engineer Cost Consultant
Mat 03 Responsible sourcing of materials	– Development and use a project sustainable procurement plan for the project.	Project manager Sustainability consultant
Mat 06 Material efficiency	– Set targets and report on opportunities and methods to optimise the use of materials. Develop and record the implementation of material efficiency.	Architect Structural Engineer
		Civil engineer
Wst01 Construction waste management	– Carry out (where relevant) a pre-demolition audit.	Demolition contractor Client
Wst 05 Adaptation to climate change	– Conduct a climate change adaption strategy appraisal for structural and fabric resistance.	Architect + Structural Engineer
Wst 06 Design for disassembly and adaptability	– Undertake a building-specific disassembly assessment and functional adaptation strategy study. – Subsequently incorporate adaption measures into the design where practical and cost effective at RIBA Stage 4.	Architect Structural Engineer
LE 02 Identifying and understanding the risks and opportunities for the project	– The project team is required to liaise and collaborate with representative stakeholders to identify and consider ecological outcome for the sites.	Ecologist Project manager
LE 03 Managing negative impacts on ecology	– 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.	Ecologist Project manager

Table 4: BREEAM 2018 Early Action Credits (RIBA Stage 2)

6. Appendix B: Detailed Credit Assessment

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
Management					
Man 01 Project brief and design	First credit - Stakeholder consultation (project delivery): Where evidence provided demonstrated that from RIBA stage 2 (design brief) or equivalent the client, building occupier, design team and contractor have met and are involved in contributing to the decision-making process for the project. As a minimum this includes meeting to identify and define their roles, responsibilities and contributions during each key phase. Consideration of contributions must meet specified minimum requirements The project team demonstrates how the project delivery stakeholder contributions and consultation process outcomes influence the following: – Initial Project Brief – Project Execution Plan – Communication Strategy – Concept Design	1	1	STAGE 2 ACTION It is necessary to develop a design responsibility matrix to identify project roles and responsibilities. How allocation of these roles and responsibilities has altered the responsibility matrix should be identified. Provide: - Responsibility matrix (template to be issued); - Meeting minutes from key DTMs during Stage 1 and 2. Credit(s) targeted.	Oval
	Second credit - Stakeholder consultation (interested parties): Where evidence provided demonstrates that prior to the completion of the Concept Design stage, all relevant interested party stakeholders have been consulted by the design team and this covers the minimum consultation content (including but not limited to functionality, impacts on local community, inclusive and accessible design). The impact this consultation has had on the Project Brief and Concept Design must be demonstrated and consultation feedback has been given to all relevant parties by the developed design stage. A design workshop is undertaken that focuses on operational energy (Ene 01).	1	1	STAGE 2 ACTION External consultation exercise to be performed that included all relevant stakeholders. It should be ensured all minimum content requirements are covered. Stakeholders should have the ability to comment on proposals, with all feasible consultation incorporated. Consultation feedback to be provided to consultee group at Stage 4. It was commented in the workshop that consultation is be undertaken soon and therefore the requirements for BREEAM could be incorporated. Provide: - Consultation plan / report - Evidence of consultation activities and topics covered - Evidence of feedback provided to consultees. Credit(s) targeted.	Consultation team
	Pre-requisite The project team, early in the design process formally agrees BREEAM targets for the project. Third credit – BREEAM AP (concept design): Where evidence provided demonstrates that a BREEAM AP has been appointed to facilitate the setting and achievement of BREEAM performance target(s) for the project and evidence shows that the designed BREEAM performance target(s) has been contractually agreed and demonstrably achieved by project design. The BREEAM AP appointment must be separate to the appointed assessor.	1	1	STAGE 2 ACTION Appointment of BREEAM AP to assist in setting the targets for the project. Consultant appointment documentation should include a requirement to design to the agreed target. Provide: - Appointment letter for the Sustainability Champion / BREEAM AP defining the scope of their role and responsibilities (as above)	Oval / Hoare Lea (Sus)

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
				- Meeting minutes and/or invites confirming the Sustainability Champion / BREEAM AP attended or invited to key design team meetings throughout the design process and the BREEAM requirements and targets discussed. - Copies of the Sustainability Champion / BREEAM AP's Status or monitoring reports at key stages. Credit(s) targeted.	
	Fourth credit – BREEAM AP (developed design): Where evidence provided demonstrates that the Third credit is achieved and a BREEAM AP is appointed to monitor progress against the agreed BREEAM performance target(s). This is done by attending key project/design team meetings during the developed design and reporting to the client throughout the process.	1	1	STAGE 3-4 ACTION Appointment of a BREEAM AP is required, with a scope to regularly update the design team on the progress of the BREEAM assessment and to consider how design development will impact the score. Provide: - Meeting minutes and/or invites confirming the Sustainability Champion / BREEAM AP attended or invited to key design team meetings throughout the design process and the BREEAM requirements and targets discussed. - Copies of the Sustainability Champion / BREEAM AP's Status or monitoring reports at key stages. Credit(s) targeted.	Hoare Lea (Sus)
Man 02 Life cycle impacts	First and second credit - Elemental life cycle cost (LCC): Where evidence provided demonstrates that an elemental Life Cycle Cost (LCC) analysis has been carried out based on the proposals developed during Process Stage 2 (concept design/RIBA Stage 2) or equivalent. The LCC analysis shows an outline LCC plan for the project, appraising a range of options based on multiple cash flow scenarios e.g. 20, 30, 50, or 60 years and a fabric and servicing strategy for the project outlining services component and fit-out options.	2	2	STAGE 2 ACTION An Elemental Life Cycle Cost (LCC) study is required to be commissioned to address the cost of different design options for a range of building elements e.g. Envelope, Structure, Services etc... The design should incorporate the lowest lifecycle cost design features. Time-critical action for Stage 2 complete. Provide: - Compliant Elemental LCC report with supporting documentation of analysis of alternative options and the benefits of the chosen option; - The fabric and servicing strategy Credit(s) targeted.	Cumming

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
	Third credit - Component level LCC option appraisal: Where evidence provided demonstrates that a component level LCC plan has been developed by end of Process Stage 4 (RIBA Stage 4) including the following component types: – Envelope: e.g. cladding, windows, and/or roofing – Services: e.g. heat source cooling source, and/or controls – Finishes: e.g. walls, floors and/or ceilings – External spaces Demonstrate using appropriate examples provided by the design team, how the component level LCC plan has been used to influence building and systems design/specification to minimise life cycle costs and maximise critical value.	1	1	STAGE 4 ACTION Update to LCC model (at stage 4) for the development to identify lowest lifecycle cost design features are incorporated. Provide: - A copy of the compliant Component level LCC plan with supporting documentation of analysis of alternative options and the benefits of the chosen option; - Design drawings / specification of the inclusion of the recommended options identified by the LCC reports. - A copy of the maintenance strategy or a formal commitment to produce one in compliance with the requirements and be informed by the LCC. Credit(s) targeted.	Cumming
	Fourth credit - Capital cost reporting: Where evidence provided demonstrates reporting of the capital cost for the building in pounds per square metre (£/m^2) via the BREEAM Assessment Scoring and Reporting tool, Assessment Issue Scoring tab, Management section.	1	1	STAGE 4 ACTION The cost consultant is required to confirm the cost of the project taking account of the relevant inclusions and exclusions. Provide: - Report with the capital cost for the building in pounds per square metre (stage 4) Credit(s) targeted.	Cumming
Man 03 (M_e) (M_o) Responsible construction practices Mandatory: – One credit (responsible construction management) for Excellent – Two credits (responsible construction management) for Outstanding	Pre-requisite All timber and timber based products used on the project is 'legally' harvested and traded timber First credit - Environmental management: Evidence which demonstrates that the principle contractor operates an environmental management system (EMS) covering main operations e.g. third party certified to ISO 14001/EMAS or equivalent standard or have a structure that is in compliance with BS 8555-2003 and has reached stage 4 of implemented stage. Evidence that the principal contractor implements best practice pollution policies and procedures on-site in accordance with Pollution Prevention Guidelines, PPG6. It is understood this document has been withdrawn, however BRE identify this still constitutes best practice.	1	1	INCLUDE WITHIN ER DOCUMENTATION This requirement can be incorporated into the project's employer's requirements documentation to require the contractor to achieve. Provide: - A formal letter of commitment or contractual requirements document confirming the actions that will be undertaken as part of site works. Credit/s targeted.	Oval & Contractor
	Pre-requisite The client and contractor formally agree and demonstrate performance targets. Second credit – BREEAM AP (site):	1	1	INCLUDE WITHIN ER DOCUMENTATION This requirement can be incorporated into the project's employer's requirements documentation to require the contractor to achieve.	Oval & Contractor

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
	Evidence which demonstrates that a BREEAM AP is appointed to monitor the project to ensure ongoing compliance with relevant sustainability performance/process criteria. The defined BREEAM performance target forms a requirement of the principal contractor's contract and to achieve this credit in final post construction phase of assessment, the BREEAM-related performance target must be demonstrably achieved by the project.			Provide: - A formal letter of commitment or contractual requirements document confirming the actions that will be undertaken as part of site works. Credit/s targeted.	

	Third and fourth credit – Responsible construction management:
	
	Using the BREEAM checklist - up to two credits:
	Appoint a dedicated person to be responsible for monitoring and reporting on activities against risk evaluation documents collected.
	
	The principal contractor evaluates the risks (on-site and off-site), plans and implements actions to minimise the identified risks, covering the following, where appropriate:
	– Vehicle movement on and near site
	  – Management of construction site entrance (M)
	  – Ensure development footprint is accessible for delivery vehicles with safety features (e.g. Side under run protection)
	  – Identify access routes to the development footprint, including for heavy vehicles to minimise the safety risks and disruption to others.
	– Pollution management
	  – Minimise the risks of air, land and water pollution. (M)
	  – Minimise the risks of nuisance from vibration, light and noise pollution.
	– Tidiness
	  – Practices ensure the development footprint is safe, clean and organised at all times. This includes, but is not limited to, facilities, materials and waste storage. (M)
	  – Ensure clear and safe access in and around the buildings at the point of handover. (M)
	– Health and wellbeing
	  – Provide processes and equipment required to respond to medical emergencies. (M)
	  – The principal contractor identifies and implements initiatives to promote and maintain the health and wellbeing of all site operatives within the development footprint. This can be via site facilities, site management arrangements, staff policies etc.
	  – Establish management practices and facilities encouraging equality, fair treatment and respect of all site operatives. (M)
	  – Provide secure, clean and organised facilities (e.g. changing and storage facilities) for site operatives within the development footprint.
	– Security processes
	  – Minimise risks of the site becoming a focus for antisocial behaviour in the local community (e.g. robust perimeter fencing, CCTV, avoid creating dark corners etc.).
	– Training, awareness and feedback
	  – Aspects of the construction process that might impact the community are communicated regularly, ensuring that nuisance and intrusion are minimised.
	  – Ensure ongoing training is provided, and up to date, for personnel and visitors. (M)
	  – The principal contractor ensures that site operatives are trained for the tasks they are undertaking. (M)
	  – The fleet operators, undertakes driver training and awareness to promote safety within the development footprint and off site.
	– Monitoring and reporting
		2	2	INCLUDE WITHIN ER DOCUMENTATION
				This requirement can be incorporated into the project's employer's requirements documentation to require the contractor to achieve.
				
				TWO CREDITS MANDATORY REQUIREMENT FOR 'OUTSTANDING'
				
				Provide:
				- A formal letter of commitment or contractual requirements document confirming the actions that will be undertaken as part of site works.
				
				Credit/s targeted.
					Oval & Contractor

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
	– The fleet operators, captures and investigates any road accidents, incidents and near misses and reports them back to the principal contractor. The principal contractor analyses these items. – All visitor, workforce and community accidents, incidents and near misses are recorded and action is taken to reduce the likelihood of them reoccurring. (M) – Processes are in place to facilitate collecting and recording feedback from the community and to address any concerns related to the development footprint. One credit is achieved for meeting the requirements for all mandatory sections, identified by (M) Two credits are achieved for meeting the requirements for all mandatory and six additional requirements An additional exemplar level credit is available for achieving all requirements within Table 4.1 (identified above)				
	Exemplary credit - Responsible construction practices: An additional exemplary level credit is available for achieving all requirements within Table 4.1 (identified above)	1	1	INCLUDE WITHIN ER DOCUMENTATION This requirement can be incorporated into the project's employer's requirements documentation to require the contractor to achieve. Provide: - A formal letter of commitment or contractual requirements document confirming the actions that will be undertaken as part of site works. Credit/s targeted.	Oval & Contractor
	Fifth and sixth credit - Monitoring of construction-site impacts: Where evidence provided demonstrates the responsibility has been assigned to an individual for monitoring, recording and reporting energy use, water consumption and transport data from all on-site construction processes throughout the build programme.	2	2	INCLUDE WITHIN ER DOCUMENTATION This requirement can be incorporated into the project's employer's requirements documentation to require the contractor to achieve. Provide: - A formal letter of commitment or contractual requirements document confirming the actions that will be undertaken as part of site works. Credit/s targeted.	Oval & Contractor
Man 04 (M_v), (M_e), (M_o) Commissioning and handover Mandatory: – One credit (commissioning test schedule and responsibilities)	First credit - Commissioning and testing schedule and responsibilities: – Where evidence provided demonstrates a schedule of commissioning and testing that identifies and includes a suitable timescale for commissioning and re-commissioning of all complex and non-complex building services and control systems and testing and inspecting building fabric, and that all commissioning is done in accordance with current Building Regulations, BSRIA and CIBSE guidelines. – An appropriate project team member(s) is appointed to monitor and programme pre-commissioning, testing, and where necessary, re-commissioning on behalf of the client – The principal contractor accounts for the commissioning and testing programmes, responsibilities and criteria within their budget and main programme of works, allowing for sufficient time to complete commissioning and testing prior to handover. – Specific requirements relate to BMS commissioning	1	1	INCLUDE WITHIN ER DOCUMENTATION This requirement is to be included within the Employer's Requirements Preliminaries and MEP documentation. MANDATORY REQUIREMENT FOR 'OUTSTANDING' Provide:	Contractor

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
and criterion 11 (Building User Guide for Very Good and above				- A formal letter of commitment or contractual requirements document confirming the actions that will be undertaken as part of site works. Credit(s) targeted.	
	Second credit - Commissioning - design and preparation: Where evidence provided demonstrates a specialist commissioning manager is appointed during the design stage with responsibility for: – Undertaking design reviews – Providing commissioning management input – Management of commissioning and performance testing.	1	1	INCLUDE WITHIN ER DOCUMENTATION This requirement can be incorporated into the project's employer's requirements documentation to require the contractor to achieve. Provide: - A formal letter of commitment or contractual requirements document confirming the actions that will be undertaken as part of site works. Credit/s targeted.	Contractor
	Third credit - Testing and inspecting building fabric: Where credit 1 is achieved and evidence provided demonstrates that the integrity of the building fabric is quality assured through compliant post construction testing and inspection. Any defects identified in the thermographic survey or airtightness testing reports are rectified prior to building handover and close out.	1	1	INCLUDE WITHIN ER DOCUMENTATION This requirement can be incorporated into the project's employer's requirements documentation to require the contractor to achieve. Provide: - A formal letter of commitment or specification document confirming the actions that will be undertaken in the performance testing of the building fabric. - Project programme confirming inclusion of thermographic survey and air leakage testing. Credit(s) targeted.	Contractor
	Fourth credit - Handover: – Where evidence provided demonstrates that Building User Guides are provided and are appropriate to all users of the building (general users including staff and if applicable residents, as well as the non-technical facilities management team/building manager). This must be presented to the building user first and amended to suit the occupier's needs. – A training schedule is prepared for building occupiers/premises mangers, timed appropriately around handover and proposed occupation plans in addition to training for building occupiers (non-technical building users).	1	1	INCLUDE WITHIN ER DOCUMENTATION This requirement is to be included within the Employer's Requirements Preliminaries and MEP documentation. MANDATORY REQUIREMENT FOR 'OUTSTANDING' Provide: - A formal letter of commitment or contractual requirements document confirming the actions that will be undertaken. Credit(s) targeted.	Contractor

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
Man 05 (M_e), (M_o) Aftercare Mandatory: – One credit (commissioning implementation) for Excellent – One credit (commissioning implementation) for Outstanding	First credit - Aftercare support There is (or will be) operational infrastructure and resources in place to provide aftercare support to the building occupier(s), which includes the following as a minimum: a. A meeting programmed to occur between the aftercare team/individual and the building occupier/management (prior to initial occupation, or as soon as possible thereafter) to: i. Introduce the aftercare team or individual to the aftercare support available, including the Building User Guide (where existing) and training schedule/content. ii. Present key information about the building including the design intent and how to use the building to ensure it operates as efficiently and effectively as possible. iii. On-site facilities management training, to include a walkabout of the building and introduction to and familiarisation with the building systems, their controls and how to operate them in accordance with the design intent and operational demands. b. Initial aftercare support provision for at least the first month of building occupation, e.g. on-site attendance on a weekly basis to support building users and management (this could be more or less frequent depending on the complexity of the building and building operations). c. Longer term aftercare support provision for occupants for at least the first 12 months from occupation, e.g. a helpline, nominated individual or other appropriate system to support building users/management. There is (or will be) operational infrastructure and resources in place to coordinate the collection and monitoring of energy and water consumption data for a minimum of 12 months, once the building is occupied. This is done to facilitate analysis of discrepancies between actual and predicted performance, with a view to adjusting systems and/or user behaviours accordingly.	0	0	Credits not applicable to assessment type	
	Second credit - Commissioning - implementation The following seasonal commissioning activities will be completed over a minimum 12-month period, once the building becomes substantially occupied: a. Complex systems - Specialist Commissioning Manager: i. Identify changes made by the owner or operator that might have caused impaired or improved performance. ii. Testing of all building services under full load conditions, i.e. heating equipment in mid-winter, cooling/ventilation equipment in mid-summer, and under part load conditions (spring/autumn). iii. Where applicable, testing should also be carried out during period of extreme (high or low) occupancy. iv. Interviews with building occupants (where they are affected by the complex services) to identify problems or concerns regarding the effectiveness of the systems. v. Produce monthly reports comparing sub-metered energy performance to the predicted ones. vi. Re-commissioning of systems (following any work needed to serve revised loads), and incorporating any revisions in operating procedures into the operations and maintenance (O&M) manuals. b. Simple systems (naturally ventilated) - external consultant/aftercare team/facilities manager: i. Review thermal comfort, ventilation, and lighting, at three, six and nine-month intervals after initial occupation, either by measurement or occupant feedback. ii. Identify deficiencies and areas in need of improvement. iii. Re-commission systems and incorporate any relevant revisions in operating procedures into the O&M manuals.	0	0	Credits not applicable to assessment type	
	Third credit - Post occupancy evaluation The client or building occupier makes a commitment to carry out a post occupancy evaluation (POE) exercise one year after initial building occupation. The POE is carried out by an independent third party and needs to cover: a. A review of the design intent and construction process (review of design, procurement, construction and handover processes).	0	0	Credits not applicable to assessment type	

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
	b. Feedback from a wide range of building users including Facilities Management on the design and environmental conditions of the building covering: i. Internal environmental conditions (light, noise, temperature, air quality) ii. Control, operation and maintenance iii. Facilities and amenities iv. Access and layout v. Energy and water consumption vi. Other relevant issues The independent party provides a report with lessons learned to the client and building occupiers. The client or building occupier makes a commitment to carry out the appropriate dissemination of information on the building's post occupancy performance. This is done to share good practice and lessons learned and inform changes in user behaviour, building operational processes and procedures, and system controls.				
Health and Wellbeing					
Hea 01 Visual comfort	First credit - Control of glare from sunlight Glare control assessment is developed to identify how areas at risk of glare are protected. The glare control assessment would also identify where areas deemed not at risk are located. In addition, a glare control strategy must be developed in tandem with the lighting strategy to ensure that glare is minimised whilst avoiding potential conflict with the lighting control systems, therefore avoiding higher than expected energy consumption.	0	0	Credits not applicable to assessment type	
	Second and third credits – Average daylighting: – Where evidence provided demonstrates that the relevant building areas meet good practice daylighting criteria as outlined below, in addition to room depth criterion, daylight uniformity or annual illuminance levels. Office buildings: two credits – All occupied spaces unless indicated as not relevant: 2.0%, 80% area	2	0	STAGE 3-4 ACTION One credit applicable to assessment type This is not currently targeted but could potentially be targeted if it is felt it may be achievable. Daylight assessment of the current design may enable the credits to be achieved. Project team to comment. Credit not currently targeted	SEW & Daylight Consultant
	Fourth credit - View out: Where evidence provided demonstrates that 95% of floor areas in relevant building areas are within 8m of a wall which has a window or permanent opening that provides an adequate view out. The window/opening must be ≥20% of the surrounding wall area.	1	0	STAGE 3-4 ACTION This is not currently targeted but could potentially be targeted if it is felt it may be achievable. Project team to comment. Credit not currently targeted	SEW
	Fifth credit - Lighting levels and controls: Where evidence provided demonstrates that internal and external lighting is designed in accordance with the required standard.	1	0 (+1)	STAGE 4 ACTION INCLUDE WITHIN ER DOCUMENTATION It was discussed that, whilst all other criteria should not be an issue, providing occupant	Hoare Lea (MEP)

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
	– Internal lighting in all relevant areas of the building is designed to provide an illuminance (lux) level appropriate to the tasks undertaken. This can be demonstrated through a lighting design strategy that provides illuminance levels in accordance with the SLL Code for Lighting 2012 and any other relevant industry standard. – For areas where computer screens are regularly used, the lighting design complies with CIBSE Lighting Guide 7 sections 2.4, 2.13, 2.15, 2.20, 6.10 and 6.20. – For external areas, lighting provided is specified in accordance with BS 5489-1:2013 Lighting of roads and public amenity areas Lighting of roads and public amenity areas, Code of Practice for the design of road lighting, BSI, 2013 and BS EN 12464-2:2014 light and lighting - Lighting of work places - Part 2: Outdoor work places. Lighting should be zoned as follows: – In office areas, zones of no more than four workplaces – Workstations adjacent to windows/atria and other building areas separately zoned and controlled – Seminar and lecture rooms: zoned for presentation and audience areas – Library spaces: separate zoning of stacks, reading and counter areas – Teaching space or demonstration area – Whiteboard or display screen – Auditoria: zoning of seating areas, circulation space and lectern area – Dining, restaurant, café areas: separate zoning of servery and seating/dining areas – Retail: separate zoning of display and counter areas – Bar areas: separate zoning of bar and seating areas – Areas used for teaching, seminar or lecture purposes have lighting controls provided in accordance with CIBSE Lighting Guide 5			controls around office areas may be problematic as these will be absence detection without manual override. Provide: - Specification confirming compliance with the relevant CIBSE, BS and zoning requirements. - Marked up drawings confirming the zoning and control of internal and external lighting. Credit(s) identified as Potential pending investigation.	
	Exemplary credits: Up to two credits are available where evidence is provided which demonstrates that the exemplary level daylight requirements and the exemplary level artificial lighting requirements are achieved, as outlined below: Daylight: One credit Daylight criteria achieved by either the exemplar daylight factors, or exemplary level minimum and average point illuminance factors. Daylight Factors - All building types (excluding retail): – Functions as identified in the standard criteria (multi storey buildings): 3.0%, 80% area – Functions as identified in the standard criteria (single storey buildings): 4.0%, 80% area – Prisons and court cells: 2.0%, 80% area – Prison internal association/atrium area: 5.0%, 80% area OR Minimum and Point Illuminance Factor - All building types (excluding retail): – Multi-storey buildings: 80% area. Average daylight illuminance: At least 300 lux for 2,650 hours per year or more, Minimum daylight illuminance at least 90 lux for 2,650 hours per year or more. – Single storey buildings: 80% area. Average daylight illuminance: At least 300 lux for 3,000 hours per year or more, Minimum daylight illuminance at least 120 lux for 3,000 hours per year or more. Artificial Light: One credit	1	0	Daylight credit: Credit not currently targeted Artificial light credit: Credit not currently targeted	SEW & Daylight Consultant

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
	One credit is available where lighting in each zone can be manually dimmed by occupants down to 20% of the maximum light output using dimmer switches positioned in accessible locations. Dimming and control gear should avoid flicker and noise.				
Hea 02 Indoor air quality	Prerequisite - Indoor air quality (IAQ) plan: Where evidence provided demonstrates that an indoor air quality plan has been produced no later than the end of concept design stage, with the objective of facilitating a process that leads to design, specification and installation decisions and actions that minimise indoor air pollution during occupation of the building. The IAQ must include: – Removal of contaminant sources – Dilution and control of contaminant sources – Where present, consideration is given to the air quality requirements of specialist areas such as Laboratories – Procedures for pre-occupancy flush out – Third party testing and analysis – Maintaining good indoor air quality in-use.	-	-	STAGE 2 ACTION An indoor air quality plan is required to be developed for the ventilation design for the project. The IAQP should identify how the ventilation system will address the requirements of the criteria and thus deliver good levels of indoor air quality. Time-critical action for Stage 2 complete. Provide: - A draft Indoor Air Quality Plan (dated) which covers all the content requirements stipulated by BREEAM. - Project programme which can be used to confirm the stage in which the IAQP was produced. Requirement targeted.	Hoare Lea (AQ)
	First credit - Ventilation: Where fresh air is provided in accordance with the relevant standard for ventilation based on the building type. Ventilation pathways are designed to minimise the ingress and build up of pollutants inside the building. Suitable filtration is provided to reduce the impact of external air pollution. Filtration to be design in accordance with BS EN 13779:2007 Annex A3. The specified filters should achieve a minimum Indoor Air Quality of IDA2. For air-conditioned and mixed-mode buildings: the building's air intakes and exhausts are over 10m apart to minimise recirculation and intakes are over 20m from sources of external pollution or designed in accordance with BS EN 13779:2007 Annex A2. Areas of the building subject to large and unpredictable or variable occupancy patterns have CO_2 or air quality sensors specified and: – In mechanically ventilated spaces, the sensor(s) are linked to the mechanical ventilation system and provide demand-controlled ventilation to the space. – In naturally ventilated spaces, the sensors either have the ability to alert the building owner/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/roof vents. 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	1	1	STAGE 3-4 ACTION INCLUDE WITHIN ER DOCUMENTATION Design to include suitable filtration and separation of extract/supply grilles. Intakes will need to be spaced 10m from extract exhausts, as well as 20m from pollution sources such as flues. Consideration will need to be given to identifying the relevant areas required for CO2 sensors controlling the ventilation system output. It was commented in the workshop that achieving the distances may be difficult but this would be reviewed and, if necessary, alternative means of meeting the credit requirements can be investigated. Provide: - Design drawings demonstrating the ventilation pathway distances minimise the ingress and build-up of air pollutants inside the building - Specification or written confirmation that HVAC systems are designed in accordance with the criteria of the relevant standard for ventilation.	Hoare Lea (MEP / AQ)

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
				- Where applicable, specification confirming suitable filtration to minimise external air pollution, as defined in BS EN 13779:2007 Annex A3 and minimum Indoor Air Quality of IDA2. - Where applicable, specification confirming areas subject to large and unpredictable or variable occupancy patterns have carbon dioxide or air quality sensors Credit(s) targeted.	
	Second credit - Emissions from building products Where evidence provided demonstrates that three of the five available product types meet the emission limits, testing requirements and additional requirements identified by the Table 5.11 in the BREEAM criteria. All wood based products should be tested and classed as formaldehyde E1 as a minimum. Compliance is achieved where the Emission limit (1) identified by the testing requirement (2) as well as any other additional requirements are met. Product types include: – Interior paints and varnishes – Wood based products – Flooring materials – Ceiling wall and acoustic and thermal insulation materials – Interior adhesives and sealants (including flooring adhesives) Third credit - Emissions from building products Where evidence provided demonstrates that all of the product types listed meet the emission limits, testing requirements and any additional requirements listed in Table 5.11.	0	0	Credits not applicable to assessment type	
	Fourth credit - Post-construction indoor air quality measurement Where evidence demonstrates that formaldehyde and TVOC emissions are measured post construction but pre-occupancy and do not exceed the emissions criteria. The formaldehyde and TVOC analysis demonstrates that levels are within best practice emission limits. TVOC Does not exceed 500 µg/ m^3over 8 hours. In accordance with ISO 16000-5 and ISO 16000-6 or ISO 16017-1 Formaldehyde Does not exceed 100 µg/ m^3 averaged over 30 minutes (World Health Organization guidelines for indoor air quality: Selected pollutants, 2010 Sampled in accordance with ISO 16000-2 and ISO 16000-3	0	0	Credits not applicable to assessment type	
	Exemplary credit:	0	0	Credits not applicable to assessment type	

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
	One credit – Three of the product types listed meet the emission limits, testing requirements and any additional requirements listed in Table 5.12 of the BREEAM criteria. – Where wood-based products are not one of the 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.				
Hea 04 Thermal comfort	First credit: Thermal modelling Where evidence provided demonstrates that thermal modelling has been carried out using software in accordance with CIBSE AM11. The modelling demonstrates that the building design and services strategy can deliver thermal comfort levels in occupied spaces in accordance with the criteria set out in CIBSE Guide A Environmental Design (winter) and CIBSE TM52/TM59 methodologies (summer) as appropriate to the building and/or building areas.	1	1	STAGE 4 ACTION A thermal model will need to be produced based on latest design information that will be provided to identify compliance with comfort criteria of CIBSE Guide A. Provide: - CIBSE AM 11 full dynamic thermal comfort study results confirming that the building complies with CIBSE Guide A Environmental design, Table 1.5; CIBSE TM52: and the PMV (predicted mean vote) and PPD (predicted percentage of dissatisfied) indices. Credit(s) targeted.	Hoare Lea (MEP) / Hoare Lea (Sus)
	Second credit: Design for future thermal comfort Where credit 1 is achieved and evidence provided outlines that the thermal modelling demonstrates that the building design and services strategy can deliver thermal comfort levels in occupied spaces in accordance with the criteria set out in CIBSE Guide A Environmental Design, and CIBSE TM52/TM59 for a projected climate change environment. Where these levels are not met the project team demonstrates how the building has been adapted or designed to be easily adapted in future using passive design solutions. Additionally, evidence is provided for air-conditioned buildings, the PMV and PPD indices based on the modelling are reported via the BREEAM assessment scoring and reporting tool.	1	1	STAGE 4 ACTION The thermal model will be used to simulate the thermal comfort performance using future climate predictions. When using system sizes based on current weather patterns, the buildings may not achieve compliance. Achieving thermal comfort in future climate scenarios is likely to result is a requirement to oversize building services plant. Provide: - CIBSE AM 11 full dynamic thermal comfort study results confirming that the building complies with CIBSE Guide A Environmental design, Table 1.5; CIBSE TM52: and the PMV (predicted mean vote) and PPD (predicted percentage of dissatisfied) indices. Credit(s) targeted.	Hoare Lea (MEP) / Hoare Lea (Sus)
	Third credit: Thermal zoning and controls Where credit 1 is achieved and the thermal modelling analysis has informed the temperature control strategy for the building and its users. The strategy for proposed heating/cooling system(s) demonstrates that it has addressed the following: – 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.	0	0	Credits not applicable to assessment type	

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		

	– The degree of occupant control required for these zones, based on discussions with the end user (or alternatively building type or use specific design guidance, case studies, feedback) considers:
	  – User knowledge of building services
	  – Occupancy type, patterns and room functions (and therefore appropriate level of control required)
	  – How the user is likely to operate or interact with the system(s), e.g. are they likely to open windows, access thermostatic radiator valves (TRV) on radiators, change air-conditioning settings etc.
	  – 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).
	– 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.
	– The need or otherwise for an accessible building user actuated manual override for any automatic systems.				

Hea 05 Acoustic performance	One credit: The building meets the appropriate acoustic performance standards and testing requirements defined in the checklists and tables section which defines criteria for the acoustic principles of: – Indoor ambient noise level	1	1	STAGE 3-4 ACTION INCLUDE WITHIN ER DOCUMENTATION Indoor Ambient Noise Levels: **Credit(s) targeted.** Provide: - Acoustician's design report - Acoustician's accreditation details - A formal letter of commitment or specification from the design team confirming the recommendations made by the Acoustician will be implemented to achieve the performance standards. **Credit(s) targeted.**	Hoare Lea (Acoustics) & SEW
Hea 06 Security	One credit - Security of site and building: Where evidence provided demonstrates that a suitably qualified security specialist (SQSS) conducts an evidence-based Security Needs Assessment during or prior to Concept Design (RIBA Stage 2). The recommendations from the SQSS must be implemented into the design.	1	1	STAGE 2 ACTION A Security Needs Assessment (SNA) is required to be performed by a Suitability Qualified Security Specialist (SQSS) during Stage 2. This will provide a list of recommendations for improving security. STAGE 4 ACTION INCLUDE WITHIN ER DOCUMENTATION It will be necessary to provide evidence to demonstrate compliance with the recommendations made by the Security specialist. Provide: - Stage 2 security needs assessment report - Written confirmation that all the recommendations set out in the Security Needs Assessment will be implemented.	Security Consultant / SEW

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
				- Evidence (design drawings / specifications) confirm that the security measures have been included in the design Credit(s) targeted.	
	Exemplary level criteria A compliant risk based security rating scheme has been used e.g. SABRE. The performance against the scheme has been confirmed by independent assessment and verification.	1	0 (+1)	It was commented in the workshop that it may be possible to pursue the SABRE accreditation as SbD is to be a baseline standard that the development will be designed to as a starting point. Potential credit only.	Security Consultant

Hea 07
Safe and healthy surroundings
	First credit - Safe access:
	Where external site areas form part of the assessed development the following apply:
	– Dedicated and safe cycle paths are provided from the site entrance to any cycle storage, and connect to offsite cycle paths where applicable.
	– Dedicated and safe footpaths are provided on and around the site providing suitable links for the following:
	  – The site entrance to the building entrance,
	  – Car parks (where present) to the building entrance
	  – The building to outdoor space
	  – Connecting to off-site paths where applicable.
	– Pedestrian drop-off areas are designed off, or adjoining to, the access road and should provide direct access to other footpaths.
	
	Where vehicle delivery access and drop-off areas form part of the assessed development, the following apply:
	– Delivery areas are not accessed through general parking areas and do not cross or share the following:
	  – pedestrian and cyclist paths
	  – outside amenity areas accessible to building users and general public.
	– There is a dedicated parking or waiting area for goods vehicles with appropriate separation from the manoeuvring area and staff and visitor car parking.
	– Parking and turning areas are designed for simple manoeuvring according to the type of delivery vehicle likely to access the site, thus avoiding the need for repeated shunting.
	
	Second credit - Outside space
	There is an outside space providing building users with an external amenity area.
	
	The space must be of an appropriate size to provide enough amenity for the predicted number of building users during coffee or lunch breaks to gather, socialise, relax and connect with the natural environment. The space is predominantly intended for building staff, but can be used by other building users where relevant and beneficial to the building users. The outside space must:
	– Be an outdoor landscaped area, for example a garden, balcony or terrace; the majority of the space should be open to the sky
	– Have appropriate seating areas and be non-smoking,
	– Be located to ensure it is accessible to all building users and avoids areas that will have disturbances from sources of noise (e.g. building services, car parks, busy roads, delivery areas etc.).
	–
		2	2	STAGE 3-4 ACTION
				INCLUDE WITHIN ER DOCUMENTATION
				
				First credit:
				Credit(s) targeted.
				
				Second credit:
				Credit(s) targeted.
				
				It is necessary to demonstrate that the site provides safe access. It is also necessary to include an appropriate outdoor space for building users. It was commented in the workshop that achieving the safe access requirements may be difficult but early designs would be reviewed ahead of planning.
				
				Provide:
				- Site plan showing safe access across site.
				- Design drawings demonstrating appropriately sized external space for the development.
				
				Credit(s) targeted.
					SEW

<table>
<tr><th rowspan="2">Issue</th><th rowspan="2">Credit Requirements</th><th colspan="2">Credits</th><th rowspan="2">Comments / Actions</th><th rowspan="2">Responsible Team Member</th></tr>
<tr><th>Available</th><th>Targeted (Potential)</th></tr>
<tr><td colspan="6">Energy</td></tr>
<tr><td>Ene 01 (M_e) (M_o)
Reduction of carbon emissions
Mandatory:
– Four credits for Excellent
– Six credits (energy performance) and 4 credits (energy modelling and reporting) for Outstanding</td><td>Up to nine credits:
Where evidence provided demonstrates an improvement in the energy efficiency of the building's fabric and services and therefore achieves lower building operational related CO_2 emissions.
The number of credits achieved is determined by comparing the Energy Performance Ratio for New Construction (EPR_{NC}) with the benchmarks in the table below.
<table>
<tr><th colspan="2"></th><th colspan="2">Minimum Standards</th></tr>
<tr><th>BREEAM credits</th><th>EPR_{NC}</th><th>Rating</th><th>Minimum Requirements</th></tr>
<tr><td>1</td><td>0.1</td><td rowspan="3">-</td><td rowspan="3">Requires a performance improvement progressively better than the relevant national building regulations compliant standard</td></tr>
<tr><td>2</td><td>0.2</td></tr>
<tr><td>3</td><td>0.3</td></tr>
<tr><td>4</td><td>0.4</td><td rowspan="2">Excellent</td><td rowspan="2">Requires 4 credits to be achieved (equivalent to an EPR_{NC} of at least 0.4).</td></tr>
<tr><td>5</td><td>0.5</td></tr>
<tr><td>6</td><td>0.6</td><td rowspan="4">Outstanding</td><td rowspan="4">Requires 6 credits to be achieved (equivalent to an EPR_{NC} of at least 0.6) and 4 credits for Energy modelling and reporting.</td></tr>
<tr><td>7</td><td>0.7</td></tr>
<tr><td>8</td><td>0.8</td></tr>
<tr><td>9</td><td>0.9</td></tr>
</table></td><td>9</td><td>6
(+1)</td><td>Nine credits applicable to assessment type
Six credits targeted
One additional potential credit

Energy performance analysis using appropriate simulation tools in order for output parameters to be used. EPR metrics to be provided. Minimum number of credits for Excellent rating targeted.

STAGE 4 ACTION
INCLUDE WITHIN ER DOCUMENTATION
Energy performance analysis is required to be provided using appropriate simulation tools in order for output parameters to be used. EPR metrics are required to be provided. As the energy strategy developments the requirements of this credit will be able to be commented upon in further detail.

SIX CREDITS MANDATORY REQUIREMENT FOR 'OUTSTANDING'

Provide:
- As-designed BRUKL Input (.inp) and Output (pdf) report.
- Details of the Energy Assessor's Accreditations

Credit(s) targeted.</td><td>Hoare Lea (MEP) / Hoare Lea (Sus)</td></tr>
<tr><td></td><td>Four credits - Prediction of operational energy consumption
Pre-requisite
Prior to completion of the concept design, relevant members of the design team hold a preliminary design workshop focusing on operational energy performance.

Four credits – Energy modelling and reporting
Undertake additional energy modelling during the design and post-construction stage to generate predicted operational energy consumption figures and report predicted energy consumption targets by end use, design assumptions and input data (with justifications). In addition, credits are achieved for completing a risk assessment to highlight any significant design, technical, and process risks that should be monitored and managed throughout the construction and commissioning process.</td><td>4</td><td>4</td><td>STAGE 2 ACTION

It is necessary to hold a preliminary design workshop to discuss operational energy performance and potential risks/opportunities to this.

MANDATORY REQUIREMENT FOR 'OUTSTANDING'

Credit(s) targeted.</td><td>Hoare Lea (MEP) / Hoare Lea (Sus)</td></tr>
<tr><td></td><td>Exemplary level criteria
Up to two credits - Beyond zero net regulated carbon
The building achieves an EPR NC ≥ 0.9 and zero net regulated CO_2 emissions.</td><td>3</td><td>0</td><td>Beyond Zero Regulated Carbon:
Credits not applicable to assessment type

Carbon Negative:
Three credits applicable to assessment type</td><td>Hoare Lea (MEP) / Hoare Lea (Sus)</td></tr>
</table>

<table>
<tr><th rowspan="2">Issue</th><th rowspan="2">Credit Requirements</th><th colspan="2">Credits</th><th rowspan="2">Comments / Actions</th><th rowspan="2">Responsible Team Member</th></tr>
<tr><th>Available</th><th>Targeted (Potential)</th></tr>
<tr><td></td><td>Energy generation from on-site and near-site LZC sources is sufficient to offset carbon emissions from regulated energy use plus a percentage of emissions from unregulated energy use. Credits are achieved based on the percentage of additional emissions from unregulated energy that are offset by LZC sources.

Three credits - Carbon negative
The building is deemed carbon negative where > 100% (see Table 6.2 below) of carbon emissions from unregulated (and regulated) energy use are offset by energy generated from on-site and near-site LZC sources

<table><tr><th>Exemplary performance credits</th><th>Equivalent % criteria</th></tr><tr><td>1</td><td>10%</td></tr><tr><td>2</td><td>50%</td></tr><tr><td>3</td><td>>100%</td></tr></table></td><td></td><td></td><td>Credits not currently targeted</td><td></td></tr>
<tr><td></td><td>Two credits – Post-occupancy stage
Achieve maximum available credits in Ene02 Energy monitoring. In addition, preschools, primary schools, law courts, prisons and multi-residential buildings must separately monitor relevant function areas or departments in accordance with ENE02 criteria, below.

The client or building occupier commits funds to pay for the post occupancy stage. This requires an assessor to be appointed and to report on the actual energy consumption compared with the targets set in criterion 4 above.

The energy model (above) is:
i. Submitted to BRE and
ii. Retained by the building owner.</td><td>0</td><td>0</td><td>Credits not applicable to assessment type</td><td></td></tr>
<tr><td>Ene 02 (M), (M_e), (M_o)
Energy monitoring

Mandatory:
One credit for Very Good and above.</td><td>First credit: Sub-metering of major energy consuming systems
Where evidence provided demonstrates that the energy metering systems are installed that enable 90% of the estimated annual energy consumption of each fuel to be assigned to the various end-use categories of energy consuming systems. For buildings with a total useful floor area > 1000m^2 are metered using an appropriate energy monitoring and management system and systems in smaller buildings are metered either with an energy monitoring and management system or separate assessable energy sub-meters with pulsed or other open protocol communication outputs, to enable future connection to an energy monitoring and management system.

The end energy consuming use is identifiable to the building user through labelling or data outputs.

Large-scale medical equipment/systems can be excluded when assessing compliance with this issue (although it is recommended that sub-metering is considered in such instances).</td><td>1</td><td>1</td><td>STAGE 4 ACTION
INCLUDE WITHIN ER DOCUMENTATION
These requirements are to be included within the Employer's Requirements MEP documentation and drawings. The metering strategy for the development is to be confirmed as appropriate prior to issue.

MANDATORY REQUIREMENT FOR 'OUTSTANDING'

Provide:
- Specification / metering schematic / drawings confirming metering of relevant systems.
- Written confirmation of the systems that have been metered using a pulsed output meter, including:
a. Space Heating
b. Domestic Hot Water</td><td>Hoare Lea (MEP)</td></tr>
</table>

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
				c. Humidification d. Cooling e. Fans (major) f. Lighting g. Small Power (lighting and small power can be on the same sub-meter where supplies are taken at each floor/department). h. Other major energy-consuming items where appropriate i. Floor plate meters in large single occupancy or single-tenancy buildings with one homogeneous function (2nd credit). Credit(s) targeted.	
	Second credit: Sub – metering of high energy load and tenancy areas An accessible energy monitoring and management system or separate accessible energy sub-meters with pulsed or other open protocol communication outputs to enable future connection to an energy monitoring and management system are provided, covering a significant majority of the energy supply to tenanted areas or, in the case of single occupancy buildings, relevant function areas or departments within the building/unit.	1	1	STAGE 4 ACTION INCLUDE WITHIN ER DOCUMENTATION These requirements are to be included within the Employer's Requirements MEP documentation and drawings. The metering strategy for the development is to be confirmed as appropriate prior to issue. Provide: - As above. Credit(s) targeted.	Hoare Lea (MEP)
Ene 03 External lighting	One credit: Where evidence provided demonstrates that the external lighting has an average initial luminous efficacy of the external light fittings within the construction zone is not less than 70 luminaire lumens per circuit watt and that all external light fittings are automatically controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian traffic.	1	1	STAGE 4 ACTION INCLUDE WITHIN ER DOCUMENTATION The only relevant requirement for this project relates to external lighting design. This requirement can be incorporated into the project's employer's requirements documentation to require the contractor to achieve. Provide: - Specification confirming compliance with the relevant energy efficient lighting and lighting control criteria. - Drawings showing the extent of the external lighting and the type of fittings. - Manufacturers literature/datasheets for the specified external light fittings (if known at this stage). Credit(s) targeted.	Hoare Lea (MEP)

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
Ene 04 Low carbon design	First credit - Passive design analysis: Where the first credit of Hea 04 (Thermal comfort) is achieved and the project team carries out an analysis of the design to identify opportunities for the implementation of passive design solutions that reduce demands for energy consuming building services, and that these solutions are implemented meaningfully into the design.	1	1	STAGE 2 ACTION It is necessary to undertake a Passive Design assessment prior to the end of Stage 2. Provide: - Passive design analysis report - Evidence that the passive design measures have been incorporated to achieve a meaningful reduction in energy / CO2 emissions. Credit(s) targeted.	Hoare Lea (Sus)
	Second credit - Free cooling: Where the first credit is achieved, the passive design analysis includes an analysis of free cooling and identifies opportunities for the implementation of free cooling solutions. Free cooling solutions might include night time cooling, ground coupled air cooling or surface water cooling (for example); i.e. does not use active cooling.	1	0	Credits not currently targeted It is not anticipated that any free cooling technology will be designed into the development.	Hoare Lea (MEP) / Hoare Lea (Sus)
	Third credit - Low zero carbon feasibility study: Where evidence provided demonstrates that a feasibility study has been carried out by the completion of the Concept Design stage (RIBA Stage 2) by an energy specialist to establish the most appropriate recognised local (on- or near-site) low or zero carbon energy source(s) for the development. A local LZC technology/ies has been specified for the building in line with the recommendations of this feasibility study and this method of supply results in a meaningful reduction in regulated CO_2 emissions.	1	1	STAGE 2 ACTION It is necessary to undertake a Passive Design assessment prior to the end of Stage 2. Provide: - LZC feasibility analysis report - Evidence that LZC(s) have been incorporated to achieve a meaningful reduction in energy / CO2 emissions. Credit(s) targeted.	Hoare Lea (MEP) / Hoare Lea (Sus)
Ene 05 Energy efficient cold storage	One credit: The refrigeration system, its controls and components have been designed, installed and commissioned as follows: – In accordance with the Code of Conduct for carbon reduction in the refrigeration retail sector and BS EN 378-2 Refrigeration systems and heat pumps - Safety and environmental requirements. – Using robust and tested refrigeration systems/components, normally defined as those included on the Enhanced Capital Allowance (ECA) Energy Technology Product List (ETPL) or an equivalent list (see CN3.2 within the BREEAM criteria document for a list of components). The refrigeration plant has been commissioned to comply with the criteria for commissioning outlined in BREEAM issue Man 04 Commissioning and handover. Two credits: The installed refrigeration system demonstrates a saving in indirect greenhouse gas emissions (CO_2 eq.) over the course of its operational life.	0	0	Credits not applicable to assessment type	
Ene 06 Energy efficient transportation systems	First credit - Energy consumption: Where evidence provided demonstrates that where either lifts, escalators or moving walks are required: – An analysis of the transportation demand and usage patterns for the building has been carried out in accordance with BS EN ISO 25745 to determine the optimum number and size of lifts, (including counter-balancing ratio), escalators and/or moving walks.	1	1	STAGE 3 ACTION A passenger demand analysis study should be undertaken. In addition to this, a lift energy analysis is required to be completed to guide	Hoare Lea (VT)

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
	– The energy consumption has been estimated for different types and the lift/escalator/moving walk system/strategy with the lowest energy consumption has been specified. – Regenerative drives should be considered. – The transportation system with the lowest energy consumption is specified.			selection of the most appropriate type of system. Provide: - Passenger demand analysis. - The professional study of transportation energy consumption comparison of systems/ strategies. - Specification confirming implementation of lowest energy consuming lift system/strategy. Credit(s) targeted.	
	Second credit - Energy efficient features: Where evidence provided demonstrates that the first credit has been achieved and: For lifts, of the following energy-efficient features the three that offer the greatest potential energy savings are specified: – The lifts operate in a stand-by condition during off-peak periods. – The lift car uses energy-efficient lighting and display lighting – The lift uses a drive controller capable of variable-speed, variable-voltage, variable frequency (VVVF) control of the drive motor. Where regenerative drives are demonstrated to save energy, they are specified. For escalators and/or moving walks, each escalator and/or moving walk complies with EITHER of the following: – It is fitted with a load sensing device that synchronises motor output to passenger demand through a variable speed drive. OR It is fitted with a passenger sensing device for automated operation (auto walk), so the escalator operates in stand-by mode when there is no passenger demand.	1	1	INCLUDE WITHIN ER DOCUMENTATION The lift specification should be developed and include suitable required energy efficiency features. This information is required to be incorporated as part of the VT specification. Provide: - Specification confirming at least three energy efficient features of the specified lift. - Manufacturer datasheet for the specified lift demonstrating the energy efficient features. Credit(s) targeted.	Hoare Lea (VT) / Contractor
Ene 07 Energy efficient laboratory systems	One credit - Design specification Client engagement is sought through consultation during the preparation of the initial project brief (RIBA Stage 1 or equivalent) to determine occupant requirements and define laboratory performance criteria. Performance criteria should include, but not be limited to the following aspects: – Description of purpose – Occupant/process activities – Containment requirements and standards – Air change rate requirements – Ventilation system performance and efficiencies – Heating and cooling requirements – Interaction between systems – Flexibility/adaptability of laboratory facilities. The design team demonstrates that the energy demand of the laboratory facilities has been minimised as a result of achieving the defined design performance criteria. This has informed the right-sizing (see Relevant definitions from the BREEAM Criteria) of the services system equipment (including ventilation supply and extract). Laboratory containment devices and containment areas (criteria only applicable to buildings containing these facilities) For ducted fume cupboards specified: – 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	0	0	Credits not applicable to assessment type	

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
	– 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 – 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. Up to two/four credits For projects with a laboratory area between 10 – 25% of the total floor area two credits are available. For projects with a laboratory area over 25% of the total floor area four credits are available. Laboratory plant and systems are designed, specified and installed to promote energy efficiency, demonstrated through compliance with best practice energy efficiency measures within the BREEAM Criteria. The measures selected must demonstrate a reasonably significant effect (2% reduction) on the total energy consumption. Features include:				

Item description	Credits
Fume cupboard volume flow rates (further reduction) An average design air flow rate of < 0.12 m^3/s per linear metre (internal width) of fume cupboard workspace.	0.5
Grouping or isolation of high filtration or ventilation activities Minimisation of room air change rates and overall facility ventilation flows by grouping together or isolating activities and equipment with high filtration or ventilation requirements.	0.5
Energy recovery – heat Heat recovery from exhaust air (where there is no risk of cross contamination) or via refrigerant or water cooling systems.	0.5
Energy recovery – cooling Cooling recovery via exhaust air heat exchangers (where there is no risk of cross-contamination) or via refrigerant or water cooling systems.	0.5
Grouping of cooling loads Grouping of cooling loads to enable supply efficiencies and thermal transfer.	0.5
Free cooling Specification of free cooling coils in chillers or dry air coolers related to laboratory-specific activities.	0.5
Load responsiveness Effective matching of supply with demand through modularity, variable speed drives and pumps, and other mechanisms.	0.5
Clean rooms Specification of particle monitoring systems, linked to airflow controls.	0.5
Diversity Achievement of high levels of diversity in central plant sizing and laboratory duct sizing, where compatible with safety.	0.5
Room air changes rates	0.5

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
	Reducing air change rates by matching ventilation airflows to environmental needs and demands of containment devices.				
	Fan power Specification and achievement of best practice fan power figures (as shown below) for all air handling units, laboratory extract systems, local extract ventilation, containment area extracts (where applicable) and fume cupboard extracts (where applicable). — 1.0				
Ene 08 Energy efficient equipment	Two credits: – Identify the building's unregulated energy consuming loads and estimate their contribution to the total annual unregulated energy consumption of the building, assuming a typical/standard specification. – Identify the systems and/or processes that use a significant proportion of the total annual unregulated energy consumption of the development and its operation. – Demonstrate a meaningful reduction in the total annual unregulated energy consumption of the building.	0	0	Credits not applicable to assessment type	

	Function / Equipment	Criteria
A	Swimming pool	1. Specify automatic or semi-automatic pool covers, or 'liquid' pool covers with an automatic dosing system to ALL pools, including spa pools and hot tubs. 2. The covers envelop the entire pool surface when fully extended. 3. Control the air temperature in the pool hall so that it is 1 °C above the water temperature.
B	Laundry facilities with commercial-sized appliances	Demonstrate at least one of the following for commercial-sized appliances: 1. Specification of heat recovery from waste water. 2. Use of greywater for part of the washing process. This may be recycled from the final rinse and used for the next pre-wash. 3. The commercial or industrial sized machines are identified as eligible for the UK's Enhanced Capital Allowance Scheme for water.
C	Data centres	1. Design is in accordance with the 'Best practices for the EU Code of Conduct on Data Centres' principles with the data centre achieving at least the 'Expected minimum practice' level (as defined in the Code of Conduct). 2. Temperature set points are not less than 24°C, as measured at the inlet of the equipment in the rack.
D	IT-intensive operating areas	1. Uses a natural ventilation and cooling strategy as standard, with forced ventilation only to be used when the internal temperature exceeds 20°C and active cooling only when the internal temperature exceeds 22°C 2. Specify a mechanism to achieve automatic power-down of equipment when not in use, including overnight.
E	Domestic scale appliances (individual and communal facilities)	Domestic scale appliances have the following ratings (or better) under the EU Energy Efficiency Labelling Scheme, where provided: 1. Fridges, fridge-freezers: A+ rating 2. Washing machines: A++ rating 3. Dishwashers: A+ rating

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
Transport					
Tra 01 Transport assessment and travel plan	Two credits: – Where evidence provided demonstrates that a travel plan has been developed as part of the feasibility and design stages which considers all types of travel relevant to the building type and users. – The travel plan must be structured to the needs of the particular site and takes into consideration the findings of a site-specific transport survey. – The travel plan must include a package of measures that have been used to steer the design of the development in order to meet the travel plan objectives and minimise car-based travel patterns. The travel plan must be demonstrated in action post construction.	2	2	STAGE 2 ACTION By the end of Stage 2, a compliant Transport Assessment and Travel Plan are required for the development that includes recommendations for reduction of impact resultant from transport. These measures are then incorporated into the design of the development. Note: the TA and TP must align with the prescriptive content requirements set by BRE. Provide: - Transport Assessment - Travel Plan - Design plans showing the recommended measures in the travel plan have been incorporated into the design. - Written confirmation that the building's management will support the implementation of the proposed Travel Plan measures Credit(s) targeted.	Curtins & SEW

	4. Washer-dryers and tumble dryers: A rating. OR 5. If any of the appliances will be purchased during occupation by the tenant/owner, information on the EU Energy Efficiency Labelling Scheme of efficient white goods must be provided to the residential areas of the building.	
F	Healthcare	1. The procurement of large-scale equipment (where present, see compliance note CN4) and sets of electrical equipment (where numbering more than 50) has been informed and selected by life cycle costing analysis for at least two options in accordance with HTM07-02, Part B, Chapter 1.
G	Kitchen and catering facilities	The project has incorporated at least two-thirds of the energy efficiency measures outlined in the section summaries of each of the following sections of CIBSE Guide TM50 (except as specified): 1. Section 8 (Drainage and kitchen waste removal) 2. Section 9 (Energy controls - specifically controls relevant to appliances) 3. Section 11 (Appliance specification - not fabrication or utensil specifications) 4. Section 12 (Refrigeration) 5. Section 13 (Warewashing: dishwashers and glasswashers) 6. Section 14 (Cooking appliance selection) Section 15 (Water temperatures, taps, faucets and water saving controls).

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
Tra 02 Sustainable transport measures	Ten credits Features included to achieve a Tra02 points score. Credits are achieved based on the site's Accessibility Index and the features provided.	10	10	Ten credits applicable to assessment type **Ten credits targeted** Currently anticipated that sufficient features can be incorporated to achieve the targeted credits. STAGE 2-4 ACTION Currently anticipated that sufficient features can be incorporated to achieve the targeted credits. The targeted features include the following: - High accessibility index (1 point) - Public transport information point (1 point) - Cycle storage (1 point) - Cycle facilities (1 point) - Electric recharging (1 point) - Existing amenities (1 point) - New amenity (2 points for 1no. amenity - e.g. café / ATM) Provide: - Evidence (design drawings, specifications, written confirmation, site plans, minutes, correspondence etc...) of the proposed inclusion of sustainable travel measures. **Credit(s) targeted.**	Curtins / SEW / Hoare Lea (MEP)

Points	Points	Points	Credits
AI < 25	25 ≤ AI < 40 (urban centres)	AI of ≥ 40 (metropolitan centre locations)	
1	1		1
2		1	2
3	2		3
4		2	4
5	3		5
6	4	3	6
7	5		7
8	6	5	8
9	7	6	9
10	8	7	10

Sustainability Transport Measures:

Public transport measures	Points
Public transport measures	
– The existing AI calculated in Tra 01 achieves the following: – ≥ 4 for prison or MOD sites, rural location sensitive buildings, and other building group 3 – ≥ 8 for all other building type	1
– Demonstrate an increase over the existing Accessibility Index through negotiation with local bus, train or tram companies to increase the frequency of the local service provision for the development;	2
– Demonstrate an increase over the existing Accessibility Index. This could be through provision of a diverted bus route, a new or enhanced bus stop, or other similar solutions.	3
– Provide a dedicated service, such as a bus route or service	3
– Provide a public transport information system in a publicly accessible area, to allow building users access to up-to-date information on the available public transport and transport infrastructure. This may include signposting to public transport, cycling, walking infrastructure or local amenities.	1
Private transport measures	
– Provide electric recharging stations of a minimum of 3kW for at least 10% of the total car parking capacity for the development.	1

Issue	Credit Requirements		Credits		Comments / Actions	Responsible Team Member
			Available	Targeted (Potential)		
	– Set up a car sharing group or facility to facilitate and encourage building users to car share. – Raise awareness of the sharing scheme with marketing and communication materials. – Provide priority spaces for car sharers for at least 5% of the total car parking capacity for the development. – Locate priority parking spaces nearest the development entrance used by the sharing scheme participants.	1				
	Active travel measures					
	– During preparation of the brief, the design team consults with the local authority (LA) on the state of the local cycling network and public accessible pedestrian routes, to focus on whichever the LA deems most relevant to the project, and how to improve it. – Agree and implement one proposition chosen with the local authority. The proposition supported by the development is additional to existing local plans and has a significant impact on the local cycling network or on pedestrian routes open to the public	2				
	– Install compliant cycle storage spaces to meet the minimum levels set out the BREEAM criteria	1				

	– Option 7 has been achieved.
	– Provide at least two compliant cyclists' facilities for the building users, (including pupils where appropriate to the building type):
	  – Showers
	  – Changing facilities
	  – Lockers
	  – Drying spaces.
		1				

	Existing amenities: – At least three existing accessible amenities are present, see Table 7.6 on page 179, where relevant for a Building Group.	1				
	Enhanced amenities: – Ensure a minimum of one new accessible amenity is provided.	2				
	Ensure more than one new accessible amenity, in accordance with Table 7.6 within the BREEAM criteria for the relevant Building Group, is provided.	3				
	Alternative transport measures					
	Implement one site-specific improvement measure, not covered by the options already listed in this issue, in line with the recommendations of the travel plan. Submit these for review by BRE.	1 - 3				

<table>
<tr><th rowspan="2">Issue</th><th rowspan="2">Credit Requirements</th><th colspan="2">Credits</th><th rowspan="2">Comments / Actions</th><th rowspan="2">Responsible Team Member</th></tr>
<tr><th>Available</th><th>Targeted (Potential)</th></tr>
<tr><td colspan="6">Water</td></tr>
<tr><td>Wat 01 (M), (M_e), (M_o)
Water consumption
Mandatory:
– One credit for Good and above.
– Two credits for Outstanding.</td><td>Up to five credits:

Where evidence provided demonstrates that water consumption has been reduced to the following levels compared against the baseline building model:
<table><tr><th>% Improvement</th><th>No. of BREEAM Credits</th></tr><tr><td>12.5%</td><td>1</td></tr><tr><td>25%</td><td>2</td></tr><tr><td>40%</td><td>3</td></tr><tr><td>50%</td><td>4</td></tr><tr><td>55%</td><td>5</td></tr><tr><td>65%</td><td>Exemplary performance</td></tr></table></td><td>6</td><td>3
(+1)</td><td>Five credits applicable to assessment type
Three credits targeted and one additional potential

STAGE 4 ACTION
INCLUDE WITHIN ER DOCUMENTATION
The specification of sanitary appliances is required to achieve water efficiency targeted to be able to achieve at least three credits. A sample specification can be provided that identifies a potential route to achieving the targeted credits. It was commented in the workshop that a rainwater harvesting system is being considered which may reduce the potable water usage.

TWO CREDITS MANDATORY REQUIREMENT FOR 'OUTSTANDING'

Provide:
- Specification / sanitary schedule confirming number of fittings and water efficiency figures for the following:
a) WCs
b) Urinals
c) Taps
d) Showers
e) Baths
f) Kitchen tap (restaurant)
g) Commercial dishwasher
h) Commercial washing machines
i) Waste disposal unit
- Manufacturer datasheet confirming the water efficiency figures in the specification can be delivered.

Credit(s) targeted.</td><td>Hoare Lea (MEP) & SEW</td></tr>
<tr><td>Wat 02 (M), (M_e), (M_o)
Water monitoring
Mandatory:
Criterion 1 only for Good and above.</td><td>One credit:
– Where evidence provided demonstrates that a water meter with a pulsed output will be installed on the mains supply to each building/unit.
– Water-consuming plant or building areas, consuming 10% or more of the building's total water demand, need to be fitted with either sub meters or have water monitoring equipment integral to the plant or area. (Not applicable to Shell Only Assessments).
– Each meter (main and sub) must have a pulsed output to enable connection to a Building Management System (BMS) for the monitoring of water consumption.</td><td>1</td><td>1</td><td>STAGE 4 ACTION
INCLUDE WITHIN ER DOCUMENTATION
These requirements are to be included within the Employer's Requirements MEP documentation and drawings. The metering strategy for the development is to be confirmed as appropriate prior to issue.</td><td>Hoare Lea (MEP)</td></tr>
</table>

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
	– If the site on which the building is located has an existing BMS, managed by the same occupier/owner (as the new building), the pulsed water meter(s) for the new building must be connected to the existing BMS.			MANDATORY REQUIREMENT FOR 'OUTSTANDING'. Provide: - Specification confirming the provision of a water meter and its connection to BMS. - Schematics confirming water meters and BMS connection. - Written confirmation whether water consuming plant or areas consume 10% or more of the building's water use. Credit(s) targeted.	
Wat 03 Water leak detection	First credit - Leak detection system: Where evidence provided demonstrates that a leak detection system which is capable of detecting a major water leak on the mains water supply within the building and between the building and the utilities water meter is provided.	1	1	STAGE 4 ACTION INCLUDE WITHIN ER DOCUMENTATION These requirements are to be to be included within the Employer's Requirements MEP documentation and drawings. The leak detection system should be installed to alarm if there is a draw off of water at unusual times or if a leak is detected from the site boundary to the building. Provide: - Specification confirming the inclusion of the leak detection system and its capabilities as listed in the BREEAM Criteria column. - Schematics confirming water meters / leak detection system and BMS connection. Credit(s) targeted.	Hoare Lea (MEP)
	Second credit - Flow control devices: Where evidence provided demonstrates that flow control devices that regulate the supply of water to each WC area/facility according to demand are installed (and therefore minimise water leaks and wastage from sanitary fittings)	1	1	STAGE 4 ACTION INCLUDE WITHIN ER DOCUMENTATION These requirements are to be to be included within the Employer's Requirements MEP documentation and drawings. The solenoid flow shutoff system should be installed to shut off the supply of water to WC areas of the building (WC rooms etc) when these spaces are not occupied. Provide: - Specification confirming the inclusion of flow control devices. - Design plan / schematic confirming location of solenoid valves and PIRs to WC areas.	Hoare Lea (MEP)

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
				Credit(s) targeted.	
Wat 04 Water efficient equipment	First credit The design team has identified all unregulated water demands that could be realistically mitigated or reduced. System(s) or processes have been identified to reduce the unregulated water demand, and demonstrate, through either good practice design or specification, a meaningful reduction in the total water demand of the building. Unregulated water uses include (but are not limited to): – Swimming pools – Recreational hot tubs and hydrotherapy pools – Equipment used for irrigation – Vehicle wash equipment – Project-specific industrial processes – Water filtration and treatment processes – Building services (e.g. cooling towers and humidification systems) Credit is not applicable and will be filtered out where there is no water demand from uses other than domestic scale and sanitary use components.	1	1	STAGE 4 ACTION INCLUDE WITHIN ER DOCUMENTATION These requirements are to be to be included within the Employer's Requirements documentation. It was commented in the workshop that irrigation will probably be included as is a blue roof. Provide: - Written confirmation that no permanent irrigation system are to be installed (where there will be such systems, specifications for a compliant system would need to be provided). Credit(s) targeted.	Landscape architect / Pool specialist
Materials					
Mat 01 Environmental impacts from construction products - Building life cycle assessment (LCA)	One - six credits: LCA superstructure Up to six credits are available for development of a building LCA on of the superstructure design using either the BREEAM Simplified Building LCA tool or a Compliant LCA tool during concept design stage. – Carry out building LCA options appraisal of 2 to 4 significantly different superstructure design options throughout the design development, using a building LCA tool that is recognised by BREEAM – Submit to BRE at concept design stage prior to planning submission. – Submit updated LCA assessment to BRE at technical design stage. One credit LCA substructure 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	5 (+1)	Seven credits applicable to assessment type Four credits targeted One additional potential credit STAGE 2 ACTION LCA assessment to be undertaken prior to submission of planning permission. LCA to be submitted to BRE and assessed at the developed design stage. STAGE 4 ACTION An LCA assessment is required to be undertaken prior to the submission of the planning application. The LCA is required to be submitted to BRE and assessed at the developed based on updated proposals at Stage 4 of the design stage. Provide: - A copy of the LCA reports and outputs (for stage 2 and 4) - Mat 01/02 results submission tools (for stage 2 and 4) - Options appraisal summary document (for stage 4)	LCA specialist / SEW / AKT II / Cumming

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
				- Letter of acknowledgement that the LCA options appraisal summary document has been received by the design team and client - Evidence of how the LCA design options have informed the design decision-making process (e.g. minutes, reports, etc) Credit(s) targeted.	
	Exemplary level criteria One credit – Core building services options appraisal during concept design Carry out building LCA options appraisal of at least 3 significantly different core building services design options, using a building LCA tool that is recognised by BREEAM One credit – LCA and LCC alignment – Achieve Elemental LCC plan and Component Level LCC options appraisal credits include design options appraised as part of the LCA within the Elemental and Component LCC models. – Integrate the aligned LCA and LCC options appraisal activity within the wider design decision-making process. Record this in an options appraisal summary document including the relevant cost information from the 'elemental LCC plan' and 'Component level LCC option appraisal'. One credit – Third-party verification A suitably qualified third party either carries out the building LCA work or verifies the building LCA work (if by others), and produces a report describing how they have checked the building LCA work accurately represent the designs under consideration during Concept Design and Technical Design with reference to the requirements of criteria 1 to 7 (and 8 to 14 if pursued).	3	1	First credit: Credit not currently targeted Second credit: Credit not currently targeted Third credit: Credit(s) targeted.	LCA specialist / SEW / AKT II / Cumming
Mat 02 Environmental impacts from construction products - Environmental Product Declarations (EPD)	One credit: Where evidence provided demonstrates the designs features construction products with EPD that achieve a total EPD points score of at least 20, according to the BRE calculation methodology.	1	0 (+1)	STAGE 3-4 ACTION INCLUDE WITHIN ER DOCUMENTATION The project team should investigate, and specify, suppliers and products that have EPD certification, where possible. It was commented in the workshop that the Contractor should be challenged to achieve this. Potential credit only.	SEW / Contractor
Mat 03 (M), (M_e), (M_o) Responsible sourcing of construction products Mandatory:	Pre-requisite All timber and timber based products used on the project are 'legally harvested and traded timber' First credit: Enabling sustainable procurement Where evidence provided demonstrates that a sustainability procurement plan is in place at by the concept design stage and is used by the design team to guide specification towards sustainable construction products.	1	1	STAGE 2 ACTION The project team will be required to develop a sustainable procurement plan now for use throughout the project. MANDATORY REQUIREMENT FOR 'OUTSTANDING' Provide:	SEW / Contractor

<table>
<tr><th rowspan="2">Issue</th><th rowspan="2">Credit Requirements</th><th colspan="2">Credits</th><th rowspan="2">Comments / Actions</th><th rowspan="2">Responsible Team Member</th></tr>
<tr><th>Available</th><th>Targeted (Potential)</th></tr>
<tr><td rowspan="3">Criterion 1 sustainable timber sourcing for all ratings</td><td></td><td></td><td></td><td>- Stage 2 Sustainable Procurement Plan
- Specification confirming that all timber will be sourced in accordance with the UK Government's Timber Procurement Policy.
- A copy of the final a BREEAM compliant Sustainability Procurement Plan (stage 4)

Credit(s) targeted.</td><td></td></tr>
<tr><td>Up to three credits:
Where evidence provided demonstrates the available responsible sourcing of materials (RSM) can be awarded where the applicable building materials are responsibility sourced in accordance with the BREEAM methodology.
<table>
<tr><th>RSM credits</th><th>% of available RSM points achieved</th><th>MAT03 Scope</th></tr>
<tr><td>1</td><td>≥ 10%</td><td>Superstructure</td></tr>
<tr><td>2</td><td>≥ 20%</td><td rowspan="2">As above, plus
– Internal finishes
– Substructure and hard landscaping</td></tr>
<tr><td>3</td><td>≥ 30%</td></tr>
</table></td><td>3</td><td>1
(+1)</td><td>Three credits applicable to assessment type
One credit and one additional potential credit targeted.

STAGE 4 ACTION
INCLUDE WITHIN ER DOCUMENTATION
These requirements are to be included within the Employer's Requirements documentation. Product selections will be required to be made for products that are covered by responsible sourcing certification. The contractor will be required to develop suitable reporting in order for the credits to be achieved. This credit can be an administratively intensive task to coordinate and therefore the credit is identified to be a potential target only.

Provide:
- Drawings/specification confirming material build-up of elements.
- Completed Mat 3 template table confirming the following:
- Breakdown of element
- Supplier details and certification type
- Volume of material
- Specification confirming that all timber will be sourced in accordance with the UK Government's Timber Procurement Policy.
- A copy of a BREEAM compliant Sustainability Procurement Plan</td><td>SEW / Contractor</td></tr>
<tr><td>Exemplary credit:
Where evidence provided demonstrates that at least 50% of the available RSM points are achieved. Scope also includes core building services.</td><td>1</td><td>0</td><td>Credit not currently targeted</td><td>SEW / Contractor</td></tr>
</table>

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		

Mat 05
Designing for durability and resilience
	One credit:
	PART A: Protecting vulnerable parts of the building from damage
	– 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:
	  – Negative impacts of high user numbers in relevant areas of the building (e.g. corridors, lifts, stairs, doors etc.).
	  – Damage from any vehicle or trolley movements within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas.
	  – 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.
	  – Potential malicious damage to building materials and finishes, in public and common areas where appropriate.
	
	PART B: Protecting exposed parts of the building from material degradation
	– 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:
	  – The element or product achieving an appropriate quality or durability standard or design guide
	
	OR
	
	– A detailed assessment of the element's resilience when exposed to the applicable material degradation and environmental factors.
	– Include convenient access to the roof and façade for cost-effective cleaning, replacement and repair in the building's design.
	– Design the roof and façade to prevent water damage, ingress and detrimental ponding.
		1	1	STAGE 3-4 ACTION
				Consideration for how wear and damage will occur within the building is required to be made. Following identification of the risks for the building consideration for where (and how) protection measures will be included to mitigate or reduce these risks is required.
				
				In addition, an environmental degradation assessment is required to be undertaken to identify how materials will be likely to be impacted by environmental hazards and what symptoms may be experienced. Following identification of potential issues, how environmental degradation will be mitigated or reduced is required to be provided.
				
				Provide:
				- Design plan marked-up / specifications / manufacturer literature to confirm internally and externally:
				  a. areas of vulnerability
				  b. protection from the effects of high pedestrian traffic
				  c. protection against any internal vehicular/ trolley movement
				  d. protection against or prevention from any potential vehicular collision where vehicular parking and manoeuvring occurs.
				  e. protection for exposed parts of the building from material degradation in accordance with the requirements.
				
				Credit(s) targeted.
					SEW

Mat 06 Material efficiency	One credit: 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 – Preparation and brief – Concept design – Developed design – Technical design – Construction Develop and record the implementation of material efficiency	1	1	STAGE 2-4 ACTION INCLUDE WITHIN ER DOCUMENTATION Stage 5, 6 to be included within Employer's Requirements documentation. Material efficiency assessments at each of the key stages is required to be provided by the design team. The design team should identify what actions were made in order to limit the use of resources. Action is required	SEW / AKT II / Hoare Lea (MEP)

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
	– Developed design – Technical design – Construction			now in order to capture those actions that have been undertaken through the early design stages. Provide: - Material efficiency design notes / report revisions for each key RIBA stage reached to date, identifying opportunities for and appropriate measures taken to optimise the use of materials in building design, procurement, construction, maintenance and end of life. - Supporting documentary evidence of implementing measures for optimising the use of materials (e.g. specifications, drawings, etc...) - Report confirming the targets and actual material efficiencies achieved. Credit(s) targeted.	
Waste					
Wst 01 (M_o) Construction waste management Mandatory: One credit for Outstanding	One credit - Pre-demolition audit 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: – Be carried out at Concept Design stage (RIBA Stage 2) by a competent person prior to strip-out or demolition works – Guide the design, consider materials for reuse and set targets for waste management – Engage all contractors in the process of maximising high-grade reuse and recycling opportunities – Compare actual waste arisings and waste management routes used with those forecast and investigate significant deviations from planned targets. Three credits - Construction resource efficiency: – Where a Resource Management Plan (RMP) has been developed covering the non-hazardous waste related to on-site construction and dedicated off-site manufacture or fabrication. – In addition, evidence provided demonstrates that non-hazardous construction waste (excluding demolition and excavation waste) generated by the building's design and construction meets or exceeds the following resource efficiency benchmarks:	5	3 (+2)	Pre-demolition audit: Credit(s) targeted. Construction resource efficiency: Three credits applicable to assessment type Two credits targeted with one additional potential credit Exemplary credit: Credit not currently targeted STAGE 2 ACTION Any demolition for the site must be accompanied with a pre-demolition survey of the demolished buildings. MANDATORY REQUIREMENT FOR 'OUTSTANDING' INCLUDE WITHIN ER DOCUMENTATION The lower waste benchmark levels will be required within the Employer's Requirements documentation. These requirements can also	Contractor

<table>
<tr><th>Issue</th><th>Credit Requirements</th><th>Credits
Available</th><th>Credits
Targeted (Potential)</th><th>Comments / Actions</th><th>Responsible Team Member</th></tr>
<tr><td></td><td>
<table>
<tr><th>BREEAM Credits</th><th colspan="2">Amount of waste generated per 100m^2 (gross internal floor area)</th></tr>
<tr><th></th><th>m^3</th><th></th></tr>
<tr><td>One credit</td><td>≤ 13.3</td><td>≤ 11.1</td></tr>
<tr><td>Two credits</td><td>≤ 7.5</td><td>≤ 6.5</td></tr>
<tr><td>Three credits</td><td>≤ 3.4</td><td>≤ 3.2</td></tr>
<tr><td>Exemplary level</td><td>≤ 1.6</td><td>≤ 1.9</td></tr>
</table>
</td><td></td><td></td><td>identify that the diversion from landfill targets must be achieved.

Any demolition of buildings or clearance of hard landscaping on site must be accompanied with a pre-demolition survey of the demolished buildings/hardstanding. The pre-demolition audit should identify the materials available and potential uses for the materials. It should be noted that the pre-demolition audit does not require that the materials are recycled, it is only to identify the quantity and potential use.

Provide:
1) Where applicable, a compliant pre-demolition audit report
2) A draft compliant Resource Management Plan (or written commitment to produce one) with stated waste quantity and diversion targets.

Credit(s) targeted.</td><td></td></tr>
<tr><td></td><td>Fifth credit - Diversion of resources from landfill:
Where evidence provided demonstrates that the following percentages of non-hazardous construction and demolition waste (where applicable) generated by the project have been diverted from landfill:
<table>
<tr><th>BREEAM credits</th><th>Type of Waste</th><th>Volume</th><th>Tonnage</th></tr>
<tr><td rowspan="3">One credit</td><td>Non-demolition</td><td>70%</td><td>80%</td></tr>
<tr><td>Demolition</td><td>80%</td><td>90%</td></tr>
<tr><td>Excavation</td><td>N/A</td><td>N/A</td></tr>
<tr><td rowspan="3">Exemplary level</td><td>Non-demolition</td><td>85%</td><td>90%</td></tr>
<tr><td>Demolition</td><td>85%</td><td>95%</td></tr>
<tr><td>Excavation</td><td>95%</td><td>95%</td></tr>
</table>
</td><td>1</td><td>1</td><td>INCLUDE WITHIN ER DOCUMENTATION
As identified above, requirements to achieve these levels of diversion from landfill will be required to be included with Employer's Requirements documentation.

Provide:
See above.

Credit(s) targeted.</td><td>Contractor</td></tr>
<tr><td>Wst 02
Use of recycled and sustainably sourced aggregates</td><td>Pre-requisite
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 Wst01 requirements.

One credit: Project sustainable aggregate points
Where evidence provided identifies amounts of aggregate used for the project, the types of aggregate, its source (location) and the transport type. This information is used to calculate the Sustainable Aggregate points score. Credits are scored as follows:</td><td>1</td><td>0</td><td>Credit not currently targeted</td><td>AKT II</td></tr>
</table>

<table>
<tr><th rowspan="2">Issue</th><th rowspan="2">Credit Requirements</th><th colspan="2">Credits</th><th rowspan="2">Comments / Actions</th><th rowspan="2">Responsible Team Member</th></tr>
<tr><th>Available</th><th>Targeted (Potential)</th></tr>
<tr><td rowspan="2"></td><td>
<table>
<tr><th>Project Sustainable Aggregate Credits</th><th>Project Sustainable Aggregate points</th></tr>
<tr><td>1</td><td>3.5–6.0</td></tr>
<tr><td>1 exemplary performance credit</td><td>> 6.0</td></tr>
</table>
The calculation is based on the following aggregate uses:
– Engineered fill
– Concrete coarse aggregate
– Concrete fine aggregate
– Asphalt aggregate
– Granular bedding for pipes
– Granular bedding for hard landscape products
– Hydraulically bound materials
</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Exemplary level criteria:
As above</td><td>1</td><td>0</td><td>Credit not currently targeted</td><td>AKT II</td></tr>
<tr><td>Wst 03 (M_e) (M_o)
Operational waste
Mandatory:
– One credit for Excellent and above</td><td>One credit:
Where evidence provided demonstrates that there is dedicated space(s) to cater for the segregation and storage of operational recyclable waste volumes generated by the assessed building/unit, its occupant(s) and activities.

The dedicated space(s) must be:
– Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams
– Accessible to building occupants / facilities operators for the deposit of materials and collections by waste management contractors
– Of a capacity appropriate to the building type, size, number of units (if relevant) and predicted volumes of waste that will arise from daily/weekly operational activities and occupancy rates.
– The specified/installed operational waste facilities are compliant with the relevant NHS guidelines for that part of the UK.
Where the consistent generation in volume of the appropriate operational waste streams is likely to exist, e.g. large amounts of packaging or compostable waste generated by the building's use and operation, the following facilities must be provided as part of its waste management strategy:
– Static waste compactor(s) or baler(s); situated in a service area or dedicated waste management space.
– Vessel(s) for composting suitable organic waste resulting from the building's daily operation and use OR adequate space(s) for storing segregated food waste and compostable organic material prior to collection and delivery to an alternative composting facility.
– Where organic waste is to be stored/ composted on site, a water outlet is provided adjacent to or within the facility for cleaning and hygiene purposes.</td><td>1</td><td>1</td><td>A waste storage area of sufficient footprint area is required to be provided in order to achieve this credit. The waste storage area will be required to have specific areas for recyclable waste and general waste and will comply with the minimum area requirements of the BREEAM criteria.

MANDATORY REQUIREMENT FOR 'OUTSTANDING'

Provide:
- Design plan confirming location and area (m^2) of storage area.
- Written confirmation that the space is adequately sized for the anticipated volume of waste and the waste collection arrangement, is clearly labelled for recycling, within easy reach of the building (<20m away from an entrance) and in a location with good vehicular access.

Where large volumes of either packaging or food waste is expected, static waste compactor(s) or baler(s); and composting facilities should be provided, along with a water outlet for cleaning and hygiene purposes.</td><td>SEW</td></tr>
</table>

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
				Credit(s) targeted.	
Wst 04 Speculative floor and ceiling finishes	One credit For tenanted areas (where the future occupant is not known), prior to full fit-out works, carpets, other floor finishes and ceiling finishes have been installed in a show area only. In a building developed for a specific occupant, that occupant has selected (or agreed to) the specified floor and ceiling finishes.	1	1	It is necessary to demonstrate that 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. Credit(s) targeted.	Oval / SEW
Wst 05 Adaptation to climate change	One credit - Structural and fabric resilience: Where evidence provided demonstrates that a climate change adaptation strategy appraisal for structural and fabric resilience has been conducted by the end of Concept design (RIBA Stage 2) covering hazard identification and assessment, risk estimation, evaluation and management. Appraisal to identify & evaluate impact on the building over its life cycle from expected extreme weather conditions arising from climate change and, where feasible, mitigate against these impacts ID hazards taking into account the following: structural stability, robustness, weather proofing and detailing, material durability, health and safety of occupants, impact on building contents and business continuity	1	1	STAGE 2 ACTION A climate change adaptation plan is required to be developed. This plan and report are required to be concluded at RIBA Stage 2. As a result of this, the reporting against the requirements need to be commenced now. Credit(s) targeted.	SEW & AKT II
	Exemplary credit: A holistic approach to the design and construction of the current building's life cycle, to mitigate against the impacts of climate change, is represented by the achievement of these criteria. In addition to achieving the first credit above, the following must also be achieved: – Hea 04 – Thermal comfort: Project team demonstrate how the building has been adapted, or designed to be easily adapted in future using passive design solutions – Ene 01 – Reduction in energy use and carbon emissions At least 6 credits in this issue have been achieved – Ene 04 – Low carbon design Passive design analysis credit has been achieved – Wat 01 – Water consumption Minimum of three credits in this issue have been achieved – Mat 05 – Designing for durability and resilience Building elements incorporate appropriate design and specification measures to limit material degradation due to environmental factors – Pol 03 Surface water run off Flood risk- A minimum of one credit has been achieved. Surface water run off- Two credits have been achieved.	1	1	Credit expected to be achieved based on current targets. Credit(s) targeted.	SEW & AKT II
Wst 06 Design for disassembly and adaptability	One credit - Design for disassembly and functional adaptability - recommendations Where evidence provided demonstrates that the design team conducts a study to explore the ease of disassembly and the functional adaptation potential of different design scenarios. Recommendations are required to be developed at the concept design stage.	1	1	STAGE 2 ACTION A functional adaptability report is required for the project that identifies how the development can be adapted for future use. The report should be undertaken now. Provide:	SEW & AKT II

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
				- Design for disassembly and functional adaptability - Evidence of how the recommendations from the report have been developed and implemented Credit(s) targeted.	
	One credit - Disassembly and functional adaptability – implementation Provide an update, during Technical Design, on: – 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. – Changes to the recommendations and solutions during the development of the Technical Design. Produce a building adaptability and disassembly guide to communicate the characteristics allowing functional adaptability and disassembly to prospective tenants.	1	1	STAGE 4 ACTION INCLUDE WITHIN ER DOCUMENTATION Anticipated that the report recommendations can be incorporated into the design. In order to achieve this credit, the recommendations of the Design for Disassembly and adaptability strategy is required to be embodied within the building design. Provide: - Evidence of how the recommendations from the report have been developed and implemented Credit(s) targeted.	SEW & AKT II
Land Use and Ecology					
LE 01 Site selection	First credit - Previously occupied land: Where evidence is provided to demonstrate that at least 75% of the proposed development's footprint is on an area of land which has previously been developed for use by industrial, commercial or domestic purposes in the last 50 years.	1	1	STAGE 4 ACTION Site Investigation reports to be provided that identify that the project has been at least 75% by areas previously developed. Site investigation report is required in order to identify that the project site has been at least 75% by area, previously developed. Provide: - A pre-development and post-development site plans (marked-up where required) to demonstrate the percentage of the site area that was previously developed. Credit(s) targeted.	SEW
	Second credit - Contaminated land: – Where evidence provided demonstrates that the site is significantly contaminated as confirmed by a contaminated land specialist's site investigation, risk assessment and appraisal. The client or principal contractor must confirm that remediation of the site will be carried out in accordance with the remediation strategy and its implementation plan.	1	1	STAGE 2-3 ACTION Site Ground Investigation Report and Contamination report to identify the level of contamination at the site and the remediation required/undertaken. It was commented in	Contamination Specialist

<table>
<tr><th rowspan="2">Issue</th><th rowspan="2">Credit Requirements</th><th colspan="2">Credits</th><th rowspan="2">Comments / Actions</th><th rowspan="2">Responsible Team Member</th></tr>
<tr><th>Available</th><th>Targeted (Potential)</th></tr>
<tr><td></td><td></td><td></td><td></td><td>the workshop that the site is likely to be contaminated and will need remediating therefore the credit is targeted.

Credit(s) targeted.</td><td></td></tr>
<tr><td>LE 02
Identifying and understanding the risks and opportunities for the project</td><td>Pre-requisite - Assessment route selection
An assessment route for the project has been determined using BREEAM Guidance Note GN34 BREEAM Ecological Risk Evaluation Checklist.

The client or contractor confirms compliance will be and is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.

Up to two credits
Depending on the route for compliance taken the following number of credits are available.

<table>
<tr><th></th><th>Project team member route (Route 1)</th><th>Ecologist route (Route 2</th></tr>
<tr><td>Survey and evaluation</td><td rowspan="2">1 credit</td><td>1 credit</td></tr>
<tr><td>Determining the ecological outcomes for the site</td><td>1 credit</td></tr>
</table>

Survey and evaluation
Route 1
Completion of the BREEAM Ecological Risk Evaluation Checklist indicates Assessment route 1 can be used as the assessment

Route 2
– An appropriate individual is appointed at a project stage that ensures early involvement in site configuration and, where necessary, can influence strategic planning decisions.
– Prior to the completion of the preparation and brief, an appropriate level of survey and evaluation:
– 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:
  – Current and potential ecological value and condition of the site, and related areas within the zone of influence.
  – Direct and indirect risks to current ecological value
  – Capacity and feasibility for enhancement of the ecological value of the site and, where relevant, areas within the zone of influence.
– Data are collated and shared with project team to inform the site preparation, design or construction works.

Determining the ecological outcomes for the site (Routes 1 and 2)
– Survey and evaluation criteria (criteria 3–6 above) relevant to the chosen route have been achieved.
– 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.
– 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:
  – avoidance</td><td>2</td><td>2</td><td>STAGE 2 ACTION
Survey and evaluation:
A Suitably Qualified Ecologist should be appointed to undertake a site survey as soon as possible.

The project team are to collaborate with the Ecologist and stakeholders to agree the optimal ecological outcomes for the site. Evidence of this collaboration should be provided.

Credit(s) targeted.

Determining ecological outcomes:
An ecology report should be produced in accordance with the BREEAM reporting requirements (GN40 reporting proforma can be used) been provided which confirms a site survey was conducted at an appropriate time. Time-critical action for Stage 2 complete.

Provide:
- Ecology report (or complete GN40 with supporting evidence) confirming that measures have been implemented that enhance ecological value.
- Evidence of collaboration between the project team and representative stakeholders at an early stage to influence key planning decisions
- Evidence of identify the optimal ecological outcomes for the site and appraisal of these in line with the mitigation hierarchy of action
Credit(s) targeted.</td><td>Urban Green / SEW (landscapes)</td></tr>
</table>

<table>
<tr><th rowspan="2">Issue</th><th rowspan="2">Credit Requirements</th><th colspan="2">Credits</th><th rowspan="2">Comments / Actions</th><th rowspan="2">Responsible Team Member</th></tr>
<tr><th>Available</th><th>Targeted (Potential)</th></tr>
<tr><td></td><td>– protection
– reduction or limitation of negative impacts
– on site compensation and,
– enhancement, considering the capacity and feasibility within the site, or where viable, off-site.
– Following this the optimal ecological outcome for the site is selected after liaising with representative stakeholders and the project team.</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>Exemplary level criteria
Determine the ecological outcomes for the site (sustainability-related activities)
When determining the optimal ecological outcome for the site consider, in addition to those outlined above, the wider site sustainability-related activities and the potential for ecosystem service related benefits.</td><td>1</td><td>0</td><td>Credit not currently targeted</td><td></td></tr>
<tr><td>LE 03
Managing negative impacts on ecology</td><td>Pre-requisite – Identification and understanding the risks and opportunities for the site
– 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

– LE02 has been achieved

<table><tr><th></th><th>Project team member route (Route 1)</th><th>Ecologist Route (Route 2)</th></tr><tr><td>Planning, liaison and implementation</td><td>1 credit</td><td>1 credit</td></tr><tr><td>Managing negative impacts of the project (limitation or compensation)</td><td>1 credit</td><td>1 or 2 credits</td></tr></table>
One credit – Planning, liaison, implementation and data
– 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.
– Site preparation and construction works have been planned for and are implemented at an early project stage to optimise benefits and outputs.
– The project team liaising and collaborating with representative stakeholders, taking into consideration data collated and shared, have implemented solutions, and measures have been selected

Up to two credits – Managing negative impacts of the project
Route 1 (one credit)
Negative impacts from site preparation and construction works have been managed according to the hierarchy and no net impact has resulted.

Route 2 (up to two credits)
Negative impacts from site preparation and construction works have been managed according to the hierarchy:

For sites where complex ecological systems are likely to be present) and either:
– No overall loss of ecological value has occurred (2 credits) OR,

– The loss of ecological value has been limited as far as possible (1 credit)</td><td>3</td><td>3</td><td>STAGE 2-4 ACTION
Planning, liaison and implementation:
Following determination of the potential outcomes for the site, roles and responsibilities are allocated in order to define who has responsibility and contributions in order to achieve the outcomes are required to be set.

Provide:
- Evidence that 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.
- Evidence of further planning to avoid and manage negative ecological impacts on-site between the design team, ecologist and any relevant stakeholders.
- Written confirmation / evidence that on-site measures to mitigate negative ecological impacts are being implemented.

Credit(s) targeted.

Managing negative impacts:
Further credits are available for mitigation or reduction of negative impacts on ecology. One credit is achieved for minor reduction in ecological value, with two credits available for no negative impact in the ecological value of the site.</td><td>Urban Green / SEW (landscapes)</td></tr>
</table>

<table>
<tr><th rowspan="2">Issue</th><th rowspan="2">Credit Requirements</th><th colspan="2">Credits</th><th rowspan="2">Comments / Actions</th><th rowspan="2">Responsible Team Member</th></tr>
<tr><th>Available</th><th>Targeted (Potential)</th></tr>
<tr><td></td><td></td><td></td><td></td><td>Credit(s) targeted.</td><td></td></tr>
<tr><td>LE 04
Change and enhancement of ecological value</td><td>Pre-requisite - Identifying and understanding the risks and opportunities for the project
– LE 03 has been achieved. Including the following, specific to the aims of this issue:
  – Roles and responsibilities have been clearly defined, allocated and implemented to support successful delivery of project outcomes
  – 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.

– The client or contractor confirms compliance is monitored against all relevant UK, EU or international legislation relating to the ecology of the site.

<table>
<tr><th></th><th>Project team member route (Route 1)</th><th>Ecologist route (Route 2)</th></tr>
<tr><td>Liaison, implementation and data</td><td>N/A</td><td>1 credit</td></tr>
<tr><td>Enhancement of ecology</td><td>1 credit</td><td>up to 3 credits</td></tr>
</table>

Route 1
One credit - Enhancement of ecology
– 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.
– Data collated is provided to the local environmental records centres nearest to, or relevant for, the site.

Route 2
One credit - Liaison, implementation and data collation
– 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:
  – On site, and where this is not feasible,
  – Off site within the zone of influence.

Up to three credits - Enhancement of ecology
– 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 Issues</td><td>4</td><td>3</td><td>Route 2 - Liaison, implementation and data collection:
Further to the limiting of ecological damage identified as part of LE03, the design will be assessed by the ecologist to identify to what extent the ecology of the site is enhanced, or where site enhancement is not possible to what extent offsite enhancement of associated habitats is possible.

Where enhancement is identified and quantified, further credits are potentially available.

Provide:
- Ecology report (or complete GN40 with supporting evidence) confirming that measures have been implemented that enhance ecological value.
- Ecological value calculations for the pre-developed and post-developed sites.

Credit(s) targeted.

Route 2 - Enhancement of ecology:
Further to the limiting of ecological damage identified as part of LE03, the design will be assessed by the ecologist to identify to what extent the ecology of the site is enhanced, or where site enhancement is not possible to what extent offsite enhancement of associated habitats is possible.

Where enhancement is identified and quantified, further credits are potentially available.

Credit(s) targeted.</td><td>Urban Green / SEW (landscapes) / Contractor</td></tr>
<tr><td>LE 05
Long term ecology management and maintenance</td><td>Pre-requisite - Roles and responsibilities, implementation, statutory obligations
– 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.
– Where pursued, LE 04 has been achieved, including the following specific aims of this issue:</td><td>2</td><td>2</td><td>STAGE 2-4 ACTION
INCLUDE WITHIN ER DOCUMENTATION
Ecology report to be commissioned/provided in order to consider how this credit can be approached.</td><td>Urban Green & Contractor</td></tr>
</table>

<table>
<tr><th rowspan="2">Issue</th><th rowspan="2">Credit Requirements</th><th colspan="2">Credits</th><th rowspan="2">Comments / Actions</th><th rowspan="2">Responsible Team Member</th></tr>
<tr><th>Available</th><th>Targeted (Potential)</th></tr>
<tr><td></td><td>
– Roles and responsibilities have been clearly defined, allocated and implemented to support successful delivery of project outcomes.
– 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.

Up to two credits are available depending on the route selected.

One credit - Planning, liaison, data, monitoring and review management and maintenance
<table>
<tr><th></th><th>Project team member route (Route 1)</th><th>Ecologist route (Route 2)</th></tr>
<tr><td>Liaison, monitoring implementation and evolving management and maintenance solutions</td><td rowspan="2">1 credit</td><td>1 credit</td></tr>
<tr><td>Landscape and habitat management plan</td><td>1 credit</td></tr>
</table>
One credit - Planning, liaison, data, monitoring and review management and maintenance
– The project team liaise and collaborate with representative stakeholders, taking into consideration data collated and shared, on solutions and measures implemented to:
  – monitor and review implementation and the effectiveness
  – develop and review management and maintenance solutions, actions or measures.
– In support of the above and to help ensure their continued relevance over the period of the project the following should be considered:
  – Monitoring and reporting of on the ecological outcomes for site implemented at the design and construction stage
  – Monitoring and reporting of outcomes and successes from the project
  – Arrangements for the ongoing management of landscape and habitat connected to the project (on and, where relevant, off site)
  – Maintaining the ecological value of the site and its relationship or connection to its zone of influence
  – Maintaining the site in line with the any sustainability linked activities, e.g. ecosystems benefits (LE 02).
  – Remedial or other management actions are carried out which relate to those identified in LE 02, LE 03 and LE 04.
– 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.
One credit - Landscape and ecology management plan (or similar) development
– 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:
  – Actions and responsibilities, prior to handover, to give to relevant individuals
  – The ecological value and condition of the site over the development life.
  – Identification of opportunities for ongoing alignment with activities external to the development project and which supports the aims of BREEAM's Strategic Ecology Framework
  – Identification and guidance s to trigger appropriate remedial actions to address previously unforeseen impacts
  – Clearly defined and allocated roles and responsibilities.
– The landscape and management plan or similar is updated as appropriate to support maintenance of the ecological value of the site.
</td><td></td><td></td><td>Credit(s) targeted.</td><td></td></tr>
</table>

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
Pollution					
Pol 01 Impact of refrigerants	Pre-requisite: All systems (with electronic compressors) must comply with the requirements of BS EN 378:2008, and where refrigeration systems containing ammonia are installed, they must comply with the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice. Three credits: No refrigerant Where evidence provided demonstrates that the building does not require the use of refrigerant within its building services or plant. Two credits: DELC Where evidence provided demonstrates that the systems specified using refrigerants have Direct Effect Life Cycle CO_2 equivalent emissions (DELC CO_{2e}) of ≤100 $kgCO_{2e}$/kW cooling/heating capacity. OR Where air-conditioning or refrigeration systems are installed the refrigerants used have a Global Warming Potential (GWP) ≤10. One credit: Where evidence provided demonstrates that the systems using refrigerants have Direct Effect Life Cycle CO_2 equivalent emissions of (DELC CO_{2e}) of ≤1000 $kgCO_{2e}$/kW cooling/heating capacity.	2	1 (+1)	No refrigerant use credits: Credits not applicable to assessment type DELC credit(s): STAGE 4 ACTION INCLUDE WITHIN ER DOCUMENTATION These requirements are to be included within the Employer's Requirements Preliminaries and MEP documentation. Provide: - Written confirmation and manufacturer datasheet of the relevant refrigeration type confirming refrigerant charge (kg) and system information, if applicable: a. Refrigerant Recovery Efficiency factor (%) b. Annual Leakage Rate (units: % refrigerant charge) c. Annual Purge Release factor (% Refrigerant charge) d. Annual Service Release (% Refrigerant charge) e. Probability factor for catastrophic failure (% refrigerant charge loss/year) f. Global Warming Potential of refrigerant g. Cooling capacity (kW) One credit(s) targeted with one additional credit identified as 'potential'.	Hoare Lea (MEP)
	One credit: Refrigerant leak detection Where evidence provided demonstrates that the systems using refrigerants have a permanent automated refrigerant leak detection system installed, capable of automatically isolating and containing the remaining refrigerant(s) charge in response to a leak detection incident.	1	1	STAGE 4 ACTION INCLUDE WITHIN ER DOCUMENTATION These requirements are to be included within the Employer's Requirements Preliminaries and MEP documentation. A leak detection system should be considered for inclusion within the MEP strategy. Please note that this leak detection system refers to a leak to atmosphere, not a	Hoare Lea (MEP)

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
				leak within spaces within the proposed building as required by BS EN 378. Provide: - Specification confirming inclusion of refrigerant leak detection and containment system as per the BREEAM Criteria column. Credit(s) targeted.	
Pol 02 Local air quality	Up to two credits: All heating and hot water is supplied by non-combustion systems. For example, only powered by electricity OR alternatively; 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 within the BREEAM Criteria document. 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 and Table 12.5 within the BREEAM. Emissions from all installed combustion plant that provide space heating and domestic hot water are required to not exceed the levels set in Table 1.21 and Table 1.22 within the BREEAM criteria.	2	2	STAGE 4 ACTION INCLUDE WITHIN ER DOCUMENTATION These requirements are to be included within the Employer's Requirements Preliminaries and MEP documentation. It is currently understood that the building services design has an all electric design and as a result, there will be no local NOx emissions. With no local emissions, the credits will be achieved. Credit(s) targeted.	Hoare Lea (MEP)
Pol 03 Surface water run off	Pre-requisite An appropriate consultant is appointed to carry out and demonstrate the development's compliance with all criteria. Part 1: Flood resilience (Up to Two credits) Two credits - Low flood risk: 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. These sources include: – Fluvial (rivers) – Tidal – Surface water: sheet run-off from adjacent land (urban or rural) – Groundwater: most common in low-lying areas underlain by permeable rock (aquifers) – Sewers: combined, foul or surface water sewers – Reservoirs, canals and other artificial sources One credit - Medium/high flood risk: Where evidence provided demonstrates that the assessed development is located in a zone defined as having a medium or high annual probability of flooding AND the ground level of the building, car parking and access is at least 600mm above the design flood level of the flood zone for the site's location OR 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	2	2	STAGE 2-3 ACTION A Flood Risk Assessment is required to be provided/commissioned that identifies the site's flood risk. It is currently anticipated that there is a low risk at the site. It was commented in the workshop that a FRA has yet to be completed but the site is raised by 8m from the river and therefore it could potentially be deemed as 'low' risk. To be confirmed by FRA. Provide: - A site-specific FRA confirming flood risk from all sources of flooding. - CV confirming the drainage consultant meets the BRE's definition of suitably qualified. Credit(s) targeted.	AKT II

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		

	Part 2: Surface water run-off
	Pre-requisite:
	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.
	
	First credit:
	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, including allowance for climate change.
	
	Additionally, relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SUDs are in place.
	
	Second credit:
	Where evidence provided demonstrates that the consultant has confirmed that there is no risk of flooding of property in the event of a local drainage system failure, AND
	
	EITHER
	– 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, including an allowance for climate change.
	– Any additional predicted volume of run-off for the 100-year 6-hour event must be prevented from leaving the site by using infiltration or other Surface Drainage System (SUDs) techniques
	
	OR (only where criterion no. 9 or 10 for this credit cannot be achieved)
	
	– 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.
	– The post development peak rate of run-off is reduced to a limiting discharge. The limiting discharge is defined as the highest flow rate from the following options:
	  – The pre-development one-year peak flow rate
	  – The mean annual flow rate (Qbar)
	  – 2L/s/ha.
		2	2	STAGE 3-4 ACTION
				First credit:
				The surface water runoff rate is not currently likely to be achieved as a 30% runoff rate reduction is required. The runoff volume credit may be possible to be achieved as the site appears to be currently covered by impermeable surfaces.
				
				Provide:
				- Drainage consultant's report/ calculations/ specification confirming:
				  a. Type and storage volume (l) of the drainage measures
				  b. Total area of hard surfaces (m2)
				  c. Peak/Volume flow rates (l/s) pre and post development for the return period events and discharge rates
				  d. Additional allowance for climate change designed into the system
				  e. Impact on the building of flooding from local drainage system failure
				  f. specification of SuDS and pollution measures for high risk areas as applicable.
				- CV confirming the drainage consultant meets the BRE's definition of suitably qualified.
				
				Credit(s) targeted.
				
				Second credit:
				The surface water runoff rate is not currently likely to be achieved as a 30% runoff rate reduction is required. The runoff volume credit may be possible to be achieved as the site appears to be currently covered by impermeable surfaces.
				
				Provide:
				See above.
				
				Credit(s) targeted.
					AKT II

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
	Part 3: Minimising watercourse pollution One credit: Where evidence provided demonstrates that the following water course pollution prevention measures are covered: – Appropriate Consultant confirms that there will be no discharge from the developed site for rainfall up to 5mm. – Specification of Sustainable Drainage Systems (SUDs) or source control systems such as permeable surfaces or infiltration trenches – Specification of oil/petrol separators (or equivalent system) in surface water drainage systems, where there is a high risk of contamination or spillage of substances – Chemical or liquid gas storage areas have a means of containment fitted to the site drainage system – All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as the SUDS manual 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. – A comprehensive and up-to-date drainage plan of the site will be made available for the building/site occupiers. – Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SUDS must be in place. – All external storage and delivery areas are designed and detailed in accordance with the current best practice planning guidance	1	0	This credit is not likely to be achieved as there are unlikely to be soakaways dealing with rainwater events. Credit(s) not currently targeted.	AKT II
Pol 04 Reduction in night time light pollution	One credit: Where evidence provided demonstrates that the lighting system has been designed in accordance with the following requirements: – The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the ILE Guidance notes for the reduction of obtrusive light, 2011. – All external lighting (except for safety and security lighting) can be automatically switched off between 2300hrs and 0700hrs. This can be achieved by providing a timer for all external lighting set to the appropriate hours. – If safety or security lighting is provided and will be used between 2300hrs and 0700hrs, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILE's Guidance notes, for example by using an automatic switch to reduce the lighting levels at 2300 or earlier. – Illuminated advertisements, where specified, must be designed in compliance with ILE Technical Report 5 – The Brightness of Illuminated Advertisements.	1	1	STAGE 4 ACTION INCLUDE WITHIN ER DOCUMENTATION To be included within the Employer's Requirements Preliminaries and MEP documentation. The external lighting design will be able to be designed in such a way that it reduces the instances of night pollution. Provide: - Specification confirming compliance with the ILP Guidance notes for the reduction of obtrusive light, 2011 and inclusion of controls to automatically switch off lighting between 23:00 and 07:00 hours. Credit(s) targeted.	Hoare Lea (MEP)
Pol 05 Reduction of noise pollution	One credit: Where evidence provided demonstrates that there is either no noise-sensitive areas or buildings within 800m radius of the assessed development OR Where there are or will be noise-sensitive areas or buildings within 800m radius of the assessed development a noise impact assessment in compliance with BS 4142:2014 has been carried out and the following noise levels measured/determined: – Existing background noise levels at the nearest or most exposed noise-sensitive development to the proposed development or at a location where background condition can be argued to be similar. – The noise level from the proposed site/building, as measured in the locality of the nearest or most exposed noise-sensitive development must be at least 5dB lower than background noise levels during day and night.	1	1	STAGE 2-3 ACTION INCLUDE WITHIN ER DOCUMENTATION Noise Impact assessment to be undertaken for the site identifying that building services noise will be limited in line with background noise levels. Provide: - Noise impact assessment - Acoustician's accreditation details - Written confirmation that any recommendations made by the Acoustician	Hoare Lea (Acoustics) / Hoare Lea (MEP)

Issue	Credit Requirements	Credits		Comments / Actions	Responsible Team Member
		Available	Targeted (Potential)		
				will be implemented into the design to ensure the final building is compliant with the relevant standards Credit(s) targeted.	
Innovation					
Exemplary credits summary	Exemplary credits Up to a maximum of ten credits are available: Where the building demonstrates exemplary performance by meeting defined exemplary level performance criteria in one or more of following BREEAM assessment issues: – Man 03 Responsible construction practices – Hea 01 Visual comfort – Hea 02 Indoor air quality – Ene 01 Reduction of energy use and carbon emissions – Wat 01 Water consumption – Mat 01 Environmental impacts from construction products - Building life cycle assessment (LCA) – Mat 03 Responsible sourcing of construction products – Wst 01 Construction waste management – Wst 02 Use of recycled and sustainably sourced aggregates – Wst 05 Adaptation to climate change One innovation credit can be awarded for each individual BREEAM issue exemplary performance level complied with. Approved Innovations One innovation credit can be awarded for each innovation application approved by BRE Global, where the building complies with the criteria defined within an Approved Innovation application form.	10	3 (+2)	The following exemplary level credits have included in the BREEAM target strategy: – MAN03-06 Considerate Construction – MAT01 Building Life Cycle assessment - Third party verification – WST05 Responding to Climate Change The following exemplary level credits have included in the BREEAM potential strategy: – MAN03-06 Considerate Construction – HEA06-02 Security of the Site and Building – MAT01 Building Life Cycle assessment - Third party verification – WST01 Resource Management Plan – WST05 Responding to Climate Change	Contractor & SEW

7. Appendix C: Credit Weightings BREEAM 2018

The weightings for the associated credits depending on the assessment route are shown in Table D1 below.

Section	Section Weighting			No. of credits available	Value of Each Credit
	Fully-fitted	Shell only	Shell and core	Shell and core	
Management	11.0%	12.0%	11.0%	18	0.61%
Health and Wellbeing	14.0%	7.0%	8.0%	11	0.73%
Energy	16.0%	9.5%	14.0%	21	0.67%
Transport	10.0%	14.5%	11.5.0%	12	0.96%
Water	7.0%	2.0%	7.0%	9	0.78%
Materials	15.0%	22.0%	17.5%	14	1.25%
Waste	6.0%	8.0%	7.0%	11	0.64%
Land Use and Ecology	13.0%	19.0%	15.0%	13	1.15%
Pollution	8.0%	6.0%	9.0%	12	0.75%
Innovation	10.0%	10.0%	10.0%	10	1.00%

Table D1: BREEAM Credit Weightings

HOARE LEA

VANESSA WALL
PRINCIPAL SUSTAINABILITY CONSULTANT

+44 161 672 7125
vanessawall@hoarelea.com

HOARELEA.COM

Royal Exchange
Manchester
M2 7FL
England