
The Seam Barnsley Phase 1

Sustainability Statement

Date: July 2022
Issue: Planning
Revision: P01

Rev	Description	Issued by	Date	Reviewed by	Date
P01	Draft for review	Niall Johnston and Robin Beatson	20.06.2022	Kat Radford	24.06.2022
P01	Planning issue	NJ and RB	06.07.2022	KR	06.07.2022

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1. Introduction

This statement seeks to address the requirements of Barnsley Metropolitan Borough Council's Local Plan (adopted 2014), demonstrating how proposals comply with the environmental standards set out in terms of energy efficiency, renewable energy and environmental design. The report further demonstrates how the scheme will meet the minimum target CO₂ reductions from low or zero carbon energy supplies. In addition, the report provides a strategy for the active travel hub to achieve net zero operational carbon, taking into account the project's anticipated usage, architecture, and HVAC servicing strategy.

This statement should be read in conjunction with the full suite of supporting documents and drawings that form the planning application submission.

The approach for the proposed development has been to influence the building design to ensure high levels of energy efficiency and sustainability, which are a key priority for Barnsley Council.

2. Description of the development

The site is located in Barnsley (grid reference: SE 34628 06771), bound by County Way to the west, Eldon Street North to the south, Old Mill Lane (A635) to the north and train line to the east. The site is in an urban setting dominated by the hardstanding of The Seam Shopper Car Park and its associated amenity grassland, introduced shrub and scattered trees. The wider landscape is dominated by commercial and residential developments with green space, woodland and waterbodies to the edge of the conurbation

The developed site will comprise the following elements:

- Active Travel Hub (ATH)
- Multi Storey Car Park (MSCP)
- Development Plots 1 and 2
- Public realm



Figure 1: Seam Phase 1 development site

3. Planning policy and drivers

This Sustainability Statement seeks to respond to Barnsley Metropolitan Borough Council's local planning policy, in addition to wider national planning policies within the National Planning Policy Framework 2021 (NPPF 2021).

Barnsley's current planning policy, in respect of environmental standards, is set out within the Local Plan. The Local Plan sets out the key elements of the planning framework for Barnsley, and the approach to its long term physical development to achieve the Council's vision of a future Barnsley.

The following planning policies, as detailed within the Local Plan, are addressed within this Sustainability Statement:

- **Policy CC2 (Sustainable Design and Construction):**

The development will be expected to minimise resource and energy consumption through the inclusion of sustainable design and construction features, where this is technically feasible and viable. All non-residential development will be expected, to achieve a minimum standard of BREEAM 'Very Good' (or any future national equivalent).

- **Policy RE1 (Low Carbon and Renewable Energy)**

All developments will be expected to seek to incorporate initially appropriate design measures, and thereafter decentralised, renewable or low carbon energy sources in order to reduce carbon dioxide emissions and should at least achieve the appropriate carbon compliance targets as defined in the Building Regulations.

We will allow development that produces renewable energy as long as there is no material harm upon: The character of the landscape and appearance of the area;

- Living conditions;
- Biodiversity, Geodiversity and water quality;
- Heritage assets, their settings and cultural features and areas;
- Key views of, from or to scenic landmarks or landscape features;
- Highway safety, or Infrastructure including radar.

4. Sustainability design response

The design for the proposed the SEAM Barnsley Phase 1 development applies a wide range of environmental design principles, as described throughout this report.

The following section aims to demonstrate how the development has responded to the sustainability requirements of the Barnsley Metropolitan Borough Council Local Plan, as set out in Section 3, as well as wider sustainability considerations and features to support the delivery of Barnsley’s “Zero45” ambitions and wider sustainability goals. As such, the approach to issues such as sustainable transport , green infrastructure, and social and economic sustainable are also addressed within this section.

4.1 BREEAM

Policy CC2 (Sustainable Design and Construction) of the Barnsley Local Plan (adopted January 2019) requires all non-residential development to achieve a minimum standard of BREEAM ‘Very Good’ (or any future equivalent). BREEAM is only applicable to occupied buildings, defined by the BRE as buildings in which spaces are occupied continuously for more than 30 minutes. As such, BREEAM is applicable to the Active Travel Hub only, assuming retail space remains within the design.

The project will be assessed under the BREEAM New Construction 2018 (Retail) shell and core scheme. The BREEAM pre-assessment was carried out at RIBA Stage 1. Following a review of project information and a BREEAM workshop with the design and client teams, it is anticipated that a score of 62.70% will be targeted. The current targeted score exceeds the minimum score of 55% required for Very Good, thereby providing a buffer of 7.70% which helps secure the ‘Very Good’ rating should any future changes to the design occur or constraints be realised that prevent particular credit criteria from being met. If any future changes to the design do occur, the team have identified a further 47.90% worth of of potential credits that can be targeted.

The strategy for achieving BREEAM ‘Very Good’ is summarised in Figure 2 and Table 1. For the full strategy including details of each credit, please refer to the BREEAM pre-assessment in Appendix 1 of this report.

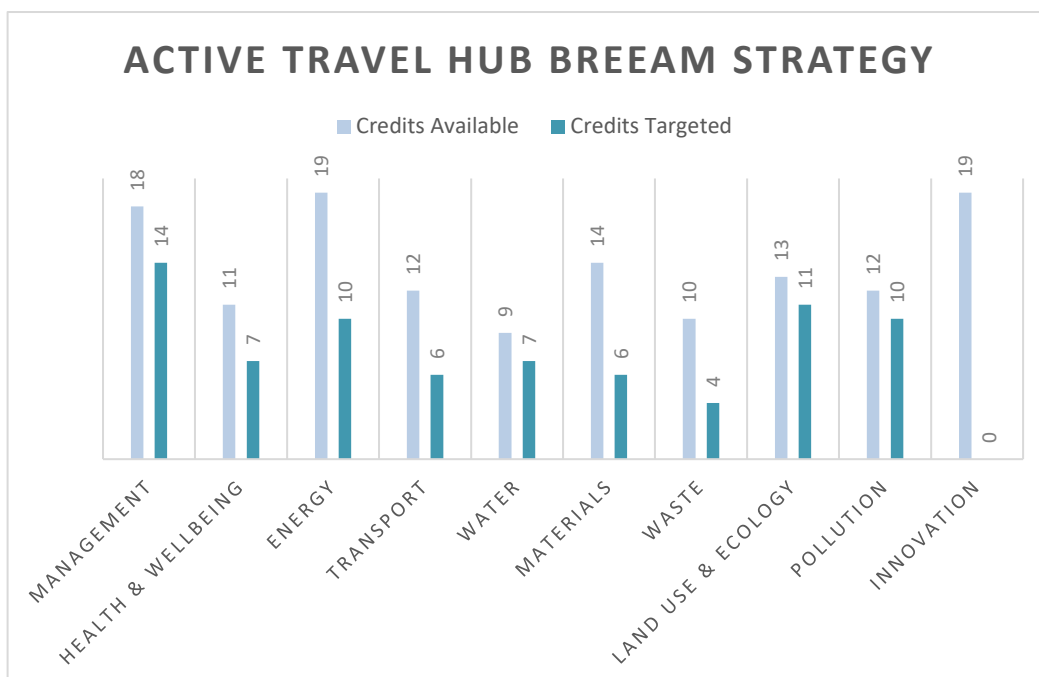


Figure 2: Route to ‘Very Good’

Table 1: Route to 'Very Good'

Environmental section	No. credits available	Indicative no. credits targeted	% credits targeted	Section weighting	Indicative section score
Management	18	14	77.78%	11.0%	8.56%
Health and Wellbeing	11	7	63.64%	8.0%	5.09%
Energy	19	10	52.63%	14.0%	7.37%
Transport	12	6	50.00%	11.5%	5.75%
Water	9	7	77.78%	7.0%	5.44%
Materials	14	6	42.86%	17.5%	7.50%
Waste	10	4	40.00%	7.0%	2.80%
Land Use and Ecology	13	11	84.62%	15.0%	12.69%
Pollution	12	10	83.33%	9.0%	7.50%
Innovation	19	0	0.00%	10.00%	0.00%
TOTAL:					62.70%

Forming part of the wider masterplan, the ATH is expected to score highly under the ecology section for improving ecological value and opportunities for urban wildlife.

The majority of the BREEAM management credits are also expected to be achieved as a result of project and contractor management processes relating to sustainability, and the use of Sustainability Champions in both the design and construction teams to ensure sustainability features targeted in the early stages are realised in the final build.

Furthermore, low water consuming sanitary ware and kitchen taps as well as water metering, sub metering and leak control will secure the majority of the water category credits.

Finally due to the development being located in Flood Risk Zone 1 and using SuDs within the development, it is expected that the development will score highly in this section.

There are currently no significant risks identified with regards to the building achieving BREEAM Very Good accreditation.

4.2 Energy and operational carbon

4.2.1 Tools and methods

A dynamic simulation model (DSM) approved by DCLG for Part L2A calculations was used. The following must also be noted:

- Network airflow was not modelled.
- Near field buildings have not been modelled.
- HVAC was modelled with basic Apache systems.
- A total of 15nr simulations were run, with one variable changed every time, to determine the effect of individual variables on the overall building energy use.

The software used was IES Virtual Environment 2021. The analysis was authored by a CIBSE accredited Low Carbon Energy Assessor (LCEA).

4.2.2 Definition of 'net zero' operational carbon

The UK Green Building Council's Framework Definition for Net Zero Carbon – Operational Energy is as follows:

"When the amount of carbon emissions associated with the building's operational energy on an annual basis is zero or negative. A net zero carbon building is highly energy efficient and powered from on-site and/or off-site renewable energy sources, with any remaining carbon balance offset."

The UKGBC definition includes heating and cooling, cooking, lighting, and plug-loads, but excludes commercial process loads and transport (electric vehicle charging).

The definition calls for carbon offsetting, recognising the reality that Net Zero is unlikely to be achieved by building design alone in many cases.

The UKGBC definition covers more energy uses than building regulations.

"Regulated energy is building energy consumption resulting from the specification of controlled, fixed building services and fittings, including space heating and cooling, hot water, ventilation, fans, pumps and lighting. Such energy uses are inherent in the design of a building."

It is therefore possible to hit zero carbon emissions according building regulations, but further work would be needed to achieve a completely zero carbon building.

4.2.3 Design inputs

The following inputs are generally constant throughout all simulations:

- **Weather data:** The Test Reference Years are synthetically generated from average months selected from a historical baseline of 1996 to 2016. 2016 weather files are the most current TRY weather data sets for 14 UK locations - this is used in line with CIBSE Guide A and the NCM Modelling Guide.
- **Location:** Leeds
- **CIBSE 2016 Test Reference Year**
- **Geometry:** The geometry will be consistent across both the thermal comfort and energy strategy simulations.

- **Layout and orientation:** The geometry was based on the Revit model: SEAM-BDP-TH-ZZ-M3-A-20001_P01 as well as internal discussions with engineers and architects.
- **Shading:** Shading elements have been modelled in a simple manner at this stage. Shading from the surrounding areas have not been modelled.

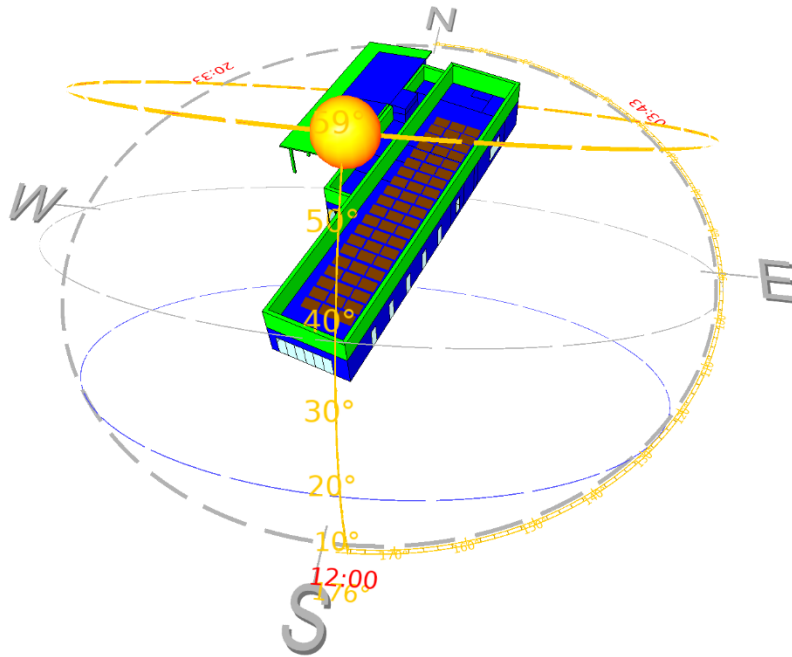


Figure 2: Model view

4.2.4 Activity assignments

At this stage, a low-resolution modelling approach has been followed for the inner zones while the perimeter zones are modelled more accurately to reflect the façade. Construction parameters can be seen in Appendix 2.

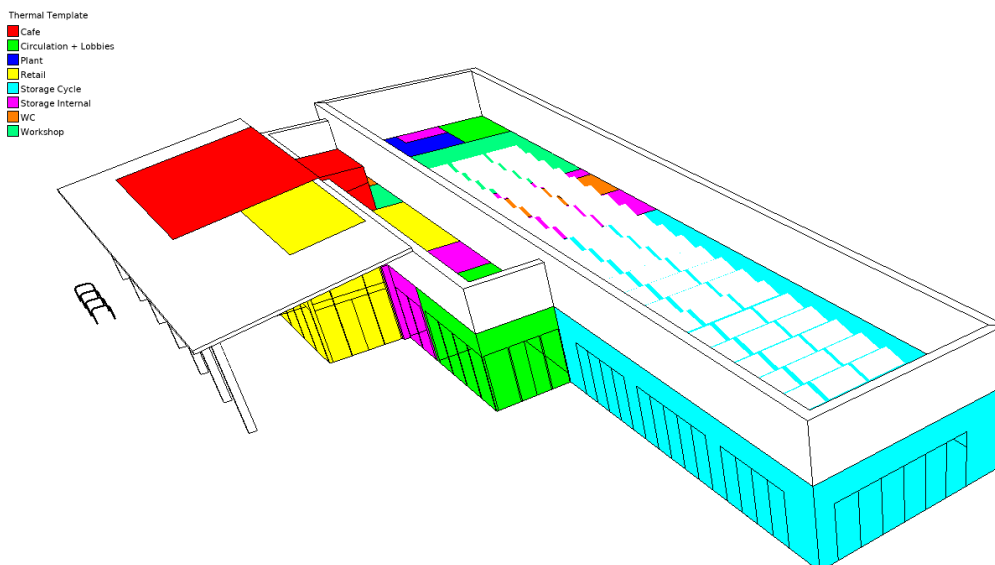


Figure 3: Space activities as seen in model

4.2.5 HVAC systems

The Active Travel Hub of the development is proposed to be fully electric, in keeping with the net zero carbon aspiration. Efficiencies can be seen in Appendix 2.

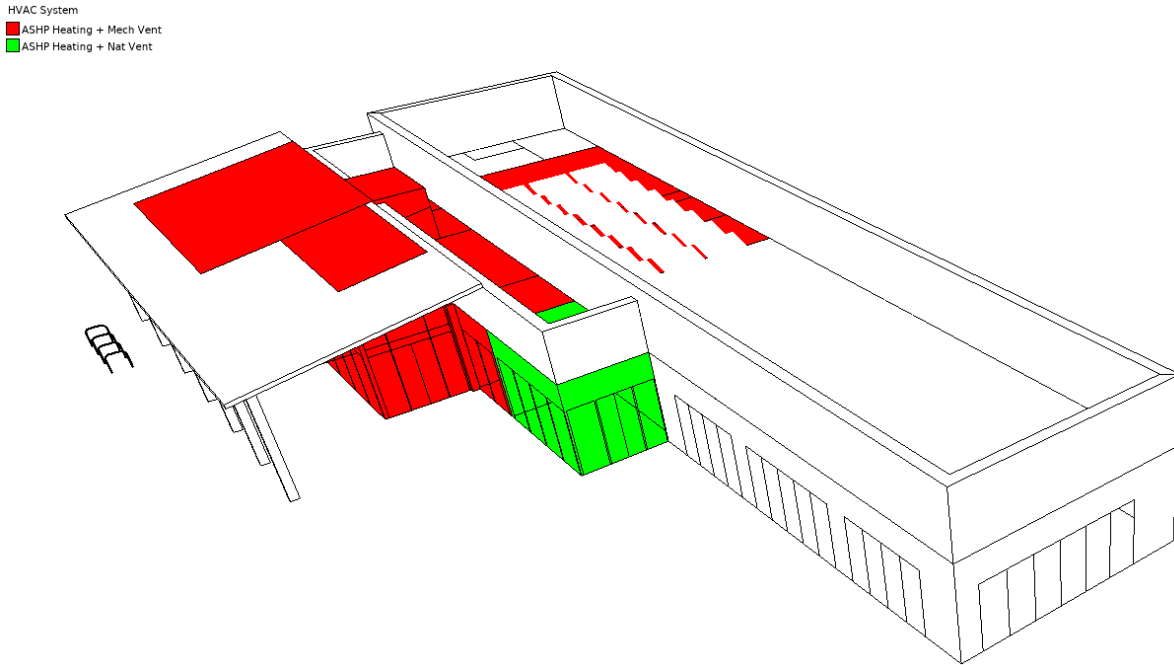


Figure 4: HVAC systems as seen in model

4.2.6 Lighting and other settings

Lighting occupancy sensing and daylight linking is necessary to reduce lighting energy use.

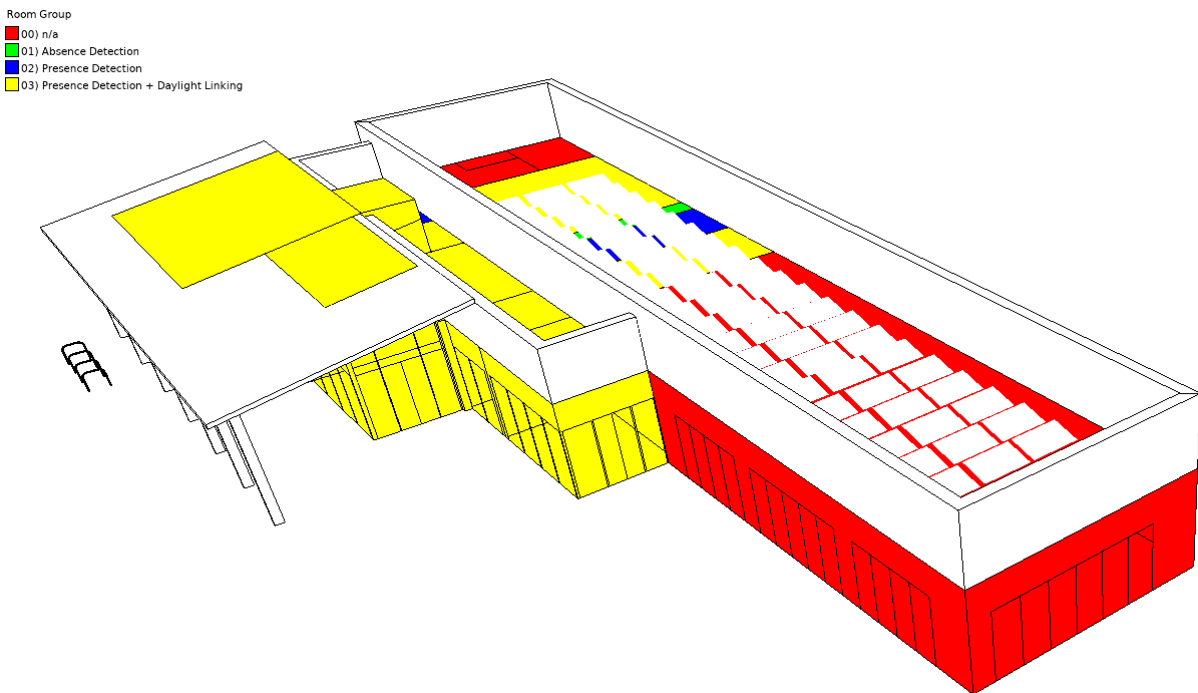


Figure 5: Occupancy sensing areas

4.2.7 Renewables

Photovoltaic panels are required to achieve zero regulated emissions. Some photovoltaic panels have been placed on the roof of the model, seen in white in Figure 5. These are approximately 1.7m x 1m each, facing south, with a 15° tilt, located on the roof based on the Revit model dimensions. These can be seen in the model images in this report.

Each panel is 22.5% efficient based on manufacturer's data, with an assumed 98% conversion efficiency.

4.2.8 Carbon emission factors

The carbon emissions improvement for this report was calculated based on carbon factors from the current building regulations Part L 2021, which came into force 15th June 2022. Table 2 shows a comparison between carbon factors between current and previous building regulations.

Part L 2021 carbon factors are a better reflection of modern technology compared to the previous version of the building regulations.

Carbon emitted by mains gas is unlikely to reduce significantly with the advent of cleaner energy production. In Part L2A 2013, 1kWh of gas emitted 0.216kW of CO₂. That figure has more or less remained constant, at 0.210kgCO₂/kWh today.

Grid electricity however has seen a 55% reduction in carbon emissions. In Part L 2013, 1kWh of electricity emitted 0.519kg of CO₂. Today, in Part L 2021, this is now 0.233kgCO₂/kWh which is almost the same as gas.

Electricity will only get cleaner over time, but gas, oil, and other fossil fuels will not. Therefore, an all-electric strategy is considered by the design team to be the ideal way to future-proof the proposed scheme and aid in achieving Net Zero.

Table 2: Previous and current carbon factors comparison

Fuel	Emission Factor kgCO ₂ /kWh		% Difference
	Part L 2013	Part L 2021	
Mains Gas	0.216	0.210	-3%
Grid Electricity	0.519	0.233	-55%
Oil	0.319	0.298	-7%
LPG	0.241	0.241	0

4.2.9 Results

Building Regulations Park L (BRUKL):

BRUKL Output Document  **HM Government**
 Compliance with England Building Regulations Part L 2021

Project name	Shell and Core
Active Travel Hub	As designed
Date: Fri Jun 24 11:02:04 2022	

Administrative information

Building Details

Address: The Seam, Barnsley, -

Certification tool

Calculation engine: Apache
Calculation engine version: 7.0.15
Interface to calculation engine: IES Virtual Environment
Interface to calculation engine version: 7.0.15
BRUKL compliance check version: v6.1.b.0

Certifier details

Name: BDP
Telephone number: 0161 828 2482
Address: 11 Ducie Street, Piccadilly Basin, Manchester, M1 2JB

Foundation area [m²]: 113.45

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	5.62
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	-0.49
Target primary energy rate (TPER), kWh/m ² annum	60.14
Building primary energy rate (BPER), kWh/m ² annum	-10.62
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 -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.15	0.15	0000000E:Surf[2]
Floors	0.18	0.12	0.12	0000000E:Surf[0]
Pitched roofs	0.16	-	-	No Pitched roofs in building
Flat roofs	0.18	0.12	0.12	0000000E:Surf[1]
Windows** and roof windows	1.6	1	1	00000001:Surf[2]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	-	-	No Personnel doors in building
Vehicle access & similar large doors	1.3	-	-	No Vehicle access doors in building
High usage entrance doors	3	-	-	No High usage entrance doors in building

U_a-Limit = Limiting area-weighted average U-values [W/(m²K)]
 U_a-Calc = Calculated area-weighted average U-values [W/(m²K)]
 U_i-Calc = Calculated maximum individual element 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
 N.B.: 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	1

Figure 6: BRUKL

Energy performance certificate (EPC):

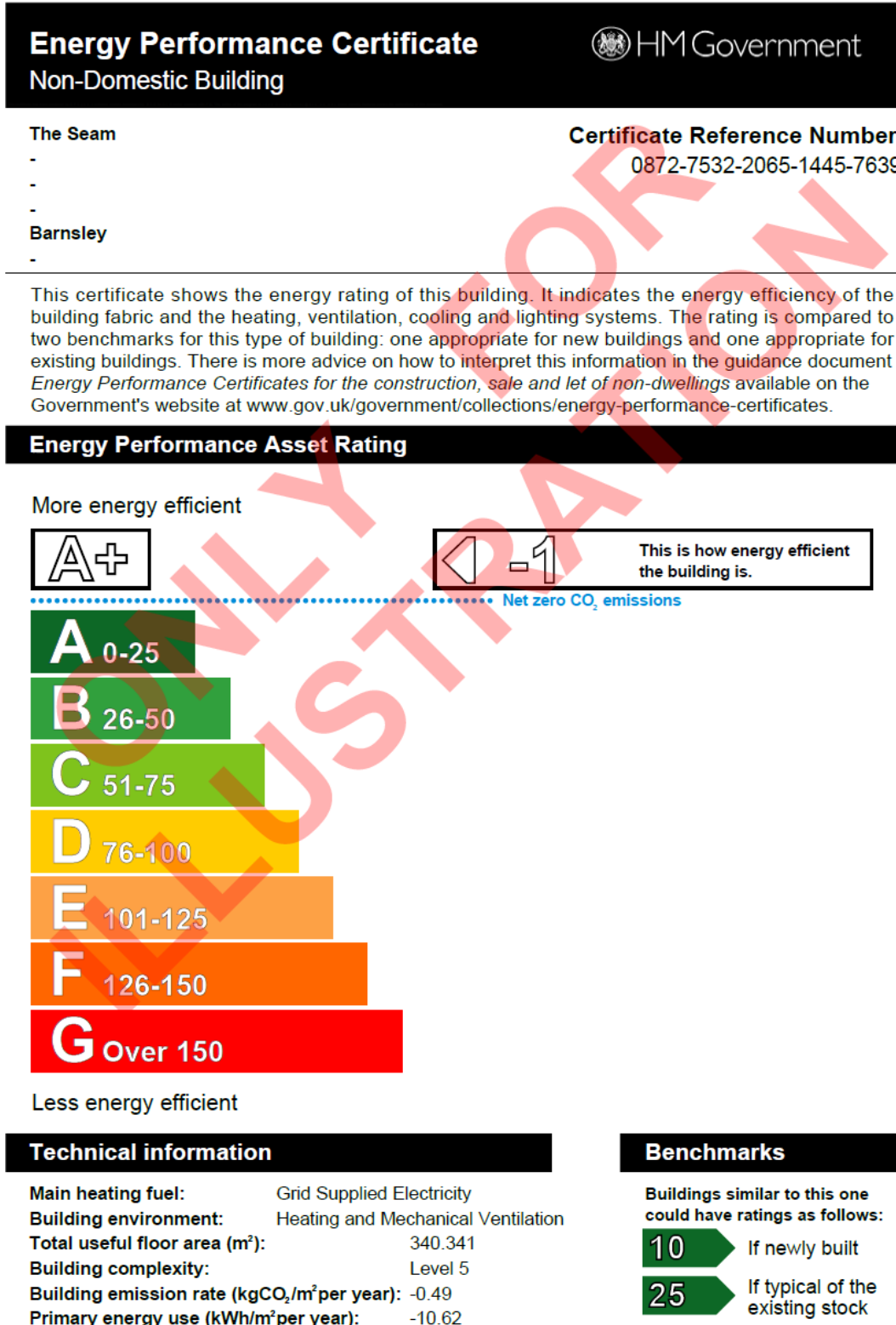


Figure 7: EPC

4.2.10 Energy discussion

Observations:

- The baseline energy proposal is already a marked improvement on carbon emissions compared to the notional building. Most of the improvements are therefore incremental.
- Currently, it is assumed that all lighting is 110lm/cW, however as the design develops the efficacy figure should be treated as an average, with some lighting better and some lighting lower.

NB: illuminance is based on NCM default figures. These are broadly in line with CIBSE minimum to mid-range figures, e.g., offices are set to 400lux whereas CIBSE recommends 300-500lux. Care must be taken not to over-light spaces by designing to a higher illuminance than necessary. This would increase energy consumption and carbon emissions.

There are some energy reduction measures that may be incorporated into the design, but it was decided not to. A few comments follow:

- The second most significant reduction in carbon emissions, apart from photovoltaics, may be achieved by switching from electric hot water to air source heat pumps to serve DHW. This was initially discussed, however was deemed infeasible due to the height of the DHW heat pumps being higher up than the parapets. Nonetheless this could be a potential future upgrade should the client decide to further reduce regulated emissions.
- Blinds would also reduce solar gains in reality, and the benefits can be modelled, however it cannot be certain that occupants would use blinds appropriately.
- Supply & extract specific fan power (SFP) is currently set to 1.5W/l/s, which is the higher end of the LETI climate emergency guidance. It may be possible to reduce SFP to ≤ 1.2 W/l/s, which is the lower end of LETI guidance, but only at a later stage once fans are selected.

Without renewable energy, the lowest regulated carbon emission rate achieved by this exercise is 4.9kgCO₂/m². Adding the proposed photovoltaic panels reduces regulated carbon emissions by 110%.

In terms of unregulated energy, energy demand from all equipment apart from lighting and HVAC (i.e. unregulated energy) is estimated in all models to be 30.19kWh/m²/yr, according to National Calculation Methodology (NCM) figures. Regulated energy demand is estimated to be 35.81kWh/m²/yr.

The PV area seen in the model is enough to cover all regulated demand, however unregulated emissions are not covered. Given that regulated energy demand is only slightly higher than unregulated demand, a rough estimate would be that the PV generated electricity would have to double to cover all energy demand. This would not be feasible on the roof, and wall mounted PV would be less efficient since these would not always be angled appropriately to maximise sunlight.

Building design typically has a more direct influence on regulated energy than unregulated, since there are high uncertainties and variety in what equipment would go into any given space and how occupants would use them. This is particularly true in shell and core spaces, where the designers have even less influence into what the final fitout would be. NCM energy demand figures often vary wildly from actual building energy use since they are meant to represent average demands of the building activity, and are not bespoke to any one project.

There are some strategies to help reduce unregulated energy by influencing occupant behaviour. Some measures that could be used follow:

- Minimizing the number of sockets in the café and retail to discourage customers from charging phones and other equipment while on the premises.
- Timed shut-off switches to small power will reduce stand-by loads, which can constitute about 10% of a building's total electrical use.

- Publicly visible energy monitoring display screens can show occupants their own activities and encourage reducing consumption. A simple smart meter may be enough to influence behaviour.

Other strategies at management level could be used:

- If possible, a member of staff could be nominated employ energy saving measures (e.g. switching off unnecessary lights during the day or turning off equipment during unoccupied hours etc.).
- The building should be maintained regularly through a planned preventive maintenance programme.
- Properly commissioned sub-meters to help to identify where energy is being used can diagnose unnecessary power consumption.
- Automatic metering reading (AMR) may also be installed.
- Building energy management software provided as part of the BMS may enable a building manager to monitor energy use and target energy saving measures.
- Energy targets/budgets may be set and monitored monthly.
- Staff may be made aware of their role in energy efficiency through regular awareness campaigns, etc.

All energy uses, regulated and unregulated, may be considered in an operational energy assessment in line with CIBSE TM54, *Evaluating Operational Energy Performance of Buildings at the Design Stage*. This is the most well-known standard of understanding operational energy use in the UK.

Instead of increasing PV area, the client may choose to offset any unregulated energy usage. The client may also opt for an all-renewable energy tariff to reduce carbon emissions.

4.3 Transport

The ATH, by the very nature of its design and purpose, will promote active travel, thereby improving health and wellbeing, and reducing transport-based emissions.

The current design comprises:

- 100 standard spaces
- 6 accessible spaces
- 15 secure lockers for foldable bikes
- 4 vertical lockers for standard sized cycles
- 15 electric bike battery charging lockers

To support the requirements of frequent and longer stay users, lockers, showers, and toilet facilities are provided. Security has also been a key consideration, with double-fob entry and CCTV provided. A lobby arrangement has been proposed with two entrances to prevent 'tailgating' to gain access to the cycle storage area.

The current MEP design of the MSCP includes charging points for 10% of parking spaces. Of this 10%:

- 70% will be slow charging spaces (7.4kW)
- 20% will be fast charging spaces (22kW)
- 10% will be rapid charging spaces (43kW)

Infrastructure allowing for future additional provision (20% of parking spaces) is also allowed for in the design.

4.4 Climate resilience and flood risk

The outline drainage strategy for Phase 1 aims to implement a variety of SUDS features in accordance with the CIRIA SuDS guidance and Local policy. It is proposed for as many SUDS features as possible to be put forward for adoption by Yorkshire Water under an S104 agreement to ensure that sufficient maintenance of the SuDS features is applied in the future.

In line with the Design and Construction Guidance and the suitability of the site, the following adoptable SuDS features are proposed to be incorporated into the drainage strategy:

- Bioretention systems, e.g. rain gardens or tree pits
- Tanks / geo-cellular tanks.

The bioretention areas are proposed to be integrated into the central green open space in the public realm area in the south of the site. However, in order to maintain the amenity value of the area, the proposed features are to be designed offline, only providing attenuation in extreme rainfall events.

Non-adoptable features such as permeable paving within the hard landscaped areas and blue/green roofs on proposed flat roofs, are to also be included in the drainage strategy to provide additional storage.

5. Conclusion

This sustainability statement seeks to the following policies listed within the Barnsley Metropolitan Borough Council's Local Plan:

- Policy CC2 (Sustainable Design and Construction)
- Policy RE1 (Low Carbon and Renewable Energy)

As per the requirements of Policy CC2, the ATH will achieve BREEAM Very Good.

With regards to energy, currently, the energy strategy could potentially reduce regulated carbon to about $-0.49\text{kgCO}_2/\text{m}^2$ and result in an EPC of A+.

It is recommended that following key measures are implemented:

- All electric building services
- Air source heat pumps to provide heating and cooling
- Building fabric to LETI standards
- Air permeability to LETI standards
- An average lighting efficacy of 110 luminaire lumens per circuit watt
- Daylight linking to reduce lighting energy use and heat gains
- Other key features include:
 - Demand control ventilation
 - Power factor correction of >0.95
- Photovoltaic panels introduced after all the above are implemented

The above represents a strategy that may be used to achieve as close to net zero operational carbon as potentially viable.

Please note that the carbon emissions figure covers regulated emissions, i.e. heating, cooling, ventilation, lighting, and domestic hot water. As of this stage, using Part L assumptions for unregulated energy, photovoltaic energy production would have to double to cover both regulated and unregulated energy demands.

To reduce unregulated energy, it is recommended that the design be geared to influence occupant behaviour, by discouraging unnecessary energy use. Additionally, monitoring equipment can diagnose and reduce unnecessary energy use.

A CIBSE TM54 operational energy analysis may be utilized to provide a more detailed energy consumption profile, including unregulated energy, to verify the feasibility of Net Zero and to help client decisions on next steps forward.

Appendix 1: BREEAM Tracker

The Seam Barnsley Phase 1: Active Travel Hub

BREEAM New Construction (2018) Retail (Shell and Core): Pre-assessment

24-Jun-22

Target: Very Good (minimum score of 55% required)

BREEAM Consultant: Kat Radford (BDP)



Targeted
Not targeted

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
MANAGEMENT (1 credit = 0.61%)								
Man 01: Project brief and design								
Project Delivery Planning	Man 01-01	1	0		<p>1. Prior to completion of the Concept Design, the project delivery stakeholders (see comments) meet to identify and define for each key phase of project delivery:</p> <ul style="list-style-type: none"> a. Roles b. Responsibilities c. Contributions <p>2. Consider each one of the following items when defining roles, responsibilities and contributions for each key phase of the project:</p> <ul style="list-style-type: none"> a. End user requirements b. Aims of the design and design strategy c. Particular installation and construction requirements/limitations d. Occupiers budget and technical expertise in maintaining any proposed systems e. Maintainability and adaptability of the proposals f. Operational energy (see Ene 01 for further details) g. Requirements for the production of project and end user documentation h. Requirements for commissioning, training and aftercare support. <p>3. The project team demonstrate how the project delivery stakeholder's contributions and the consultation process outcomes influence the following:</p> <ul style="list-style-type: none"> a. Initial Project Brief b. Project Execution Plan c. Communication Strategy d. Concept Design. 	Project Manager / Design Team	2	16.05.2022 BREEAM workshop: Design team confirmed that this was not undertaken.

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Stakeholder Consultation (Interested Parties)	Man 01-02	1	0	1	<p>4. Prior to completion of the Concept Design, interested parties (see comments) are consulted with on matters that cover the minimum consultation content:</p> <ol style="list-style-type: none"> 1. Functionality, build quality and impact (including aesthetics). 2. Provision of appropriate internal and external facilities (for future building occupants and visitors or users). 3. Management and operational implications. 4. Maintenance resources implications. 5. Impacts on the local community, e.g. local traffic or transportation impact. 6. Opportunities for shared use of facilities and infrastructure with the community or appropriate stakeholders. 7. Compliance with statutory (national or local) consultation requirements. 8. Energy use and sustainability measures. 9. Implementing principles and processes that deliver an inclusive and accessible design. <p>In the case of educational building types, minimum content also includes:</p> <ol style="list-style-type: none"> 10. How the building or grounds could best be designed to facilitate learning and provide a range of social spaces appropriate to the needs of a diverse range of pupils, students and other users, including people of all abilities. <p>In the case of building types containing technical areas or functions, e.g. laboratories, workshops etc., minimum content also includes:</p> <ol style="list-style-type: none"> 11. The end users' broad requirements for such facilities, including appropriate sizing, optimisation and integration of equipment and systems. 	Project Manager / Design Team / Client	2	<p>It is assumed the required consultation will not be completed prior to the completion of RIBA Stage 2.</p> <p>Interested parties include: This includes but is not limited to:</p> <ol style="list-style-type: none"> 1. Actual or intended building users (if known) including facilities management staff or those responsible for the day-to-day operation of the building and grounds. 2. Representative consultation group from the existing community (if the building is a new development in an existing community) or for a community still under construction. 3. Existing partnerships and networks that have knowledge of, and experience of working on, existing buildings of the same type. 4. Potential users of any shared facilities, e.g. operators of clubs and community groups. <p>AND the following where relevant:</p> <ol style="list-style-type: none"> 5. Local or national historic or heritage groups (over and above any requirements relating to statutory consultees). 7. Specialist service and maintenance contractors or representatives where the building function has particular technical requirements in complex environments, e.g. buildings containing laboratories.
					5. Demonstrate how the stakeholder contributions and consultation exercise outcomes influence the Initial Project Brief and Concept Design.	Architect / M&E Consultant		
					6. Prior to completion of the detailed design (RIBA Stage 4, Technical Design or equivalent), all interested parties give and receive consultation feedback.	Project Manager / Design Team		
BREEAM AP (Concept Design)	Man 01 pre	-	-	-	8. The project team, including the client, formally agree strategic performance targets early in the design process with the support of the BREEAM AP where appointed).	Client / BREEAM Assessor	2	A BREEAM AP should be appointed as soon as possible to ensure this issue is achieved.
	Man 01-03	1	1	<p>9. Involve a BREEAM AP in the project at an appropriate time and level to:</p> <ol style="list-style-type: none"> 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. b. Monitor progress against the performance targets agreed under criterion 8 throughout all stages after their appointment where decisions critically impact BREEAM performance. c. Proactively identify risks and opportunities related to the achievement of the targets agreed under criterion 8. d. Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team. 				
BREEAM AP (Developed Design)	Man 01-04	1	1	<p>10. Criteria 8 and 9 are achieved.</p> <p>11. Involve the BREEAM AP in the project at an appropriate time and level to:</p> <ol style="list-style-type: none"> a. Work with the project team, including the client, to consider links between BREEAM issues and to assist them in maximising the project's overall performance against BREEAM throughout developed design. b. Monitor progress against the performance targets agreed under criterion 8, throughout all stages where decisions critically impact the specification and tendering process and the BREEAM performance. c. Proactively identify risks and opportunities related to the achievement of the targets agreed under criterion 8. d. Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team. 	Client / BREEAM Assessor	4	The BDP BREEAM Assessor is also an AP and as such this credit will be achieved.	

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Man 02: Life Cycle Cost and Service Life Planning								
Elemental Life Cycle Cost (LCC)	Man 02-01	2	0	2	1. A competent person carries out an outline, entire asset LCC plan at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) together with any design options appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:2008.	Cost Consultant	2	It is assumed that this was not undertaken prior to the completion of RIBA Stage 2.
					2. The elemental LCC plan: 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); b. Includes service life, maintenance and operation cost estimates. The study period should ideally be agreed by the client, in line with the design life expectancy of the building. However, where the life expectancy of the building is not yet formally agreed (due to being at very early design stages), the default design life of 60 years should be used for modelling purposes (in line with the UK default).	Cost Consultant		
					3. Demonstrate, using appropriate examples provided by the design team, how the elemental LCC plan has been used to influence building and systems design/specification to minimise life cycle costs and maximise critical value.	Design Team		
Component Level LCC Option Appraisal	Man 02-02	1	1		4. A competent person develops a component level LCC options appraisal by the end of Process Stage 4 (equivalent to Technical Design – RIBA Stage 4) in line with PD 156865:2008. The component level LCC includes (where present): a. Envelope, e.g. cladding, windows, and/or roofing b. Services, e.g. heat source cooling source, and/or controls c. Finishes, e.g. walls, floors and/or ceilings 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 the appraisal.	Cost Consultant	4	The component level LCC plan must include all component types installed by the developer.
					5. Demonstrate, using appropriate examples provided by the design team, how the component level LCC options appraisal has been used to influence building and systems design/specification to minimise life cycle costs and maximise critical value.	Design Team		
Capital Cost Reporting	Man 02-03	1	1		6. Report the capital cost for the building in pounds per square metre of gross internal floor area (£k/m ²), as part of the submission to BRE. The capital cost for the building includes the expenses related to the initial construction of the building: – Construction, including preparatory works, materials, equipment and labour – Site management – Construction financing – Insurance and taxes during construction – Inspection and testing Costs related to land procurement, clearance, design, statutory approvals and post occupancy aftercare are not included.	Contractor / Project Manager		
Man 03: Responsible Construction Practices								
Pre-requisite	Man 03-pre	-	-	-	1. All timber and timber based products used during the construction process of the project are 'Legally harvested and traded timber'.	Contractor / Architect		
Environmental Management	Man 03-01	1	1		3. All parties who at any stage manage the construction site (e.g. the principal contractor, the demolition contractor) operate an EMS covering their main operations. The EMS must: a. Be third party certified, to ISO 14001:2015/EMAS or equivalent standard; or b. In compliance with BS 8555:2016 have: i. Appropriate structure ii. Reached implementation stage phase four 'implementation and operation of the environmental management system' iii. Completed defined phase audits one to four.	Contractor		All contractors (including any demolition contractors) will be ISO 14001 accredited.
					4. All parties who at any point manage the construction site (e.g. the principal contractor, the demolition contractor) implement best practice pollution prevention policies and procedures on site in accordance with Working at construction and demolition sites: PPG6, Pollution Prevention Guidelines.			

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
BREEAM AP (Site)	Man 03-02 pre	-	-	-	5. The client and the contractor formally agree performance targets.	Contractor		
	Man 03-02	1	1		6. Involve a BREEAM AP in the project at an appropriate time and level to: 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. b. Monitor construction progress against the performance targets agreed under criterion 5 above throughout all stages where decisions critically impact BREEAM performance. c. Proactively identify risks and opportunities related to the procurement and construction process and the achievement of the targets agreed under criterion 5. 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. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team and the provision to the assessor.	Contractor		
Responsible Construction Management	Man 03-03	2	2		One credit: 7. Achieve items listed as required for one credit in table 4.1 of the guidance manual. Two credits: 8. Achieve criterion 7 9. Achieve six additional items in table 4.1 of the guidance manual.	Contractor		Alternatively, a CCS score of >35 will secure both credits.

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Monitoring of Construction-Site Impacts	Man 03-04	2	2		<p>10. Responsibility has been assigned to an individual(s) for monitoring, recording and reporting energy use, water consumption and transport data (where measured) resulting from all on-site construction processes (and dedicated off-site manufacturing) throughout the build programme. To ensure the robust collection of information, this individual(s) must have the appropriate authority and responsibility to request and access the data required. Where appointed, the BREEAM AP could perform this role.</p>	Contractor		
					<p>First Monitoring Credit - Utility consumption Energy consumption 11. Achieve criterion 10. 12. Set targets for the site energy consumption in kWh (and where relevant, litres of fuel used) as a result of the use of construction plant, equipment (mobile and fixed) and site accommodation. 13. Monitor and record data for the energy consumption described in criterion 12. 14. Report the total carbon dioxide emissions (total kgCO₂/project value) from the construction process via the BREEAM Projects (for the purposes of potential future BREEAM performance benchmarking). Water consumption 15. Achieve criterion 10. 16. Set targets for the potable water consumption (m³) arising from the use of construction plant, equipment (mobile and fixed) and site accommodation. 17. Monitor and record data for the potable water consumption described in criterion 18. Use the collated data to report the total net water consumption (m³), i.e. consumption minus any recycled water use from the construction process via BREEAM Projects (for the purposes of potential future BREEAM performance benchmarking).</p>	Contractor		
					<p>Second Credit - Transport 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. Transport of materials from the point of supply to the building site, including any transport, intermediate storage and point of supply. Monitor as a minimum: 20.a.i. Materials used in major building elements (e.g. those defined in BREEAM issue Mat01 Environmental impacts from construction products - Building life cycle assessment (LCA)). 20.a.ii. Ground works and landscaping materials. 20.b. Transportation of construction waste from the construction gate to waste disposal processing or recovery centre gate. This monitoring must cover the construction waste groups outlined in the project's resource management plan. 21. Monitor and record data for the transportation movement as described in criterion 20. 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).</p>	Contractor		
Exemplary Level Criteria	Man 03-Ex	1	0	1	23. Achieve all items in Table 4.1 of the guidance manual.	Contractor		This issue could be targeted, if required.

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Man 04: Commissioning and handover								
Commissioning and Testing Schedule and Responsibilities	Man 04-01	1	1		<p>1. Prepare a schedule of commissioning and testing. The schedule identifies 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.</p> <p>2. The schedule identifies the appropriate standards for all commissioning activities to be conducted, where applicable, in accordance with: a. Current Building Regulations b. BSRIA guidelines c. CIBSE guidelines d. Other appropriate standards (see Methodology) Exclude from the assessment any process or 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 some heat recovery systems.</p> <p>3. Where a building management system (BMS) is specified: a. Carry out the commissioning of air and water systems when all control devices are installed, wired and functional b. Include physical measurements of room temperatures, off-coil temperatures and other key parameters, as appropriate, in Commissioning results. c. The BMS or controls installation should be running in auto with satisfactory internal conditions prior to handover d. All BMS schematics and graphics (if BMS is present) are fully installed and functional to user interface prior to handover e. Fully train the occupier or facilities team in the operation of the system.</p> <p>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.</p> <p>5. The principal contractor accounts for the commissioning and testing programme, responsibilities and criteria within their budget and the main programme of works. Allow the required time to complete all commissioning and testing activities prior to handover.</p>	Contractor		<p>Mandatory for BREEAM Very Good</p> <p>This issue is applicable according to the scope of services being specified or installed.</p>
Commissioning - Design and Preparation	Man 04-02	1	1		<p>6. Achieve criteria 1-5.</p> <p>7. During the design stage, the client or the principal contractor appoints an appropriate project team member provided they are not involved in the general installation works for the building services systems: with responsibility for: a. Undertaking design reviews and giving advice on suitability for ease of commissioning. b. Providing commissioning management input to construction programming and during installation stages. 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.</p>	Client / Contractor		<p>This issue is applicable according to the scope of services being specified or installed.</p>
Testing and Inspecting Building Fabric	Man 04-03	1	1		<p>8. Achieve criteria 1-5.</p> <p>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 airtightness testing and a thermographic survey). A suitably qualified professional undertakes the survey and testing in accordance with the appropriate standard.</p> <p>10. Rectify any defects identified during post-construction testing and inspection prior to building handover and close out. Any remedial work must meet the required performance characteristics for the building or element as defined at the design stage.</p>	Contractor		
Handover	Man 04-04	1	1		<p>11. Prior to handover, develop two building user guides for the following users: a. A non-technical user guide for distribution to the building occupiers b. A technical user guide for the premises facilities managers c. 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.</p> <p>12. Prepare two training schedules timed appropriately around handover and proposed occupation plans for the following users: a. A non-technical training schedule for the building occupiers b. A technical training schedule for the premises facilities managers.</p>	Contractor		<p>Provision of a compliant building user guide is mandatory for BREEAM Very Good</p> <p>The guides and training schedules include, as far as possible, all relevant sections regarding the services and fabric installed. On completion of works the building owner, agent or user hands it over to the fit-out contractor, who can then complete the relevant sections based on the fit-out strategy.</p>

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HEALTH AND WELLBEING (1 credit = 0.73%)								
Hea 01: Visual Comfort								
Daylighting	Hea 01-02	2	0	2	<p>4. Daylighting criteria have been met using either of the following options:</p> <p>a. The relevant building areas meet good practice daylight factor(s) and other criterion as outlined in Table -5.1 and Table - 5.2:</p> <p>1 credit: In sales areas, a point daylight factor of at least 2% is achieved for 35% of the area (m2)</p> <p>1 credit: In other occupied areas, an average daylight factor of at least 2% is achieved in at least 80% of the area and either meet the average uniformity ratio and depth of sky criteria OR room depth criteria.</p>	Architect / TBC		<p>16.05.2022 BREEAM workshop: Design team confirmed that these requirements are unlikely to be met in the workshop area.</p> <p>The percentage of the total floor area of all relevant rooms must comply where the criteria specify that a percentage of floor area must have adequate daylight illuminance. For example, six relevant rooms each have a floor area of 150m² making a total relevant floor area of 900m²; 80% of this floor area must meet the criterion, so 720m² must comply. This is the equivalent to 4.8 rooms. The number of rooms must always be rounded up so, in this example, five rooms must comply to achieve the credit.</p>
View Out	Hea 01-03	1	0	1	<p>5. 95% of the floor area in 95% of space in relevant building areas is within 8m of an external wall. The external wall has a window or permanent opening that provides an adequate view out.</p> <p>6. The window/opening must be ≥ 20% of the surrounding wall area. Where the room depth is greater than 8m, compliance is only possible where the percentage of window/opening is the same as, or greater than, the values in Table 1.0 of BS 8206:part 2.</p>	Architect		<p>16.05.2022 BREEAM workshop: Design team confirmed that these requirements are unlikely to be met in the workshop area.</p> <p>Until the layout of the building is confirmed it is not known whether these requirements will be met.</p>
Internal and External Lighting Levels, Zoning and Control	Hea 01-04	1	1		<p>External Lighting</p> <p>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 and BS EN 12464-2:2014 Light and lighting - lighting of work places - 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.</p> <p>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.</p>	M&E Consultant		
Exemplary Level Criteria	Hea 01-EX 1	1	0	1	<p>15. To achieve an exemplary performance credit for daylighting: Daylighting criteria have been met using either of the following options:</p> <p>a. Relevant building areas meet exemplary daylight factors and the relevant criteria in Table 5.8 of the guidance manual.</p> <p>b. Relevant building areas meet exemplary average and minimum point daylight illuminance criteria in Table 5.9 of the guidance manual.</p>	M&E Consultant		
Hea 02: Indoor Air Quality								
Pre-requisite	Hea 02-Pre	-	-	-	<p>1. A site-specific indoor air quality plan has been produced and implemented in accordance with the guidance in Guidance Note GN06. The objective of the plan is to facilitate a process that leads to design, specification and installation decisions and actions that minimise indoor air pollution during occupation of the building. The indoor air quality plan must consider the following:</p> <p>a. Removal of contaminant sources</p> <p>b. Dilution and control of contaminant sources:</p> <p>i. Where present, consideration is given to the air quality requirements of specialist areas such as laboratories</p> <p>c. Procedures for pre-occupancy flush out</p> <p>d. Third party testing and analysis</p> <p>e. Maintaining good indoor air quality in-use.</p>	M&E Consultant / Architect / Contractor		
Ventilation	Hea 02-01	1	1		<p>2. The building has been designed to minimise the indoor concentration and recirculation of pollutants in the building as follows:</p> <p>a. Provide fresh air into the building in accordance with the criteria of the relevant standard for ventilation</p>	M&E Consultant		<p>If ventilation systems are not within the remit of the shell and core developer, compliance can be demonstrated through the building servicing strategy where this is predetermined by the built form or core services provision.</p> <p>The relevant standard in this instance is BS ISO 17772-1:2017 or, for naturally ventilated buildings, CIBSE AM10.</p>

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Hea 04: Thermal Comfort								
Thermal Modelling	Hea 04-01	1	1		<p>1. Thermal modelling has been carried out using software in accordance with CIBSE AM11 Building Energy and Performance Modelling.</p> <p>2. The software used to carry out the simulation at the detailed design stage provides full dynamic thermal analysis. For smaller and more basic building designs with less complex heating or cooling systems, an alternative less complex means of analysis may be appropriate (such methodologies must still be in accordance with CIBSE AM11).</p> <p>3. The modelling demonstrates that:</p> <p>a. For air conditioned buildings, summer and winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design, Table 1.5; or other appropriate industry standard (where this sets a higher or more appropriate requirement/level for the building type) or the thermal environment in occupied spaces meet the Category B requirements for PPD, PMV and local discomfort set out in Table A.1 of Annex A of ISO 7730:2005.</p> <p>b. For naturally ventilated buildings:</p> <p>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/level for the building type).</p> <p>ii. The building is designed to limit the risk of overheating, in accordance with the adaptive comfort methodology outlined in CIBSE TM52: The limits of thermal comfort: avoiding overheating in European buildings or CIBSE TM59: Design methodology for the assessment of overheating risk in homes.</p> <p>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.</p>	M&E Consultant		Thermal modelling assumptions must be reasonable and represent typical use patterns and loads given the parameters and function of the building. Thermal modelling may need to be completed on the basis of a typical notional layout.
Design for Future Thermal Comfort	Hea 04-02	1	1		<p>5. Criteria 1 to 4 are achieved.</p> <p>6. The thermal modelling demonstrates that the relevant requirements set out in criteria 3 are achieved for a projected climate change environment.</p> <p>7. Where criterion 6 is not met, the project team demonstrated 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.</p> <p>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.</p>	M&E Consultant		
Hea 05: Acoustic Performance								
Acoustic Performance	Hea 05-01	1	1		<p>1. The building meets the appropriate acoustic performance standards and testing requirements defined in Table 5.14 of the guidance manual which defines criteria for the acoustic principles of:</p> <p>A. Indoor ambient noise level OR</p> <p>2. A suitably qualified acoustician (SQA) is appointed to define a bespoke set of performance requirements for all function areas in the building. The bespoke performance requirements use the three acoustic principles defined in criterion Hea 05 Acoustic Performance - Criterion 1, setting out the performance requirements for each and the testing regime required.</p>	Acoustician / Contractor		The basic built form has a large impact on the acoustic performance of the building and would be outside the control of the tenant. A suitably qualified acoustician (SQA) must carry out a quantifiable assessment of the specification of the build form, construction and any external factors likely to affect the indoor ambient noise levels. The SQA must then confirm the developer's works will enable a future tenant utilising a typical fit-out and specification to meet the levels required to demonstrate compliance.

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Hea 06: Security								
Security of Site and Building	Hea 06-01	1	1		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.	Architect / Client / SQSS	2	If the SQSS is unable to make complete recommendations due to the speculative nature of the assessment, then the credit may still be available. The SQSS must confirm that they have addressed all parts of the project where it is feasible to do so, based on the information available to them at the time of assessment. In relation to the influence of the occupiers on security, the SQSS shall clearly document their assumptions in the SNA.
					2. The SQSS develops a set of security controls and recommendations for incorporation into the proposals. These controls and recommendations shall directly relate to the threats and assets identified in the preceding SNA.			
					3. The controls and recommendations shall be incorporated into proposals and implemented in the as-built development. Any deviation from those controls and recommendations shall be justified and agreed with the SQSS.	Architect / M&E Consultant		
Exemplary Level Criteria	Hea 06-Ex	1	0	1	4. To achieve an exemplary level performance credit: A compliant risk based security rating scheme has been used. The performance against the scheme has been confirmed by independent assessment and verification.	Architect		The only currently accepted scheme is SABRE.
Hea 07: Safe and Healthy Surroundings								
Safe Access	Hea 07-01	1	0	1	1. Where external site areas form part of the assessed development the following apply: Dedicated and safe cycle paths are provided from the site entrance to any cycle storage, and connect to off-site cycle paths where applicable.	Landscape Architect / Architect		This credit is typically difficult to achieve however the design team should endeavour to implement the criteria.
					2. Dedicated and safe footpaths are provided on and around the site providing suitable links for the following: a. The site entrance to the building entrance b. Car parks (where present) to the building entrance c. The building to outdoor space 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 (criteria 4, 5 and 6):			
					4. Delivery areas are not accessed through general parking areas and do not cross or share the following: a. pedestrian and cyclist paths 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.			
6. Parking and turning areas are designed for simple manoeuvring according to the type of delivery vehicle likely to access the site, thus avoiding the need for repeated shunting.								
Outside Space	Hea 07-02	1	1		7. There is an outside space providing building users with an external amenity area.	Architect		This issue will be achieved.

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ENERGY (1 credit = 0.67%)								
Ene 01: Reduction of energy use and carbon emissions								
Energy Performance	Ene 01-01	9	6	3	1. Calculate an Energy Performance Ratio for New Constructions (EPRNC). Compare the EPRNC achieved with the benchmarks in Table 6.1 in the guidance manual and award the corresponding number of BREEAM credits.	M&E Consultant		In line with the development's NZC ambitions, it is thought that at least 6 credits will be achieved. For the energy modelling, if the building services efficiencies and performance specifications are not known (i.e. they are not within the remit of the shell and core developer and will be provided as part of the fit-out works), services complying with the minimum energy efficiency standards or backstop levels required by the relevant national building regulations should be used. For the energy modelling, the design team can use the performance specifications confirmed within a green fit-out agreement that is contractually required from the tenants in their fit-out works. This rule applies only to those areas of the building that the scope of the green fit-out agreement covers. Speculative areas of the assessed building not fitted out or covered by the scope of such an agreement must follow the comments above.
Prediction of Operational Energy Consumption	Ene 01-02	4	0	4	2. Involve relevant members of the design team in an energy design 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 125 of the guidance manual - assessor to provide.) 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.	M&E Consultant		These credits could be targeted, if required.
Exemplary Level Criteria	Ene 01-Ex	2	0	2	6. The building achieves an EPR NC ≥ 0.9 and zero net regulated CO ₂ -eq emissions. 7. Energy generation from on-site and near-site LZC sources is sufficient to offset carbon emissions from regulated energy use plus a percentage of emissions from unregulated energy use. 8. Award the exemplary credits based on the percentage of additional emissions from unregulated energy that are offset by LZC sources. (Table 6.2 guidance manual).	M&E Consultant		These credits require the development to be zero carbon for regulated operational energy and achieve a 50% reduction in unregulated energy from on site LZCs.
	Ene 01-Ex	3	0	3	9. The building is deemed carbon negative where >100% (see Table 6.2 guidance manual) of carbon emissions from unregulated (and regulated) energy use are offset by energy generated from on-site and near-site LZC sources.	M&E Consultant		Compliance with these credits will be investigated.
	Ene 01-Ex	2	0	2	10. Achieve maximum available credits in Ene 02 Energy monitoring. 11. The client or building occupier commits funds to pay for the post occupancy stage. This requires an assessor to be appointed and to report on the actual energy consumption compared with the targets set in criterion 4. 12. The energy model (criterion 3) is: a. Submitted to BRE and b. Retained by the building owner.	Client		These credits could be targeted if required.

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Ene 02: Energy Monitoring								
Sub-Metering of End-Use Categories	Ene 02-01	1	1		<p>1. Install energy metering systems so at least 90% of the estimated annual energy consumption of each fuel is assigned to the end-use categories.</p> <p>2. Meter the energy consumption in buildings according to the total useful floor area: a. If the area is greater than 1,000m², by end-use category with an appropriate energy monitoring and management system. b. If the area is less than 1,000m², use either: i. an energy monitoring and management system or ii. separate accessible energy sub-meters with pulsed or other open protocol communication outputs, for future connection to an energy monitoring and management system</p> <p>3. Building users can identify the energy consuming end users, for example through labelling or data outputs.</p>	M&E Consultant		<p>Mandatory for BREEAM Very Good</p> <p>End-use categories include: 1. Space heating 2. Domestic hot water heating 3. Humidification* 4. Cooling* 5. Ventilation, i.e. fans (major)* 6. Pumps 7. Lighting 8. Small power 9. Renewable or low carbon systems (separately) 10. Controls 11. Other major energy consuming systems or plant, where appropriate. Depending on the building type, this might include for example: plant used for swimming or hydrotherapy pools; other sports and leisure facilities; kitchen plant or catering equipment; office equipment; cold storage plant; laboratory plant; sterile services equipment; transportation systems (e.g. lifts and escalators); drama studios and theatres with large lighting rigs; telecommunications; dedicated computer room or suite; server rooms; dealing rooms; covered car parks; ovens or furnaces; and floodlighting. See also CIBSE TM39: Building energy metering for further information.</p>
Sub-Metering of High Energy Load and Tenancy Areas	Ene 02-02	1	1		<p>4. Monitor a significant majority of the energy supply with: a. An accessible energy monitoring and management system for: i. tenanted areas or ii. Relevant function areas or departments in single occupancy buildings OR 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: i. tenanted areas ii. relevant function areas or departments in single occupancy buildings.</p> <p>5. Sub-meter per floor plate in large single occupancy or single-tenancy buildings with one homogenous function, for example hotel bedrooms, offices.</p>	M&E Consultant		<p>This should be easily achieved where there are few function areas. For small retail units, a single meter per unit for electricity and another for heating is sufficient to achieve this credit. Individual areas within each unit do not need to be sub-metered. For the purpose of this BREEAM issue, a small unit is defined as less than 200m².</p>
Ene 03: External Lighting								
External Lighting	Ene 03-01	1	1		<p>1. No external lighting (which includes lighting on the building, at entrances and signs).</p> <p>OR</p> <p>2. External light fittings within the construction zone with: a. Average initial efficacy of not less than 70 luminaire lumens per circuit Watt. b. Automatic control to prevent operation during daylight hours. c. Presence detection in areas of intermittent pedestrian traffic.</p>	M&E Consultant		

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Ene 04: Low carbon design								
Passive Design Analysis	Ene 04-01	1	0		1. Achieve the first credit Hea 04 Thermal comfort: One credit - Thermal modelling to demonstrate that the building design delivers appropriate thermal comfort levels in occupied spaces.	M&E Consultant	2	This was not undertaken prior to the completion of RIBA Stage 2.
					2. The project design team analyses the proposed building design and development during concept design to identify opportunities for the implementation of passive design measures.	M&E Consultant		
					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.	M&E Consultant		
					4. Quantify the reduced total energy demand and carbon dioxide (CO ₂) emissions resulting from the passive design measures.	M&E Consultant		
Free Cooling	Ene 04-02	1	0		5. Achieve the passive design analysis credit.	M&E Consultant		16.05.2022 BREEAM workshop: The M&E team confirmed that this cannot be achieved.
					6. Include free cooling analysis in the passive design analysis carried out under criterion 2.			
					7. Identify opportunities for the implementation of free cooling solutions.			
					8. The building is naturally ventilated or uses any combination of the free cooling strategies listed in free cooling analysis.			
Low and Zero Carbon Feasibility Study	Ene 04-03	1	1		9. An energy specialist completes a feasibility study by the end of the concept design.	M&E Consultant	2	It is assumed that a compliant LZC study will be undertaken. The BRE will allow the credit to be awarded if this is completed after Stage 2, providing the energy specialist confirms no technologies have been discounted due to later consideration.
					10. Establish the most appropriate recognised local (on-site or near-site) low or zero carbon (LZC) energy sources for the building or development based on the feasibility study.	M&E Consultant / Architect		
					11. Specify local LZC technologies for the building or development in line with the feasibility study recommendations.	M&E Consultant		
					12. Quantify the reduced regulated carbon dioxide (CO ₂) emissions resulting from the feasibility study.	M&E Consultant		
TRANSPORT (1 credit = 0.96%)								
Tra 01: Transport Assessment and Travel Plan								
Travel Plan	Tra 01-01	2	0		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 (in line with the BREEAM methodology).	Transport Consultant	2	16.05.2022 BREEAM workshop: Design team confirmed that this was not undertaken. Although it is thought a compliant transport assessment and travel plan will be undertaken, it is assumed that this will not be completed prior to the completion of Concept Design. It will still be required for issue Tra 02, however.
					2 The site-specific travel assessment (or statement) shall cover as a minimum: a. If relevant, travel patterns and attitudes of existing building or site users towards cycling, walking and public transport, to identify relevant constraints and opportunities. b. Predicted travel patterns and transport impact of future building or site users. c. Current local environment for pedestrians and cyclists, accounting for any age-related requirements of occupants and visitors. d. Reporting of the number and type of existing accessible amenities (as per Table 7.1 of the BREEAM guidance manual), within 500m of the site. e. Disabled access accounting for varying levels and types of disability, including visual impairment. f. Calculation of the existing public transport Accessibility Index (AI), in line with the BREEAM methodology. 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 and supported by the building's management in operation.			

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Tra 02: Sustainable Transport Measures								
Sustainable Transport Measures	Tra 02-Pre	-	-	-	1. Achieve criteria 3-5 in the Tra 01 Transport assessment and travel plan issue.	Design Team		<p>Based on the worst-case scenario, an AI of <25 may be achieved, resulting in 1 Tra 02 point equating to 1 credit. It is assumed points for implementing the following will be targeted:</p> <ul style="list-style-type: none"> - Achieve an accessibility index of at least 8 (1 point) - Provide compliant cycle spaces (1 point) - Provide compliant cyclist facilities (1 point) - Access to at least 3 existing amenities (1 point) - Provide 1 new amenity (2 points) <p>For small retail developments, a minimum of 4 cycle storage spaces are required. Cyclist facilities are required for staff only.</p> <p>Where the AI is >25, fewer measures are required to achieve the same number of credits.</p>
	Tra 02-01	10	6	4	<p>2. Identify the sustainable transport measures in table 7.4 of the guidance manual (see criterion 3 and comments section).</p> <p>3. Award credits according to the Accessible Index of the project and the total number of points achieved for the options implemented. Current anticipated measures include:</p> <ul style="list-style-type: none"> - Achieve an accessibility index (AI) of at least 8 (1 point) - Improve the AI through negotiation with local transport companies (2 points) - Demonstrate increase over existing AI. This could be through provision of a diverted bus route, new or enhanced bus stop or other similar solutions (3 points) - Provide a real-time 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 point). - Provide EV charging stations of at least 3kW for at least 10% of parking spaces - Set up a compliant car sharing group (includes providing priority spaces for car sharers for at least 5% of total car parking capacity) (1 point). - Provide compliant cycle spaces (1 point) - Provide compliant cyclist facilities (1 point) - Access to at least 3 existing amenities (1 point) - Provide 1 new amenity (2 points) - Provide more than 1 new amenity (3 points) 			
WATER (1 credit = 0.78%)								
Wat 01: Water Consumption								
Water Consumption	Wat 01-01	5	3	2	<p>1. Use the BREEAM Wat 01 calculator to assess the efficiency of the domestic water-consuming components.</p> <p>2. Use the standard Wat01 method to compare the water consumption (litres/person/day) for the assessed building against a baseline performance. Award BREEAM credits based upon the following:</p> <p>1 credit: 12.5%</p> <p>2 credits: 25%</p> <p>3 credits: 40%</p> <p>4 credits: 50%</p> <p>5 credits: 55%</p> <p>Where it is not possible to use the standard method, and for some building types, complete the assessment using the alternative Wat 01 method.</p> <p>3. If a greywater or rainwater system is specified, use its yield in L/person/day to offset potable water demand from components.</p> <p>4. If a greywater or rainwater system is specified and installed:</p> <p>a. Greywater systems in compliance with BS 8525-1:2010 Greywater systems - Part 1 Code of Practice.</p> <p>b. Rainwater systems in compliance with BS 8515:2009+A1:2013 Rainwater harvesting systems - Code of practice</p> <p>Assessment scope - Criterion 6 on page 201, if you intend to pursue a post occupancy stage certification. Achieve</p>	Architect / M&E Consultant		<p>A minimum of 1 credit is mandatory for BREEAM Very Good</p> <p>Although 1 credit is required for Very Good, it is thought that at least 3 will be targeted.</p> <p>Components to be included as a minimum:</p> <ul style="list-style-type: none"> - WCs - Wash-hand basin taps - Showers - Urinals - Kitchen taps: kitchenette <p>Where these will not be installed the BRE backstop values must be used in the Wat 01 calculations unless the building occupier / fit out client confirms their specification.</p>
Exemplary Level Criteria	Wat 01-Ex	1	0	1	<p>To achieve an exemplary performance credit:</p> <p>7. Achieve criteria 1 to 4.</p> <p>8. The water consumption (litres/person/day) for the assessed building achieves the 65% improvement described as exemplary performance in Table 8.1 of the guidance manual.</p>	Architect / M&E Consultant		

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Wat 02: Water Monitoring								
Water Monitoring	Wat 02-01	1	1		<p>1. The specification of a water meter on the mains water supply to each building; this includes instances where water is supplied via a borehole or other private source.</p> <p>2. Water-consuming plant or building areas, consuming 10% or more of the building's total water demand: a. Fit easily accessible sub-meters OR b. Install water monitoring equipment integral to the plant or area.</p> <p>3. For each meter (main and sub): a. Install a pulsed or other open protocol communication output AND 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.</p> <p>6. Additionally for those pursuing a post occupancy stage certification: 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.</p>	M&E Consultant		<p>Criterion 1 is mandatory for BREEM Very Good</p> <p>With regards to criterion 3, this only applies to water-consuming plant or building areas identifiable by the developer.</p>
Wat 03: Water Leak Detection and Prevention								
Leak Detection System	Wat 03-01	1	1		<p>1. Install a leak detection system capable of detecting a major water leak: a. On the utilities water supply within the buildings, to detect any major leaks within the buildings AND b. Between the buildings and the utilities water supply, to detect any major leak between the utilities supply and the buildings under assessment.</p> <p>2. The leak detection system is: 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. b. Activated when the flow of water passing through the water meter or data logger is at a flow rate above a pre-set maximum for a pre-set period of time. This usually involves installing a system which detects higher than normal flow rates at meters or sub-meters. It does not necessarily require a system that directly detects water leakage along part or the whole length of the water supply system. c. Able to identify different flow and therefore leakage rates e.g. continuous, high or low level, over set time periods. Although high and low level leakage rates are not specified, the leak detection equipment installed must have the flexibility to distinguish between different flow rates to enable it to be programmed to suit the building type and owners or occupiers usage patterns. d. Programmable to suit the owner's or occupiers water consumption criteria. 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.</p>	M&E Consultant		
Flow Control Devices	Wat 03-02	1	1		<p>2. Install flow control devices that regulate the supply of water to each WC area/sanitary facility according to demand, in order to minimise undetected wastage and leaks from sanitary fittings and supply pipework.</p>	M&E Consultant		<p>Criterion 3 has to be assessed regardless of whether the WC areas or facilities are fitted out or not.</p>
Wat 04: Water Efficient Equipment								
Water Efficient Equipment	Wat 04-01	1	1		<p>1. Identify all water demands from users other than those considered under Wat 01 that could be realistically mitigated or reduced. Where there is no water demand from uses other than domestic -style, sanitary use components in the building, this issue is not applicable.</p> <p>2. Identify systems or processes to reduce the relevant water demand (criterion 1) and establish, through either good practice design or specification, a demonstrable reduction in the total water demand of the building.</p>	M&E Consultant / Client		

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
MATERIALS (1 credit = 1.25%)								
Mat 01: Life Cycle Impacts								
Superstructure	Mat 01-01	6	2	4	<p>Comparison with the BREEAM LCA benchmark during Concept Design (office, industrial and retail buildings only) 1. During the Concept Design, demonstrate the environmental performance of the building as follows: 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. 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).</p>	Architect / C&S Engineer	2	Unlike other BREEAM issues, this information must be submitted to the BRE prior to the completion of Concept Design / Planning. Due to the short programme it is assumed they will not be targeted. The Stage 4 time-limited embodied carbon credits should be targeted, however, in line with the net zero carbon agenda.
					<p>Option appraisal during Concept Design (all building types). 2. During Concept Design, identify opportunities for reducing environmental impacts as follows: a. Carry out building LCA options appraisal of 2 to 4 significantly different superstructure design options (applicable to the Concept Design stage) b. Use a building LCA tool that is recognised by BREEAM (as suitable for assessing superstructure during Concept Design) according to the methodology. c. For each design option, fulfil the same functional requirements specified by the client and all statutory requirements (to ensure functional equivalency). d. Integrate the LCA options appraisal activity within the wider design decision-making process. Record this in an options appraisal summary document.</p>			
					<p>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. 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 BREEAM Simplified Building LCA tool (or an IMPACT Compliant LCA tool) shall be used for criteria 1 to 2.</p>			
					<p>Comparison with the BREEAM LCA benchmark during Technical Design (office, industrial and retail buildings only) 4. During Technical Design, demonstrate the environmental performance of the building as follows: a. As criterion 1.a b. Submit the Mat 01/02 Results Submission Tool to the BRE at the end of Technical Design. Where a project has not achieved criterion 1, criterion 2 may still be achieved.</p>	Architect / LCA Consultant	4	
					<p>Options appraisal during Technical Design (all building types) 5. During Technical Design identify opportunities for reducing environmental impacts as follows: 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). b. Use a building LCA tool that is recognised by BREEAM (as suitable for assessing superstructure during Technical Design) according to the methodology. 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. 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.</p>	Architect / LCA Consultant	4	

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Substructure and Hard Landscaping options appraisal	Mat 01-02	1	0	1	6. Criteria 3 and 4 are achieved.	C&S Engineer / Landscape Architect	2	As above.
					7. During Concept Design identify opportunities for reducing environmental impacts as follows: 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). 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. c As criteria 4.c. to 4.f.			
					d. 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.			
Exemplary Performance Criteria	Mat 01-Ex1	1	0	1	8. Criteria 3-4 are achieved.	M&E Consultant	2	As above.
					9. During Concept Design, identify opportunities for reducing environmental impacts as follows: a. Carry out building LCA options appraisal of at least 3 significantly different core building services design options. 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. c. As criteria 4.c to 4.f.			
					d. 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.			
Exemplary Performance Criteria	Mat 01-Ex2	1	0	1	10. Achieve criteria 3 to 5.	Design Team	2	As above.
					11. Achieve the Elemental LCC plan and Component Level LCC options appraisal credits (Man 02 Life cycle cost and service life planning).			
					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.			
	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)	Design Team						
	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'.	Design Team						
Mat 01-Ex3	1	0	1	15. Criteria 1 to 7 (as applicable to the building type) are achieved. 16. A suitably qualified third party either carries out the building LCA work or verifies the building LCA work (if by others), and produces a report describing how they have checked the building LCA work accurately represent the designs under consideration during Concept Design and Technical Design with reference to the requirements of criteria 1 to 7 (and 8 to 14 if pursued). 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 232. of the guidance manual. 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.	M&E Consultant		This could be targeted, if required.	
Mat 02: Environmental Impacts from Construction Products - Environmental Product Declarations (EPD)								
Specification of Products with a Recognised EPD	Mat 02-01	1	1		1. Specify construction products with EPD that achieve a total EPD points score of at least 20, according to the BREEAM methodology (to be supplied by the assessor).	Architect / Contractor		This issue requires the selection of a number of materials with the appropriate level of environmental performance declaration (EPD) certification.
					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.	BDP BREEAM assessor		

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Mat 03: Responsible Sourcing of Construction Products								
Ensuring Sustainable Procurement	Mat 03-Pre	-	-	-	1. All timber and timber based products used on the project is ' Legally harvested and traded timber' as per the UK government's Timber Procurement Policy (TPP)	Contractor / Architect		Criterion 1 is mandatory for BREEAM It is assumed a sustainable procurement plan was not in place at RIBA Stage 1. If the Council have their own compliant plan, then Mat 03-01 could still be awarded.
	Mat 03-01	1	0	1	2. A sustainable procurement plan must be used by the design team to guide specification towards sustainable construction products. The plan must: a. Be in place before Concept Design 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. 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. 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: e. Identify the risks and opportunities of procurement against a broad range of social, environmental and economic issues following the process set out in BS ISO 20400:2017.	Architect	1	
Measuring Responsible Sourcing	Mat 03-02	3	2	1	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. (Use table 9.10 in the guidance manual).	Contractor		
Mat 05: Designing for Durability and Resilience								
Designing for Durability and Resilience	Mat 05-01	1	1		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: a. Negative impacts of high user numbers in relevant areas of the building (e.g. corridors, lifts, stairs, doors etc.) b. Damage from any vehicle or trolley movements within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas. c. External building fabric damage by vehicle. Protection where parking or manoeuvring areas are within 1 metre of the building facade and where delivery areas or routes are within 2 metres of the facade i.e. specifying bollards or protection rails. 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: a. The element or product achieving an appropriate quality or durability standard or design guide, see Table 9.14 of the guidance manual. If none are available use BS 7543:2015 as the default appropriate standard. OR 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 in the guidance manual for an example list of relevant industry durability and quality standards.	Architect		Key exposed building elements in the context of this issue are those adding up to at least 80% by area of each of the following categories: 1. External walls and cladding 2. Roof or balconies 3. Glazing: windows, skylights 4. Hard landscaping

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Mat 06: Material efficiency								
Material Efficiencies	Mat 06-01	1	0		<p>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:</p> <p>a. Preparation and Brief b. Concept Design c. Developed Design d. Technical design e. Construction</p> <p>2. Develop and record the implementation of material efficiency during:</p> <p>a. Developed Design b. Technical Design c. Construction</p> <p>3. Report the targets and actual material efficiencies achieved.</p>	Design Team / Architect	1 to 5	<p>16.05.2022 BREEAM workshop: It was confirmed that the early stage actions were not carried out. As such, this is not achievable.</p> <p>Examples of suitable material efficiency design measures can include:</p> <ol style="list-style-type: none"> 1. Increasing the utilisation factor of structural members 2. Designing to standard material dimensions to reduce off-cuts and waste on site 3. Removing redundant materials from the design 4. Using materials that can be recycled or reused at the end of their service life 5. Making use of recycled or reclaimed materials 6. Designing for deconstruction and material reuse 7. Using pre-fabricated elements where appropriate to reduce material waste 8. Consider using an 'exposed thermal mass' design strategy to reduce finishes. 9. Avoiding over-specification of predicted loads 10. Using lightweight structural design strategies 11. Making use of bespoke structural elements where this will reduce overall material use 12. 'Rationalisation' of structural elements 13. Optimising the foundation design for embodied environmental impact.
WASTE (1 credit = 0.70%)								
Wst 01: Construction Waste Management								
Pre-Demolition Audit	Wst 01-01	1	0		<p>1. Complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition. This must be used to determine whether refurbishment or reuse is feasible and, in the case of demolition, to maximise the recovery of material for subsequent high grade or value applications. The audit must cover the content of pre-demolition audit scope and:</p> <p>a. Be carried out at Concept Design stage (RIBA Stage 2) by a competent person prior to strip-out or demolition works. b. Guide the design, consider materials for reuse and set targets for waste management. c. Engage all contractors in the process of maximising high grade reuse and recycling opportunities. d. Compare actual waste arisings and waste management routes used with those forecast and investigate significant deviations from planned targets.</p> <p>2. Make reference to the audit in the resource management plan (RMP).</p>	Demolition Contractor / Design Team	2	<p>16.05.2022 BREEAM workshop: It was confirmed that this was not completed.</p> <p>A BREEAM compliant pre-demolition audit will need to be undertaken to investigate the potential for the reuse of demolition materials, and to maximise opportunities for diversion of demolition materials from landfill. It has been confirmed that this will be undertaken by the principal contractor.</p>
Construction Resource Efficiency	Wst 01-02	3	2	1	<p>3. Prepare a compliant Resource Management Plan (RMP) covering:</p> <p>a. Non-hazardous waste materials (from on-site construction and dedicated off-site manufacturer or fabrication) including demolition and excavation waste. b. Accurate data records on waste arising's and waste management routes.</p> <p>4. Meet or improve upon the benchmarks below for non-hazardous construction waste, excluding demolition and excavation waste: Amount of waste generated per 100m2 GIFA: 1 credit: ≤ 13.3m3 actual volume (not bulk) / ≤ 11.1 tonnes 2 credits: ≤ 7.5m3 actual volume (not bulk) / ≤ 6.5 tonnes 3 credits: ≤ 3.4m3 actual volume (not bulk) / ≤ 3.2 tonnes Exemplary level: ≤ 1.6m3 actual volume (not bulk) / ≤ 1.9 tonnes</p>	Contractor		

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Diversion of Resources from Landfill	Wst 01-03	1	1		5. Meet, where applicable, the diversion from landfill benchmarks below for non-hazardous construction waste and demolition and excavation waste generated: Non-demolition: 70% volume / 80% tonnage Demolition: 80% volume / 90% tonnage Excavation: n/a	Contractor		
					6. Sort waste materials into separate key waste groups as per Table 10.3 of the guidance manual, either on-site or through a licensed contractor for recovery.			
Exemplary Performance Criteria	Wst 01-Ex	1	0	1	7. Non-hazardous construction waste generated, excluding demolition and excavation waste is less than or equal to the exemplary level resource efficiency benchmarks: Exemplary level: ≤ 1.6m2 actual volume (not bulk) / ≤ 1.9 tonnes	Contractor		
					8. The percentage of non-hazardous construction (on-site and dedicated off-site manufacture/fabrication), demolition and excavation waste (if relevant) diverted from landfill meets or exceeds the exemplary level percentage benchmarks outlined below: Non-demolition: 85% volume / 90% tonnage Demolition: 85% volume / 95% tonnage Excavation: 95% volume / 95% tonnage			
					9. All key waste groups in Table 10.3 of the guidance manual, for diversion from landfill are covered in the RMP.			
					10. Waste data obtained from licenced external waste contractors is reliable and verifiable, by using data from EA/SEPA/EA Wales/NIEA Waste Return Forms or from PAS 402:2013 compliant company.			
Wst 02: Recycled Aggregates								
Pre- Requisite	Wst 02-Pre	-	-	-	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 and Assessment Scope - Criterion 2	C&S Engineer		Although these criteria are difficult to achieve, compliance should be investigated.
Sustainable Aggregate Points	Wst 02-01	1	0	1	2. Identify all aggregate uses and types on the project Table 10.5, and Table 10.6 in the guidance manual.	C&S Engineer		
					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 (refer to Table 10.4 in the guidance manual).			
Exemplary Performance Criteria	Wst 02-Ex	1	0	1	To achieve an exemplary performance credit: 7. The Project Sustainable Aggregate Points score meets or exceeds the exemplary level performance benchmark in Table 10.4 of the guidance manual.	C&S Engineer		
Wst 03: Operational Waste								
Operational Waste	Wst 03-01	1	1		1. Provide a dedicated space for the segregation and storage of operational recyclable waste generated. The space is: a. Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams b. Accessible to building occupants or facilities operators for the deposit of materials and collections by waste management contractors c. Of a capacity appropriate to the building type, size, number of units (if relevant) and predicted volumes of waste that will arise from daily/weekly operational activities and occupancy rates.	Architect		Shared waste storage areas can be considered, however the recyclable waste storage area must be appropriately sized for all buildings being served.
					2. For consistent and large amounts of operational waste generated, provide: a. Static waste compactors or balers; situated in a service area or dedicated waste management space 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 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.			

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Wst 05: Adaptation to Climate Change								
Resilience of Structure, Fabric, Building Services and Renewables Installation	Wst 05-01	1	0		1. Conduct a climate change adaptation strategy appraisal using: 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: i. Hazard identification ii. Hazard assessment iii. Risk estimation iv. Risk evaluation v. Risk management.	Architect / C&S Engineer/ M&E Consultant	2	16.05.2022 BREEAM workshop: It was confirmed that the early stage actions were not carried out. As such, this is not achievable.
					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.	Architect / C&S Engineer/ M&E Consultant	4	
Exemplary Criteria	Wst 05-Ex	1	0		Achievement of the following criteria demonstrates a holistic approach to the design and construction of the building's life cycle to mitigate against the impacts of climate change. To achieve an exemplary level performance credit: 4. Meet criteria 1-3.	Design Team		
					5. Meet the criteria or achieve credits of the assessment issues given below: - Hea 04: Criterion 6 - Ene 01: Minimum 6 credits - Ene 04: Passive design credit - Wat 01: Minimum 3 credits - Mat 05: Criteria 2 - 4 - Pol 03: Minimum 1 credit for flood resilience and 2 credits under Surface Water Runoff			
Wst 06: Design for Disassembly and Adaptability								
Recommendations	Wst 06-01	1	0	1	1. Conduct a study to explore the ease of disassembly and the functional adaptation potential of different design scenarios by the end of Concept Design.	Architect	2	16.05.2022 BREEAM workshop: It was confirmed that the early stage actions were not carried out. As such, this is not achievable.
					2. Develop recommendations or solutions based on the study during or prior to Concept Design, that aim to enable and facilitate disassembly and functional adaptation.			
Implementation	Wst 06-02	1	0	1	3. Achieve criteria 1 and 2.	Architect	4	
					4. Provide an update, during Technical Design, on: 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. 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.			

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
LAND USE AND ECOLOGY (1 credit = 1.15%)								
LE 01: Site Selection								
Previously Occupied Land	LE 01-01	1	1		1. At least 75% of the proposed development is on previously occupied land	Architect		This will be met.
Contaminated Land	LE 01-02	1	0	1	2. A contaminated land professional undertakes a site investigation, risk assessment and appraisal, which deems that land within the development footprint to be affected by contamination. This report identifies: a. The degree of contamination b. The contaminant sources/types c. The options for remediating sources of contamination which present an unacceptable risk.	C&S Engineer		16.05.2022 BREEAM workshop: BDP C&S confirmed that although contamination may be present, this is likely to be negligible. This will be confirmed following issue of the site investigation report.
					3. The client or principal contractor confirms that a remediation strategy will be implemented, in line with the report.			
LE 02: Ecological Risks and Opportunities								
Pre-Requirement (Statutory Obligations)	LE 02-Pre	-	-	-	1. The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.	Client / Contractor		
Survey and Evaluation	LE 02-01	1	1		3. A Suitably Qualified Ecologist (SQE) carries out a survey and evaluation for the site early enough to influence site preparation works, layout and, where necessary, strategic planning decisions (typically Preparation and brief stage).	Ecologist	1	This credit is required in order to achieve any credits under LE 03. A site-wide approach to ecological enhancements can be used on sites where multiple buildings share areas of soft landscaping. The enhancement benefits are applied to the individual building assessments within the site. The benefit can be applied on a site-wide basis provided all developments are completed within the appropriate timeframe of a valid ecological survey.
					4. The SQE's survey and evaluation determines the site's ecological baseline, including: a. Current and potential ecological value and condition of the site and related areas within the Zone of Influence. b. Direct and indirect risks to current ecological value from the project. c. Capacity and feasibility for enhancement of the site's ecological value and, where relevant, areas within the Zone of Influence.	Ecologist / Design Team		As an ecologist has been involved since Stage 1, it is assumed these criteria will be met.
					5. Recommendations and data collected from the survey and evaluation are shared with appropriate project team members to influence decisions made for activities during site preparation, design and construction works, which can support ecological features.			
Determining Ecological Outcomes	LE 02-02	1	1		6. Achieve the LE 02-01 "Survey and Evaluation" credit.			This credit is required in order to achieve any further credits under issue LE 03.
					7. The project team liaise and collaborate with representative stakeholders early enough to influence key planning decisions (typically Concept Design stage), to: a. Identify the optimal ecological outcomes for the site. b. Identify, appraise and select measures to meet the optimal ecological outcomes for the site (criterion 7a), in line with the mitigation hierarchy of action: 1. Avoidance 2. Protection 3. Reduction or limitation of negative impacts 4. On site compensation and 5. Enhancement, considering the capacity and feasibility within the site, or where viable, offsite.	Ecologist / Design Team	2	

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Exemplary Level Criteria	LE 02-Ex	1	0	1	To achieve one exemplary performance credit: Wider site sustainability 8. Achieve criteria 7 / LE02-02 above.	Ecologist / Design Team		
					9. Wider sustainability related activities and potential ecosystem service benefits are considered as part of determining the optimal ecological outcomes for the site (criterion 7), including the areas outlined in the Methodology below.			
					10 Achieve the credits of the assessment issues outlined below: a. Hea 07 Safe and healthy surroundings - Both credits b. Pol 03 Flood and surface water management - Achieve credits for 'Surface water run-off' and 'Minimising watercourse pollution' c. Pol 05 Reduction of noise pollution			
LE 03: Managing Impacts on Ecology								
Pre- Requisite	LE 03-Pre	-	-	-	1. LE 02's 'Survey and evaluation and Determining ecological outcomes' criteria have been achieved.	Design Team		This must be achieved in order to award LE 03-02. "Further planning" refers to defining and allocating roles and responsibilities towards promoting and protecting ecology, allocating resources (time, money), and putting in place procedures for monitoring effectiveness etc.
Planning and Measures On-Site	LE 03-01	1	1		2. Further planning to avoid and manage negative ecological impacts on-site is carried out (see Methodology in guidance manual) early enough to influence the concept design and design brief as well as site preparation planning (typically Concept Design stage).	Design Team	1 or 2	
					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 in guidance manual).	Contractor		
Managing Negative Impacts of the Project	LE 03-02	2	2		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 LE 02 Ecological risks and opportunities (see Methodology).	Design Team		
					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 and, either: a. No overall loss of ecological value has occurred (two credits). OR where criterion 8.a is not possible: b. The loss of ecological value has been minimised (Minimising Loss) (one credit)	Ecologist / Contractor / Design Team		
								This credit is required to achieve credits under LE 04 and LE 05.

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
LE 04: Ecological Change and Enhancement								
Pre- Requisite	LE 04-Pre	-	-	-	1. Criterion 8 in LE 03 has been achieved.	Design Team		
					2. The client or contractor confirms compliance is monitored against all relevant UK, EU or international legislation relating to the ecology of the site.	Contractor / Client		
Change and Enhancement of Ecology	LE 04-01	3	2	1	4. 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.	Ecologist / Landscape Architect		It is assumed that at least 2 of the 3 available credits will be achieved. Credits are awarded as follows: a. Minimising loss of ecological value (one credit - percentage score of 75-94) b. No net loss of ecological value (two credits - percentage score of 95-104) c. Net gain of ecological value (three credits - percentage score of 105-109)
Ecological Enhancement	LE 04-02	1	1		5 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. Measures are implemented in the following order: a. On site, and where this is not feasible, b. Off site within the Zone of Influence.	Ecologist / Landscape Architect		
					6. Data collated are analysed and where potentially valuable, provided to the local environmental records centres nearest to, or relevant for, the site.			
Exemplary Level Criteria	LE 04-EX	1	0	1	7. The change in ecological value calculated under criterion 6 above confirms significant net gain has been achieved as set out in GN36 - BREEAM, CEEQUAL and HQM Ecology Calculation Methodology – Route 2. The credit is awarded as follows: a. Significant net gain of ecological value (percentage score of 110 or above)	Ecologist / Landscape Architect		It is thought that a biodiversity net gain may be achieved. This will need to be confirmed by the ecologist, however.
LE 05: Long Term Ecological Management and Maintenance								
Pre- Requisite	LE 05-Pre	-	-	-	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. Criterion 8 in LE 03 has been achieved, and at least one credit under LE 04 for 'Change and Enhancement of Ecology' has been awarded.			
Planning, Liaison, Data, Monitoring and Review Management and Maintenance	LE 05-01	1	1		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. 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.	Contractor / Design Team		
					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. 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 / Contractor / Design Team		

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Landscape and Ecology Management Plan (or similar) development	LE 05-02	1	1		5. A Landscape and Ecology Management Plan, or equivalent, has been developed in accordance with BS 42020:2013 Section 11.1(213) covering at least the first five years after project completion as a minimum and including: a. Actions and responsibilities of relevant individuals prior to handover b. The ecological value and condition of the site at handover and how this is expected to develop and change over time c. Identification of opportunities for ongoing alignment with activities beyond the development project, which support the aims of BREEAM's Strategic Ecology Framework d. Identification and guidance to trigger appropriate remedial actions to address previously unforeseen impacts e. Clearly defined and allocated roles and responsibilities for delivering the plan	Ecologist / Landscape Architect		
					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).			
POLLUTION (1 credit = 0.75%)								
Pol 01: Impact of Refrigerants								
Impact of Refrigerant	Pol 01-01	2	1	1	Three credits - No refrigerant use 1. Where the building does not require the use of refrigerants within its installed plant/systems. OR alternatively, where the building does require the use of refrigerants, the three credits can be awarded as follows: Pre-requisite 2. All systems (with electric compressors) must comply with the requirements of BS EN 378:2016 (parts 2 and 3) and where refrigeration systems containing ammonia comply with the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice	M&E Consultant		It is thought that at least 1 of the 2 credits will be targeted. If the building is designed to avoid the need for refrigerant-containing building services, so no refrigerant use will be specified for the fit-out, the available credits can be awarded by default.
					Two credits - Impact of refrigerant 3. Where the systems using refrigerants have Direct Effect Life Cycle CO ₂ equivalent emissions (DELCO ₂ e) of ≤ 100 kgCO ₂ e/kW cooling/heating capacity. 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. OR 4. Where air-conditioning or refrigeration systems are installed the refrigerants used have a Global Warming Potential (GWP) ≤10. OR One credit - Impact of refrigerant 5. Where the systems using refrigerants have Direct Effect Life Cycle CO ₂ equivalent emissions (DELCO ₂ e) of ≤ 1000 kgCO ₂ e/kW cooling/heating capacity.			
Leak Detection	Pol 01-02	1	1		6. All systems are hermetically sealed or only use environmentally benign refrigerants. OR 7. Where the systems are not hermetically sealed: a. Systems have: i. A permanent automated refrigerant leak detection system, that is robust and tested, and capable of continuously monitoring for leaks. OR ii. An inbuilt automated diagnostic procedure for detecting leakage is enabled. 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).	M&E Consultant		

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Pol 02: Local Air Quality								
Local Air Quality	Pol 02-01	2	2		<p>1. All heating and hot water is supplied by non-combustion systems. For example, only powered by electricity OR alternatively;</p> <p>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 in the guidance manual (assessor to provide). The measurements must be provided by manufacturers, following the labelling requirements of the European Directive 2009/125/EC. No credits can be awarded for Pol02 if any of the combustion appliances are not covered in Table 12.4 and Table 12.5 in the guidance manual.</p> <p>3. 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 12.15 of the guidance manual.</p>	M&E Consultant		<p>16.05.2022 BREEAM workshop: BDP M&E confirmed that ASHPs will be provided. As such, both credits will be achieved.</p> <p>In line with the Council's NZC agenda, it is assumed both credits will be achieved.</p>
Pol 03: Flood and Surface Water Management								
Flood Resilience	Pol 03-01	2	2		<p>1. An appropriate consultant is appointed to carry out and demonstrate the development's compliance with all criteria. Two credits - Low flood risk</p> <p>2. A site-specific flood risk assessment (FRA) confirms that the development is in a flood zone that is defined as having low annual probability of flooding. The FRA takes all current and future sources of flooding into consideration.</p> <p>One credit - Medium/high flood risk</p> <p>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. For smaller sites, refer to Level of detail required in the FRA for smaller sites which overrides criterion 2.</p> <p>4. To increase the resilience of the development to flooding, one of the following must be achieved: 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 600mm above the design flood level of the site's flood zone. b. The final design of the building and wider site reflects the recommendations made by an appropriate consultant with the hierarchy approach outlined in section 5 of BS 8533:2017.</p>	C&S Engineer		
Surface Water Run-off	Pol 03-Pre	-	-	-	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.	C&S Engineer		
	Pol 03-02	1	1		<p>One credit - Surface water run-off - Rate</p> <p>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.</p> <p>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 pre-development site. This should comply at the 1-year and 100-year return period events.</p> <p>8. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Sustainable Drainage Systems (SuDS) are in place.</p> <p>9. Calculations include an allowance for climate change. This should be made in accordance with the current best practice planning guidance.</p>	C&S Engineer		

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Surface Water Run-off	Pol 03-03	1	1		<p>One credit - Surface Run-off - Volume</p> <p>10. Flooding of property will not occur and in the event of local drainage system failure (caused by either extreme rainfall or a lack of maintenance); AND EITHER</p> <p>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.</p> <p>12. Any additional predicted volume run-off for this event is prevented from leaving the site by using infiltration or other SUDS techniques.</p> <p>OR (only where criteria 10 and 11 for this credit cannot be achieved):</p> <p>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.</p> <p>14. Drainage design measures are specified so that that post-development peak run-off is reduced to the limiting discharge. The limiting discharge is defined as the highest flow rate from the following options: a. the pre-development one-year peak flow rate b. The mean annual flow rate (Qbar) c 2L/s/ha.</p> <p>For the one-year peak flow rate, the one-year return period event criterion applies.</p> <p>15. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Suds are in place.</p> <p>16. For either option, above calculations must include an allowance for climate change; this should be made in accordance with current best practice planning guidance.</p>	C&S Engineer		
Minimising Water Course Pollution	Pol 03-04	1	0		<p>17. There is no discharge from the developed site for rainfall up to 5mm (confirmed by the Appropriate Consultant).</p> <p>18. Areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate Suds techniques.</p> <p>19. Areas with a high risk of contamination of spillage of substances, such as petrol and oil have separators (or an equivalent system) are installed in surface water drainage systems.</p> <p>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 spillage or bunding failure.</p> <p>21. All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as the Suds manual and other relevant industry best practice. They must be bespoke solutions taking account of the specific site requirements and natural or man-made environment of and surrounding the site.</p> <p>22. A comprehensive and up to date drainage plan of the site will be made available for the building or site occupiers.</p> <p>23. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Suds must be in place.</p>	C&S Engineer		16.05.2022 BREEAM workshop: BDP C&S confirmed that this cannot be achieved.
Pol 04: Reduction of Night Time Light Pollution								
Reduction of Night Time Light Pollution	Pol 04-01	1	1		<p>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:</p> <p>2. The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the Institution of Lighting Professionals (LP) Guidance notes for the reduction of obtrusive light, 2011.</p> <p>3. All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00</p> <p>4. If safety or security lighting is provided and will be used between 23:00 and 07:00, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP guidance notes.</p> <p>5. Illuminated advertisements are designed in compliance with IPL PLG05 The Brightness of Illuminated Advertisement.</p>	M&E Consultant		

Title	Credit Ref	Credits available	Route to Very Good 62.70%	Potential credits 47.90%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Pol 05: Reduction of noise pollution								
Reduction of Noise Pollution	Pol 05-01	1	1		1. There are no noise-sensitive areas within the assessed building or within 800m radius of the assessed site. OR	Acoustician		
					2. Where there are noise-sensitive areas within the assessed building or noise-sensitive areas within 800m radius of the assessed site, a noise impact assessment compliant with BS4142:2014 is commissioned. Noise levels must be measured or determined for: a. Existing background noise levels: i. at the nearest or most exposed noise-sensitive development to the proposed assessed site. ii. Including existing plant on a building, where the assessed development is an extension to the building. b. Noise rating level from the assessed building			
					3. The noise impact assessment must be carried out by a suitably qualified acoustic consultant.	Contractor		
					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.			

Appendix 2: Building inputs and results summary

Differences between simulations are in **yellow**.

Compliance Results	Base	With PV
Building Regulations	Part L 2021	Part L 2021
Modelling Software	IES ve 2022.1.0.0	IES ve 2022.1.0.0
TER	5.62	5.62
BER	4.93	-0.49
% Improvement over TER	12.28%	108.72%
BER Improvement over first iteration	11.09%	107.53%
TPER	60.14	60.14
BPER	53.15	-10.62
% Improvement over TPER	11.62%	117.66%
BPER Improvement over first iteration	10.75%	116.78%
Pass?	Yes	Yes
Criterion 3 Pass?	Yes	Yes
Summary of Iteration	Per BDP proposal	With proposed PV

Building Data	Base	With PV
Location	Barnsley	Barnsley
Orientation (° from North)	288 clockwise from North	288 clockwise from North
Part L Weather File (TRY)	Leeds	Leeds
Building HVAC control	Dry Resultant Temperature	Dry Resultant Temperature
Building Type	21% Retail, 79% Workshop Business	21% Retail, 79% Workshop Business
Air Permeability (m ³ /h/m ² @ 50Pa)	1	1

Building Data	Base	With PV
Infiltration Rate (ach, result of air permeability)	0.028	0.028
Portable / Modular?	No	No
Power Factor	>0.95	>0.95
Provision for metering / out of range values?	Yes	Yes

U-Value (W/m ² K)	Base	With PV
Door	n/a	n/a
External Wall	0.15	0.15
External Window	1	1
Ground/Exposed Floor	0.12	0.12
Roof	0.12	0.12

Window	Base	With PV
g-value	0.4	0.4
Visible Light Transmission	0.71	0.71
Blinds?	n/a	n/a

Heating & Cooling System	Base	With PV
Heating & Cooling System	ASHP	ASHP
Heating + Natural Ventilation	•00 - Lobby	•00 - Lobby

Heating & Cooling System	Base	With PV
Heating + Supply & Extract	<ul style="list-style-type: none"> •00 - Acc Change/WC •00 - Acc WC 01 •00 - Acc WC 02 •00 - Change/WC 01 •00 - Change/WC 02 •00 - Change/WC 03 •00 - Lockers •00 - Staff/Storage •00 - Workshop •00 - Storage 01 •00 - Storage 02 •00 - Storage 03 •00 - Bike Loan Retail •00 - Café 	<ul style="list-style-type: none"> •00 - Acc Change/WC •00 - Acc WC 01 •00 - Acc WC 02 •00 - Change/WC 01 •00 - Change/WC 02 •00 - Change/WC 03 •00 - Lockers •00 - Staff/Storage •00 - Workshop •00 - Storage 01 •00 - Storage 02 •00 - Storage 03 •00 - Bike Loan Retail •00 - Café
Heating & Cooling + Supply & Extract	n/a	n/a
No System Present	External plant, stairs, & cycle storage	External plant, stairs, & cycle storage
System Fuels	Electricity	Electricity
Heating Seasonal Efficiency	4.2	4.2
Cooling Seasonal Efficiency	3.9 nominal, 6.6 seasonal	3.9 nominal, 6.6 seasonal

Ventilation	Base	With PV
Supply & Extract SFP (W/l/s)	Supply & Extract w/ Heat Recovery=1.5	Supply & Extract w/ Heat Recovery=1.5
Heat Recovery Efficiency	90%	90%
Ductwork leakage?	n/a	n/a
AHU Testing?	n/a	n/a
Supply & Extract Demand Control?	Speed control based on occupant density	Speed control based on occupant density
Zonal Extract Demand Control?	n/a	n/a

DHW	Base	With PV
DHW System	Central electric heating	Central electric heating

DHW	Base	With PV
Heating Efficiency	1	1
Delivery efficiency	2% delivery losses	2% delivery losses
Storage Volume (litres)	n/a	n/a
Storage Losses (kWh/l/day)	n/a	n/a
Insulation Thickness (mm)	n/a	n/a
Secondary Circulation?	n/a	n/a
Loop Length (m)	n/a	n/a
Circulation losses (W/m)	n/a	n/a
Pump Power (kW)	n/a	n/a

Lighting & Controls	Base	With PV
Lighting Power Density W/m ² /100lux	n/a lighting efficacy used	n/a lighting efficacy used
Illuminance (lux)	Per NCM	Per NCM
Lighting Efficacy lm/cW	110	110
Light Output Ratio	1	1
Display Lighting Efficacy (lm/W)	110	110
Display Lighting Power Density (W/m ²)	1.5	1.5
Display Light Time Switching	Yes	Yes
Occupancy Sensing		
Dimming	<ul style="list-style-type: none"> •00 - Lobby •00 - Lockers •00 - Workshop •00 - Bike Loan •00 - Café 	<ul style="list-style-type: none"> •00 - Lobby •00 - Lockers •00 - Workshop •00 - Bike Loan •00 - Café
Different Sensor in Back Half?	Yes	Yes

Lighting & Controls	Base	With PV
Dimming Time Switch?	Yes	Yes
Presence Detection	<ul style="list-style-type: none"> •00 - Lobby •00 - Lockers •00 - Workshop •00 - Bike Loan •00 - Cafe •00 - Acc Change/WC •00 - Acc WC 01 •00 - Acc WC 02 •00 - Change/WC 01 •00 - Change/WC 02 •00 - Change/WC 03 •00 - Staff/Storage 	<ul style="list-style-type: none"> •00 - Lobby •00 - Lockers •00 - Workshop •00 - Bike Loan •00 - Cafe •00 - Acc Change/WC •00 - Acc WC 01 •00 - Acc WC 02 •00 - Change/WC 01 •00 - Change/WC 02 •00 - Change/WC 03 •00 - Staff/Storage
Absence Detection	<ul style="list-style-type: none"> •00 - Storage 01 •00 - Storage 02 •00 - Storage 03 	<ul style="list-style-type: none"> •00 - Storage 01 •00 - Storage 02 •00 - Storage 03
Parasitic Power (W/m ²)	0.1	0.1
Occupancy Sensing Time Switch?	Yes	Yes

Renewable Energy Systems	Base	With PV
Photovoltaic Array	n/a	Yes
Area (m ²)	n/a	60 panels, 1.05x1.70m
Azimuth (°Clockwise from North)	n/a	180
Incline (° from horizontal)	n/a	15
PV module Nominal Efficiency	n/a	22.5
Conversion Efficiency	n/a	0.98
Temperature Coefficient Pmax (%/°C)	n/a	-0.26
NOCT Irradiance (W/m ²)	n/a	1000
NOCT Cell Temperature (°C)	n/a	42