Sustainability & Energy Statement

Ladybarn Apartments, Manchester

Prepared for
Bluesky Student Ladybarn House Ltd
August 2024

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EXECUTIVE SUMMARY

1. This Sustainability and Energy Statement, has been prepared by MEP Concepts Ltd on behalf of Bluesky Student Ladybarn House Ltd, (The Applicant) and is submitted in support of a full planning application for the proposed student accommodation block within the Ladybarn site in Manchester.

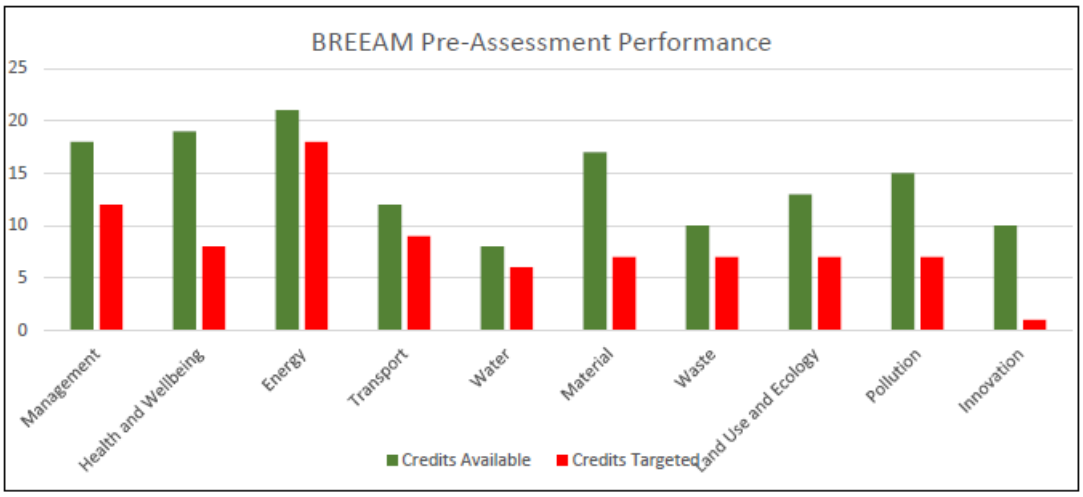
2. The proposed scheme includes 36 new student studio apartments with communal areas split across three floors.

3. The primary purpose of this document is to explain how the scheme will be developed to meet the national & local Council's planning polices as well as Building Regulation requirements.

1.1 Through the use of the measures set out within the following sections the scheme has been demonstrated to be in compliance with the national, local and regulatory planning requirements as set out within section 3.

Sustainability

1.2 The scheme is targeting a BREEAM rating of Very Good, the figure below summarises the credits being targeted.



1.3 The following are the key sustainability measures which are being proposed for the scheme.

- The project will be registered with the Considerate Constructors Scheme and the contractor will be required to follow best practices for environmental management, responsible product sourcing and labour;
- Targets will be set for resource efficiency and diversion from landfill;

- All new materials will come from responsible sources, with manufacturers to hold an ISO 14001 certificate as minimum;
- A commissioning programme will be established by the incoming tenant and all building services will be commissioned in line with CIBSE & BSRIA guidelines;
- All lighting will be designed to avoid light spillage using high efficiency LED lighting;
- Water efficiency measures within the building; restrictors on all taps/appliances to reduce consumption.
- No gas will be used on site.
- Sub metering will be provided on electrical and water supplies;

Energy

1.4 The proposed works have been demonstrated to meet with the relevant targets in line with Manchester City Council's planning policy.

1.5 The scheme will incorporate the following measures to minimise energy usage and associated carbon emissions:

- High efficiency thermal elements;
- High efficient domestic hot water via ASHP;
- High efficient heating & cooling via VRF systems;
- High efficiency ventilation with heat recovery;
- High efficacy lighting with automatic controls where possible;
- Incorporation of PV at roof level;
- Fully electrified to enable benefit of electrical supply decarbonisation.

1.6 With the incorporation of the above measures for the extension portion the scheme is able to achieve a 100% reduction over the Part L 2021 targets.

CO_2 Emission Rate	$kgCO_2/M^2$	Savings over base
Target Emission Rate (TER)	4.13	
Building Emission Rate (BER)	-0.01	100%
Primary Energy Rate	**kWh/M^2**	**Savings over base**
Target Primary Energy Rate (TPER)	44.54	
Building Primary Energy Rate (BPER)	-2.98	107%

2. INTRODUCTION

2.1 MEP Concepts is a dynamic building services, energy, and sustainability consultancy, dedicated to providing strategic and technical advice to clients through all phases of planning and development.

2.2 MEP Concepts has been appointed by Bluesky Student Ladybarn House Ltd (the Applicant) to produce an Sustainability and Energy Statement in support of a full planning application for the the proposed student accommodation block within the Ladybarn site in Manchester.

Scope

2.3 The primary purpose of this statement is to explain how best practice sustainable design and construction measures would be incorporated in the proposed development to ensure alignment with local planning policy.

2.4 The proposed development involves the erection of a new student accommodation block within the existing Ladybarn site to create an additional 36 student studio apartments and amenity spaces.

2.5 This statement is structured as follows:

- The remainder of this section provides a description of the site and the development proposals;
- Section 2 provides a description of the main sustainability and energy policies relevant to the application;
- Section 3 assesses the Sustainability measures presented by the proposed solution;
- Section 4 references the Energy Statement, including measures proposed to reduce energy demand and carbon dioxide in operation;
- Section 5 provides a concluding summary.

Site Overview

Location and Existing Situation

2.6 The existing site incorporates 120 studio & 1 bedroom flats for student accommodation which is split across 4 floor which Ladybarn house. The land surrounding the accommodation is primarily car parking with external amenity space located on the eastern side.

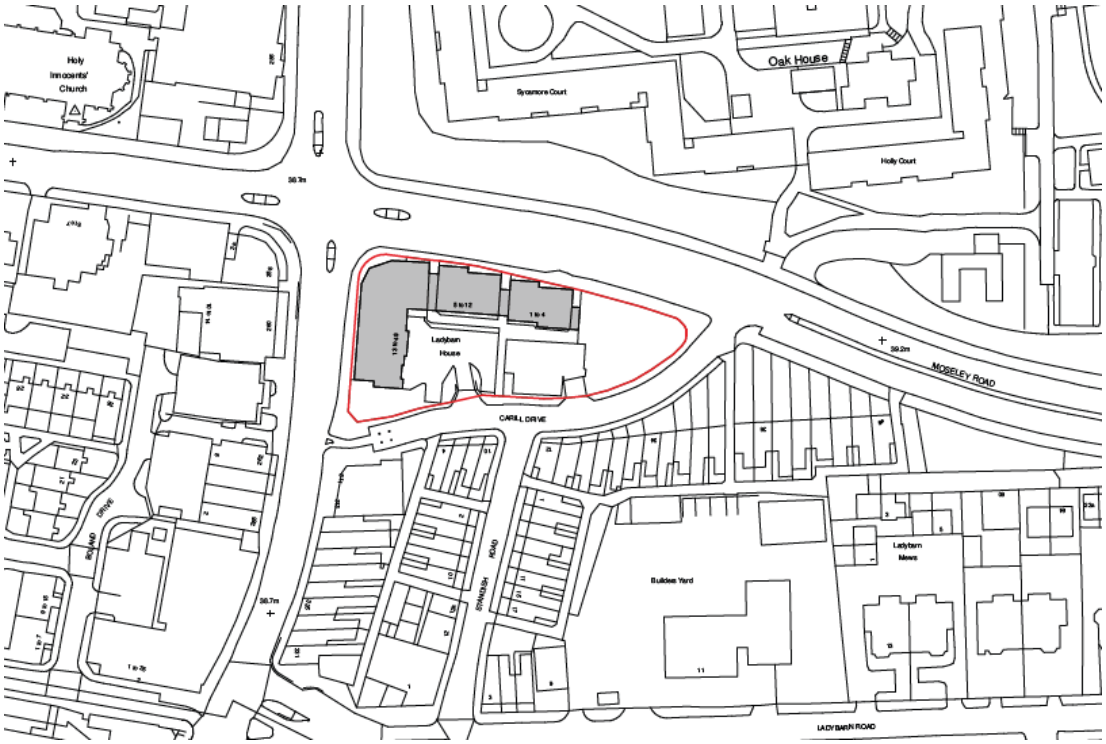


Image 1.1 – Site Location Plan

The Proposed Redevelopment

2.7 It is proposed that a quantum of the under used car parking is repurposed to enable the construction of a three storey student accommodation block to increase the sites capacity by providing 36 new high quality studios and associated common room spaces.

2.8 The scheme includes landscaping works to the existing external areas to further enhance the sites provisions.

2.9 A full description of works is provided within the Design and Access Statement.

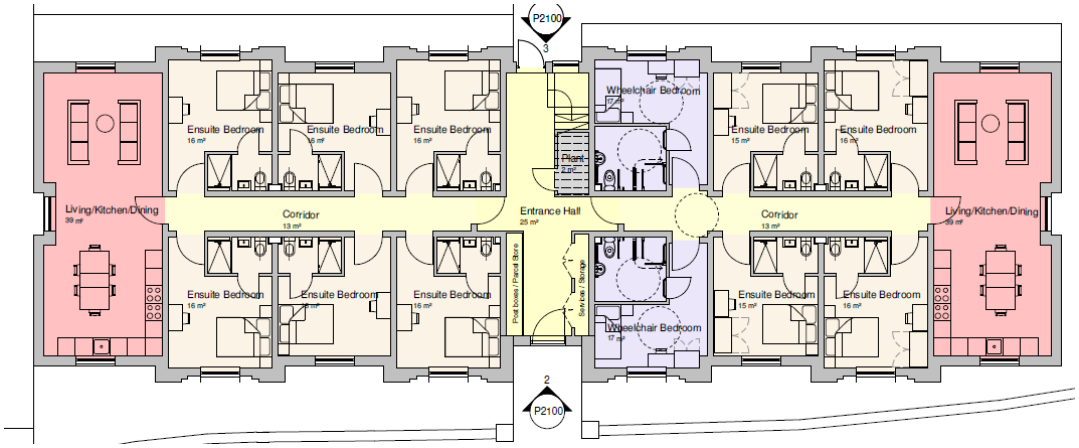


Image 1.2 – Proposed typical floor plan

3. Sustainability Policy context

3.1 Many definitions of sustainable development exist, although the common objective for all is the integration of economic, social and environmental issues to ensure a better quality of life for people today, without compromising the needs of future generations.

3.2 A key mechanism for delivering the principles of sustainable development lies within the UK planning system, which is implemented through national guidance and local planning policies. A review of all the relevant policy, regulatory and energy guidance documents was undertaken to gain an understanding of the guiding requirements for sustainability.

National Planning Policy Framework

3.3 The revised National Planning Policy Framework (NPPF) was released on 19th December 2023. This replaces the previous National Planning Policy Framework published in March 2012, revised in July 2018 and updated in February 2019 revised in July 2021 and updated in September 2023. It sets out the framework for all planning policy in England and how these policies are expected to be applied. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs. At a similarly high level, members of the United Nations – including the United Kingdom – have agreed to pursue the 17 Global Goals for Sustainable Development in the period to 2030. These address social progress, economic well-being and environmental protection.

3.4 The NPPF sets out a presumption in favour of sustainable development, and the need to support economic growth through the planning system. Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):

- An economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;
- A social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and

- An environmental objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.
- Planning plays a key role in helping shape places to radical reductions in greenhouse gas emissions, minimising vulnerability and providing resilience to the impacts of climate change, and supporting the delivery of renewable and low carbon energy and associated infrastructure. This is central to the economic, social and environmental dimensions of sustainable development. The NPPF does not include detailed measures on sustainable design codes and standards to apply, although expects that when setting any local requirement for a building's sustainability, local planning authorities should do so in a way consistent with the national technical standards.

Manchester City Council – Core Strategy Plan 2012 to 2027

3.5 The following provides excerpts of the councils current planning policy, as identified within the Core strategy, that are relevant to the Sustainability & Energy statement for the development.

Policy EN 4: Reducing CO_2 Emissions by enabling Low and Zero Carbon Developments

3.6 The Council will seek to reduce fuel poverty and decouple growth in the economy, growth in CO_2 emissions, and rising fossil fuel prices, through the following actions:

3.7 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

3.8 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.

3.9 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.

3.10 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.

3.11 The use of building materials with low embodied carbon in new development and refurbishment schemes.

Policy EN 6: Target Framework for CO_2 reductions from low or zero carbon energy supplies

3.12 Applications for residential development of 10 or more units and all other development over 1,000m^2 will be expected as a minimum to meet the target shown in Tables 12.1 or 12.2, unless this can be shown not to be viable. This should be demonstrated through an energy statement, submitted as part of the Design and Access Statement. Such a statement will be expected to set out the projected regulated energy demand and associated CO_2 emissions for all phases of the development.

3.13 Developments smaller than the above threshold, but involving the erection of a building or substantial improvement to an existing building will also be expected to meet the minimum target, where viable, but will not be expected to submit an energy statement.

The target framework relates to three broad development locations and their potential for low and zero carbon, decentralised energy. The areas are defined as follows

- Target 1 Network development areas: Locations where the proximity of new and existing buildings, the mix of uses and density of development provide the right conditions to support district heating (and cooling).
- Target 2 Electricity intense areas: Locations where the predominant building type has an all electric fit-out such as retail units and leisure complexes.
- Target 3 Micro-generation areas: Locations where lower densities and a fragmented mix of uses tend to mean that only building scale solutions are practical.

Policy EN 8 Adaptation to Climate Change

3.14 All new development will be expected to be adaptable to climate change in terms of the design, layout, siting and function of both buildings and associated external spaces. In achieving developments which are adaptable to climate change developers should have regard to the following, although this is not an exhaustive list:

- Minimisation of flood risk by appropriate siting, drainage, and treatment of surface areas to ensure rain water permeability.
- Reduction in urban heat island effect through the use of green Infrastructure such as green roofs, green walls, increased tree cover and waterways.
- The need to control overheating of buildings through passive design.
- The opportunity to provide linked and diverse green space to enhance natural habitats which will assist species adaptation.

3.15 Developers will be permitted to use green infrastructure elements such as green roofs, green walls, street trees and waterways to contribute to compliance with CO_2 mitigation under Policy EN6, subject to sufficient evidence to quantify their contribution to compliance.

Part L Building Regulations 2021

3.16 The document applicable to this scheme is Part L2: Conservation of fuel and power (buildings other than dwellings).

3.17 All new elements will be designed to be inline with the relevant requirements for new buildings other than dwellings.

Summary of Policy Targets

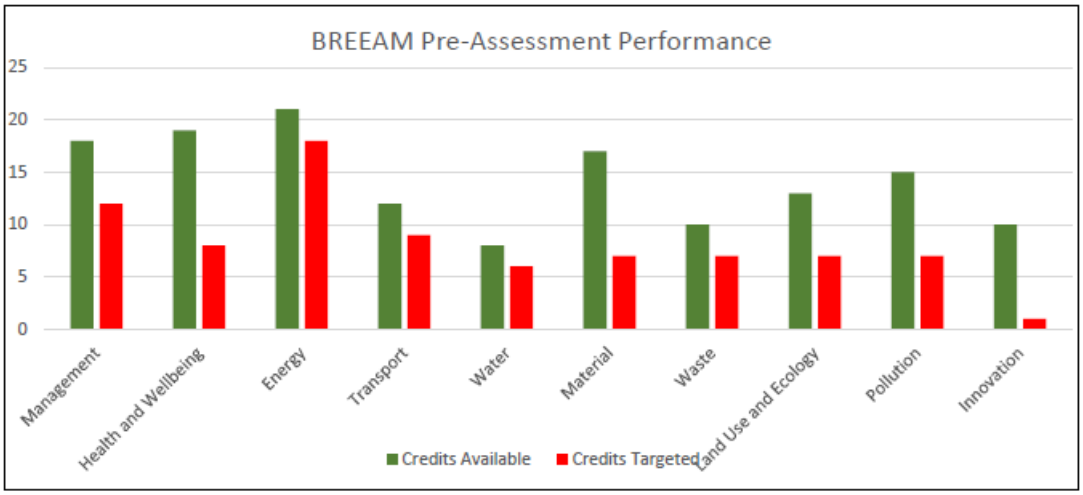
3.18 Therefore, the targets to be met by this development are;

- To follow the energy and heating/cooling hierarchies when developing the Energy Strategy for the development;
- Maximise on site carbon savings through efficient design measures and low carbon generation; the building will exceed the current 2021 building regulations targets.
- Achieve BREEAM 'Very Good' rating

4. SUSTAINABILITY

4.1 This section summaries the sustainable strategies being implemented within the scheme. The scheme is targeting a BREEAM rating of Very Good measured against the New Construction 6.1 BREEAM Version.

4.2 This section outlines the key sustainability measures being targeted within the scheme, the full pre-assessment can be found in appendix I. The following summaries the current credits being targeted.



4.3 The following table outline the credits being targeted, for a full breakdown refer to the pre-assessment in appendix I.

Section	Description	Credits targeted
Man 01a	Project Delivery Planning	1
Man 02a	Elemental Life Cycle Costs	2
Man 02b	Component Level LCC options appraisal	1
Man 02c	Capital Cost Reporting	1
Man 03a	Prerequisite	Met
Man 03b	Environmental Management	1
Man 03h	Transport of construction material and waste	1
Man 04a	Commissioning – testing and schedule and responsibilities	1
Man 04b	Commissioning – design and preparation	1
Man 04d	Handover	1
Man 05a	Aftercare support	1
Man 05b	Commissioning – implementation	1
Man	Total Credits	12 of 18

Hea 01d	Internal and external lighting level, zoning and control	1
Hea 02c	Emissions from construction products	1 of 2
Hea 04a	Thermal Modelling	1
Hea 04b	Design for future thermal comfort	1
Hea 04c	Thermal zoning and controls	1
Hea 05a	Acoustic performance (residential institutions)	2 of 4
Hea 07b	Outside Space	1
Hea	Total Credits	8 of 22
Ene 01a	Energy Performance	8 of 9
Ene 02a	Sub metering of end-use categories	1
Ene 01b	Energy modelling and reporting	4
Ene 03	External Lighting	1
Ene 04c	LZC Technologies	1
Ene 08a	Energy Efficient equipment	1 of 2
Ene	Total Credits	18 of 21
Tra 01a	Transport assessment and travel plan	2 of 2
Tre 02	Prerequisite	MET
Tre 02a	Transport options implementation	6 of 10
Tre	Total Credits	8 of 12
Wat 01	Water consumption	3 of 5
Wat 02a	Water Monitoring	1
Wat 03a	Leak Detection	1
Wat 03b	Flow Control Devices	1
Wat	Total Credits	6 of 9
Mat 01a	Environmental impacts from construction products - Building life cycle assessment (LCA)	2 of 6
Mat 02a	Specification of products with a recognised environmental product declaration	1
Mat 03a	Legally harvested and traded timber	MET
Mat 03b	Enabling sustainable procurement	1
Mat 03c	Measuring responsible sourcing	1 of 3
Mat 05a	Protecting vulnerable parts of the building from damage	1
Mat 06a	Material efficiency	1
Mat	Total Credits	7 of 17
Wst 01b	Construction resource efficiency	2 of 3
Wst 01c	Diversion of resources from landfill	1
Wst 03a	Operational waste	1
Wst 05a	Resilience of structure, fabric, building services and renewables installation	1

Wst 06a	Design for disassembly and functional adaptability - recommendations	1
Wst 06b	Disassembly and functional adaptability – implementation	1
Wst	Total Credits	7 of 11
Pol 02a	Local air quality	2 of 2
Pol 03a	Prerequisite	MET
Pol 03b	Flood resilience	2 of 2
Pol 03c	Surface water run-off	1 of 2
Pol 04	Reduction of night time light pollution	1
Pol	Total Credits	6 of 17
Man 03l	Responsible Construction management	1

4.4 At this stage of the design a number of credits are being targeted which have not yet been achieved due to the level of design being undertaken, the following outlines the potential further credits which are being proposed for inclusion in order to meet the BREEAM target.

Action / Recommendation Summary						
Section	Comment	Credits Targeted	% credit value	Target Section Score %	Responsibility	Credit status
Man 01c BREEAM AP (Concept Design)	BREEAM AP, potential credits.	2	0.55	1.1	BREEAM AP	Potential credits to add
Man 03d BREEAM AP (site)	BREEAM AP, potential credits.	1	0.55	1.1	MC and BREEAM AP	Potential credits to add
Hea 02b Ventilation	Noted as Potential at this stage.	1	0.64	0.64	M&E Contractor	Potential credit to add
Ene 04a Passive design analysis	Potential credit at present. Passive design analysis to be completed for credit.	1	0.52	0.52	Consultant	Potential credits
Le 04b Change and enhancement of ecology	Information relating to planting enhancements.	3	1.08	4.32	ES /Design Team	Potential credits to add
Le 05b Management and maintenance throughout the project– Foundation and Comprehensive routes (Route 1 and Route 2)	Client to confirm if there will be a five year management plan after project completion.	1	1.08	2.16	ES /Design Team	Potential credits to add
Pol 01c Impact of refrigerant	Potential credit. GWP ≤10 or ≤1000kgC02-eq. TO be confirmed by Team.	1	0.47	0.94	M&E	Potential credits
	Potential credits	**10**		**7.60**		

Water Efficiency

4.5 Water is becoming an increasingly scarce resource, with new development generating a growing demand. To meet increased demand new water sources and associated infrastructure need to be in place.

4.6 Manchester was classified as seriously water stressed by the Secretary of state and part of the 2021 determinations. Freshwater consumption of the proposed redevelopment will be reduced through water efficiency.

4.7 The extension will incorporate water efficient fittings to reduce the water consumption, including aerated taps (also helping to reduce hot water demand), dual flush toilets, and low water consumption appliances where provided, as outlined below:

Fitting	Flow Rate
WC	4 litre dual flush
WHB Taps	2.88 litres /minute aerating taps
Kitchen Taps	4.8 litres /minute
Shower	N/A
Dishwasher	12 litres per cycle.

Table 3.3 Water fittings

Climate change and adaption

4.8 One of the key requirements for any development is that it has the ability to adapt to future changes in the environment. The phenomenon of climate change is a global problem, affecting both existing and proposed developments as well as all aspects of life on earth. Due to the complex nature of climatology, it is difficult to predict the exact course that the global climate will take, although there are a number of key trends, for example rising global temperatures, which are generally agreed upon.

4.9 There are two key approaches that can be taken with regards to climate change:

- Mitigate the factors which lead to increased climate change.
- Implement adaptation measures to enable buildings to cope with the changing climate.

4.10 Section 14 of the National Planning Policy Framework, states that development should meet the challenge of climate change by;

- a) Avoiding increased vulnerability to the range of impacts arising from climate change.
- b) Helping to reduce greenhouse gas emissions, such as through the location, orientation and design of the building.

4.11 Details on the energy-related considerations for the building have been summarised in section 5.

Waste reduction

4.12 More than 400 million tonnes of materials get delivered to building sites each year. Of these around 60 million tonnes of UK waste go straight to waste collection facilities due to inappropriate or over-ordering and damage resulting from poor storage.

4.13 The effects of construction activity on waste production are enormous. The industry produces 109m tonnes of construction waste each year (24% of total waste), of which up to 13% is delivered but unused, It produces, on average, three times more waste than all UK households combined.

4.14 Around 25 million tonnes of construction waste are disposed to landfill each year.

4.15 The works will look at the measures to specify and source materials with the least environmental impact. It also looks at the sustainable management of construction and operational waste (including the future maintenance and repairs) associated with the proposed building structure.

4.16 The following highlights measures which might be implemented to reduce construction waste.

- Minimising the overall creation of waste will reduce the quantity sent to landfill and environmental impact of the development. The Principal Contractor should aim to target the diversion of 100% of waste from landfill, with a minimum of 80% of non-demolition waste (by tonnage) and 90% of demolition waste (by tonnage).
- Damage to internal parts of the building could be minimised by considering water tightness early in the build. The careful protection of completed elements could be written into the Employers Works Information to further avoid rework and waste.
- Materials with high recycled contents should be explored and the use of suppliers who offer take-back schemes should be encouraged.
- Sufficient waste storage is being provided on site in order to allow for on Site operational waste collection.
- A series of design, construction and operational waste minimisation and management measures have therefore been considered for the building.

Transport

4.17 The proposed building will utilise the existing transport infrastructure for the site including the car park at ground level and local public transport surrounding the site.

Pollution

4.18 Pollution is the process of making land, water, air or other parts of the environment dirty, unsafe or unsuitable for use. Any substance that is not naturally found in an environment could cause environmental pollution.

4.19 A significant issue with environmental pollution is that the effects are not always immediate or completely understood, furthermore, mitigation measures are not always completely effective. The prevention of environmental pollution should therefore always be considered rather than mitigation.

4.20 It is therefore important to recognise the importance and value of incorporating pollution prevention measures into the building design, construction and operation to prevent the effects of mitigation.

4.21 The measures incorporated into the design of the building to minimise the building impact with regard to pollution on the surrounding communities and environment are as follows:

Water Pollution

4.22 While it is understood that the site is not located within a groundwater source protection zone measures will be in place during the construction phase to mitigate an risk of uncontrolled release of contaminating chemicals into the local ground and water systems.

4.23 All risks and associated recommended mitigation measures will be included within the construction plan.

Air Pollution

4.24 Measures will be implemented to limit the release of air pollutants during the construction phase to mitigate the risk on the local air quality.

4.25 All risks and associated recommended mitigation measures will be included within the construction plan.

Light Pollution

4.26 Artificial light does much to safeguard and enhance our environment at night; however, where not properly controlled, light pollution can present some physiological and ecological problems. The external lighting should therefore be designed so that it

minimises upward lighting, reduces unnecessary light pollution, energy consumption and nuisance to neighbouring properties and animals (such as bats).

4.27 All external lighting installed as part of the works will consider the impact on light pollution with lighting only being operation during occupied hours.

5. ENERGY STRATEGY

5.1 This section summarises the proposed energy strategy employed to meet the target requirements set out in section 3. The methodology used to assess the schemes performance will be outlined along with the resulting primary energy usage & carbon emissions following the incorporation of the proposed demand reduction measures, efficient supply and renewable technologies.

Assessment method

5.2 To assess the performance of the proposed building a thermal model has been developed using the approved software EDSL Tas Version 9.5.6. The figure below illustrates the geometric model which has been created using the schemes design layouts & elevations.

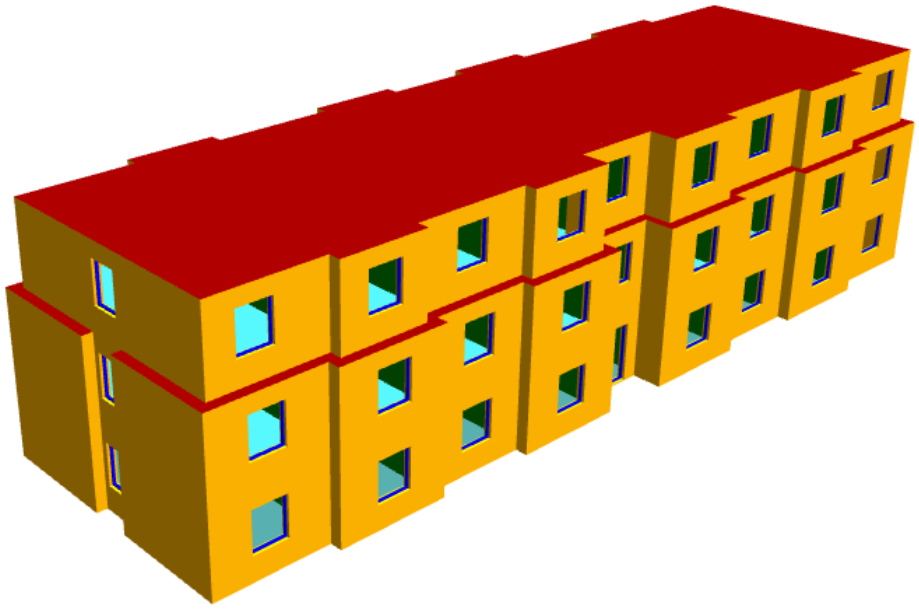


Figure 5.1 Geometric model of proposed building

Demand Reduction

5.3 The first stage of minimising the energy consumption and associated carbon emissions for the scheme is to minimise the demands of the heating, cooling and lighting systems. This can be achieved through high performance facades which minimise the heat losses and high efficacy lighting systems with intelligent control systems.

Fabric

5.4 The scheme looks to incorporate the following facade performance for the new build elements.

Element	Performance W/(m².K)	Comments
External Walls	0.15	
Ground Floor	0.12	
Roof	0.11	
Windows inc frame	1.4	G-Value 0.5 Light Transmittance 0.7

5.5 The building will look to achieve an air permeability of 3 $m^3/h/m^2$.

Lighting

5.6 It is anticipated that high efficiency lighting will be used across the scheme with an indicative efficacy of 110 lumens/Watt of general lighting.

5.7 The lighting systems will be automatically controlled with studios being provided with absence detection and all other areas provided with presence detection.

Ventilation

5.8 It is anticipated that the units will incorporate mechanical ventilation to maintain the air quality in accordance with the relevant regulations. It has been assumed at this stage that the mechanical ventilation system will incorporate high efficiency heat recovery (circa 80% efficient) to capture waste heat being exhausted to atmosphere within the extract air. This waste heat will be used to temper the incoming fresh air to lower the associated heating demand. Each cluster of studios will have an independent MVHR with an SFP of less than 1.5W/l/s.

Efficient supply

5.9 Following the reduction of the sites energy demands the next stage is to meet the remaining demands via high efficient systems in order to minimise the sites overall energy consumption. The following outlies the HVAC systems that are anticipated for the scheme along with indicative efficiencies.

5.10 Heating & cooling is to be achieved through the use of a central VRF in conjunction with fan coil units within each studio & common room. The hot water demands of the scheme will be met through the use of a central high temperature ASHP in conjunction with domestic hot water storage.

5.11 The heating is anticipated to have a minimum SCOP of 4 while the cooling has a minimum SCOP of 4.5.

5.12 The high temperature heat pump delivering the domestic hot water requirements will have a minimum SCOP of 3. This will be used in conjunction with storage vessel with 1000l capacity and secondary circuit with timer switch control.

Renewable technologies

5.13 Currently it is proposed that air source heat pumps are used to meet the heating demands in an efficient electrified manor. By electrifying the proposed units it enables them to take advantage of the wider continued efforts to decarbonise the national electrical supply.

5.14 The roof space has been fully utilised to incorporate a circa 40kWp array with a total annual output in the region of 33,500kWh. Appendix I illustrates the proposed array layout at roof level.

Summary

5.15 With the incorporation of the strategies identified within this section of the report the new build development achieves an 100% reduction in carbon emissions over the Part L 2021 target emission rates. The table below summarises the performance against the Part L 2021 targets.

CO_2 Emission Rate	$kgCO_2/M^2$	Savings over base
Target Emission Rate (TER)	4.13	
Building Emission Rate (BER)	-0.01	100%
Primary Energy Rate	**kWh/M^2**	**Savings over base**
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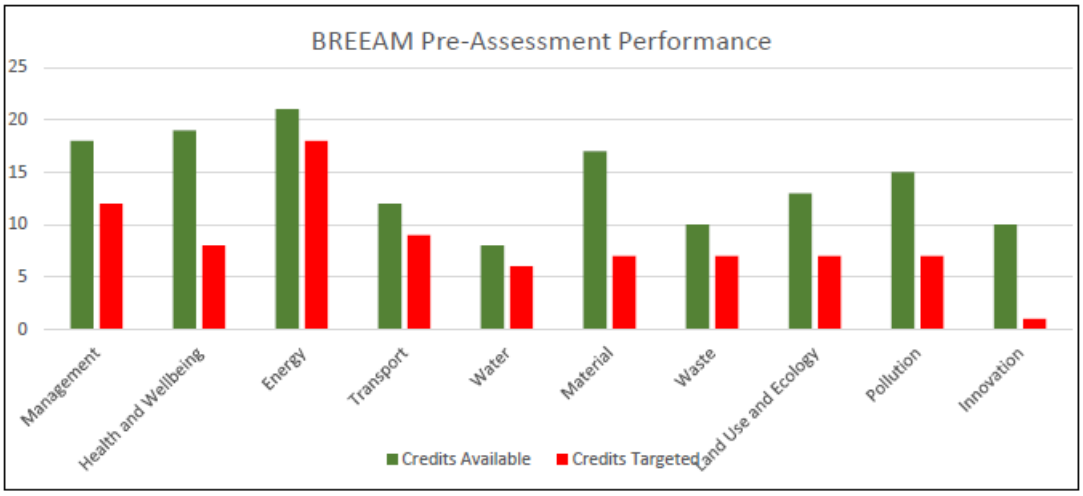
5.16 With the above performance in conjunction with the specification for the retained elements the scheme has been demonstrated to be in compliance with the relevant national, local and regulatory planning requirements.

6. CONCLUSION

6.1 The report summaries the various sustainability and energy efficiency measures that are proposed for the proposed student accommodation block on the existing Ladybarn site. Through the use of these measures the scheme has been demonstrated to be in compliance with the national, local and regulatory planning requirements as set out within section 3.

Sustainability

6.2 The scheme is targeting a BREEAM rating of Very Good, the figure below summarises the credits being targeted.



6.3 The following are the key sustainability measures which are being proposed for the scheme.

- The project will be registered with the Considerate Constructors Scheme and the contractor will be required to follow best practices for environmental management, responsible product sourcing and labour;
- Targets will be set for resource efficiency and diversion from landfill;
- All new materials will come from responsible sources, with manufacturers to hold an ISO 14001 certificate as minimum;
- A commissioning programme will be established by the incoming tenant and all building services will be commissioned in line with CIBSE & BSRIA guidelines;
- All lighting will be designed to avoid light spillage using high efficiency LED lighting;
- Water efficiency measures within the building; restrictors on all taps/appliances to reduce consumption.
- No gas will be used on site.
- Sub metering will be provided on electrical and water supplies;

Energy

6.4 The scheme have been demonstrated to meet with the relevant targets in line with planning policy.

6.5 The following summarise the key elements of the proposed energy strategy:

- High efficiency thermal elements;
- High efficient heating & cooling via ASHP;
- High efficiency high temperature ASHP for domestic hot water;
- High efficiency ventilation with heat recovery;
- High efficacy lighting with automatic controls where possible;
- Incorporation of PV at roof level;
- Fully electrified to enable benefit of electrical supply decarbonisation.

6.6 With the incorporation of the above measures for the extension portion the scheme is able to achieve a 100% reduction over the Part L 2021 targets.

CO_2 Emission Rate	$kgCO_2/M^2$	Savings over base
Target Emission Rate (TER)	4.13	
Building Emission Rate (BER)	-0.01	100%
Primary Energy Rate	**kWh/M^2**	**Savings over base**
Target Primary Energy Rate (TPER)	44.54	
Building Primary Energy Rate (BPER)	-2.98	107%

APPENDIX I – BREEAM PRE-ASSESSMENT

LADYBARN HOUSE, MANCHESTER

2665 – BREEAM Pre-Assessment

A report prepared for and on behalf of:

MEP Concepts Ltd

HARNISS

Issue Date: 25/09/2024

Revision: 1

Author: Jayna Chauhan

Checker: Adam Alexander



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1.0 EXECUTIVE SUMMARY

1.1 This document details the intended BREEAM Pre-Assessment score and rating to support the development of Ladybarn House, Manchester. The BREEAM Pre-Assessment has been completed by Harniss and their qualified BREEAM Assessors.

1.2 The BREEAM report highlights the BREEAM score and rating, along with potential credits which can be achieved should the Client choose these options.

Project Name	Ladybarn House, Manchester
Project Number	2665
BREEAM Target	Very Good
BREEAM Version	New Construction 6.1
Assessment Type	Residential
BREEAM Type	Fully Fitted
BREEAM Score	55.09
BREEAM Rating	Very Good

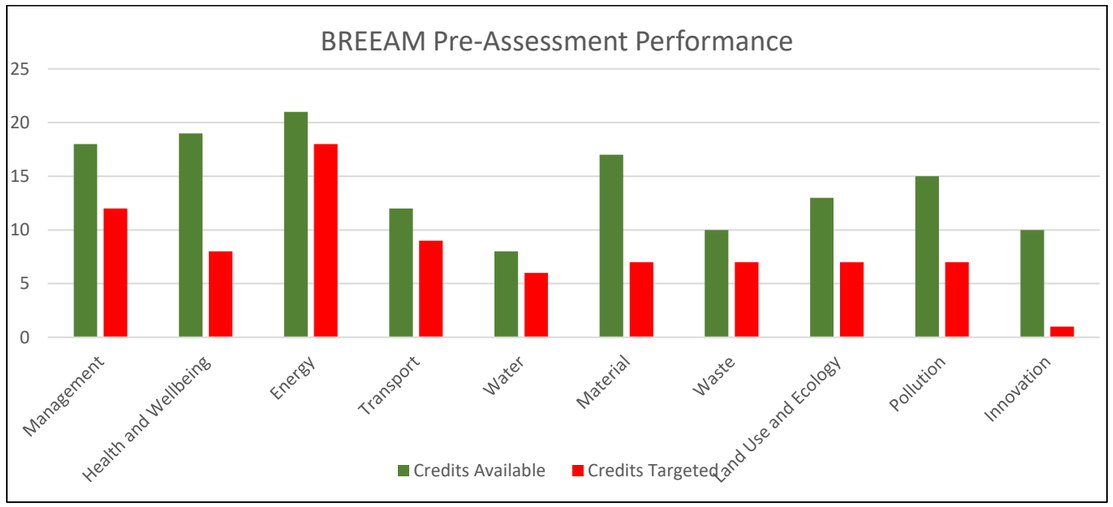


Figure 1: BREEAM Category Breakdown

2.0 INTRODUCTION

2.1 Site Context

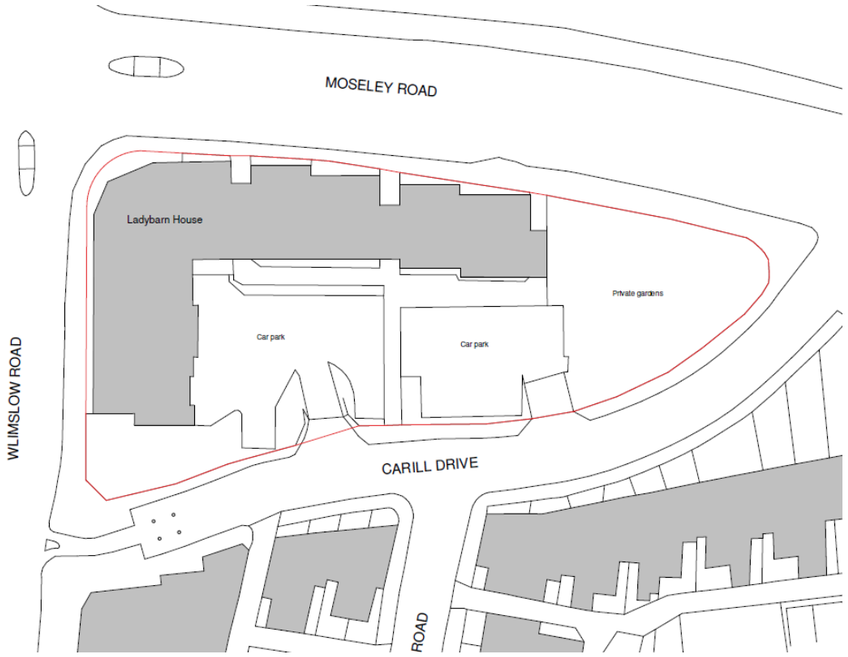


Figure 2: Site Boundary

2.1.1 The proposed development consists of 36 self-contained student accommodation over three storeys, which is located off Moseley Road, Manchester. There will be associated hard landscaping, soft landscaping, car parking and amenity spaces.

3.0 CREDITS

3.1 Potential Credits

3.1.1 It has been noted that there are 10 potential credits which equate to 7.60% towards the total score listed in the Executive Summary.

Action / Recommendation Summary						
Section	Comment	Credits Targeted	% credit value	Target Section Score %	Responsibility	Credit status
Man 01c BREEAM AP (Concept Design)	BREEAM AP, potential credits.	2	0.55	1.1	BREEAM AP	Potential credits to add
Man 03d BREEAM AP (site)	BREEAM AP, potential credits.	1	0.55	1.1	MC and BREEAM AP	Potential credits to add
Hea 02b Ventilation	Noted as Potential at this stage.	1	0.64	0.64	M&E Contractor	Potential credit to add
Ene 04a Passive design analysis	Potential credit at present. Passive design analysis to be completed for credit.	1	0.52	0.52	Consultant	Potential credits
Le 04b Change and enhancement of ecology	Information relating to planting enhancements.	3	1.08	4.32	ES /Design Team	Potential credits to add
Le 05b Management and maintenance throughout the project– Foundation and Comprehensive routes (Route 1 and Route 2)	Client to confirm if there will be a five year management plan after project completion.	1	1.08	2.16	ES /Design Team	Potential credits to add
Pol 01c Impact of refrigerant	Potential credit. GWP ≤10 or ≤1000kgC02-eq. TO be confirmed by Team.	1	0.47	0.94	M&E	Potential credits
	Potential credits	**10**		**7.60**		

Table 1: Potential BREEAM Credits

4.0 BREEAM ASSESSMENT

4.1 Project Overview

Project Overview	
Project Scope	Fully fitted
Building Type (Main Description)	Residential Institute (Long Term Stay)
Sub Group	Residential College or School (Halls of Residence)
Assessment Stage	Pre-Assessment
Building Floor Area (GIA)	TBC
Building Floor Area (NIFA)	TBC
Is the building(s) designed to be untreated?	No
Building Services – Heating System Type	ASHP and LTHW
Building Services – Cooling System Type	ASHP / VRF
Are commercial or industrial sizes refrigeration and storage systems specified?	No
Are building user lifts present?	Yes
Are building user escalators or moving walks present?	No
Are laboratories present?	No
Are there fume cupboard(s) and/or other containment devices present?	No
Are there external areas within the boundary of the assessment development?	Yes
Are there statutory requirements, or other issues outside of the control of the project that impact the ability to provide outside space?	No
Are there systems specified that contribute to the unregulated energy load?	Yes
Are the post-construction stage credits targeted in ENE01 issue?	No

Table 2: Project Overview

5.0 APPENDIX A - BREEAM PRE-ASSESSMENT

		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Man 01 Project Brief and Design									
Man 01a Project delivery planning	**RIBA Stage 2**	**One credit - Project delivery planning** 1. Prior to completion of the Concept Design, the project delivery stakeholders (see Definitions on page 37) meet to identify and define for each phase of project delivery: 1.a Roles 1.b Responsibilities 1.c Contributions. 2. Consider each one of the following items when defining roles, responsibilities and contributions for each key phase of the project: 2.a End user requirements 2.b Aims of the design and design strategy 2.c Particular installation and construction requirements of limitations 2.d Occupiers' budgets and technical expertise in maintaining any proposed systems 2.e Maintainability and adaptability of the proposals 2.f Operational energy (see Assessment scope on page 120) 2.g Requirements for the production of project and end user documentation 2.h Requirements for commissioning, training and aftercare support. Where the building occupants are not known, the list of considerations above still applies. The appropriate project delivery stakeholder considers each item, based on likely scenarios of building occupancy. 3. The project team demonstrates how the project delivery stakeholders' contributions and the consultation process outcomes influence the following: 3.a Initial Project Brief 3.b Project Execution Plan (see Definitions on page 37) 3.c Communication Strategy (see Definitions on page 37) 3.d Concept Design	Meeting minutes. Summary documents of roles and responsibilities	**1**	**1**	**0**	**0**	Project team	Credit Taken. Narrative needed - RIBA Stage 1-2
Man 01b Stakeholder consultation (interested parties)	**RIBA Stage 2**	**One credit - Stakeholder consultation (interested parties)** 4. Prior to completion of the Concept Design, the design team consult with all interested parties (see Definitions on page 37) on matters that cover the minimum consultation content (see Methodology). 5. Demonstrate how the stakeholder contributions and consultation exercise outcomes influence the Initial Project Brief and Concept Design. 6. Prior to completion of the detailed design (RIBA Stage 4, Technical Design or equivalent), all interested parties (see Definitions on page 37) give and receive consultation feedback.	A list of interested parties consulted. A consultation plan setting our the process and the scope of the consultation. Agenda.minutes from the consultation meetings. Documentation demonstrating consultation feedback and subsequent actions.	**0**	**0**	**0**	**1**	Design Team	Noted not sought at this stage
Man 01c Prerequisite	**RIBA Stage 2**	Prerequisite for BREEAM Advisory Professional (Concept and Developed Design) 8. The project team, including the Client, formally agree strategic performance targets (see Definitions on page 37) early in the design process, see Definitions on page 37, (with the support of the BREEAM AP where appointed).	Appointment letter	**–**	**-**	**–**	**–**	BREEAM AP	Pre-requisite needs to be met for Man 01c and Man01d to be achieved.
Man 01c BREEAM AP (Concept Design)	**RIBA Stage 2-4**	One credit - BREEAM AP (Concept Design) 9. Involve a BREEAM AP in the project at an appropriate time and level to: 9.a Work with the project team, including the Client, to consider the links between BREEAM issues and assist them in maximising the project's overall performance against BREEAM, from their appointment and throughout Concept Design. 9.b Monitor progress against the performance targets (see Definitions on page 37) agreed under criterion 8 above throughout all stages after their appointment where decisions critically impact BREEAM performance. 9.c Proactively identify risks and opportunities related to the achievement of the targets agreed under criterion 8. 9.d Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. 9.e Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team.	Relevant section/clauses of the building specification or contract. Project programme, indicating the dates by which the key work stages (Preparation and Design) are to be completed. Meeting notes/minutes, recorded correspondence or schedules that can demonstrate BREEAM issues are a regular agenda item and AP attendance. The AP progress report (for each work stage).	**1**	**0**	**1**	**0**	BREEAM AP	BREEAM AP, potential credits.
Man 01d BREEAM A (Development Design)	**RIBA Stage 2-4**	One credit - BREEAM AP (Developed Design) 10. Criteria 8 and 9 has been achieved. 11. Involve the BREEAM AP in the project at an appropriate time and level to: 11.a Work with the project team, including the Client, to consider the links between BREEAM issues and to assist them in maximising the project's overall performance against BREEAM throughout Developed Design. 11.b Monitor progress against the performance targets agreed under criterion 8 on the previous page throughout all stages where decisions critically impact the specification and tendering process and the BREEAM performance. 11.c Proactively identify risks and opportunities related to the achievement of the targets agreed under criterion 8. 11.d Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. 11.e Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team.	Relevant section/clauses of the building specification or contract. Project programme, indicating the dates by which the key work stages (Preparation and Design) are to be completed. Meeting notes/minutes, recorded correspondence or schedules that can demonstrate BREEAM issues are a regular agenda item and AP attendance. The AP progress report (for each work stage).	**1**	**0**	**1**	**0**	BREEAM AP	BREEAM AP, potential credits.
Man 02 Life cycle cost and service life planning									

BREEAM NC Criteria			Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Man 02a Elemental life cycle cost	RIBA Stage 2	Two credits - Elemental life cycle cost 1. A competent person (see Definitions on page 43) carries out an outline, entire asset LCC plan at process Stage 2 (equivalent to Concept Design - RIBA Stage 2) together with any design options appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:2008(6). 2. The elemental LCC plan: 2.a Provides an indication of future replacement costs over a period of analysis as required by the Client (e.g.20,30,50 or 60 years); 2.b Includes service life, maintenance and operation cost estimates. The study period should ideally be agreed by the Client, in line with the design life expectancy of the building. However, where the life expectancy of the building is not yet formally agreed (due to very early design stages), the default design life of 60 years should be used for modelling purposes (in line with the UK default). 3. Demonstrate, using appropriate examples provided by the design team, how the elemental LCC plan has been used to influence building and systems design and specification for minimise life cycle costs and maximise critical value.	Relevant sections of the feasibility stage life cycle cost analysis report / documentation. Relevant sections of the feasibility stage appraisal documentation. Elemental LCC plan.	2	2	0	0	QS	Project 1201 instructed.
Man 02b Component level LCC options appraisal	RIBA Stage 4	**One credit - Component level LCC options appraisal** 4. A competent person develops a component level LCC options appraisal by the end of Process Stage 4 (equivalent to Technical Design - RIBA Stage 4) in line with PD 456865:2008. The component level LCC includes (where present): 4.a Envelope, e.g. classing, windows, or roofing 4.b Services, e.g. heat source, cooling source or controls 4.c Finishes, e.g. walls, floors or ceilings 4.d External spaces, e.g. alternative hard landscaping, boundary protection. The Component level LCC option appraisal should review all of the above component types (where present). However, you do not need to consider every single example cited under each component; only a selection of those most likely to draw valued comparisons. This is to ensure that a wide range of options are considered and help focus the analysis on components which would benefit the most from appraisal. 5. Demonstrate, using appropriate examples provided by the design team, how the component level LCC options have been used to influence building and systems design and specification to minimise life cycle costs and maximise critical value.	Relevant sections of the component level life cycle cost analysis report / documentation. Evidence of how this has influenced building and systems specification/design. Component level LCC options appraisal plan.	1	1	0	0	QS	Project 1201 instructed.
Man 02a Capital Cost reporting		**One credit - Capital cost reporting** 6. Report the capital cost for the building in pounds per square meter of gross internal floor area (£k/m²) as part of the submission to BRE. See also Methodology and Additional information on page 44.	Provide capital cost report.	1	1	0	0	QS	Project 1201 instructed.
Man 03 Responsible construction practices									
Man 03a Prerequisite		**Prerequisite - Legally harvested and traded timber** 1. All timber and timber-based products used during he construction process of the project are 'legally harvested and traded timber' (see Definitions page 50). For other materials there are no prerequisite requirements at this stage.	Relevant section/clauses of the building specification or contract OR A signed and dated letter of commitment to meet the relevant criteria OR Timber Policy.	–	MET	–	–	MC	Pre-requisite will be met.
Man 03b Environmental management		**One credit - Environmental management** 3. All parties who at any stage manage the construction site (e.g. the Main Contractor, the demolition contractor) operate an EMS covering their main operations. The EMS must: 3.a Be third party certified, to ISO 14001:2015(10), EMAS (EU Eco-Management and Audit Scheme) or equivalent standard; OR 3.b In compliance with BS 8555:2016(11) have: 3.b.i Appropriate structure 3.b.ii Reached implementation stage phase four 'implementation and operation of the environmental management system' 3.b.ii Completed the defined phase audits one to four. 4. All parties who at any point manage the construction site (e.g. the demolition contractor) implement best practice pollution prevention policies and procedures on site in accordance with Working at construction and demolition sites: PPG6, Pollution Prevention Guidelines(12).	Relevant section/clauses of the building specification or contract OR A signed and dated letter of commitment to meet the relevant criteria OR 3rd party certified EMS certificate.	1	1	0	0	MC	EMS to be confirmed and is Targeted from Main contractor.
Man 03c Prerequisite		Prerequisite - BREEAM AP 5. The Client and the contractor formally agree performance targets.	Letter confirming targets have been agreed.	–	-	POTENTIAL	–	BREEAM AP	Potential.

		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Man 03d BREEAM AP (site)		**One credit - BREEAM AP (site)** 6. Involve a BREEAM AP in the project at an appropriate time and level to: 6.a Work with the project team, including the Client, to consider the links between BREEAM issues and assist them in achieving, and if possible, going beyond the design intent, to maximise the project's performance against the agreed performance targets throughout the Construction, Handover and Close Out stages. 6.b Monitor construction progress against the performance targets agreed under criterion 5 above throughout all stages where decisions critically impact BREEAM performance. 6.c Proactively identify risks and opportunities related to the procurement and construction process and the achievement of the targets agreed under criterion 5. 6.d Provide feedback to the constructors and the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. 6.e Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team and the provision to the assessor.	The AP appointment letter. Relevant section/clauses of the building specification or contract Project programme indicating the dates by which the key work stages (Preparation and Design) are to be completed. Meeting notes/minutes, recorded correspondence or schedules that can demonstrate BREEAM issues are a regular agenda item and AP attendance. The AP progress report (for each work stage). Additional information on page 52.	**1**	**0**	**1**	**0**	MC and BREEAM AP	BREEAM AP, potential credits.
Man 03d BREEAM AP (site)		**One credit - BREEAM AP (site)** 6. Involve a BREEAM AP in the project at an appropriate time and level to: 6.a Work with the project team, including the Client, to consider the links between BREEAM issues and assist them in achieving, and if possible, going beyond the design intent, to maximise the project's performance against the agreed performance targets throughout the Construction, Handover and Close Out stages. 6.b Monitor construction progress against the performance targets agreed under criterion 5 above throughout all stages where decisions critically impact BREEAM performance. 6.c Proactively identify risks and opportunities related to the procurement and construction process and the achievement of the targets agreed under criterion 5. 6.d Provide feedback to the constructors and the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. 6.e Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team and the provision to the assessor.	The AP appointment letter. Relevant section/clauses of the building specification or contract Project programme indicating the dates by which the key work stages (Preparation and Design) are to be completed. Meeting notes/minutes, recorded correspondence or schedules that can demonstrate BREEAM issues are a regular agenda item and AP attendance. The AP progress report (for each work stage). Additional information on page 52.	**1**	**0**	**1**	**0**	MC and BREEAM AP	BREEAM AP, potential credits.
Man 03h Transport of construction materials and waste		**Second monitoring credit - transportation of construction materials and waste** 19. Achieve criterion 10. 20. Set targets for transportation movements and impacts resulting from delivery of the majority of construction materials to site and construction waste from site. As a minimum cover: 20.a Transportation of materials from the point of supply to the building site, including any transport, intermediate storage and point of supply (see Definitions on page 50). Monitor as a minimum: 20.a.i Materials used in major building elements (i.e. those defined in BREEAM issue Mat 01 Environmental impacts from construction products - Building life cycle assessment (LCA on page 208). 20.a.ii Ground works and landscaping materials. 20.b Transportation of construction waste from the construction gate to the waste disposal processing or recovery centre gate. This monitoring must cover the construction waste groups outlined in the projects resource management plan. 21. Monitor and record data from the transportation movements as described in criterion 22. Using the collated data, report separately for materials and waste, the total transport-related carbon dioxide emissions (kgCO2-eq), plus total distance travelled (km) via BREEAM Projects (for the purposes of potential future BREEAM performance benchmarking).	Relevant section/clauses of the building specification or contract OR A formal letter of commitment from the Client/developer.	**1**	**1**	**0**	**0**	MC	Assumed credit will be targeted and achieved - team to confirm

BREEAM NC Criteria			Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Man 04 Commissioning and handover									
Man 04a Commissioning - testing and schedule and repsonsibilities		**One credit - Commissioning - testing schedule and responsibilities** 1. Prepare a schedule of commissioning and testing. The schedule identifies and includes a suitable timescale for commissioning and re-commissioning of all complex and non-complex building services and control systems and for testing and inspecting building fabric. 2. The schedule identifies the appropriate standards for all commissioning activities to be conducted, where applicable, in accordance with: 2.a Current Building Regulations 2.b BSRIA guidelines (16) 2.c CIBSE guidelines (17) 2.d Other appropriate standards (see Methodology). Exclude from the assessment any process of manufacture-related equipment specified as part of the project. However, include such equipment in cases where they form an integral part of the building HVAC services, such as heat recovery systems. 3. Where a BMS is specified: 3.a Carry out commissioning of air and water systems when all control devices are installed, wired and functional. 3.b Include physical measurements of room temperatures, off-coil temperatures and other key parameters, as appropriate, in commissioning results. 3.c The BMS or controls installation should be running in auto with satisfactory internal conditions prior to handover. 3.d All BMS schematics and graphics (if BMS is present) are fully installed and functional to user interface prior to handover. 3.e Fully train the occupier or facilities team in the operation of the system. 4. Appoint an appropriate project team member to monitor and programme pre-commissioning, commissioning and testing. Where necessary include re-commissioning activities on behalf of the Client. 5. The Main Constractor accounts for the commissioning and testing programme, responsibilities and criteria within their budget Man 04a Commissioning - testing schedule and responsibilities and main programme of works. Allow the required time to complete all commissioning and testing activities prior to handover.	Appointment letter or commissioning responsibilities schedules Relevant section/clauses of the building specification or contract Main contractors programme Commissioning schedule	**1**	**1**	**0**	**0**	M&E	Must be achieved for Very Good score, therefore 1 credit targeted.
Man 04b Commissioning - design and preparation		One credit - Commissioning - design and preparation 6. Achieve criteria 1 to 5. 7. During the design stage, the Client or The Main Constractor appoints an appropriate project team member (see criterion 4), provided they are not involved in the general installation works for the building services systems, with responsibility for: 7.a Undertaking design reviews and giving advise on suitability for ease of commissioning. 7.b Providing commissioning management input to construction programming and during installation stages. 7.c Management of commissioning, performance testing and handover or post-handover stages. For buildings with complex building services and systems, this role needs to be carried out by a specialist commissioning manager (see Definitions on page 58).	Appointment letter or commissioning responsibilities schedules Relevant section/clauses of the building specification or contract Main contractors programme Commissioning schedule	**1**	**1**	**0**	**0**	M&E	Credit taken.
Man 04c Testing and inspecting building fabric		**One credit - Testing and inspection building fabric** 8.Achieve criteria 1 to 5. 9. Complete post-construction testing and inspection to quality-assure the integrity of the building fabric, including continuity of insulation, avoidance of thermal bridging and air leakage paths (this is through air tightness testing and thermographic survey). A suitably qualified professional (see Definitions on page 58) undertakes the survey and testing in accordance with the appropriate standard. 10. Rectify any defects identified during post-construction testing and inspection prior to building handover and close out. Any remedial work must meet the required performance characteristics for the building or element as defined at design stage (see Methodology).	Appointment letter or commissioning responsibilities schedules Relevant section/clauses of the building specification or contract Main contractors programme Commissioning schedule	**1**	**0**	**0**	**1**	MC	Credit not sought.
Man 04d - Handover		**One credit - Handover** 11. Prior to handover, develop two building user guides (see Methodology) for the following users: 11.a A non-technical user guide for distribution to the building occupiers. 11.b A technical user guide for the premises facilities managers.A draft copy is developed and discussed with users first (where the building occupants are known) to ensure the guide is most appropriate and useful to potential users. 12. Prepare two training schedules timed appropriately around handover and proposed occupation plans for the following users: 12.a A non-technical training schedule for the building occupants. 12.b A technical training schedule for the premises facilities managers.	Building User Guide Training schedule	**1**	**1**	**0**	**0**	MC and M&E	Must be achieved for Very Good score, therefore 1 credit targeted.

BREEAM NC Criteria			Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Man 05 Aftercare									
Man 05a Aftercare support		**One credit - Aftercare support** 1. Provide aftercare support to the building occupiers through having operational infrastructure and resources in place. This includes as a minimum: 1.a A meeting between the aftercare support team or individual, and the building occupier or management team (prior to initial occupation, or as soon as possible thereafter) to: 1.a.i Introduce the aftercare support available, including the content of the building user guide (where is exists) and training schedule. 1.a.ii Present key information on the building including the design intent and how to use the building to ensure it operates as efficiently and effectively as possible. 1.b On-site facilities management training including: 1.b.i A walkabout of the building. AND 1.b.ii Introduction to and familiarisation with the building systems, their controls and how to operate them in accordance with the design intent and operational demands. 1.c Provide initial aftercare support for at least the first month of building occupation, e.g. weekly attendance on-site, to support building users and management (the level of frequency will depend on the complexity of the building and building operations). 1.d Provide longer term aftercare support for occupiers for at least the first 12 months from occupation, e.g. a helpline, nominated individual or other appropriate system to support building users and management. 2. Establish operational infrastructure and resources to coordinate the collection and monitoring of energy and water consumption data for a minimum of 12 months, once the building is substantially occupied. This facilitates analysis of discrepancies between actual and predicted performance, with a view to adjusting systems and user behaviours accordingly.	Evidence of a commitment/contract to provide compliant aftercare support and training.	**1**	**1**	**0**	**0**	MC & Client	Credit for aftercare taken, to be confirmed by team.
Man 05b - Commissioning - implementation		**One credit - Commissioning - implementation** 3. Complete the following commissioning activities over a minimum 12-month period, once the building becomes substantially occupied: 3.a Complex systems: The specialist commissioning manager will: 3.a.i Identify changes made by the owner or operator that might have caused, impaired or improved performance. 3.a.ii Test all building services under full load conditions, i.e. heating equipment in mid-winter, cooling and ventilation equipment in mid-summer and under part load conditions (spring and autumn). 3.a.iii Where applicable, carry out testing during periods of extreme (high or low) occupancy. 3.a.iv Interview building occupants (where they are affected by the complex services) to identify problems or concerns regarding effectiveness of the systems. 3.a.v Produce monthly reports comparing sub-metered energy performance to the predicted one (see Ene 01 Reduction of energy use and carbon emissions on page 120). 3.a.vi. Identify inefficiencies and areas in need of improvement. 3.a.vii Re-commission systems (following any work needed to serve revised loads) and incorporate any revisions in operating procedures into the operations and maintenance (O&M) manuals. 3.b Simple systems (naturally ventilated): The external consultant, aftercare team or facilities manager will: 3.b.i Review thermal comfort, ventilation and lighting, at three, six and nine month intervals after initial occupation, either by measurement or occupant feedback. 3.b.ii Identify deficiencies and areas in need of improvement. 3.b.iii Re-commission systems and incorporate any relevant revisions in operating procedures into the O&M manuals	Confirmation that commissioning has been carried out as per DS commitment.	**1**	**1**	**0**	**0**	M&E	Assumed credit would be targeted - to be confirmed by team

		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Man 05c Post Occupancy Evaluation		One credit - Post-occupancy evaluation (POE) 4. The Client or building occupier commits to carry out a POE exercise (see Definitions on page 63) one year after the building is substantially occupied. This gains comprehensive in-use performance feedback (see criterion 5.b.v) and identifies gaps between design intent and in-use performance. The aim is to highlight any improvements or interventions that need to be made and to inform operational processes. 5. An independent party (see Definitions on the facing carries out the POE covering: 5.a A review of the design intent and construction process(review of design, procurement, construction and handover processes). 5.b Feedback from a wide range of building users including facilities management on the design and environmental conditions of the building covering: 5.b.i Internal environmental conditions(light, noise, temperature, air quality) 5.b.ii Control, operation and maintenance 5.b.iii Facilities and amenities 5.b.iv Access and layout 5.b.v Energy and water consumption (see criterion 2 and Methodology 5.b.vi Other relevant issues, where appropriate (see Definitions on the facing page) 6 The independent party provides a report with lessons learned to the Client and building occupiers. 7 The Client or building occupier commits funds to pay for the POE in advance. This requires an independent party to be appointed to carry out the POE as described in criterion 5. Evidence of the appointment of the independent party and schedule of responsibilities which fulfils the BREEAM criteria are acceptable to demonstrate compliance.	A signed and dated commitment by the Client/developer or future building occupier. Where the criteria require the commissioning activities to be completed over a minimum 12-month period following (substantial) building occupation, it is accepted that completed records may not be available at the time of final certification. In such cases, evidence of the appointment of a commissioning manager and schedule of commissioning responsibilities which fulfils the BREEAM criteria are acceptable to demonstrate compliance.	1	0	0	1	Client	Credit not sought.
Total Credits				18	12	4	3		
			11%	11%	7%	2%	2%		
Hea 01 Visual Comfort									
Hea 01a Control of glare from sunlight		**One credit - Control of glare from sunlight** 1. Identify areas at risk of glare using a glare control assessment. The glare control assessment also justifies any areas deemed not at risk of glare. 2. A glare control strategy designs out potential glare in all relevant building areas where risk has been identified. This should be achieved through building form and layout or building design measures. 3. The glare control strategy does not increase energy consumption used for lighting. This is achieved by: 3.a Maximising daylight levels in all weather, cloudy or sunny AND 3.b Ensuring the use or location of shading does not conflict with the operation of lighting control systems.	Design drawings Relevant section/clauses of the building specification or contract	1	0	0	1	Arch / Consultant	Not sought
Hea 01b Daylighting (building type dependent)		**Up to two credits - Daylighting (building type dependent)** 4 Daylighting criteria have been met using either of the following options: 4.a The relevant building areas meet good practice daylight factors and other criteria as outlined in Table 5.1 and Table 5.2 OR 4.b The relevant building areas meet good practice average and minimum point daylight illuminance criteria as outlined in Table 5.3 on the next page.	Daylighting calculations.	2	0	0	2	Arch / Consultant	Not sought
Hea 01c View out		**One credit - View out** 5. 95% of the floor area in 95% of spaces for each relevant building area provides an adequate view out (see Adequate View Out definition on page 84*). 6. In addition, the building type criteria for Prisons, multi-residential and healthcare are outlined in Table 5.6. *Where relevant building areas are within 8m of an external wall which as a window or permanent opening, and the window/opening is ≥20% of the surrounding wall area. Where the room depth is greater than 8m, the percentage of window or opening must instead be the same as, or greater than, than values in Table 1.0 BS8206:Part 2. The view out must be a view of a landscape or buildings (rather than just sky) at seated level (1.2-1.3m) with the relevant building areas and should ideally be through an external window. A view into an internal courtyard or atrium will comply provided the distance from the opening to the back wall of the courtyard/atrium is at least 10m. The view cannot be an internal view across the room, as this is likely to become obstructed by partitions, filing cabinets etc. An internal view cannot offer the additional benefits of an external view. **Multi-residential buildings** Self-contained flats - living rooms Sheltered housing - communal lounges, individual bedrooms and bedsits All positions within relevant areas are to be within 5m of a wall which has a window or permanent opening providing an adequate view out. The window or opening must be ≥ 20% of the surrounding wall area.	Design drawings Relevant section/clauses of the building specification or contract Window schedule	1	0	0	1	Arch	Not sought

		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Hea 01d Internal and external lighting levels, zoning and control		**One credit - Internal and external lighting levels, zoning and control Internal lighting** 8. Internal lighting in all relevant areas of the building is designed to provide illuminance (lux) levels and colouring rendering index in accordance with the SLL Code for Lighting 2012(33) and any other relevant industry standard. Internal lighting should be appropriate to the tasks undertaken, accounting for building user concentration and comfort levels. 9. For areas where computer screens are regularly used, the lighting design complies with CIBSE Lighting Guide 7 (34)sections 2.4, 2.13 to 2.15, 2.20, and 6.10 to 6.20. This gives recommendations highlighting: 9.a Limits to the luminance of the luminaires to avoid screen reflections. (Manufacturers' data for the luminaires should be sought to confirm this.) 9.b Any area where a surface is used to reflect light in to a space, such as up lighting, the recommendations refer to the luminance of the lit ceiling rather than the luminaire; a design team calculation is usually required to demonstrate this. 9.c Recommendations for direct lighting, ceiling illuminance, and average wall illuminance. External lighting 10. All external lighting located within the construction zone is specified in accordance with BS5489-1:2013 Code for the practice for the design of road lighting. Lighting of roads and public amenity areas(35) and BS EN 12464-2:2014(36) Light and lighting - Lighting of workplaces- Part 2:Outdoor workplaces. External lighting should provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night. 11. Where no external light fittings are specified (either separate from or mounted on the external building façade or roof), the criteria relating to external lighting do not apply and the credit can be awarded on the basis of compliance with criteria 8–9.c above. Zoning and occupant control 12. Internal lighting is zoned to allow for occupant control. Zoning is in accordance with the criteria below for relevant areas present within the building: 12.a In office areas, zones of no more than four workplaces 12.b Workstations adjacent to windows or atria and other building areas separately zoned and controlled 12.c Seminar and lecture rooms: zoned for presentation and audience areas 12.d Library spaces: separate zoning of stacks, reading and counter areas 12.e Teaching space or demonstration area 12.f Whiteboard or display screen 12.g Auditoria: zoning of seating areas, circulation space and lectern area 12.h Dining, restaurant, café areas: separate zoning of servery and seating or dining areas 12.i Retail: separate zoning of display and counter areas 12.j Bar areas: separate zoning of bar and seating areas 12.k Wards or bedded areas: zoned lighting control for individual bed spaces and control for staff over groups of bed spaces 12.l Treatment areas, dayrooms, waiting areas: zoning of seating and activity areas and circulation space with controls accessible to staff. 13. Areas used for teaching, seminar or lecture purposes have lighting controls provided in accordance with CIBSE Lighting Guide 5 (37) 14. In addition, the building type criteria in Table 5.7 on the next page (where relevant). 74 SD5078	Design drawings and/or room data sheets/schedules Relevant section/clauses of the building specification or contract OR A letter of formal confirmation of compliance from the relevant design team member. Further information on page 40 'Additional Information'	**1**	**1**	**0**	**0**	M&E	Lux levels in all internal relevant areas shall be designed in accordance to the SLL Code for lighting 2012. Assumed credit would be targeted - to be confirmed by team.
Hea 02 Indoor Air Quality									
Hea 02a Prerequisite	RIBA Stage 2	**Prerequisite - Indoor Air Quality (IAQ) Plan** 1. A site-specific indoor air quality plan has been produced and implemented in accordance with the Guidance Note GN06. The objective of the plan is to facilitate a process that leads to design, specification and installation decisions and actions, which minimise indoor air pollution during occupation of the building. The indoor air quality plan must consider the following: 1.a Removal of contaminant sources .b Dilution and control of contaminant sources: 1.b.i Where present, consideration is given to the air quality requirements of specialist areas such as laboratories 1.c Procedures for pre-occupancy flush out 1.d Third party testing and analysis 1.e Maintaining good indoor air quality in-use.	Indoor air quality plan	–	–	**POTENTIAL**	–	M&E	Potential credit. Report would be needed to gain Prerequisite and credit.
Hea 02b Ventilation		**One credit - Ventilation** 2. The building has been designed to minimise the indoor concentration and recirculation of pollutants in the building as follows: 2.a Provide fresh air into the building in accordance with the criteria of the relevant standard for ventilation 2.b Ventilation pathways are designed to minimise the ingress and build-up of air pollutants inside the building (see Methodology on page 87) 2.c Where present, HVAC systems must incorporate suitable filtration to minimise external air pollution, as defined in BS EN 16798-3:2017(45). The specified filters should achieve supply air classification of at least SUP 2. 2.d Areas of the building subject to large and unpredictable or variable occupancy patterns have carbon dioxide (CO_2) or air quality sensors specified and: 2.d.i In mechanically ventilated buildings or spaces: sensors are linked to the mechanical ventilation system and provide demand controlled ventilation to the space 2.d.ii In naturally ventilated buildings or spaces: sensors either have the ability to alert the building owner or manager when CO_2 levels exceed the recommended set point, or are linked to controls with the ability to adjust the quantity of fresh air, i.e. automatic opening windows or roof vents. 2.e For naturally ventilated or mixed mode buildings, the design demonstrates that the ventilation strategy provides adequate crossflow of air to maintain the required thermal comfort conditions and ventilation rates in accordance with CIBSEAM10.	Relevant section/clauses of the building specification or contract Design drawings	**1**	**0**	**1**	**0**	M&E	Noted as Potential at this stage.

		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Hea 02c Emissions from construction products		**Up to two credits - Emissions from construction products**. **One credit** 3. Three out of the five product types meet the emission limits, testing requirements and any additional requirements listed in Table 5.11 on the facing page. Where wood-based products are not one of three selected product types, all wood-based products used for internal fixtures and fittings must be tested and classified as formaldehyde E1 class as a minimum. **Two Credits** 4. All of the product types listed meet the emission limits, testing requirements and any additional requirements listed in Table 5.11 on the facing page.	Relevant section/clauses of the building specification or contract confirming products to be used meet the requirements.	**2**	**0**	**2**	**0**	Arch	Noted as Potential at this stage.
Hea 02d Post Construction indoor air quality measurement		**One credit - Post-construction indoor air quality measurement** 5. The formaldehyde concentration in indoor air is measured post construction (but pre-occupancy) and does not exceed 100 µg/ m³averaged over 30 minutes(World Health Organization guidelines for indoor air quality: Selected pollutants, 2010(58)). 6. The formaldehyde sampling and analysis is performed in accordance with ISO16000-2 (59) and ISO16000-3 (60) 7. The total volatile organic compound (TVOC) concentration in indoor air is measured post construction (but pre-occupancy) and does not exceed 500 µg/ m³over 8 hours. 8. The TVOC sampling and analysis is performed in accordance with ISO16000-5 (61) and ISO16000-6 (62) or ISO 16017-1(63) 9. Where levels are found to exceed these limits, the project team confirms the measures that have, or will be, undertaken in accordance with the IAQ plan, to reduce the TVOC and formaldehyde levels to within the above limits. 10. The measured concentration levels of formaldehyde (µg/ m³) and TVOC (µg/ m³) are reported, via the BREEAM Scoring and Reporting Tool.	Commitment to carry out necessary testing post construction.	**1**	**0**	**0**	**1**	Project team	Credit not sought.

BREEAM NC Criteria			Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Hea 04 Thermal comfort									
Hea 04a Thermal Modelling	**RIBA Stage 3**	**One credit - Thermal modelling** 1. Thermal modelling has been carried out using software in accordance with CIBSEAM11(78) Building Energy and Performance Modelling. The software used to carry out the simulation at the detailed design stage provides full dynamic thermal analysis. For smaller and more basic building designs with less complex heating or cooling systems, an alternative less complex means of analysis may be appropriate (such methodologies must still be in accordance withCIBSEAM11). 3. The modelling demonstrates that: 3.a For air-conditioned buildings, summer and winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design(79), Table 1.5;or other appropriate industry standard (where this sets a higher or more appropriate requirement or level for the building type) 3.b For naturally ventilated buildings: 3.b.i Winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design, Table 1.5. Or other appropriate industry standard (where this sets a higher or more appropriate requirement or level for the building type). 3.b.ii The building is designed to limit the risk of overheating, in accordance with the adaptive comfort methodology outlined in either of the following standards as appropriate; CIBSE TM52: The limits of thermal comfort: avoiding overheating in European buildings(80) or CIBSE TM59:Design methodology for the assessment of overheating risk in homes(81). 4. For air-conditioned buildings, the PMV(predicted mean vote) and PPD (predicted percentage of dissatisfied) indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool.	Relevant section/clauses of the building specification or contract or correspondence (e.g. letter, email or meeting minutes) from the design team Thermal modelling results TOR data from the design team	**1**	**1**	**0**	**0**	MEP	Credit taken.
Hea 04b Design for future thermal comfort		**One credit - Design for future thermal comfort** 5. Criteria 1 to 4 are achieved. 6. The thermal modelling demonstrates that the relevant requirements set out in criterion 3 above are achieved for a projected climate change environment (see Definitions on the next page). 7. Where criterion 6 above is not met, the project team demonstrates how the building has been adapted, or designed to be easily adapted in future using passive design solutions in order to subsequently meet the requirements under criterion 6 above. 8. For air-conditioned buildings, the PMV and PPD indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool.		**1**	**1**	**0**	**0**	MEP	Credit taken. To be confirmed by team.
Hea 04c Thermal Zoning and controls		**One credit - Thermal zoning and controls** 9 Criteria 1 above to 4 above are achieved. 10 The thermal modelling analysis (criteria 1 on the previous page to 4 on the previous page) has informed the temperature control strategy for the building and its users. 11 The strategy for proposed heating or cooling systems demonstrates that it has addressed the following: 11.a Zones within the building, and how the building services could efficiently and appropriately heat or cool these areas. For example consider the different requirements for the central core of a building compared with the external perimeter adjacent to the windows. 11.b The degree of occupant control required for these zones. This is based on discussions with the end user (or alternatively building type or use specific design guidance, case studies, feedback) and considers: 11.b.i User knowledge of building services. 11.b.ii Occupancy type, patterns and room functions(and therefore appropriate level of control required). 11.b.iii How the user is likely to operate or interact with the systems, e.g. are they likely to open windows, access thermostatic radiator valves(TRV) on radiators, change air-conditioning settings etc. 11.b.iv The user expectations (this may differ in the summer and winter) and degree of individual control (i.e. obtaining the balance between occupant preferences, for example some occupants like fresh air and others dislike draughts) 11.c How the proposed systems will interact with each other (where there is more than one system) and how this may affect the thermal comfort of the building occupants 11.d The need or otherwise for an accessible building user actuated manual override for any automatic systems.	Thermal comfort strategy highlighting the points that have been considered and decisions taken accordingly Relevant section/clauses of the building specification or contract Design drawings	**1**	**1**	**0**	**0**	MEP	Credit taken. To be confirmed by team.

BREEAM NC Criteria			Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Hea 05 Acoustic Performance									
Hea 05 a Acoustic performance (Residential Institutions (Short and Long Term)		**Up to four credits - Acoustic performance for Residential institutions (short term and long term stay).** 3. The building meets the appropriate acoustic performance standards and testing requirements defined in the relevant table below. These tables define criteria for the acoustic principles of: 3.a Sound insulation 3.b Indoor ambient noise level 3.c Room acoustics.		**4**	**2**	**0**	**2**	SQA Consultant	SQA appointed. 2 credits taken.
Hea 06 Security									
Hea 06 Security of site and building	**RIBA Stage 2**	**One credit - Security of site and building** 1. A Suitably Qualified Security Specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) during or prior to Concept Design (RIBA Stage 2 or equivalent). The purpose of the SNA will be to identify attributes of the proposal, site and surroundings which may influence the approach to security for the development. 2. The SQSS develops a set of security controls and recommendations for incorporation into the proposals. Those controls and recommendations shall directly relate to the threats and assets identified in the preceding SNA. 3. The controls and recommendations shall be incorporated into proposals and implemented in the as-built development. Any deviations from those controls and recommendations shall be justified and agreed with the SQSS.	Design drawings (including a scaled site plan), AND/OR relevant sections of the specification highlighting all necessary compliant features and dimensions. Security Needs Assessment.	**1**	**1**	**0**	**0**	SQSS and Arch	Security Needs Assessment to be conducted for credit to be awarded.
Hea 07 Safe and healthy surroundings									
Hea 07a Safe access		**One credit - Safe access** Where external site areas form part of the assessed development the following apply: 1. Dedicated and safe cycle paths are provided from the site entrance to any cycle storage, and connect to offsite cycle paths where applicable. 2. Dedicated and safe footpaths are provided on and around the site providing suitable links for the following: 2.a The site entrance to the building entrance 2.b Car parks (where present)to the building entrance 2.c The building to outdoor space 2.d Connecting to off-site paths where applicable. 3. 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: 4. Delivery areas are not accessed through general parking areas and do not cross or share the following: 4.a pedestrian and cyclist paths 4.b outside amenity areas accessible to building users and general public. 5. There is a dedicated parking or waiting area for goods vehicles with appropriate separation from the manoeuvring area and staff and visitor car parking.	Correspondence from or a copy of the report/feedback from the ALO/CPDA/Security Consultant confirming: • Scope of their advice/involvement • The stage of design in which their advice was sought • Summary of their recommendations Design drawings AND/OR relevant sections of the specification or contract	**1**	**0**	**0**	**1**	Arch	Safe access present to majority of areas but not towards the car parking area.
Hea 07b Outside space		**One credit - Outside space** 7. There is an outside space providing building users with an external amenity area.	Design drawings	**1**	**1**	**0**	**0**	Arch	Space is present.
Total Credits				**19**	**8**	**3**	**11**		
			14%	**14%**	**6%**	**2%**	**8%**		
Ene 01 Reduction of Energy use and carbon emissions									

BREEAM NC Criteria			Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Ene 01a Energy Performance		**Up to nine credits - Energy performance** 1. Calculate an Energy Performance Ratio for New Construction (EPR NC). Compare the EPR NC achieved with the benchmarks in Table 6.1 and award the corresponding number of BREEAM credits.	A copy of the Building Regulations Output Document from the approved software, as follows: 1. England Wales (Part L): Approved Documents checks (BRUKL Output Document) 2. Scotland (Section 6): Specification checks 3. N. Ireland (Part F): Approved Documents checks (BRUKL Output Document) 4. Where relevant for multi-residential buildings, a copy of the calculations based on design stage SAP outputs. The output documents must be based on the "As designed" stage of analysis. output documents from the approved software reflecting performance at the as-built stage of analysis. This must account for any changes to the specification during construction and the measured air leakage rate, ductwork leakage and fan performances(as required by building regulations).	9	8	1	0	MEP	8 credits confirmed.
Ene 01b Energy modelling and reporting	RIBA Stage 2	**Four credits – Energy modelling and reporting** 2. Involve relevant members of the design team in an energy workshop, focusing on operational energy performance. 3. Undertake additional energy modelling during the design and post-construction stage to generate predicted operational energy consumption figures(see Prediction of operational energy consumption on page 124). 4. Report predicted energy consumption targets by end use, design assumptions and input data (with justifications). 5. Carry out a risk assessment to highlight any significant design, technical, and process risks that should be monitored and managed throughout the construction and commissioning process.	Predicted energy consumption values, design assumptions, input data and risk assessments reported as detailed in the Energy Prediction and Post-occupancy guidance available from the BREEAM website. Confirmation of suitably qualified energy modeller's qualifications. Where changes to design assumptions and input data have occurred at post construction stage, the energy modelling should be re-run to take into account those changes.	4	4	0	0	MEP	Report completed.
Ene 02 Energy Monitoring									
Ene 02a Sub metering of end-use catergories		**One credit - Sub-metering of end-use categories** 1. Install energy metering systems so that at least 90% of the estimated annual energy consumption of each fuel is assigned to the end-use categories(see Methodology below). 2. Meter the energy consumption in buildings according to the total useful floor area: 2.a If the area is greater than 1,000 m², by end-use category with an appropriate energy monitoring and management system. 2.b If the area is less than 1,000 m², use either: 2.b.i an energy monitoring and management system or 2.b.ii separate accessible energy sub-meters with pulsed or other open protocol communication outputs, for future connection to an energy monitoring and management system (see Definitions on page 135). 3. Building users can identify the energy consuming end uses, for example through labelling or data outputs.	Relevant section/clauses of the building specification or contract. Design drawings	1	1	0	0	M&E	One credit must be achieved for Very Good, therefore credit taken.
Ene 02b Sub metering of high energy load and tenancy areas		4 Monitor a significant majority of the energy supply with: 4.a An accessible energy monitoring and management system for: 4.a.i tenanted areas or 4.a.ii relevant function areas or departments in single occupancy buildings. OR 4.b Separate accessible energy sub-meters with pulsed or other open protocol communication outputs for future connection to an energy monitoring and management system for: 4.b.i tenanted areas or 4.b.ii relevant function areas or departments in single occupancy buildings. 5 Sub-meter per floor plate in large single occupancy or single-tenancy buildings with one homogeneous function, for example hotel bedrooms, offices.		1	1	0	0	M&E	Credit for sub metering taken.
Ene 03 Energy Monitoring									
Ene 03 External lighting		**One credit - External lighting** 1. No external lighting (which includes lighting on the building, at entrances and signs). OR 2. External light fittings within the construction zone with: 2.a Average initial luminous efficacy of not less than 70 luminaire lumens per circuit Watt 2.b Automatic control to prevent operation during daylight hours 2.c Presence detection in areas of intermittent pedestrian traffic	Relevant section/clauses of the building specification or contract - Evidence received Design drawings	1	1	0	0	M&E	Assumed credit would be targeted to be confirmed by team
Ene 04 Low Carbon Design									

		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Ene 04a Passive design analysis	RIBA Stage 2	**One credit - Passive design analysis** 1. Achieve the first credit Hea 04 Thermal comfort: One credit - Thermal modelling on page 102 to demonstrate that the building design delivers appropriate thermal comfort levels in occupied spaces. 2. The project team analyses the proposed building design and development during Concept Design to identify opportunities for the implementation of passive design measures (see Passive design analysis on page 152). 3. Implement passive design measures to reduce the total heating, cooling, mechanical ventilation, lighting loads and energy consumption in line with the passive design analysis findings. 4. Quantify the reduced total energy demand and carbon dioxide (CO_2-eq) emissions resulting from the passive design measures.	Copy of Passive Design Analysis Results from a dynamic simulation model demonstrating the reduced energy demand and CO_2 emissions from the specified passive design measures.	1	0	1	0	Consultant	Potential credit at present. Passive design analysis to be completed for credit.
Ene 04b Free Cooling		**One credit - Free cooling** 5. Achieve the passive design analysis credit. 6. Include a free cooling analysis (see Free cooling analysis on page 153) in the passive design analysis carried out under criterion 2. 7. Identify opportunities for the implementation of free cooling solutions. 8. The building is naturally ventilated or uses any combination of the free cooling strategies listed in Free cooling analysis.	Results from a dynamic simulation model and other used methods demonstrating that the free cooling strategy can meet the building's cooling demand	1	0	0	1	M&E	Credit not sought
Ene 04c LZC tech	RIBA Stage 2	**One credit - Low zero carbon feasibility study** 9. An energy specialist (see Definitions on page 156) completes a feasibility study (see Low and zero carbon feasibility study on page 153) by the end of Concept Design. 10. Establish the most appropriate recognised local (on-site or near-site) low or zero carbon (LZC) energy sources for the building or development (see Scope of LZC systems and how they are assessed on page 154), based on the feasibility study. 11. Specify local LZC technologies for the building or development in line with the feasibility study recommendations. 12. Quantify the reduced regulated carbon dioxide (CO_2-eq) emissions resulting from the feasibility study 1.	Results from a dynamic simulation model demonstrating reductions in CO_2 emissions from the specified low zero carbon technology	1	1	0	0	M&E	Awaiting report from MEP.
Ene 05 Energy efficient cold storage									
Ene 06 Energy efficient transportation systems									

BREEAM NC Criteria			Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Ene 07 Energy efficient laboratory systems									
Ene 08 Energy Efficient equipment									
Ene 08a Energy efficient equipment		**Two credits - Energy efficient equipment** 1. Identify the building's unregulated energy consuming loads. Estimate their contribution to the total annual unregulated energy consumption of the building, assuming a typical or standard specification. 2. Identify the systems or processes that use a significant proportion of the total annual unregulated energy consumption of the building. 3. Demonstrate a meaningful reduction in the total annual unregulated energy consumption of the building. Table 6.5 lists some examples of significant contributors to unregulated energy consumption, and the associated criteria. If additional significant contributors, not listed in the table, will be specified, the design team should justify how meaningful reduction will be achieved for these contributors. Anticipated that the building will have domestic scale appliances and kitchen/catering facilities. Note: 1.0 Where there are no systems specified that contribute to the unregulated energy load, the issue is not applicable. 2.1 Multi-residential: Domestic-scale appliances (individual and communal facilities) below item 5b is only applicable to multi residential assessments.	Manufacturers product details Documentation confirming compliance with the relevant scheme or standard outlined in the criteria e.g. details of compliance with the ECA scheme Design drawings and/or calculations.	**2**	**2**	**0**	**0**	Client and Kitchen Specialist	To be confirmed by Kitchen Specalist / Client.
Total Credits				**21**	**18**	**2**	**11**		
			16%	**16%**	**14%**	**2%**	**8%**		

		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Tra 01 Transport assessment and travel plan									
Tra 01a Transport assessment and Travel Plan	**RIBA Stage 2**	**Two credits – Transport assessment Travel plan** 1. No later than Concept Design stage, undertake a site-specific transport assessment (or statement) and draft travel plan, which can demonstrably be used to influence the site layout and built form; see Methodology. 2. The site-specific travel assessment or statement covers as a minimum: 2.a Existing travel patterns and opinions of existing building or site users towards cycling and walking, identifying constraints and opportunities, if relevant 2.c Current local environment for walkers and cyclists(accounting for visitors who may be accompanied by young children). 2.d Reporting of the number and type of existing accessible amenities, see Table 7.1 below, within 500m of the site. 2.e Disabled access(accounting for varying levels of disability and visual impairment) 2.f Calculation of the existing public transport Accessibility Index (AI),see Methodology on the next page. 2.g Current facilities for cyclists. 3. Following a transport assessment (in accordance with the requirements set out in criteria 2a-2g) develop a site-specific travel plan, that provides a long term management strategy which encourages more sustainable travel. The travel plan includes measures to increase or improve more sustainable modes of transport and movement of people and goods during the building's operation; see Methodology. 4. If the occupier is known, involve them in the development of the travel plan. 5. Demonstrate that the travel plan will be implemented post construction and be supported by the building's management in operation.	A copy of the Travel Plan. A copy of the site-specific transport survey/assessment. Design drawings demonstrating examples of design measures implemented in support the travel plan's findings. OR Where a detailed site plan is not available, a formal letter from the Client confirming that measures will be implemented into the final design in support the travel plan's findings. A letter of confirmation from either the building's occupier, or in the case of a speculative development, the developer	**2**	**2**	**0**	**0**	Client / Transport Consultant	Travel Plan / Travel Assessment in hand.
Tra 02 Sustainable Transport measures									
Tra 02 Prerequisite		**Prerequisite** 1. Achieve criteria 3-5 in the Tra 01 Transport assessment and travel plan issue.		**–**	**MET**	**–**	**–**	Client	Pre-requisite will need to be met for the following credits to be awarded.
Tra 02a Transport options implementation AI <25		**Ten credits – Transport options implementation AI<25** 2. Identify the sustainable transport measures, in Table 7.4 page 174. 3. Award credits according to the existing Accessible Index (AI) of the project, and the total number of points achieved for the options implemented, see Table 7.3	Identify sustainable transport measures. Scale map highlighting the location of the building and all public transport nodes in proximity of the building. Timetables for each service at each public transport node considered. The calculated Accessibility Index for the building. A formal letter from the future building occupier confirming provision of and details for the dedicated bus service(s).	**10**	**7**	**0**	**3**	Client / Arch	
		Public transport measures							
1		1. 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 types.		**1**	**0**	**1**			AI 2.14
2a		2. 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; OR		**2**	**0**	**2**			
2b		3. 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 OR		**3**	**0**	**3**			
2c		4. Provide a dedicated service, such as a bus route or service (See Methodology on page 178).		**3**	**0**	**3**			
3		5. 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**	**1**	**0**			Residents to have transport information made available and accessible.
		Private transport measures							
4		6. Provide electric recharging stations of a minimum of 3kw for at least 10% of the total car parking capacity for the development.		**1**	**0**	**1**			No EV Chargers.
5		7. Set up a car sharing group or facility to facilitate and encourage building users to car share. 8. Raise awareness of the sharing scheme with marketing and communication materials. 9. Provide priority spaces for car sharers for at least 5% of the total car parking capacity for the development. 10. Locate priority parking spaces nearest the development entrance used by the sharing scheme participants.		**1**	**0**	**1**			No car sharing.
		Active travel measures							

		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
6		11. 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. 12. 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	0	2			
7		13. Install compliant cycle storage spaces to meet the minimum levels set out in Table 7.5 on page 176.		1	1	0			6 spaces in total.
8		14. Option 7 has been achieved. 15. Provide at least two compliant cyclists' facilities or the building users, (including pupils where appropriate to the building type) – see Definitions for the scope of each compliant facility: – Showers – Changing facilities – Lockers – Drying spaces		1	1	0			Y
9		Existing amenities: 16. At least three existing accessible amenities are present		1	1	0			Y
10a		17. Ensure a minimum of one new accessible amenity, in accordance with Table 7.6 on page 191, for the relevant Building Group, is provided. OR		2	0	2			N/A
10b		18. Ensure more than one new accessible amenity, in accordance with Table 7.6 on page 191 for the relevant Building Group, is provided.		3	3	0			Outdoor space
11		19. 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.		3	0	3			
Total Credits				12	9	0	3		
			10%	10%	8%	0%	3%		
Wat 01 Water Consumption									
Wat 01 Water Consumption		**Up to five credits - Water consumption** 1. Use the BREEAM Wat 01 calculator to assess the efficiency of the domestic water-consuming components. 2. Use the standard Wat 01 method (see Methodology on the facing page)to compare the water consumption (litres/person/day)for the assessed building against a baseline performance. Award BREEAM credits based upon Table 8.1 below. Where it is not possible to use the standard method, complete the assessment using the alternative 3. If a greywater or rainwater system (see Definitions on page 195) is specified, use its yield in L/person/day to offset potable water demand from components. 4. If a greywater or rainwater system is specified and installed: 4.a Greywater systems in compliance with BS8525-1:2010 Greywater systems- Part 1 Code of Practice (153). 4.b Rainwater systems in compliance with BS8515:2009+A1:2013 Rainwater harvesting systems- Code of practice(154) Achieve Assessment scope - Criterion 6 on page 199, if you intend to pursue a post occupancy stage certification. Additionally for Healthcare building types only: 5. If applicable, the flushing control for each WC or urinal must be suitable for operation by patients with frail or infirm hands or activated by electronic sensors. Additionally for 6. Sanitary components specified within a prison cell have a volume controller specified on the individual fittings or water supply to each cell (see Definitions on page 195).	A completed copy of the BREEAM Wat 01 calculator Documentary evidence supporting the data used to complete the calculator tool. Relevant section/clauses of the building specification/ design drawings confirming technical details of 1. Sanitary components 2.Rainwater and greywater collection system OR where detailed documentary evidence is not available at this stage; Completed BREEAM Wat 01 calculator A letter of instruction to a contractor/supplier or a formal letter from the developer giving a specific undertaking, providing sufficient information to allow the water calculations to be completed.	5	3	0	2	M&E	Assumed 3 Credits would be targeted - to be confirmed by team Water efficient /low flow applicances and fittined to be installed.
Wat 02 Water monitoring									
Wat 02a Rating min standard		**Rating Related Min Standard- Good Rating and Above** 1. Specify a water meter on the mains water supply to each building. This includes instances where water is supplied via a borehole or other private source.	Relevant section/clauses of the building specification or contract Design drawings	–	MET	–	–	M&E	Pre-requisite will need to be met for the following credits to be achieved

		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Wat 02a Water monitoring		**One credit - Water monitoring** 1. As above, specify a water meter on the mains water supply to each building. This includes instances where water is supplied via a borehole or other private source. 2. For water-consuming plant or building areas consuming 10% or more of the building's total water demand: 2.a Fit easily accessible sub-meters OR 2.b Install water monitoring equipment integral to the plant or area. 3 For each meter (main and sub): 3.a Install a pulsed or other open protocol communication output AND 3.b Connect it to an appropriate utility monitoring and management system, e.g. a building management system (BMS), for the monitoring of water consumption. If there is no BMS system in operation at Post Construction stage, award credits provided that the system used enables connection when the BMS becomes operational. 4. In buildings with swimming pools, or large water tanks and aquariums, fit separate sub-meters on the water supply of the above and any associated changing facilities (toilets, showers etc.) irrespective of their water consumption levels. 5. In buildings containing laboratories, fit a separate water meter on the water supply to any process or cooling loop for 'plumbed-in' laboratory process equipment, irrespective of their water consumption levels. Additionally for those pursuing a post occupancy stage certification: 6. The water monitoring strategy used enables the identification of all water consumption for sanitary uses as assessed under Wat 01 (litres/person/day), if a post occupancy stage certification is sought.	Relevant section/clauses of the building specification or contract Design drawings	**1**	**1**	**0**	**0**	M&E	One Credit targeted
Wat 03 Leak Detection									
Wat 03a Leak detection		**One credit - Leak detection system** 1. Install a leak detection system capable of detecting a major water leak: 1.a On the utilities water supply within the buildings, to detect any major leaks within the buildings AND 1.b Between the buildings and the utilities water supply, to detect any major leaks between the utilities supply and the buildings under assessment. 2. The leak detection system is: 2.a A permanent automated water leak detection system that alerts the building occupants to the leak OR an inbuilt automated diagnostic procedure for detecting leaks 2.b Activated when the flow of water passing through the water meter or data logger is at a flowrate above a pre-set maximum for a pre-set period of time. This usually involves installing a system which detects higher than normal flowrates at meters or sub-meters. It does not necessarily require a system that directly detects water leakage along part or the whole length of the water supply system 2.c Able to identify different flow and therefore leakage rates, e.g. continuous, high or low-level, over set time periods. Although high and low-level leakage rates are not specified, the leak detection equipment installed must have the flexibility to distinguish between different flowrates to enable it to be programmed to suit the building type and owner's or occupier's usage patterns. 2.d Programmable to suit the owner's or occupier's water consumption criteria 2.e Where applicable, designed to avoid false alarms caused by normal operation of large water consuming plant such as chillers. Where there is physically no space for a leak detection system between the utilities water meter and the building, alternative solutions can be used, provided that a major leak can still be detected. **Short and long term residential accommodation**: 2.1 Short and long term residential accommodation Flow control devices in WC areas or facilities are not required for facilities in residential areas of long-term residential accommodation. This is due to the fact that those occupants have a sense of ownership and would identify and report a potential leak. This applies to all of the following: ensuite facilities in individual bedrooms, a single bathroom shared between several individual bedrooms(e.g. in halls of residence), or one single bathroom in an independent dwelling (e.g. within a care home). The requirement for flow control devices still applies for the rest of the facilities within long-term residential accommodation. Where WC facilities are only provided within the residential areas of a long-term residential accommodation project (e.g. there is no staff WC), the credit is filtered out of the assessment. However, for short term accommodation, the credit still applies to buildings that have guest bedrooms with ensuite facilities, e.g. hotel rooms, and communal WC areas or facilities, e.g. communal WC facilities in hotels and hostels.	Relevant section/clauses of the building specification or contract Design drawings Manufacturers product details	**1**	**1**	**0**	**0**	M&E	To be included - One Credit targeted
Wat 03b Flow Control devices		**One credit - Flow control devices** 3. Install flow control devices that regulate the water supply to each WC area or sanitary facility according to demand, in order to minimise undetected wastage and leaks from sanitary fittings and supply pipework. **Where WC facilities are only provided within the residential areas of a long-term residential accommodation project (e.g. there is no staff WC), the credit can be filtered out of the assessment**.	Relevant section/clauses of the building specification or contract - Design drawings Manufacturers product details	**1**	**1**	**0**	**0**	M&E	One Credit targeted
Wat 04 Water efficient equipment									
Total Credits				8	6	0	2		
			7%	**7%**	**5%**	**0%**	**2%**		

		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Mat 01 Environmental impacts from construction products - Building life cycle assessment (LCA)									
Mat 01a Environmental impacts from construction products - Building life cycle assessment (LCA)	**RIBA Stage 2 & 4**	Superstructure (office, industrial and retail buildings (except for Simple Buildings and where Notes 1.1 and 1.2 above apply)). 1 During the Concept Design, demonstrate the environmental performance of the building as follows: 1.a Carry out a building LCA on of the superstructure design using either the BREEAM Simplified Building LCA tool or an IMPACT Compliant LCA tool according to the methodology (see Methodology on page 234). 1.b Submit the Mat 01/02 Results Submission Tool to BRE at the end of Concept Design, and before planning permission is applied for (that includes external material or product specifications). Comparison with the BREEAM LCA benchmark during Technical Design (office, industrial and retail buildings only). 2 During Technical Design, demonstrate the environmental performance of the building as follows: 2.a As criterion 1.a 2.b Submit the Mat 01/02 Results Submission Tool to BRE at the end of Technical Design. Where a project has not achieved criterion 1, criterion 2 may still be achieved. Option appraisal during Concept Design (all building types). 3 For office, industrial and retail building types, achieve criterion 1 (except where Notes 1.0, 1.1 and 1.2 on the previous page apply). 4 During Concept Design, identify opportunities for reducing environmental impacts as follows: 4.a Carry out building LCA options appraisal of 2 to 4 significantly different superstructure design options (applicable to the Concept Design stage, see Methodology on the next page). 4.b Use a building LCA tool that is recognised by BREEAM (as suitable for assessing superstructure during Concept Design) according to the methodology (see Methodology on the next page). 4.c For each design option, fulfil the same functional requirements specified by the client and all statutory requirements (to ensure functional equivalency). 4.d Integrate the LCA options appraisal activity within the wider design decision-making process. Record this in an options appraisal summary document. 4.e Record the following in the Mat 01/02 Results Submission Tool: The differences between the design options; the design option selected by the client to be progressed beyond Concept Design; the reasons for selecting it and the reasons for not selecting the other design options. 4.f Submit the Mat 01/02 Results Submission Tool to BRE at the end of Concept Design, and before planning permission is applied for (that includes external material or product specifications). If the building LCA tool recognised by BREEAM and used for criteria 3 to 5 (and 6 to 9, if pursued) is not an IMPACT Compliant LCA tool and criteria 1 to 2 are applicable, then the BREEAM Simplified Building LCA tool (or an IMPACT Compliant LCA tool) shall be used for criteria 1 to 2. Options appraisal during Technical Design (all building types). 5 During Technical Design identify opportunities for reducing environmental impacts as follows: 5.a Carry out building LCA options appraisal of 2 to 3 significantly different superstructure design options (based on the selected Concept Design option and as applicable to the Technical Design stage, see Methodology on the next page). 5.b Use a building LCA tool that is recognised by BREEAM (as suitable for assessing superstructure during Technical Design) according to the methodology (see Methodology on the next page). 5.c As criteria 4.c to 4.e above. Where an options appraisal summary document was produced during Concept Design, update it to include the Technical Design options. 5.d Submit the Mat 01/02 Results Submission Tool to BRE at the end of Technical Design. Where a project has not achieved criteria 3 and 4, criterion 5 may still be achieved.	Copy of LCA. 1-2 - Mat01/02 submission results 3-4 – The options appraisal summary document – Evidence that the LCA options appraisal summary document has been received by the design team and Client (meeting minutes, letter of acknowledgement) – Evidence of how the LCA design options have informed the design decision-making process(e.g. meeting minutes, documented design development showing how the LCA options have affected the design). 5 As criteria 3 to 4 6-7 - The LCA options appraisal summary document includes substructure and hard landscaping according to the criteria 8-9 - The LCA options appraisal summary document includes core building services according to the criteria 10-14 - The 'elemental LCC plan' and 'Component level LCC option appraisal; in issue Man 02 life cycle cost and service life planning on page 41'. 15-18 The third party's report: - Verifying that building LCAs accurately represent the designs under consideration - Itemising the findings of their verification checks - Evidence that the requirements of a suitably qualified third party are fulfilled	**6**	**2**	**0**	**4**	LCA and Arch	LCA assessment not appointed - BREEAM MAT01 cal conducted - limited to 2 credits
Mat 01b Substructure and hard landscaping options appraisal during Concept Design	**RIBA Stage 2**	**One credit – Substructure and hard landscaping options appraisal during Concept Design (all building types)** 6. Criteria 3 and 4 are achieved. 7. During Concept Design identify opportunities for reducing environmental impacts as follows: 7.a Carry out building LCA options appraisal of a combined total of at least six significantly different substructure or hard landscaping design options(at least two shall be substructure and at least two shall be hard landscaping). 7.b Using a building LCA tool that is recognised by BREEAM (as suitable for assessing substructure and hard landscaping during Concept Design) according to the methodology (see Methodology on page 211). 7.c As criteria 4.c to 4.f.	The LCA options appraisal summary document includes substructure and hard landscaping according to the criteria.	**1**	**0**	**0**	**1**	LCA and Arch	Credit not sought.
Mat 01c Core building services options appraisal during Concept Design (all		8. Criteria 3 to 4 are achieved. 9. During Concept Design identify opportunities for reducing environmental impacts as follows: 9.a Carry out building LCA options appraisal of at least 3 significantly different core building services design options. 9.b Use a building LCA tool that is recognised by BREEAM (as suitable for assessing core building services during Concept Design) according to the methodology (see Methodology below). 9.c As criteria 4.c to 4.f on the previous page.		**1**	**0**	**0**	**1**	LCA and Arch	Credit not sought.

BREEAM NC Criteria			Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Mat 01d LCA and LCC alignment (all building types)		10. Achieve criteria 3 to 5. 11. Achieve Elemental LCC plan and Component Level LCC options appraisal credits (Man 02 Life cycle cost and service life planning on page 44). 12. Include design options appraised for criteria 3 to 4 (and 6 to 7 and 8 to 9, if pursued) during Concept Design in - The elemental LCC plan: on page 45. 13. Include the design options appraised for criterion 5 during Technical Design in the 'Component level LCC option appraisal' (in Man 02 Life cycle cost and service life planning on page 44). 14. 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'.		1	0	0	1	LCA and Arch	Credit not sought.
Mat 01e Third party verification (all building types)		15. Criteria 1 to 7 (as applicable to the building type) are achieved. 16. A suitably qualified third party (see Definitions on page 237) 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). 17. For each LCA option, itemise in the report the checks made by the suitably qualified third party including, as a minimum, the quality requirements shown in Table 9.4 on page 241. 18. Include details of the suitably qualified third party's relevant skills and experience and a declaration of their third party independence from the project client and design team in the report.		1	0	0	1	LCA and Arch	Credit not sought.

		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Mat 02 Environmental impacts from construction products - EnvironmentalProduct Declarations (EPD)									
Mat 02a Specification of products with a recognised EPD		**One credit - Specification of products with a recognised environmental product declaration (EPD)** 1. Specify construction products with EPD that achieve a total EPD points score of at least 20, according to the Methodology on page 221. 2. Enter the details of each EPD into the Mat 01/02 Results Submission Tool, including the material category classification. The Mat 01/02 Results Submission Tool will verify the EPD points score and credit award.	Copies of Environmental Product Declarations A link/reference to the EPD's Product Category Rules Mat 01/02 Results Submission Tool	**1**	**1**	**0**	**0**	Arch	One credit targeted - Specification submission for confirmation
Mat 03 Responsible sourcing of construction products									
Mat 03a Prerequisite		**Prerequisite - Legally harvested and traded timber** 1. All timber and timber-based products used on the project are legally harvested and traded timber as per the UK Government's Timber Procurement Policy (TPP) (see Definitions on page 228). Compliance with criterion 1 is a minimum requirement for achieving any BREEAM rating. There are no prerequisite requirements for other materials.	Relevant section/clauses of the building specification or contract OR A signed and dated letter of commitment to meet the relevant criteria OR Timber Policy	**–**	**MET**	**–**	**–**		Pre-requisite will need to be met for the following credits to be awarded
Mat 03b Enabling sustainable procurement	**RIBA Stage 2**	**One credit - Enabling sustainable procurement** 2. A sustainable procurement plan must be used by the design team to guide specification towards sustainable construction products. The plan must: 2.a Be in place before Concept Design. 2.b Include sustainability aims, objectives and strategic targets to guide procurement activities. Note: targets do not need to be achieved for the credit to be awarded but justification must be provided for targets that are not achieved. 2.c Include a requirement for assessing the potential to procure construction products locally. There must be a policy to procure construction products locally where possible. 2.d Include details of procedures in place to check and verify the effective implementation of the sustainable procurement plan. In addition, if the plan is applied to several sites or adopted at an organisational level it must: 2.e Identify the risks and opportunities of procurement against a broad range of social, environmental and economic issues following the process set out in BS ISO20400:2017(166).	Evidence of level of responsible sourcing achieved for each construction product. For example, certificates. Completed copy of the Mat 03 Calculator tool. Evidence to show how the Mat 03 calculator tool has been completed.	**1**	**1**	**0**	**0**	Design Team	One credit targeted.
Mat 03c Measuring responsible sourcing		**Up to 3 credits - Measuring responsible sourcing** 3. Use the Mat 03 calculator tool and methodology to determine the number of credits achieved for the construction products specified or procured. Credits are awarded in proportion to the scope of the assessment and the number of points achieved, asset out in Table 9.10.		**3**	**1**	**0**	**2**	MC	MAT03 cal tool to be completed, 1 Credit targeted.

BREEAM NC Criteria			Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Mat 05 Designing for durability and resilience									
Mat 05a Protecting vulnerable parts of the building from damage		**One credit Protecting vulnerable parts of the building from damage**. 1. Protection measures are incorporated into the building's design and construction to reduce damage to the building's fabric or materials in case of accidental or malicious damage occurring. These measures must provide protection against: 1.a Negative impacts of high user numbers in relevant areas of the building (e.g. corridors, lifts, stairs, doors etc. 1.b Damage from any vehicle or trolley movements within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas. 1.c External building fabric damage by a vehicle. Protection where parking or manoeuvring areas are within 1 metre of the building façade and where delivery areas or routes are within 2 metres of the façade, i.e. specifying bollards or protection rails. 1.d Potential malicious damage to building materials and finishes, in public and common areas where appropriate. Protecting exposed parts of the building from material degradation. 2. Key exposed building elements have been designed and specified to limit long and short term degradation due to environmental factors. This can be demonstrated through one of the following: 2.a The element or product achieving an appropriate quality or durability standard or design guide, see Table 9.14 on the next page. If none are available, use BS7543:2015(168) as the default appropriate standard OR 2.b A detailed assessment of the element's resilience when exposed to the applicable material degradation and environmental factors. 3. Include convenient access to the roof and façade for cost-effective cleaning, replacement and repair in the building's design. 4. Design the roof and façade to prevent water damage, ingress and detrimental ponding. See Table 9.14 on the next page for an example list of relevant industry durability and quality standards.	Design drawings illustrating vulnerable areas/parts of the building. Design drawings and/or relevant section/clauses of the building specification or contract confirming the durability measures specified	**1**	**1**	**0**	**0**	Arch	Credit taken - dwg needed to show details provided.
Mat 06 Material Efficiency									
Mat 06a Material Efficiency	**RIBA Stage 1-5**	**One credit - Material efficiency** 1. At the Preparation and Brief and Concept Design stages, set targets and report on opportunities and methods to optimise the use of materials. These must be done for each of the following stages. See Table 9.15 on page 237: 1.a Preparation and Brief 1.b Concept Design 1.c Developed Design 1.d Technical Design 1.e Construction 2. Develop and record the implementation of material efficiency, see Table 9.15 below, during: 2.a Developed Design 2.b Technical Design 2.c Construction 3. Report the targets and actual material efficiencies achieved.	A copy of the report	**1**	**1**	**0**	**0**	Arch	Arch provided information.
Total Credits				**17**	**7**	**0**	**10**		
			15%	**15%**	**6%**	**0%**	**9%**		
Wst 01 Construction waste management									
Wst 01a Pre-demolition audit	**RIBA Stage 2**	**One credit - Pre-demolition audit** 1. Complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition. This must be used to determine whether refurbishment or reuse is feasible and, in the case of demolition, to maximise the recovery of material. 1.a Be carried out at Concept Design stage (RIBA Stage 2) by a competent person (see Definitions on page 245) prior to strip-out or demolition works 1.b Guide the design, consider materials for reuse and set targets for waste management. 1.c Engage all contractors in the process of maximising high grade reuse and recycling opportunities. 1.d Compare actual waste arisings and waste management routes used with those forecast and investigate significant deviations from planned targets. 2. Make reference to the audit in the resource management plan (RMP) (see Definitions). Note: 1.0 Where, under the developer's ownership, no demolition will be undertaken to enable the assessed development, the pre-demolition audit credit is not applicable and therefore filtered out of the assessment.	A copy of the Resource Management Plan and, where relevant, the pre-demolition audit Relevant section/clauses of the building specification or contract AND/OR A letter from the Client or their representative	**1**	**0**	**0**	**1**	Demo / MC	Not to be sought

BREEAM NC Criteria			Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Wst 01b Construction resource efficiency		**Up to three credits - Construction resource efficiency** 3. Prepare a compliant Resource Management Plan (RMP) covering: 3.a Non-hazardous waste materials (from on-site construction and dedicated off-site manufacture or fabrication, see Definitions on page 245), including demolition and excavation waste. 3.b Accurate data records on waste arisings and waste management routes. 4. Meet or improve upon the benchmarks in Table 10.1 for non-hazardous construction waste, excluding demolition and excavation waste.		**3**	**2**	**0**	**1**	MC	Two credits targeted - to be confirmed by project ream
Wst 01c Diversion of resources from landfill		**One credit - Diversion of resources from landfill** 5. Meet, where applicable, the diversion from landfill benchmarks in Table 10.2 for non-hazardous construction waste and demolition and excavation waste generated. 6. Sort waste materials into separate key waste groups as per Table 10.3 on page 247, either on-site or through a licensed contractor for recovery		**1**	**1**	**0**	**0**	MC	Credit taken.
Wst 02 Use of recycled ad sustainably sourced aggregates									
Wst 02 Prerequisite		**Prerequisite - Pre-demolition audit** 1. If demolition occurs on site, to encourage the reuse of site-won material on site, complete a pre-demolition audit of any existing buildings, structures or hard surfaces in accordance with Assessment Scope - Criterion 1.		–	-	–	–	Design Team	Not sought
Wst 02a Project sustainable aggregate points		**One credit - Project Sustainable Aggregate Points** 2. Identify all aggregate uses and types on the project Table 10.5 and Table 10.6 on the next page. 3. Determine the quantity in tonnes for each identified use and aggregate type. 4. Identify the region in which the aggregate source is located. 5. Calculate the distance in kilometres travelled by all aggregates by transport type. 6. Enter the information into the BREEAM Wst 02 calculator to calculate the Project Sustainable Aggregate points. The corresponding number of BREEAM credits will be awarded as shown in Table 10.4.	Completed copy of Wst 02 calculator Documentary evidence supporting the data used to complete the Calculator tool. Documentation confirming the source of recycled/secondary aggregates and that the required amount can be provided	**1**	**0**	**0**	**1**	Design Team	Not sought

BREEAM NC Criteria			Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Wst 03 Operational waste									
Wst 03a Operational waste		**One credit - Operational waste** 1. Provide a dedicated space for the segregation and storage of operational recyclable waste generated. The space is: 1.a Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams. 1.b Accessible to building occupants or facilities operators for the deposit of materials and collections by waste management contractors. 1.c Of a capacity appropriate to the building type, size, number of units (if relevant) and predicted volumes of waste that will arise from daily or weekly operational activities and occupancy rates. 2. For consistent and large amounts of operational waste generated, provide: 2.a Static waste compactors or balers; situated in a service area or dedicated waste. 2.b Vessels for composting suitable organic waste OR adequate spaces for storing segregated food waste and compostable organic material for collection and delivery to an alternative composting facility 2.c A water outlet provided adjacent to or within the facility for cleaning and hygiene purposes where organic waste is to be stored or composted on site. 4 Provide three internalstorage containersfor each dwelling or bedsit with: 4.a A minimum total capacity of 30 litres 4.b No individual container smaller than 7 litres 4.c All containersin a dedicated non-obstructive position 4.d Storage containersfor recycling in addition to non-recyclable waste storage. 5 Provide home composting facilities and a home composting information leaflet within the kitchen area or communal space for each self-contained dwelling or bedsit. Note: Additionally for multi-residential buildings with individual bedrooms and communal facilities only: 6 Meet criteria 4.a and 4.b for self-contained dwellings or bedsits for every six bedrooms. 7 Locate recyclable storage in a dedicated, unobstructive position in communal kitchens or other appropriate communal space. 8 Provide home composting facilities and a home composting information leaflet within the kitchen area or communal space. 9 Provide a minimum of 10 litres of internal storage for compostable waste.	Design drawings and/or relevant section/clauses of the building specification or contract confirming provision and scope of dedicated facilities. Project team meeting minutes / letter confirming likely building waste streams and indicative volumes	**1**	**1**	**0**	**0**	Arch	One Credit to be targeted
Wst 04 Speculative finishes (Offices only)									
Wst 05 Adaption to climate change									
Wst 05a Resilience of structure, fabric, building services and renewables installation	**RIBA Stage 2 & 4**	**One credit - Resilience of structure, fabric, building services and renewables installation** 1. Conduct a climate change adaptation strategy appraisal using: 1.a A systematic risk assessment to identify the impact of expected extreme weather conditions arising from climate change on the building over its projected life cycle. The assessment covers the installation of building services and renewable systems, as well as structural and fabric resilience aspects and includes(see Methodology below): 1.a.i Hazard identification 1.a.ii Hazard assessment 1.a.iii Risk estimation 1.a.iv Risk evaluation 1.a.v Risk management. 2. Develop recommendations or solutions based on the climate change adaptation strategy appraisal, before or during Concept Design, that aim to mitigate the identified impact. 3. Provide an update during Technical Design demonstrating how the recommendations or solutions proposed at Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing by the assessor.	Relevant section/clauses of the building specification or contract. Design drawings. Report/study.	**1**	**1**	**0**	**0**	Arch	Arch provided information.

		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Wst 06 Design for disassembly and adaption									
Wst 06a Design for disassembly and adapability - recommendations	**RIBA Stage 2**	**One credit - Design for disassembly and functional adaptability - recommendations** 1. Conduct a study to explore the ease of disassembly and the functional adaptation potential of different design scenarios (see Methodology on page 269) by the end of Concept Design. 2. Develop recommendations or solutions (see Methodology on page 269) based on the study (criterion 1 above), during or prior to Concept Design, that aim to enable and facilitate disassembly and functional adaptation.	Disassembly and functional adaptability study, implementation plan report, building adaptability and disassembly guide	**1**	**1**	**0**	**0**	Arch / Civils	Arch provided information.
Wst 06b Disassembly and functional adapability - imnlementation	**RIBA Stage 4**	**One credit - Disassembly and functional adaptability – implementation** 3. Achieve criteria 1 and 2 4. Provide an update, during Technical Design, on: 4.a How the recommendations or solutions proposed by Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing to the assessor. 4.b Changes to the recommendations and solutions during the development of the Technical Design. 5. Produce a building adaptability and disassembly guide to communicate the characteristics allowing functional adaptability and disassembly to prospective tenants.	Disassembly and functional adaptability study, implementation plan report, building adaptability and disassembly guide	**1**	**1**	**0**	**0**	Arch / Civils	Arch provided information.
Total Credits				**10**	**7**	**0**	**4**		
			6%	**6%**	**4%**	**0%**	**2%**		
Le 01 Site selection									
Le 01a Previously occupied land		**One credit - Previously occupied land** 1 At least 75% of the proposed development's footprint is on an area of land which has previously been occupied (see Definitions).	Disassembly and functional adaptability study, implementation plan report, building adaptability and disassembly guide	**1**	**0**	**0**	**1**	Arch	Not targetted.
Le 01b Contaminated land		**One credit - Contaminated land** 2. A contaminated land professional's site investigation, risk assessment and appraisal has deemed land within the site to be affected by contamination. The site investigation, risk assessment and appraisal have identified: 2.a The degree of contamination 2.b The contaminant sources or types 2.c The options for remediating sources of contamination which present an unacceptable risk. 3. The Client or Main contractor confirms that remediation of the site will be carried out in accordance with the remediation strategy and its implementation plan as recommended by the contaminated land professional (see Definitions).	A copy of the remediation strategy and implementation plan. Evidence to demonstrate the recommendations set out in the remediation strategy plan have been implemented.	**1**	**0**	**0**	**1**	Civils	Not targetted.
Le 02 Identifying and understanding the risks and opportunities for the project									
Le 02a Prerequisite	**RIBA Stage 1 or 2**	**Prerequisite - Assessment route selection** 1. An assessment route (see Definitions on page 300) for the project has been determined using BREEAM Guidance Note GN34 BREEAM Ecological Risk Evaluation Checklist. 2. The Client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.	Completed Guidance Note 34: BREEAM Ecology Risk Evaluation Checklist	**–**	**MET**	**-**	**–**	Arbtech	Assessment Route 2 - Arbtech has sent through a Draft Ecology Report.

		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Le 02b Survey and evaluation	RIBA Stage 1 or 2	**One or up to two credits depending on route -Survey and evaluation** **Route 2** 4. A Suitably Qualified Ecologist (SQE) is appointed at a project stage that ensures early involvement in site configuration and, where necessary, can influence strategic planning decisions. 5. Prior to the completion of the preparation and brief project stage, an appropriate level of survey and evaluation (see Assessment route 2: For sites where complex ecological systems are likely to be present) has been carried out to determine the ecological baseline of the site, taking account of the zone of influence to establish: 5.a Current and potential ecological value and condition of the site, and related areas within the zone of influence. 5.b Direct and indirect risks to current ecological value 5.c Capacity and feasibility for enhancement of the ecological value of the site and, where relevant, areas within the zone of influence. 6. 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) 7. Survey and evaluation criteria (criterion 3 or 4-6 above) have been achieved. 8. During Concept Design, the project team liaise and collaborate with representative stakeholders to identify and consider ecological outcome for the sites. 9. The ecological outcome for the site is determined by identifying, appraising and selecting specific solutions and measures. The solutions and measures must be identified sufficiently early in the project to influence key project planning decisions and must be done in accordance with the following hierarchy of action, which is dependant on the route being used.	A copy of the Ecological Survey and Evaluation document. Note: A phase 1 habitat assessment or other equivalent type of assessment can act as acceptable evidence as long as it can be shown that they cover the content of the assessment criteria,	**2**	**2**	**0**	**0**	Arbtech	Details within the Arbtech Report.
Le 03 Managing negative impact on ecology									
Le 03a Prerequisite		**Prerequisite – Ecological risks and opportunities** 1. LE02's 'Survey and evaluation and Determining ecological outcomes' criteria have been achieved using the Foundation route (Route 1) or the Comprehensive route (Route 2).		**–**	**MET**	**–**	**–**	Arbtech	Details within the Arbtech Report.
Le 03b Planning and measures on-site	RIBA Stage 1 or 2	**One credit – Planning and measures on-site** **Routes 1 and 2** 2. Further planning to avoid and manage negative ecological impacts on-site is carried out (see Methodology) early enough to influence the concept design and design brief as well as site preparation planning (typically Concept Design stage). 3. On-site measures for managing negative ecological impacts during site preparation and construction are implemented in practice (e.g. mitigation measures to protect existing ecological features) (see Methodology). 4. Criteria 2-3 are based on input from the project team in collaboration with representative stakeholders and data collated as part of the 'Determining ecological outcomes' in Le02 Ecological risks and opportunities (see Methodology).		**1**	**1**	**0**	**0**	Arbtech	Details within the Arbtech Report.
Le 03c Managing negative impacts		**Up to two credits – Managing negative impacts of the project Foundation route (Route 1) (one credit)** 5. Criteria 2 and 3 are achieved. 6. Negative impacts from site preparation and construction works have been managed according to the hierarchy (see Methodology) and no overall loss of ecological value has occurred. Comprehensive route (Route 2) (up to two credits) 7. Criteria 2-4 have been achieved. 8. Negative impacts from site preparation and construction works have been managed according to the mitigation hierarchy, in line with the SQE's recommendations (see Methodology) and, either: a. No overall loss of (see Definitions) ecological value has occurred (2 credits) OR where criterion 8a is not possible: b. The loss of ecological value has been minimised (Minimising Loss) (1 credit).		**2**	**2**	**0**	**0**	Arbtech	Details within the Arbtech Report.
Le 04 Change and enhancement of ecological value									
Le 04a Prerequisite		Prerequisite - Managing negative impacts on ecology 1. Criterion 6 (for Foundation route) or 8 (for Comprehensive route) in Le03 has been achieved. 2. The Client or contractor confirms compliance is monitored against all relevant UK, EU or international legislation relating to the ecology of the site.		**–**	**MET**	**–**	**–**	Client / MC	Client / MC to confirm compliance by monitoring against relevant legislations relating to ecology on site

		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Le 04b Change and enhancement of ecology		**One credit - Change and enhancement of ecology Foundation route (Route 1) only** 3 Locally relevant ecological measures have been implemented that enhance the site's ecological value. The measures adopted are based on (see Methodology). 3.a Recommendations from recognised 'local' ecological expertise and specialist input and guidance. 3.b Input from the project team in collaboration with representative stakeholders and data collated as part of 'Determining ecological outcomes' in LE 02.Comprehensive route (Route 2) only. 4 Measures have been implemented that enhance ecological value, which are based on input from the project team and SQE in collaboration with representative stakeholders and data collated as part of the 'Determining ecological outcomes' in LE 02 (see Methodology). Measures are implemented in the following order: 4.a On site, and where this is not feasible, 4.b Off site within the Zone of Influence. 5 Data collated are analysed and where potentially valuable, provided to the local environmental records centres nearest to, or relevant for, the site.	Ecologist's report Design drawings including proposed and existing (pre-development) site plan/survey Written confirmation from the Client/design team confirming how the ecologist's recommendations will be implemented	**1**	**1**	**0**	**0**	Arbtech	Information relating to planting enhancements.
Le04c Change and enhancement of ecology		Comprehensive route (Route 2) only 6 Up to three credits are awarded based on the change in ecological value occurring as a result of the project. This must be calculated in accordance with the process set out in GN36 - BREEAM, CEEQUAL and HQM Ecology Calculation Methodology – Route 2. Credits are awarded in line with the Reward Scale table in GN36 where there are no residual impacts on protected sites or irreplaceable habitats.		**3**	**0**	**3**	**0**	ES /Design Team	No change in ecological value has been demonstrated within the report, therefore no credit can be given.
Le 05 Long term ecology management and maintenance									
Le 05a Prerequisite		Prerequisite - Statutory obligations, planning and site implementation 1. The Client or contractor has confirmed that compliance is being monitored against all relevant UK, EU and international standards relating to the ecology of the site. 2. The following must be achieved, according to the route being assessed: a. Foundation route (Route 1) - criterion 6 in Le03 has been achieved . b. Comprehensive route (Route 2) - criterion 8 in Le03 has been achieved, and at least one credit under Le 04 for 'Change and Enhancement of Ecology' has been awarded.		**–**	**MET**	**–**	**–**	ES /Design Team	Awaiting Ecologist report.
Le 05b Management and maintenance throughout the project– Foundation and Comprehensive routes (Route 1 and Route 2)		3. Measures have been implemented to manage and maintain ecology throughout the project. These measures are based on input from the project team in collaboration with representative stakeholders and data collated as part of the 'Determining ecological outcomes' in LE 02 (see Methodology). To ensure the optimal ecological outcomes agreed in LE 02 are met in-practice, these measures must monitor and review the effectiveness of the mitigation and enhancement measures in place for LE 03 & LE 04 to ensure they are implemented. 4. A section on Ecology and Biodiversity has been included as part of the tenant or building owner information supplied, to inform the owner or occupant of local ecological features, value and biodiversity on or near the site (see Methodology). This should include detailed management and maintenance plans as required by landscape and asset managers as well as relevant parts of the handover information for occupiers written in a format that encourages understanding and supportive behaviours.	Ecologist's report Design drawings including proposed and existing (pre-development) site plan/survey Written confirmation from the Client/design team confirming how the ecologist's recommendations will be implemented.	**1**	**1**	**1**	**-1**	ES /Design Team	Awaiting Ecologist report.
Le05c Landscape and ecology management plan		5. A Landscape and Ecology Management Plan, or equivalent, has been developed in accordance with BS 42020:2013 Section 11.1(211) covering at least the first five years after project completion as a minimum and including: 5.a Actions and responsibilities of relevant individuals prior to handover Technical Manual - 6.1.1 - 28/06/2023 - SD5079 Page 329 of 397 LE 05 Long term ecological management and maintenance BREEAM UK New Construction 5.b The ecological value and condition of the site at handover and how this is expected to develop and change over time. 5.c Identification of opportunities for ongoing alignment with activities beyond the development project, which support the aims of BREEAM's Strategic Ecology Framework. 5.d Identification and guidance to trigger appropriate remedial actions to address previously unforeseen impacts. 5.e Clearly defined and allocated roles and responsibilities for delivering the plan 6 The landscape and management plan or similar will be updated to support maintenance of the ecological value of the site (see sections relating to Maintenance and Monitoring in CIEEM, CIRIA, IEMA, for helpful guidance(212)).		**1**	**0**	**1**	**0**	Client	Client to confirm if there will be a five year management plan after project completion.

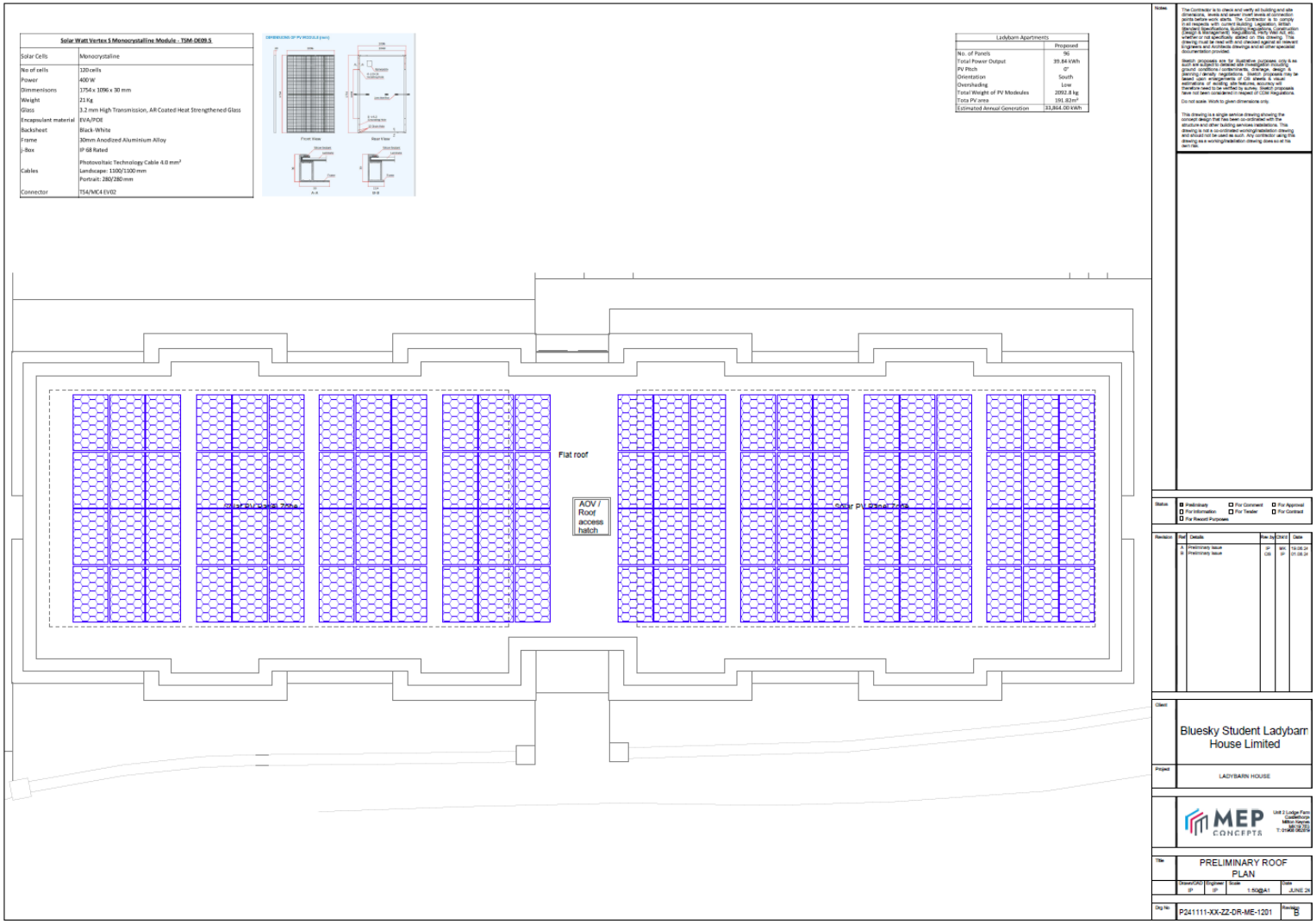
		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Total Credits				13	7	4	1		
			13%	13%	7%	4%	1%		
Pol 01 Impacts of refrigerants									
Pol 01a No refrigerant use		1 No refrigerant use within the installed plant or systems. OR alternatively, where the building does use refrigerants, the three credits can be awarded as follows:	Completed copy of Pol 01 calculator tool. Documentary evidence supporting the data used to complete the calculator tool. A copy of the specification clause or letter from the Harniss engineer / system manufacturer confirming relevant refrigeration type and system information.	3	0	0	3	M&E	Not possible to target
Pol01b Prerequisite		2 All systems with electric compressors comply with the requirements of BS EN 378-2:2016(213) and BS EN 378-3:2016+A1:2020(214). Refrigeration systems containing ammonia comply with the Institute of Refrigeration Ammonia Refrigeration Systems code of practice(215).			-	-	-	M&E	
Pol 01c Impact of refrigerant		**Two credits** 3 The direct effect life cycle CO_2 equivalent emissions (DELC) of ≤100 CO_2-eq/kW. For systems which provide cooling and heating, the worst performing output based on the lower of kW cooling output and kW heating output is used to complete the calculation. To calculate the DELC, refer to the relevant definitions in Methodology on the next page and Additional information on page 339. OR 4 All refrigerants used have a global warming potential (GWP) ≤10. OR **One credit** 5 Systems using refrigerants have a DELC of ≤1000kgCO_2-eq/kW cooling and heating capacity.		2	1	1	0	M&E	Potential credit. GWP ≤10 or ≤1000kgC02-eq. TO be confirmed by Team.
Pol 01d Leak detection		6 All systems are hermetically sealed or only use environmentally benign refrigerants (see Leak detection on page 337 and Hermetically sealed systems on page 338). OR 7 Where the systems are not hermetically sealed: 7.a Systems have: 7.a.i A permanent automated refrigerant leak detection system, that is robust and tested, and capable of continuously monitoring for leaks. OR 7.a.ii An inbuilt automated diagnostic procedure for detecting leakage is enabled. 7.b In the event of a leak, the system must be capable of automatically responding and managing the remaining refrigerant charge to limit loss of refrigerant (see Automatic isolation and containment of refrigerant on page 339).		1	0	0	1	M&E	
Pol 02 Local air quality									
Pol 02a Local air quality		**Up to two credits - Local air quality** 1. All heating and hot water is supplied by non-combustion systems. For example, only powered by electricity. OR alternatively; 2. Emissions from all installed combustion plant that provide space heating and domestic hot water do not exceed the levels set in Table 12.4 and Table 12.5 on page 328. The measurements must be provided by manufacturers. Must determine whether the development is in a high or low pollution zone (methodology).		2	2	0	0	M&E	All heating and hot water will be electric.

BREEAM NC Criteria			Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Pol 03 Flood and surface water management									
Pol 03a Prerequisite		**Prerequisite** 1. An appropriate consultant is appointed to carry out and demonstrate the development's compliance with all criteria.		–	**MET**	-	–	Civils	Prerequisite met.
Pol 03b Flood resilience		**Up to two credits - Flood resilience** **Two credits - Low flood risk** 2. A site-specific flood risk assessment (FRA) confirms the development is in a flood zone that is defined as having a low annual probability of flooding. The FRA takes all current and future sources of flooding into consideration (see Sources of flooding on page 312). **One credit - Medium or high flood risk** 3. A site-specific FRA confirms the development is in a flood zone that is defined as having a medium or high annual probability of flooding and is not in a functional floodplain. The FRA must take all current and future sources of flooding into consideration (see Sources of flooding on page 312). For smaller sites refer to Level of detail required in the FRA for smaller sites on page 312, which overrides criterion 2 above. 4. To increase the resilience and resistance of the development to flooding, one of the following must be achieved: 4.a The ground level of the building and access to both the building and the site, are designed (or zoned) so they are at least 600 mm above the design flood level of the site's flood zone (see 600 mm threshold on page 312). 4.b The final design of the building and the wider site reflects the recommendations made by an appropriate consultant in accordance with the hierarchy approach outlined in section 5 of BS 8533:2017 (214).		**2**	**2**	**0**	**0**	Civils	FRA confirmed low risk.
Pol 03c Surface water run-off		**Two credits - Surface water run-off** Prerequisite for surface water run-off credits 5 Surface water run-off design solutions must be bespoke, i.e. they must take account of the specific site requirements and natural or man-made environment of and surrounding the site. The priority levels detailed in the Methodology must be followed, with justification given by the appropriate consultant where water is allowed to leave the site. **One credit - Surface Water Run-Off - Rate** 6. For brownfield sites, 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. 7. For Greenfield sites, drainage measures are specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) is no greater for the developed site than it was for the predevelopment site. This should comply at the 1-year and 100-year return period events. 8. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Sustainable Drainage Systems (SuDS) are in place. 9. Calculations include an allowance for climate change. This should be made in accordance with current best practice planning guidance (see Definitions on page 353). **One credit - Surface Water Run-Off - Volume** 10. Flooding of property will not occur in the event of local drainage system failure (caused either by extreme rainfall or a lack of maintenance); AND EITHER 11. Drainage design measures are specified so that the post-development run-off volume, over the development lifetime, is no greater than it would have been prior to the assessed site's development. This must be for the 100-year 6-hour event, including an allowance for climate change (see criterion 15). 12. Any additional predicted volume of run-off for this event is prevented from leaving the site by usinginfiltration or other SuDS techniques. OR (only where criteria 11 and 12 cannot be achieved): 13. 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. 14. Drainage design measures are specified so that the post-development peak rate of run-off is reduced to the limiting discharge. The limiting discharge is defined as the highest flow rate from the following options: 14.a The pre-development one-year peak flow rate 14.b The mean annual flow rate (Qbar) 14.c 2L/s/ha. For the one-year peak flow rate, the one-year return period event criterion applies. 15. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS are in place.		**2**	**1**	**1**	**0**	Civils	1 credit taken for surface water run off.

		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Pol 03d Minimising watercourse pollution		**One credit - Minimising watercourse pollution** 17. There is no discharge from the developed site for rainfall up to 5 mm (confirmed by the appropriate consultant). 18. Areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate SuDS techniques. 19. Areas with a high risk of contamination or spillage of substances, such as petrol and oil, have separators (or an equivalent system) are installed in surface water drainage systems. 20. Chemical or liquid gas storage areas have a means of containment fitted to the site drainage system (i.e. shut-off valves). This is to prevent the escape of chemicals to natural watercourses in the event of a spillage or bunding failure. 21. All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as the SuDS manual(222) 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. 22. A comprehensive and up to date drainage plan of the site will be made available for the building or site occupiers. 23. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place. 24. All external storage and delivery areas are designed and detailed in accordance with the current best practice planning guidance.		**1**	**0**	**1**	**0**	Civils	Not targetted.
Pol 04 Reduction of night time light pollution									
Pol 04a Reduction of night time light pollution		**One credit - Reduction of night time light pollution** 1. External lighting pollution has been eliminated through effective design that removes the need for external lighting. This does not adversely affect the safety and security of the site and its users. OR alternatively, where the building does have external lighting, one credit can be awarded as follows: 2. All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00. 3. If safety or security lighting is provided and will be used between 23:00 and 07:00, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP guidance notes. 4. Illuminated advertisements are designed in compliance with ILP PLG05 The Brightness of Illuminated Advertisements.(221).	Design drawings Relevant section/clauses of the building specification or contract or external lighting design data/calculations In the case of the external lighting design, the Harniss engineer or lighting designer must provide indicative examples of where and how the strategy complies with the assessment criteria.	**1**	**1**	**0**	**0**	M&E	Assumed credit would be targeted to be confirmed by team

		BREEAM NC Criteria	Potential Design stage Evidence Approach	Credits Available	Current Targeted	Potential	Balance	Responsibility	Comments
Pol 05 Reduction of noise pollution									
Pol 05a Reduction of noise pollution		**One credit - Reduction of noise pollution** 1. There are no noise-sensitive areas within the assessed building or within 800 m radius of the assessed site. OR 2. Where there are noise-sensitive areas within the assessed building or noise-sensitive areas within 800 m radius of the assessed site, a noise impact assessment compliant with BS4142:2014(222) is commissioned. Noise levels must be measured or determined for: 2.a Existing background noise levels: 2.a.i at the nearest or most exposed noise-sensitive development to the proposed assessed site. 2.a.ii including existing plant on a building, where the assessed development is an extension to the building. 2.b Noise rating level from the assessed building. 3. The noise impact assessment must be carried out by a suitably qualified acoustic consultant. 4. The noise level from the assessed building, as measured in the locality of the nearest or most exposed noise sensitive development, must be at least 5dB lower than the background noise throughout the day and night. 5. If the noise sources from the assessed building are greater than the levels described in criterion 4, measures have been installed to attenuate the noise at its source to a level where it will comply with the criterion	For 1: Design drawings highlighting: 1. All existing and proposed noise-sensitive buildings local to, and within, the site boundary. 2. Proposed sources of noise from the new development. 3. Distance (m) from these buildings to the assessed development. For 2 to 3: The acoustician's report, acoustician's qualifications and professional status. OR Relevant section/clauses of the building specification or contract requiring a noise assessment by a suitably qualified acoustician in compliance with BS 4142:1997. OR A letter from the Client or design team confirming that they will appoint an acoustician to carry out a noise assessment in compliance with BS 4142:1997 For 4: Acoustician's report with recommendations for noise attenuation measures. AND EITHER A marked-up design plan highlighting the specification of the acoustician's attenuation measures OR A formal letter from the Client or design team confirming where relevant, that attenuation measures recommended by an appointed suitably qualified acoustician will be installed.	**1**	**0**	**0**	**1**	SQA Consultant	
Total Credits				**15**	**7**	**5**	**5**		
			8%	**8%**	**4%**	**3%**	**3%**		
Innovation - Exemplary Level Criteria									
Man 03i Responsible Construction management		23. Achieve all items in Table 4.1 on page 47.	As Man 03 evidence.	**1**	**1**	**0**	**0**	MC	Noted as targeted at this stage - CSCS

APPENDIX II – INDICATIVE PV LAYOUT



APPENDIX III – BRUKL OUTPUT DOCUMENT

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Ladybarn Apartments As-Designed — As designed

Date: Thu Aug 15 16:50:22 2024

Administrative information

Building Details

Address: Ladybarn Apartment, Manchester,

Certifier details

Name: Ian Pope

Telephone number: 01908062819

Address: Unit 2, Lodge Farm Business Park, Castlethorpe, Milton Keyens, MK19 7ES

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.5.6"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.5.6

BRUKL compliance module version: v6.1.e.0

Foundation area [m²]: 317.6

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	4.13	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	-0.01	
Target primary energy rate (TPER), $kWh_{pe}/m^2.annum$	44.54	
Building primary energy rate (BPER), $kWh_{pe}/m^2.annum$	-2.98	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.15	0.15	External Wall
Floors	0.18	0.12	0.12	Ground Floor
Pitched roofs	0.16	0.11	0.11	Roof
Flat roofs	0.18	-	-	No flat roofs in project
Windows** and roof windows	1.6	1.35	1.41	Stair Window
Rooflights***	2.2	-	-	No rooflights in project
Personnel doors^	1.6	-	-	No personnel doors in project
Vehicle access & similar large doors	1.3	-	-	No vehicle access or similar large doors in project
High usage entrance doors	3	-	-	No high usage entrance doors in project

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] — $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m²K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
$m^3/(h.m^2)$ at 50 Pa	8	3

Page 1 of 8

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	0.9 to 0.95

1- Heating Only

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4	-	-	-	-
Standard value	2.5*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

2- MVHR Kitchen/Living (6 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4	4.5	-	1.1	0.8
Standard value	2.5*	3	N/A	1.5^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

3- HVHR Studio (72 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4	4.5	-	1.1	0.8
Standard value	2.5*	3	N/A	1.5^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

1- New HWS Circuit

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	3	0
Standard value	2*	N/A

* Standard shown is for all types except absorption and gas engine heat pumps.

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

General lighting and display lighting	**General luminaire**	**Display light source**	
Zone name	**Efficacy [lm/W]**	**Efficacy [lm/W]**	**Power density [W/m²]**
Standard value	95	80	0.3
Ground Floor Living/Kitchen 1	110	-	-
Ground Floor Living/Kitchen 2	110	-	-
Ground Floor Bedroom 1	110	-	-
Ground Floor Ensuite 1	110	-	-
Ground Floor Bedroom 2	110	-	-
Ground Floor Ensuite 2	110	-	-
Ground Floor Bedroom 3	110	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Ground Floor Ensuite 3	110	-	-
Ground Floor Bedroom 4	110	-	-
Ground Floor Ensuite 4	110	-	-
Ground Floor Bedroom 5	110	-	-
Ground Floor Ensuite 5	110	-	-
Ground Floor Bedroom 6	110	-	-
Ground Floor Ensuite 6	110	-	-
Ground Floor Bedroom 7	110	-	-
Ground Floor Ensuite 7	110	-	-
Ground Floor Bedroom 8	110	-	-
Ground Floor Ensuite 8	110	-	-
Ground Floor Bedroom 9	110	-	-
Ground Floor Ensuite 9	110	-	-
Ground Floor Bedroom 10	110	-	-
Ground Floor Ensuite 10	110	-	-
Ground Floor Bedroom 11	110	-	-
Ground Floor Ensuite 11	110	-	-
Ground Floor Bedroom 12	110	-	-
Ground Floor Ensuite 12	110	-	-
First Floor Living/Kitchen 1	110	-	-
First Floor Living/Kitchen 2	110	-	-
First Floor Bedroom 1	110	-	-
First Floor Ensuite 1	110	-	-
First Floor Bedroom 2	110	-	-
First Floor Ensuite 2	110	-	-
First Floor Bedroom 3	110	-	-
First Floor Ensuite 3	110	-	-
First Floor Bedroom 4	110	-	-
First Floor Ensuite 4	110	-	-
First Floor Bedroom 5	110	-	-
First Floor Ensuite 5	110	-	-
First Floor Bedroom 6	110	-	-
First Floor Ensuite 6	110	-	-
First Floor Bedroom 7	110	-	-
First Floor Ensuite 7	110	-	-
First Floor Bedroom 8	110	-	-
First Floor Ensuite 8	110	-	-
First Floor Bedroom 9	110	-	-
First Floor Ensuite 9	110	-	-
First Floor Bedroom 10	110	-	-
First Floor Ensuite 10	110	-	-
First Floor Bedroom 11	110	-	-
First Floor Ensuite 11	110	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
First Floor Bedroom 12	110	-	-
First Floor Ensuite 12	110	-	-
Corridor 1	110	-	-
Cooridor 2	110	-	-
Circulation	110	-	-
Plant Room	110	-	-
Ground Floor 27	110	-	-
Ground Floor 28	110	-	-
Ground Floor 29	110	-	-
Second Floor Living/Kitchen 1	110	-	-
Second Floor Living/Kitchen 2	110	-	-
Second Floor Bedroom 1	110	-	-
Second Floor Ensuite 1	110	-	-
Second Floor Bedroom 2	110	-	-
Second Floor Ensuite 2	110	-	-
Second Floor Bedroom 3	110	-	-
Second Floor Ensuite 3	110	-	-
Second Floor Bedroom 4	110	-	-
Second Floor Ensuite 4	110	-	-
Second Floor Bedroom 5	110	-	-
Second Floor Ensuite 5	110	-	-
Second Floor Bedroom 6	110	-	-
Second Floor Ensuite 6	110	-	-
Second Floor Bedroom 7	110	-	-
Second Floor Ensuite 7	110	-	-
Second Floor Bedroom 8	110	-	-
Second Floor Ensuite 8	110	-	-
Second Floor Bedroom 9	110	-	-
Second Floor Ensuite 9	110	-	-
Second Floor Bedroom 10	110	-	-
Second Floor Ensuite 10	110	-	-
Second Floor Bedroom 11	110	-	-
Second Floor Ensuite 11	110	-	-
Second Floor Bedroom 12	110	-	-
Second Floor Ensuite 12	110	-	-
Second Floor Coorridor 1	110	-	-
Second Floor Cooridor 2	110	-	-
Second Floor Circulation	110	-	-
Second Floor Store/Plant	110	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Ground Floor Living/Kitchen 1	NO (-73%)	NO
Ground Floor Living/Kitchen 2	NO (-74%)	NO
Ground Floor Bedroom 1	NO (-67%)	NO
Ground Floor Ensuite 1	N/A	N/A
Ground Floor Bedroom 2	NO (-65%)	NO
Ground Floor Ensuite 2	N/A	N/A
Ground Floor Bedroom 3	NO (-67%)	NO
Ground Floor Ensuite 3	N/A	N/A
Ground Floor Bedroom 4	NO (-67%)	NO
Ground Floor Ensuite 4	N/A	N/A
Ground Floor Bedroom 5	NO (-64%)	NO
Ground Floor Ensuite 5	N/A	N/A
Ground Floor Bedroom 6	NO (-67%)	NO
Ground Floor Ensuite 6	N/A	N/A
Ground Floor Bedroom 7	NO (-54%)	NO
Ground Floor Ensuite 7	N/A	N/A
Ground Floor Bedroom 8	NO (-51%)	NO
Ground Floor Ensuite 8	N/A	N/A
Ground Floor Bedroom 9	NO (-61%)	NO
Ground Floor Ensuite 9	N/A	N/A
Ground Floor Bedroom 10	NO (-61%)	NO
Ground Floor Ensuite 10	N/A	N/A
Ground Floor Bedroom 11	NO (-52%)	NO
Ground Floor Ensuite 11	N/A	N/A
Ground Floor Bedroom 12	NO (-55%)	NO
Ground Floor Ensuite 12	N/A	N/A
First Floor Living/Kitchen 1	NO (-73%)	NO
First Floor Living/Kitchen 2	NO (-74%)	NO
First Floor Bedroom 1	NO (-67%)	NO
First Floor Ensuite 1	N/A	N/A
First Floor Bedroom 2	NO (-65%)	NO
First Floor Ensuite 2	N/A	N/A
First Floor Bedroom 3	NO (-67%)	NO
First Floor Ensuite 3	N/A	N/A
First Floor Bedroom 4	NO (-67%)	NO
First Floor Ensuite 4	N/A	N/A
First Floor Bedroom 5	NO (-64%)	NO
First Floor Ensuite 5	N/A	N/A
First Floor Bedroom 6	NO (-67%)	NO
First Floor Ensuite 6	N/A	N/A
First Floor Bedroom 7	NO (-54%)	NO
First Floor Ensuite 7	N/A	N/A
First Floor Bedroom 8	NO (-51%)	NO
First Floor Ensuite 8	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
First Floor Bedroom 9	NO (-61%)	NO
First Floor Ensuite 9	N/A	N/A
First Floor Bedroom 10	NO (-61%)	NO
First Floor Ensuite 10	N/A	N/A
First Floor Bedroom 11	NO (-52%)	NO
First Floor Ensuite 11	N/A	N/A
First Floor Bedroom 12	NO (-55%)	NO
First Floor Ensuite 12	N/A	N/A
Second Floor Living/Kitchen 1	NO (-73%)	NO
Second Floor Living/Kitchen 2	NO (-73%)	NO
Second Floor Bedroom 1	NO (-65%)	NO
Second Floor Ensuite 1	N/A	N/A
Second Floor Bedroom 2	NO (-67%)	NO
Second Floor Ensuite 2	N/A	N/A
Second Floor Bedroom 3	NO (-65%)	NO
Second Floor Ensuite 3	N/A	N/A
Second Floor Bedroom 4	NO (-65%)	NO
Second Floor Ensuite 4	N/A	N/A
Second Floor Bedroom 5	NO (-67%)	NO
Second Floor Ensuite 5	N/A	N/A
Second Floor Bedroom 6	NO (-65%)	NO
Second Floor Ensuite 6	N/A	N/A
Second Floor Bedroom 7	NO (-51%)	NO
Second Floor Ensuite 7	N/A	N/A
Second Floor Bedroom 8	NO (-54%)	NO
Second Floor Ensuite 8	N/A	N/A
Second Floor Bedroom 9	NO (-55%)	NO
Second Floor Ensuite 9	N/A	N/A
Second Floor Bedroom 10	NO (-56%)	NO
Second Floor Ensuite 10	N/A	N/A
Second Floor Bedroom 11	NO (-53%)	NO
Second Floor Ensuite 11	N/A	N/A
Second Floor Bedroom 12	NO (-50%)	NO
Second Floor Ensuite 12	N/A	N/A

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m²]	953	953
External area [m²]	1550	1550
Weather	MAN	MAN
Infiltration [m³/hm²@ 50Pa]	3	3
Average conductance [W/K]	346	593
Average U-value [W/m²K]	0.22	0.38
Alpha value* [%]	32.28	17.28

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
	Storage or Distribution
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
100	**Residential Institutions: Universities and Colleges**
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
	Others: Miscellaneous 24hr Activities
	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	3.38	7.28
Cooling	1.31	2.29
Auxiliary	9.25	6.87
Lighting	7.22	7.16
Hot water	4.5	6.42
Equipment*	58.58	58.58
TOTAL**	**25.66**	**30.02**

* Energy used by equipment does not count towards the total for consumption or calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	28.45	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*28.45*	*0*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	71.03	111.02
Primary energy [kWh_{PE}/m²]	-2.98	44.54
Total emissions [kg/m²]	-0.01	4.13

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	38.2	0	2.8	0	1.6	3.8	0	4	0
	Notional	32.1	0	3.4	0	1.8	2.64	0	---	---
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	13.2	72.4	1	4.5	14.1	3.8	4.5	4	4.5
	Notional	40.4	120.7	4.3	7.6	8.8	2.64	4.4	---	---
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	64.9	8.4	4.7	0.5	10.3	3.8	4.5	4	4.5
	Notional	95.4	15.7	10	1	6.4	2.64	4.4	---	---

Key to terms

Heat dem [MJ/m2]	- Heating energy demand
Cool dem [MJ/m2]	- Cooling energy demand
Heat con [kWh/m2]	- Heating energy consumption
Cool con [kWh/m2]	- Cooling energy consumption
Aux con [kWh/m2]	- Auxiliary energy consumption
Heat SSEFF	- Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	- Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	- Heating generator seasonal efficiency
Cool gen SSEER	- Cooling generator seasonal energy efficiency ratio
ST	- System type
HS	- Heat source
HFT	- Heating fuel type
CFT	- Cooling fuel type

APPENDIX IV – DRAFT EPC

Energy Performance Certificate
Non-Domestic Building

HM Government

Ladybarn Apartment
Manchester

Certificate Reference Number:
9165-6379-8976-6781-0538

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating



Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Heating and Mechanical Ventilation
Total useful floor area (m^2):	953
Building complexity:	Level 5
Building emission rate ($kgCO_2/m^2$ per year):	-0.01
Primary energy use (kWh_{pe}/m^2 per year):	-2.98

Benchmarks

Buildings similar to this one could have ratings as follows:

7 If newly built

28 If typical of the existing stock

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