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Member of the SNC-Lavalin Group

Summerland Street - Exeter

Sustainability and Energy Statement for Planning

McLaren (Exeter) Limited

08 September 2023

Notice

This document and its contents have been contributed to by Gleeds and Hulley & Kirkwood Consulting Engineers Ltd, and are intended solely as information for McLaren (Exeter) Limited and use in relation to the Sustainability and Energy Statement for Planning

Contents

Introduction

McLaren (Exeter) Limited are proposing to regenerate the site, which is currently under multiple occupancy, to provide residential development in the form of new Co-living accommodation in place of the industrial units that currently occupy the site.

The development will include Co-living studio apartments on the upper floors, external rooftop amenity space with communal uses on the ground floor and dispersed throughout the upper floors.

McLaren (Exeter) Limited is committed to providing sustainable and innovative solutions for the Exeter Co-Living Scheme, with sustainability driving the design.

1. Sustainability Statement

McLaren (Exeter) Limited is committed to providing sustainable and innovative solutions for the Exeter Co-Living Scheme. Throughout the design development of this project sustainability has been considered, and in line with BRE guidance methods for delivering this have been employed. With sustainability driving the design, the scheme will achieve BREEAM Excellent.

Gleeds, our appointed as BREEAM consultants, have set out a clear strategy for achieving BREEAM Excellent which we are implementing.

The BREEAM pre assessment, can be viewed at Appendix 1.

1.1 To embed sustainability into the full project lifecycle the design team have undertaken as follows:

Mat01 – Life Cycle Assessment

A workshop has been undertaken to review different design options; these were then analysed using OneClick LCA to determine the embodied carbon impact over numerous life cycle stages. The following design options were reviewed:

- Brick, render and metal cladding with RC frame and pile foundations
- Brick slips and render with RC frame
- Brick, render and metal cladding with steel frame
- Render with SFS frame
- RC concrete with pad foundations
- Asphalt
- Paving slab/blocks
- ASHP and electric panel heaters
- Gas fired boilers and wet panel radiators
- ASHP and underfloor heating to communal areas

Each option was reviewed in terms of the material types and quantities and the kgCO2 output provided.

Mat06 – Material Efficiency

<u>Architectural</u>

Stride Treglown (Architects) confirmed that the following strategies were being considered early as part of the material efficiency strategy:

- **External Walls** – The proposed design for planning includes external brick outer skin with metal stud inner skin which increased the opportunity for material with a higher recycled content, whilst also ensuring durability of the external walls to limit material degradation.

- **En-suite bathroom pods -** these would be prefabricated and brought to site, therefore waste during the installation stages would be mitigated.
- **Furniture -** would be of a standardised specification to ensure it is easily replaceable and low maintenance. The bedroom fit-out would include furniture manufactured off-site to reduce waste. It was noted that the design had not progressed to a point where specific products or materials would be specified, this will be captured at subsequent RIBA stages.
- **Removing redundant materials from the design/ Making use of recycled or reclaimed materials** – A RIBA 2 Life Cycle Assessment has been undertaken to review numerous superstructure design options to determine the impact (embodied carbon), within this assessment, review of external façade options is taking place to determine the impact of changes (e.g., brick or brick-slips/render).
- **Designing for deconstruction and material reuse –** Functional adaptation strategy study and ease of disassembly guide to be produced by Stride Treglown to reduce waste and cost associated with future refurbishment or fit-out works and likelihood of demolition. Increasing the lifetime value of materials and products and improving the ability to cost-effectively reuse and recycle materials.
- **Removing redundant materials from the design –** Designing for durability and resilience exercise to be undertaken by Stride Treglown to avoid unnecessary cost and material use resulting from the need to repair and replace materials and reduce the likelihood and impact of environmental degradation to exposed building elements.

It was confirmed that very early considerations had been given to the design and that these would start to take shape as the RIBA 3 design progresses.

Structural

- **Increasing the utilisation factor of structural members** – A&C confirmed that the column design and foundations have been designed to the appropriate SLS (serviceability limit state) and ULS (Ultimate Limit State) to avoid overspecification whilst still meeting the structural requirements for the design. The structural design has been produced to the limits within the code.
- **Designing to standard material dimensions to reduce cut-offs and waste on site** – This will be reviewed in more detail at RIBA 3, it may be challenging to align this with other standards/requirements for the design, but this has been noted as one to review at the next stage. One example of how this will be achieved is via optimising the floor to ceiling heights.
- **Remove redundant materials from the design** – The structure has been optimised with a reinforced concrete frame. This has been determined the most optimal solution. A Life Cycle Assessment of the alternative structural options for the design has been undertaken to understand the embodied carbon impact.
- **Using materials that can be recycled or reused at the end of their service life** – this has been considered in the structure and substructure, considerations will be made during the next phase also and this passed to the contractor at the appropriate stage.
- **Using prefabricated elements where appropriate to reduce material waste** – reinforcement comes to site pre-cut/bent (BAMTEC) to increase efficiency and reduce off-cuts etc. BAMTEC saves costs and resources by being a prefabricated solution for surface reinforcement. According to their website, it is possible to save 20-40% steel due to FEM software and static calculations. When compared to steel mesh, BAMTEC can save 10-20% material and as it can be rolled out this can reduce the need for overlapping saving material and time.
- **Consider using an 'exposed thermal mass' design strategy to reduce finishes** – A&C confirmed the selection of a concrete frame design option. This assists with the SBEM being considered an ‘exposed thermal mass’ design strategy.
- **Avoiding over-specification of predicted loads** – this has been considered above, but within the Employer’s Requirements the structure must be designed to the appropriate loads.
- **Optimising the foundation design for embodied environmental impact** – A life cycle assessment of the alternative superstructure and sub-structure has been undertaken to determine the most optimal design.

- **Providing material elements that reduce the need for replacement** – A life cycle costing exercise is to be undertaken once the RIBA 2 cost plan is available.

Building Services

Hulley & Kirkwood confirmed the following considerations had been included within the early design:

- **Providing material elements that reduce the need for replacement -** LED lighting incorporated throughout the building. All pumps are inverter driven reducing energy demand and wear and tear
- Primary plant all monitored by BMS to ramp up/down as required, thereby reducing unnecessary energy consumption and wear and tear
- **Using prefabricated elements where appropriate to reduce material** - Pipework sections to be measured up and prefabricated offsite to reduce waste.
- **Removing redundant materials from the design -** Use of thermal stores to manage peak demands, reducing the primary plant size. Ventilation plant selected with spare capacity to future-proof (in the event of change of use) and reduce the risk of premature wear. Controls to include spare capacity to future-proof.
- A life cycle assessment of three alternative services design options has been undertaken to determine the embodied carbon impact. Consideration of the operational energy has also been included with a passive design analysis and low zero carbon technology feasibility study undertaken to optimise the design.

Further measures will be discussed and identified as the design develops.

Wst05 – Adaptation to Climate Change

A climate change adaptation strategy appraisal has been produced using a systematic risk assessment to identify the impact of expected extreme weather conditions from climate change and the impact on the building over its predicted life cycle.

The assessment covered the installation of building services and renewable systems, as well as structural and fabric resilience aspects. Solutions and recommendations were included within the report for implementation within the design as follows:

- Completion of the Flood Risk Assessment (FRA) and Surface Water-run Off strategy detailing risk of flooding and the appropriate allowances for future climate change. While it is expected that the drainage engineer will provide a detailed and suitable strategy, it is advised that detailed consideration is given to the longevity of the drainage systems and their capacity to deal with future climate change. As this development is on existing previously developed land within the city centre it is not anticipated that a significant increase in surface water run-off would be provided as a result of the development, however, this is to be reviewed and advised by the drainage engineer and associated professionals.
- Undertake a thermal assessment of the building to identify if there is any risk of overheating under future climate scenarios (using the relevant future weather data files). Futureproof the building to ensure that changes can be made to avoid overheating in the future.
- External envelope and structure to be designed to withstand the effects of driving rain and increased wind velocity and any associated subsidence variance.
- Roof to be designed to withstand the effects of potential overwhelming and increased structural damage from expected extreme weather scenarios. Allow for access to the roof and façade for ease of general maintenance.
- Specification of development appropriate leak detection systems (both water and refrigerant)

To achieve BREEAM compliance with credit reference WST 05, the above recommendations would need to be considered and implemented during the design and build of this development.

Climate Change Resilience –Mitigation

The aim of Climate Change Resilience – Mitigation, is to demonstrate how the development will adapt to the changing climate with consideration given to mitigation to reduce the likelihood of worst-case emissions pathways being realised.

The following recommendations are being followed as they take account of climate change scenarios expected to impact the UK. Climate change may not necessarily have any immediate impact anticipated in regards to Summerland Street, Exeter. However, due to the nature of the climate change challenges these recommendations are strongly advised to allow for more substantial mitigation and adaption of future climate change events and to assist with related regional and national goals.

- Where specifying combustion systems, consider the emissions of the systems to be installed and select low NO_x plant to reduce the impact on local and wider air quality (it is understood this will be a fully electric site so this will be achieved by progressing with the existing development design).
- Undertake Life Cycle Assessment of the building design/materials to reduce the embodied carbon impact of the development.
- Ensure an appropriate metering strategy is in place (with BMS) to monitor energy consuming systems.
- Appoint a qualified ecologist to review and advise on any potential recommendations and enhancements to develop the biodiversity net gain of the site and improve ecological value/green space where possible.
- Undertake a passive design analysis and low zero carbon technology feasibility study to determine the most effective design measures to implement within the development. Identify opportunities to incorporate passive design prior to specification of LZC technologies, selecting only the technologies most appropriate for the site to reduce further the demand in line with the energy hierarchy.

These recommendations are being implemented within the project.

2. Energy Statement

Please see Appendix 2.

Appendix 1 - BREEAM pre assessment

gleeds

BREEAM New Construction 2018 Credit Tracker Report

Summerland St. Co-living Assessment

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Document Control

Project name	Summerland Street - Co-living Assessment
Client Name	Mclaren Property Limited
Date of Issue	03/04/2023
Reason for issue	Pre-assessment review
Project number	GASE0211
Version number	v3

Document author Catherine Heslop

Signature 

Reviewed by Joanne Murray

Signature 

Revision History

Issue	Date	Reason
v1	14/12/2022	Pre-assessment review
v2	06/01/2023	Update
v3	03/04/2023	Update

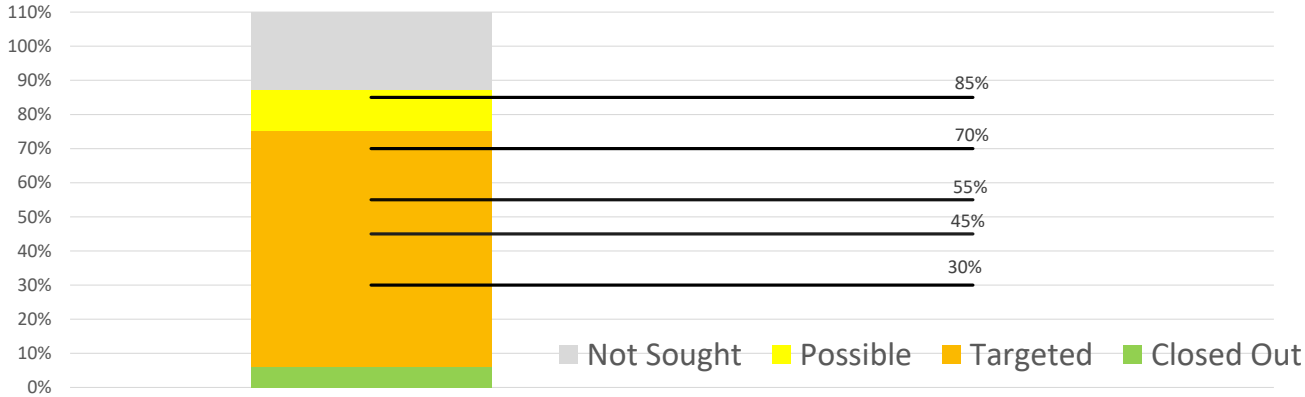
BREEAM Assessment Details

Project Address	Summerland Street
BREEAM manual	SD5078 - BREEAM New Construction v6.0
BREEAM Registration No	Not yet registered
Project Scope	Fully fitted
Building Type	Long term Stay
Sub Group	Residential College or School (Co-living)
GIFA (m2)	5360
NIA (m2)	4029
Detailed Planning Date	14th March 2022
RIBA 2 End	End of Feb 2022
RIBA 4 End	TBC
RIBA 5 Start	TBC
Are there external areas?	Yes
Commercial cold storage	No
Lifts/Escalators?	Yes
Unregulated Water demands?	TBC
Statutory demands on project?	No
Unregulated energy loads	Yes
Are there Labs? (% of GIFA)	No
Fume cupboards?	No
Additional notes	

BREEAM Assessor & Advisory Professional Notes	

BREEAM Scores

Performance Summary:	BREEAM Rating	% Score
Closed Out	Unclassified	6.19%
Targeted	Very Good	69.15%
Closed Out + Targeted + Possible	Outstanding	87.19%



Outstanding 85%
Excellent 70%
Very Good 55%
Good 45%
Pass 30%

Credit Summary:

				Closed Out	Targeted	Possible	Not Sought
Section	Total Credits	Weighting	Credit Value	% score	% score	% score	% score
Management	21	11.0	0.52	0.00%	11.00%	0.00%	0.00%
Health and Wellbeing	19	14.0	0.74	0.00%	7.37%	3.68%	2.95%
Energy	22	16.0	0.73	0.00%	8.73%	0.00%	7.27%
Transport	12	10.0	0.83	0.83%	4.17%	0.83%	4.17%
Water	9	7.0	0.78	0.00%	5.25%	0.00%	1.75%
Materials	14	15.0	1.07	5.36%	7.50%	1.07%	1.07%
Waste	10	6.0	0.60	0.00%	4.80%	0.60%	0.60%
Landuse and Ecology	13	13.0	1.00	0.00%	12.00%	1.00%	0.00%
Pollution	12	8.0	0.67	0.00%	5.33%	2.67%	0.00%
Innovation	10	10.0	1.00	0.00%	3.00%	2.00%	5.00%
Total	142	110		**6.19%**	**69.15%**	**12%**	**23%**

Management

Man 01	Criteria	Project Brief and Design	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Project delivery planning	**1**	Prior to completion of the Concept Design (RIBA Stage 2), the project delivery stakeholders meet to identify and define for each key phase of project delivery the 1.a Roles, 1.b Responsibilities & 1.c Contributions.	F&G/Project Team	**1**	**0.52**		**1**			
	2	During the stakeholders review the roles, responsibilities and contributions for each key phase of the project will need to be defined / reviewed.	F&G/Project Team							
	3	The project team demonstrates how the project delivery stakeholders' contributions and the consultation process outcomes have influenced the following, 3.a Initial Project Brief 3.b Project Execution Plan, 3.c Communication Strategy & 3.d Concept Design.	F&G/Project Team							
Credit 2 - Stakeholder consultation (interested parties)	**4**	Prior to completion of the Concept Design, the design team consult with all interested parties on matters that cover the minimum consultation content	F&G/MPL/DevComms	**1**	**0.52**		**1**			
	5	The project demonstrates how consultation has influenced the Initial Project Brief and Concept Design	F&G/MPL/DevComms							
	6	Consultation feedback has been provided (prior to the end of the Technical Design Stage, RIBA Stage 4)	F&G/MPL/DevComms							
Credit 3 - BREEAM AP (Concept Design)	**8**	**Prerequisite:** The project team, including the client, formally agree strategic performance targets early in the design process with the support of the BREEAM Advisory Professional (AP)	F&G/Gleeds	**1**	**0.52**		**1**			
	9	The BREEAM AP will need to be continually involved throughout the Concept design and continue to report and monitor progress.	F&G/Gleeds							
Credit 4 - BREEAM AP (Developed Design)	**10**	Man 01 Criteria 8 & 9 will need to be achieved.	F&G/Gleeds	**1**	**0.52**		**1**			
	11	The BREEAM AP will need to be continually involved throughout the Developed design and continue to report and monitor progress.	F&G/Gleeds							

Man 02	Criteria	Life Cycle Cost and Service Life Planning	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credits 1 and 2 - Elemental Life Cycle Costs (LCC)	**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	LCC Consultant	**2**	**1.05**		**2**			
	2	The elemental LCC plan: 2.a Provides an indication of future replacement costs over a period of analysis as required by the client (e.g. 20, 30, 50 or 60 years); 2.b Includes service life, maintenance and operation cost estimates.	LCC 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 and specification to minimise life cycle costs and maximise critical value.	LCC Consultant/Design Team							
Credit 3 - Component Level LCC Plan	**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.	LCC Consultant	**1**	**0.52**		**1**			
	5	Demonstrate, using appropriate examples provided by the design team, how the component level LCC options appraisal has been used to influence building and systems design and specification to minimise life cycle costs and maximise critical value.	LCC Consultant/Design Team							
Credit 4 - Cost Reporting	**6**	Report the capital cost for the building in pounds per square metre of gross internal floor area (£k/ m²)	MPL	**1**	**0.52**		**1**			

Man 03	Criteria	Responsible Construction Practices	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Prerequisite	1	Prerequisite: All timber and timber-based products used during the construction process of the project are 'legally harvested and traded timber'	Main Contractor							
Prerequisite	2	To award any of the available credits for this issue, any party who at any stage manages the construction site (e.g. the principal contractor, the demolition contractor) operates an Environmental Management System (EMS)								
Credit 1 - Environmental Management	3	All parties who at any stage manage the construction site (e.g. the principal contractor, demolition contractor) operate an EMS.		1	0.52		1			
	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.								
Credit 2 - BREEAM AP (Construction)	5	Prerequisite: The client and the contractor formally agree performance targets.		1	0.52		1			
	6	The BREEAM AP will need to be continually involved throughout the construction works and continue to report and monitor progress.								
Credits 3 and 4 - Responsible construction management	7	The principal contractor evaluates the risks (on site and off site), plans and implements actions to minimise the identified risks, covering the following, where appropriate: vehicle movement, pollution management, tidiness, health and wellbeing & security process, monitoring and report.		1	0.52		1			
	8	Achieve criterion 7		1	0.52		1			
	9	Achieve six additional items listed in the risk table								
Prerequisite	10	Prerequisite: Responsibility has been assigned to an individual (with appropriate authority and responsibility) for monitoring, recording and reporting energy use, water consumption and transport data resulting from on-site construction process (and off-site where possible)								
Credit 5 - Utility Consumption	11	Prerequisite - achieve criterion 10		1	0.52		1			
	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								
	14	Report the total carbon dioxide emissions (total $kgCO_2$/project value) from the construction process								
Credit 5 - Utility Consumption	15	Prerequisite - achieve criterion 10								
	16	Set targets for the potable **water consumption** (m^3) arising from the use of construction plant, equipment (mobile and fixed) and site accommodation.								
	17	Monitor and record data for the potable water consumption								
	18	Use the collated data to report the total net water consumption (m^3), i.e. consumption minus any recycled water use from the construction process via BREEAM Projects								
Credit 6 - Transport of Construction Materials and Waste	19	Prerequisite - achieve criterion 10		1	0.52		1			
	20	Set targets for transportation movements and impacts resulting from delivery of the majority of construction materials to site and construction waste from site.								
	21	Monitor and record data for the transportation movements								
	22	Using the collated data, report separately for materials and waste, the total transport-related carbon dioxide emissions ($kgCO_2$-eq), plus total distance travelled (km)								

Minimum Standard Check - Timber requirement must be met for ANY rating to be achieved
Minimum Standard Check - Credits 3 and 4: One for EXCELLENT, Two for OUTSTANDING

Man 04	Criteria	Commissioning and Handover	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Commissioning - testing schedule & responsibilities	**1**	Prepare a schedule of commissioning and testing. The schedule identifies and includes a suitable timescale for commissioning and re-commissioning of all complex and non-complex building services and control systems and for testing and inspecting building fabric.	H&K/Main Contractor	**1**	**0.52**		**1**			
	2	The schedule identifies the appropriate standards for all commissioning activities to be conducted, where applicable, in accordance with Current Building Regulations, BSRIA guidelines, CIBSE guidelines & Other appropriate standards	H&K/Main Contractor							
	3	Where a BMS is provided the applicable commissioning procedures are followed	H&K/Main Contractor							
	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.	H&K/Main Contractor							
	5	The principal contractor accounts for the commissioning and testing programme, responsibilities and criteria within their budget and the main programme of works.	Main Contractor							
Credit 2 - Commissioning - design and preparation	**6**	**Prerequisite** - achieve criterion 1-5	H&K/Main Contractor	**1**	**0.52**		**1**			
	7	During the design stage, the client or the principal contractor appoints an appropriate project team member not involved in the general installation works for the building services systems, with responsibility for detailed commissioning reviews. For buildings with complex building services and systems, this role needs to be carried out by a specialist commissioning manager	H&K/Main Contractor							
Credit 3 - Testing and Inspecting Building Fabric	**8**	**Prerequisite** - achieve criterion 1-5	Main Contractor	**1**	**0.52**		**1**			
	9	Building fabric integrity is assessed via a thermographic survey and air tightness testing and inspection								
	10	Any defects are rectified **PRIOR TO** building handover and close out.								
Credit 4 - Handover	**11**	Prior to handover, develop two building user guides for the following users: 11.a A non-technical user guide for distribution to the building occupiers. & 11.b A technical user guide for the premises facilities managers.	Main Contractor	**1**	**0.52**		**1**			
	12	Prepare two training schedules timed appropriately around handover and proposed occupation plans for the following users: 12.a A non-technical training schedule for the building occupiers. 12.b A technical training schedule for the premises facilities managers	Main Contractor							

Man 05	Criteria	Aftercare Support	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Aftercare support	**1**	Provide aftercare support to the building occupiers through having in place operational infrastructure and resources.	Main Contractor	**1**	**0.52**		**1**			
	2	Establish operational infrastructure and resources to coordinate the collection and monitoring of energy and water consumption data for a minimum of 12 months, once the building is substantially occupied.	Main Contractor/H&K							
Credit 2 - Commissioning - implementation	**3**	Complete commissioning and energy metering activities over a minimum 12-month period, once the building becomes substantially occupied.	Main Contractor/M&E/TBC	**1**	**0.52**		**1**			
Credit 3 - Post-occupancy evaluation (POE)	**4**	The client or building occupier commits to carry out a POE exercise one year after the building is substantially occupied.	Client	**1**	**0.52**		**1**			
	5	An independent party carries out the POE review i.e. a person or body not involved with the design of the project.	Client							
	6	The independent party provides a report with lessons learned to the client and building occupiers.	Client							
	7	The client or building occupier commits funds to pay for the POE in advance.	Client							

Minimum Standard Check - Credit 4 (Building User Guide) required for EXCELLENT and OUTSTANDING

TOTAL CREDITS	**21**		**0**	**21**	**0**	**0**
SCORE EQUIVALENT	**11.00**	**11.00**	**0.00**	**11.00**	**0.00**	**0.00**

Health and Wellbeing

Hea 01	Criteria	Visual Comfort	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Control of glare from sunlight	**1**	Identify areas at risk of glare using a glare control assessment. The glare control assessment also justifies any areas deemed not at risk of glare.	Stride treglown	**1**	**0.74**		**1**			
	2	A glare control strategy designs out potential glare in all relevant building areas where risk has been identified. This should be achieved through building form and layout or building design measures.								
	3	The glare control strategy does not increase energy consumption used for lighting. This is achieved by: 3.a Maximising daylight levels in all weather, cloudy or sunny AND 3.b Ensuring the use or location of shading does not conflict with the operation of lighting control systems.								
Credit 2 - Daylighting	**4**	**The criteria for this credit depend on the type of assessment - refer to the manual and incorporate as appropriate.** The applicable daylighting criteria have been met OR The applicable good practice average and minimum point daylight illuminance criteria have been met.	H&K	**2**	**1.47**				**2**	Unlikely to achieve these
Credit 3 - View Out	**5**	95% of the floor area in 95% of spaces for each relevant building area is within 8 m of an external wall. The external wall has a window or permanent opening that provides an adequate view out.	Stride treglown	**1**	**0.74**			**1**		This will largely be dependent on the distance from external boundary as well as the wall-window ratio
	6	The window or opening must be ≥ 20% of the surrounding wall area. Where the room depth is greater than 8 m, compliance is only possible where the percentage of window or opening is the same as, or greater than, the values in Table 1.0 of BS 8206: part 2	Stride treglown							
Credit 4 - Internal and external lighting levels, zoning and control	**8**	Internal lighting in all relevant areas of the building is designed to provide illuminance (lux) levels and colouring rendering index in accordance with the SLL Code for Lighting 2012 and any other relevant industry standards.	H&K	**1**	**0.74**		**1**			
	9	For areas where computer screens are regularly used, the lighting design complies with CIBSE Lighting Guide 7 sections 2.4, 2.13 to 2.15, 2.20, and 6.10 to 6.20.	H&K							
	10	All external lighting located within the construction zone is specified in accordance with BS 5489-1:2013 and BS EN 12464-2:2014	H&K							
	11	Where no external light fittings are specified, the criteria relating to external lighting do not apply and the credit can be awarded on the basis of compliance with criteria 8 – 9 above	H&K							
	12	Internal lighting is appropriately zoned to allow for occupant control **- Refer to the BREEAM Manual for guidance**	H&K							
	13	Areas used for teaching, seminar or lecture purposes have lighting controls provided in accordance with CIBSE Lighting Guide 5	H&K							

Hea 02	Criteria	Indoor Air Quality	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Prerequisite Indoor Air Quality Plan	**1**	**Prerequisite -** A site-specific indoor air quality plan has been produced to influence the Design and Specification. The plan will need to cover: contaminant sources, dilution and control, specialist areas, pre-occupancy flush out, third party testing & maintaining the air quality in-use.	H&K/Stride Treglown							
Credit 1 - Ventilation	**2**	The building has been designed to minimise the indoor concentration and recirculation of pollutants in the building via fresh air, adequate ventilation patACys, where present HVAC systems incorporate suitable filtration to minimise external air pollution, as defined in BS EN 13779:2007 Annex A3 & Areas of the building subject to large and unpredictable or variable occupancy patterns have carbon dioxide (CO_2) or air quality sensors specified. For naturally ventilated or mixed mode buildings, the design demonstrates that the ventilation strategy provides adequate cross flow of air to maintain the required thermal comfort conditions and ventilation rates in accordance with CIBSE AM10	H&K	**1**	**0.74**				**1**	
Credit 2 & 3 - Emissions from construction products	**3**	**One credit** Three out of five product types meet emission limits, testing requirements and any additional requirements listed in Table 5.11. **NOTE:** Where wood-based products are not one of three selected products all wood products used for internal fittings must be tested and classified as formaldehyde E1 class as a minimum	Stride treglown/Main Contractor	**2**	**1.47**			**1**	**1**	TBC
	4	**Two credits** All product types meet emission limits, testing requirements and any additional requirements listed in Table 5.11.	Stride treglown/Main Contractor							
Credit 4 - Air Quality Testing	**5**	The formaldehyde concentration in indoor air is measured post construction (but pre-occupancy) and does not exceed 100 µg/ m^3 averaged over 30 minutes (World Health Organization guidelines for indoor air quality: Selected pollutants, 2010	Main Contractor	**1**	**0.74**			**1**		TBC
	6	The formaldehyde sampling and analysis is performed in accordance with ISO 16000-2and ISO 16000-3								
	7	The total volatile organic compound (TVOC) concentration in indoor air is measured post construction (but pre-occupancy) and does not exceed 500 µg/ m^3over 8 hours.								
	8	The TVOC sampling and analysis is performed in accordance with ISO 16000-5 and ISO 16000-6 or ISO 16017-1								
	9	Where levels are found to exceed these limits, the project team confirms the measures that have, or will be, undertaken in accordance with the IAQ plan, to reduce the TVOC and formaldehyde levels to within the above limits.								
	10	The measured concentration levels of formaldehyde (µg/ m^3) and TVOC (µg/ m^3) are reported								

Hea 04	Criteria	Thermal Comfort	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Thermal Modelling	**1**	Thermal modelling has been carried out using software in accordance with CIBSE AM11 Building Energy and Performance Modelling.	H&K	**1**	**0.74**		**1**			
	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).	H&K							
	3	The modelling demonstrates that: 3.a **For air-conditioned buildings**, summer and winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design, Table 1.5; or other appropriate industry standard 3.b **For naturally ventilated buildings**: 3.b.i Winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design, Table 1.5. Or other appropriate industry standard 3.b.ii The building is designed to limit the risk of overheating, in accordance with the adaptive comfort methodology	H&K							
	4	For air-conditioned buildings, the PMV (predicted mean vote) and PPD (predicted percentage of dissatisfied) indices based on the above modelling are reported	H&K							
Credit 2 - Design for future thermal comfort	**5**	Achieve criterion 1-4	H&K	**1**	**0.74**			**1**		
	6	The thermal modelling demonstrates that the relevant requirements set out in criterion 3 above are achieved for a projected climate change environment	H&K							
	7	If the building cannot meet the above, it must be demonstrated that the building has been adapted (or will be adaptable in future) using passive design solutions in order to meet the above requirement	H&K							
	8	The PMV (predicted mean votes) and PPD (predicted percentage of dissatisfied) indices are reported (air conditioned buildings)	H&K							
Credit 3 - Thermal zoning and controls	**9**	Achieve criterion 1-4	H&K	**1**	**0.74**		**1**			
	10	The thermal modelling analysis has informed the temperature control strategy for the building and its users.	H&K							
	11	Strategy for heating/cooling addresses efficient zoning, occupant control provision, interaction between proposed system(s) and need for manual overrides	H&K							

Hea 05	Criteria	Acoustic Performance	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Up to 3 credits - Acoustic performance	**1**	**The criteria for this credit depend on the type of assessment - refer to the manual and incorporate as appropriate.** The building meets the appropriate acoustic performance standards and testing requirements for the following, 1.a Sound insulation, 1.b Indoor ambient noise level & 1.c Room acoustics.	Apex Acoustics	**4**	**2.95**		**3**	**1**		
	2	Or A suitably qualified acoustician (SQA) is appointed to define a bespoke set of performance requirements for all function areas in the building.	Apex Acoustics							

Hea 06	Criteria	Security	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Security	**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).	F&G/SQSS	**1**	**0.74**		**1**			Confirmation/design stage evidence to confirm the implementation of the measures at RIBA 3 - 4 needed
	2	The SQSS develops a set of security controls and recommendations for incorporation into the proposals. Those controls and recommendations shall directly relate to the threats and assets identified in the preceding SNA.	F&G/SQSS							
	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.	F&G/SQSS							

Hea 07	Criteria	Safe and Healthy Surroundings	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Safe access	**1**	Dedicated and safe cycle paths are provided from the site entrance to any cycle storage, and connect to offsite cycle paths where applicable.	Stride treglown/AC/MPL	**1**	**0.74**		**1**			May be awarded by default if no external areas
	2	Dedicated and safe footpaths are provided on and around the site providing suitable links	Stride treglown/AC/MPL							
	3	Pedestrian drop-off areas are designed off, or adjoining to, the access road and should provide direct access to other footpaths.	Stride treglown/AC/MPL							
	4	Delivery areas are not accessed through general parking areas and do not cross or share the following: 4.a pedestrian and cyclist paths 4.b outside amenity areas accessible to building users and general public.	Stride treglown/AC/MPL							
	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.	Stride treglown/AC/MPL							
	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.	Stride treglown/AC/MPL							
Credit 2 - Outside Space	**7**	There is an outside space providing building users with an external amenity area	Stride treglown	**1**	**0.74**		**1**			

TOTAL CREDITS	**19**		**0**	**10**	**5**	**4**
SCORE EQUIVALENT	**14.00**	**14.03**	**0.00**	**7.37**	**3.68**	**2.95**

Energy

Ene 01	Criteria	Reduction of Energy Use and Carbon Emissions	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credits 1 to 9 - Energy Performance	**1**	Confirm likely carbon reduction of the building above Building Regulation Part L requirements using the Energy Performance Ratio for New Construction	H&K	**9**	**6.55**		**4**		**5**	4 Credits minimum standard for Excellent.
Credits 10 to 13 - Energy modelling and reporting	**2**	**Prerequisite -** Prior to completion of the Concept Design, relevant members of the design team hold a preliminary design workshop focusing on operational energy performance.	H&K	**4**	**2.91**				**4**	
	3	Undertake additional energy modelling during the design and post-construction stage to generate predicted operational energy consumption figures								
	4	Report predicted energy consumption targets by end use, design assumptions and input data								
	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.								

Minimum Standard Check - Five credits required for EXCELLENT, Eight for OUTSTANDING

Ene 02	Criteria	Energy Monitoring	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Sub-metering of end-use categories	**1**	Energy consuming systems accounting for >90% of estimated annual energy consumption are metered (using energy management and monitoring system(s) or separate accessible energy sub meters with pulsed output)	H&K	**1**	**0.73**		**1**			
	2	Meter the energy consumption in buildings according to the total useful floor area: 2.a If the area is greater than 1,000 m^2, by end-use category with an appropriate energy monitoring and management system. 2.b If the area is less than 1,000 m^2, use either: 2.b.i an energy monitoring and management system or 2.b.ii separate accessible energy sub-meters with pulsed or other open protocol communication outputs, for future connection to an energy monitoring and management system	H&K							
	3	Building users can identify the energy consuming end uses, for example through labelling or data outputs.	H&K							

Minimum Standard Check - First credit required for VERY GOOD, EXCELLENT and OUTSTANDING

Ene 03	Criteria	External Lighting	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Energy Efficient Light Fittings	**1**	External light fittings are not required (inc. on the building, signs and on entrances) **OR**	H&K	**1**	**0.73**		**1**			
	2	External light fittings within the construction zone with: 2.a Average initial luminous efficacy of not less than 70 luminaire lumens per circuit Watt 2.b Automatic control to prevent operation during daylight hours 2.c Presence detection in areas of intermittent pedestrian traffic.	H&K							

Ene 04	Criteria	Low Carbon Design	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Passive Design Analysis	**1**	First credit under Hea 04 has been achieved	H&K/Stride Treglown	**1**	**0.73**		**1**			M&E aspect has been provided. Full report needed.
	2	A building analysis has been undertaken to identify opportunities for the implementation of passive design solutions (before the end of RIBA Stage 2)	H&K/Stride Treglown							
	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.	H&K/Stride Treglown							
	4	Quantify the reduced total energy demand and carbon dioxide (CO_2) emissions resulting from the passive design measures.	H&K/Stride Treglown							
Credit 2 - Free Cooling	**5**	Credit 1 is achieved for passive design	H&K	**1**	**0.73**				**1**	
	6	Include a free cooling analysis in the passive design analysis carried out under criterion 2.	H&K							
	7	Identify opportunities for the implementation of free cooling solutions.	H&K							
	8	The building is naturally ventilated or uses any combination of the free cooling strategies.	H&K							
Credit 3 - Low and Zero Carbon Technologies	**9**	An energy specialist completes a feasibility study (see Low and zero carbon feasibility study by the end of Concept Design. (by close of RIBA Stage 2)	H&K	**1**	**0.73**		**1**			A few minor comments needed to finalise the study. Also need RIBA 3 - 4 evidence at the appropriate time to confirm the specified technology.
	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.	H&K							
	11	Specify local LZC technologies for the building or development in line with the feasibility study recommendations.	H&K							
	12	Quantify the reduced regulated carbon dioxide (CO_2) emissions resulting from the feasibility study.	H&K							
Minimum Standard Check - Five credits required for EXCELLENT, Eight for OUTSTANDING										

Ene 06	Criteria	Energy Efficient Transportation Systems	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Energy consumption	**1a**	Analysis of the transportation demand and usage patterns for the building has been undertaken to determine the optimum number and size of lifts, escalators or moving walks	Design Team	**1**	**0.73**		**1**			
	1b	The energy consumption has been calculated in accordance with BS EN ISO 25745 Part 2 or Part 3 for one of the following: 1.b.i At least two types of system for each transportation type required OR 1.b.ii An arrangement of systems, for example for lift systems, hydraulic traction, machine room-less lift (MRL) OR 1.b.iii A system strategy that is 'fit for purposes'	Main Contractor/Lift Supplier							
	1c	The use of regenerative drives has been considered, where it produces an energy saving greater than the additional standby energy used to support the drives. Regenerative drives will typically be appropriate for lifts with high travel and high intensity use.	Main Contractor/Lift Supplier							
	1d	The transportation system with the lowest energy consumption has been specified	Main Contractor/Lift Supplier							
Credits 2 -3 - Energy efficient features	**2**	Achieve criterion 1	Main Contractor/Lift Supplier	**1**	**0.73**		**1**			
	3	**Credit 2 - Lifts** - The following three energy efficient features have been specified for each lift: 3.a. A standby condition for off-peak periods 3.b. The lift car lighting and display lighting provides an average luminous efficacy across all fittings in the car of >70 luminaire lumens per circuit Watt 3.c. Use of a drive controller capable of variable speed, variable-voltage, and variable-frequency (VVVF) control of the drive motor.								
	4	**Credit 2 - Lifts** - Specify regenerative drives where their use is demonstrated to save energy								
	5	**Credit 2 - Escalators or moving walks** - At least one of the following has been specified for each escalator or moving walk: 5.a. A load-sensing device that synchronises motor output to passenger demand through a variable speed drive OR 5.b. A passenger-sensing device for automated operation (auto walk), so the escalator operates in auto start mode when there is no passenger demand								
Minimum Standard Check - First credit required for VERY GOOD, EXCELLENT and OUTSTANDING										

Ene08	Criteria	Energy Efficient Equipment	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credits 1 - 2	**1**	Identify the building's unregulated energy consuming loads. Estimate their contribution to the total annual unregulated energy consumption of the building, assuming a typical or standard specification	H&K/Main Contractor	**2**	**1.45**		**2**			If laundry is greatest contributor this may be more challenging:
	2	Identify the systems or processes that use a significant proportion of the total annual unregulated energy consumption of the building								
	3	Demonstrate a meaningful reduction in the total unregulated energy consumption of the building. Table 6.5 lists examples of significant contributors to unregulated energy consumption, and the associated criteria. If additional significant contributors, not listed in the table, will be specified, the design team must justify how a meaningful reduction will be achieved for these contributors								
			TOTAL CREDITS	**22**		**0**	**12**	**0**	**10**	
			SCORE EQUIVALENT	**16.00**	**16.02**	**0.00**	**8.73**	**0.00**	**7.27**	

Transport

Tra 01	Criteria	Transport Assessment and Travel Plan	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credits 1 to 2 - Travel plan	**1**	During Concept Design, a transport assessment and draft travel plan have been developed based on a site-specific travel assessment or statement	Advanced Consulting							
	2	The site-specific travel assessment or statement covers as a minimum: 2.a: Existing travel patterns and opinions of existing building or site users towards cycling and walking, identifying constraints and opportunities, if relevant 2.b: Travel patterns and transport impact of future building users 2.c: Current local environment for walkers and cyclists (accounting for visitors who may be accompanied by young children) 2.d: Reporting of the number and type of existing accessible amenities, see Table 7.1, within 500m of the site 2.e: Disabled access (accounting for varying levels of disability and visual impairment) 2.f: Calculation of the existing public transport Accessibility Index (AI) 2.g: Current facilities for cyclists	Advanced Consulting	**2**	**1.67**		**2**			
	3	The travel plan includes proposals to increase or improve sustainable modes of transport and movement of people and goods during the building's operation and use	Advanced Consulting							
	4	If the occupier is know, they are involved in the development of the travel plan	Advanced Consulting							
	5	Demonstrate that the travel plan will be implemented post construction and be supported by the building's management in operation	Advanced Consulting							

Tra 02	Criteria	Sustainable Transport Measures	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credits 1 - 10 - Transport options implementation	**Prerequisite**	Prerequisite: Achieve criteria 3-5 in the Tra 01 Transport assessment and travel plan Issue	Transport Consultant / Project Team							
	2	Identify the sustainable transport measures, see **Table 7.4**	Transport Consultant / Project Team	**10**	**8.33**	**1**	**3**	**1**	**5**	1 credit - existing amenities 1 credit - AI of 8 - TBC
	3	Award credits according to the Accessibility Index (AI) of the project, and the total number of points achieved for the options implemented, **see Table 7.3**								
			TOTAL CREDITS	**12**		**1**	**5**	**1**	**5**	
			SCORE EQUIVALENT	**10.00**	**10.00**	**0.83**	**4.17**	**0.83**	**4.17**	

Water

Wat 01	Criteria	Water Consumption	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credits 1 to 5 - Water efficient sanitaryware	**1**	Using the BREEAM Wat01 calculator, assess the efficiency of the domestic water-consuming components	Stride treglown/Project Team	**5**	**3.89**		**3**		**2**	
	2	Use the standard Wat01 method to compare the water consumption (litres/person/day) for the assessed building against a baseline performance. Credits are awarded based on Table 8.1. Where it is not possible to use the standard method, complete the assessment using the alternative Wat01 method	Stride treglown/Project Team							
	3	If a greywater or rainwater system is specified, use its yield in L/person/day to offset potable water demand from components	Stride treglown/Project Team							
	4	If a greywater or rainwater system is specified and installed: 4.a: Greywater systems are in compliance with BS 8525-1:2010 Greywater systems - Part 1 Code of Practice 4.b: Rainwater systems in compliance with BS 8515:2009+A1:2013 Rainwater harvesting systems - Code of practice	Stride treglown/Project Team							

Minimum Standard Check - 1 Credit required for GOOD, VERY GOOD and EXCELLENT, 2 for OUTSTANDING

Wat 02	Criteria	Water Monitoring	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Potable water consumption monitoring	**1**	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	H&K	**1**	**0.78**		**1**			
	2	For water-consuming plant or building areas consuming 10% or more of the building's total water demand: 2.a: Fit easily accessible sub-meters OR 2.b: Install water monitoring equipment integral to the plant or area								
	3	For each meter (main and sub): 3.a: Install a pulsed or other open protocol communication output AND 3.b: Connect it to an appropriate utility monitoring and management system, e.g. a building management system (BMS), for the monitoring of water consumption. If there is no BMS system in operation at Post-Construction stage, award credits provided that the system used enables connection when the BMS becomes operational.								
	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 Wat01 (litres/person/day), if a post occupancy stage certification is sought.								

Minimum Standard Check - Water meter must be fitted to achieve a GOOD and ABOVE

Wat 03	Criteria	Water Leak Detection	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Leak detection system	**1**	Install a leak detection system capable of detecting a major water leak: 1.a: On the utilities water supply within the buildings, to detect any major leaks within the buildings AND 1.b: Between the buildings and the utilities water supply, to detect any major leaks between the utilities supply and the buildings under assessment	H&K	**1**	**0.78**		**1**			
	2	The leak detection system is: 2.a: A permanent automated water leak detection system that alerts the building occupants to the leak OR an inbuilt automated diagnostic procedure for detecting leaks 2.b: Activated when the flow of water passing through the water meter or data logger is at a 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 2.c: Able to identify different flow and therefore leakage rates, e.g. continuous, high or low level, over set time periods. Although high and low level leakage rates are not specified, the leak detection equipment installed must have the flexibility to distinguish between different flow rates to enable it to be programmed to suit								
Credit 2 - Flow control devices	**3**	Install flow control devices that regulate the water supply to each WC area or sanitary facility according to demand, in order to minimise undetected wastage and leaks from sanitary fittings and supply pipework	H&K	**1**	**0.78**		**1**			

	Credits	Value (%)	Awarded	Targeted	Possible	Withheld
TOTAL CREDITS	**8**		**0**	**6**	**0**	**2**
SCORE EQUIVALENT	**7.00**	**6.23**	**0.00**	**5.25**	**0.00**	**1.75**

Materials

Mat 01	Criteria	Environmental Impacts from Construction	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credits 1 - 6 - Superstructure	**1**	**Superstructure (offices, industrial and retail buildings - except for Simple Buildings and where Notes 1.1 and 1.2 apply)** 1. During the Concept Design, demonstrate the environmental performance of the building as follows: 1.a: Carry out a building LCA on the superstructure design using either the BREEAM Simplified Building LCA tool or an IMPACT Compliant LCA tool according to the methodology 1.b: Submit the Mat01/02 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)	Gleeds/Design Team	**6**	**6.43**	**4**	**2**			
	2	During Technical Design, demonstrate the environmental performance of the building as follows: 2.a: As criterion 1.a 2.b: Submit the Mat01/02 Results Submission Tool to BRE at the end of Technical Design								
	3	For offices, industrial and retail building types, achieve criterion 1 (except where Notes 1.0, 1.1 and 1.2 apply).								
	4	During Concept Design, identify opportunities for reducing environmental impacts as follows: 4.a: Carry out building LCA options appraisal of 2 to 4 significantly different superstructure design options., 4.b: Use a building LCA tool that is recognised by BREEAM, 4.c: For each design option, fulfil the same functional requirements specified by the client and all statutory requirements (to ensure functional equivalency), 4.d: Integrate the LCA options appraisal activity within the wider design decision-making process. Record this in an options appraisal summary document, 4.e: Record the following in the Mat01/02 Results Submission Tool: The difference 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 other design options. 4.f: Submit the Mat01/02 Results Submission Tool to BRE at the end of Concept Design, and before planning permission.								
	5	During Technical Design identify opportunities for reducing environmental impacts as follows: 5.a: Carry out building LCA options appraisal of 2 to 3 significantly different superstructure design options (based on the selected Concept Design option and as applicable to the Technical Design stage, see Methodology) 5.b: Use a building LCA tool that is recognised by BREEAM (as suitable for assessing superstructure during Technical Design) according to the methodology 5.c: As criteria 4.c to 4.e. Where an options appraisal summary document was produced during Concept Design, update it to include the Technical Design options. 5.d: Submit the Mat01/02 Results Submission Tool to BRE at the end of Technical Design								

Credit 7 - Substructure and hard landscaping options appraisal during Concept Design (all building types)	**6**	Criteria 3 and 4 are achieved								
	7	During Concept Design identify opportunities for reducing environmental impacts as follows: 7.a: Carry out building LCA options appraisal of a combined total of at least six significantly different substructure or hard landscaping design options (at least two shall be substructure and at least two shall be hard landscaping) 7.b: Using a building LCA tool that is recognised by BREEAM (as suitable for assessing substructure and hard landscaping during Concept Design) according to the methodology 7.c: As criteria 4.c to 4.f	Gleeds/Design Team	**1**	**1.07**	**1**				

Mat 02	**Criteria**	**Environmental Impacts from Construction**	**Responsibility**	**Credits**	**Value (%)**	**Awarded**	**Targeted**	**Possible**	**Withheld**	**Comments**
Credit 1 - Specification of products with a recognised environmental	**1**	Specify construction products with EPD that achieve a total EPD points score of at least 20, according to the Methodology below	Stride treglown	**1**	**1.07**			**1**		
	2	Enter the details of each EPD into the Mat01/02 Results Submission Tool, including the material category classification. The Mat01/02 Results Submission Tool will verify the EPD points score and credit award	Stride treglown							

Mat 03	**Criteria**	**Responsible Sourcing of Construction Products**	**Responsibility**	**Credits**	**Value (%)**	**Awarded**	**Targeted**	**Possible**	**Withheld**	**Comments**
MANDATORY	**1**	All timber and timber-based products used on the project are legally harvested and traded timber as per the UK Government's Timber Procurement Policy (TPP)	Main Contractor							
Credit 1 - Enabling sustainable procurement	**2**	A sustainable procurement plan is used by the design team to guide specification towards sustainable construction products. The plan must: 2.a: Be in place before Concept Design 2.b: Include sustainability aims, objectives and strategic targets for procurement activities. 2.c: Include a requirement for assessing the potential to procure construction products locally. There must be a policy to procure construction products locally where possible 2.d: Include details of procedures in place to check ad verify the effective implementation of the sustainable procurement plan In addition.	MPL/F&G	**1**	**1.07**		**1**			
Credits 2 to 4 - Measuring responsible sourcing	**3**	Use the Mat03 calculator tool and methodology to determine the number of credits achieved for the construction products specified or procured. Credits are awarded in proportion to the scope of the assessment and the number of points achieved, as set out in Table 9.10	Stride treglown/Main Contractor	**3**	**3.21**		**2**		**1**	
Minimum Standard Check - Timber requirement must be met for ANY rating to be achieved										

Mat 05	Criteria	Designing for Durability and Resilience	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Ensuring Material Longevity	**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 address 1.a: Negative impacts of high user numbers in relevant areas of the building (e.g. corridors, lifts, stairs, doors etc.) 1.b: Damage from any vehicle or trolley movements within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas 1.c: External building fabric damage by a vehicle. Protection where parking or manoeuvring areas are within 1 metre of the building facade and where delivery areas or routes are within 2 metres of the facade, i.e. specifying bollards or protection rails 1.d: Potential malicious damage to building materials and finishes, in public and common areas where appropriate.	Stride treglown	**1**	**1.07**		**1**			
	2	Key exposed building elements have been designed and specified to limit long and short term degradation due to environmental factors. This can be demonstrated through one of the following: 2.a: The element or product achieving an appropriate quality or durability standard or design guide, see Table 9.14. If none are available, use BS 7543:2015 as the default appropriate standard OR 2.b: A detailed assessment of the element's resilience when exposed to the applicable material degradation and environmental factors	Stride treglown							
	3	Include convenient access to the roof and façade for cost-effective cleaning, replacement and repair in the building's design	Stride treglown							
	4	Design the roof and façade to prevent water damage, ingress and detrimental ponding	Stride treglown							

Mat 06	Criteria	Material Efficiency	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Minimise Material Use and Waste	**1**	At the Preparation and Brief and Concept Design stages, set targets and report on opportunities and methods to optimise the use of materials. These must be done for each of the following stages (see Table 9.15): 1.a: Preparation and Brief 1.b: Concept Design 1.c: Developed Design 1.d: Technical Design 1.e: Construction	Project Team	**1**	**1.07**		**1**			
	2	Develop and record the implementation of material efficiency (see Table 9.15) during: 2.a: Developed Design 2.b: Technical Design 2.c: Construction	Project Team							
	3	Report the targets and actual material efficiencies achieved	Main Contractor							
			TOTAL CREDITS	**14**		**5**	**7**	**1**	**1**	
			SCORE EQUIVALENT	**15.00**	**15.00**	**5.36**	**7.50**	**1.07**	**1.07**	

Waste

Wst 01	Criteria	Construction Waste Management	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Pre-demolition audit	**1**	Complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition. This must be used to determine whether refurbishment or reuse is feasible, in the case of demolition, maximise the recovery of material for subsequent high grade or value applications. The audit must cover the content of pre-demolition scope and: 1.a: Be carried out at Concept Design stage (RIBA Stage 2) by a competent person prior to strip-out or demolition works, 1.b: Guide the design, consider materials for reuse and set targets for waste management 1.c: Engage all contractors in the process of maximising high grade reuse and recycling opportunities, 1.d: Compare actual waste arisings and waste management routes used with those forecast and investigate significant deviations from planned targets	F&G/AC/Stride treglown	**1**	**0.60**		**1**			
	2	Make reference to the audit in the resource management plan (RMP)	Main Contractor							
Credits 2 - 4 - Construction resource efficiency	**3**	Prepare a compliant Resource Management Plan (RMP) covering: 3.a: Non-hazardous waste materials (from on-site construction and dedicated off-site manufacture or fabrication, including demolition and excavation waste 3.b: Accurate data records on waste arisings and waste management routes	Main Contractor	**3**	**1.80**		**2**		**1**	
	4	Meet or improve upon the benchmarks in Table 10.1 for non-hazardous construction waste, excluding demolition and excavation waste	Main Contractor							
Credit 5 - Diversion of resources from landfill	**5**	Meet, where applicable, the diversion from landfill benchmarks in Table 10.2 for non-hazardous construction waste and demolition and excavation waste generated	Main Contractor	**1**	**0.60**		**1**			
	6	Sort waste materials into separate key waste groups as per Table 10.3, either on-site or through a licensed contractor for recovery	Main Contractor							

Minimum Standard Check - One credit for OUTSTANDING

Wst 02	Criteria	Use of recycled and sustainably sourced aggregates	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Project Sustainable Aggregate Points	**1**	**Prerequisite** **If demolition occurs on site, to encourage the reuse of site-won material on site, complete a pre-demolition audit of any existing buildings, structures or hard surfaces in accordance with Wst01 Construction waste management: Criterion 1 and Criterion 2**	Gleeds/AC	**1**	**0.60**			**1**		
	2	Identify all aggregate uses and types on the project Table 10.5 and Table 10.6	Main Contractor							
	3	Determine the quantity in tonnes for each identified use and aggregate type	Main Contractor							
	4	Identify the region in which the aggregate source is located	Main Contractor							
	5	Calculate the distance in kilometres travelled by all aggregates by transport type	Main Contractor							
	6	Enter the information into the BREEAM Wst 02 calculator to calculate the Project Sustainable Aggregate points. The corresponding number of BREEAM credits will be awarded as shown in Table 10.4	Main Contractor							

Wst 03	Criteria	Operational Waste	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Diversion of operational waste from landfill	**1**	Provide a dedicated space for the segregation and storage of operational recyclable waste generated. The space is: 1.a: Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams 1.b: Accessible to building occupants or facilities operators for the deposit of materials and collections by waste management contractors 1.c: Of a capacity appropriate to the building type, size, number of units (if relevant) and predicted volumes of waste that will arise from daily or weekly operational activities and occupancy rates	Stride treglown	**1**	**0.60**		**1**			Minimum Standard for Excellent
	2	For consistent and large amounts of operational waste generated, provide: 2.a: Static waste compactors or balers; situated in a service area or dedicated waste management space 2.b: Vessels for composting suitable organic waste OR adequate spaces for storing segregated food waste and compostable organic material for collection and delivery to an alternative composting facility 2.c: A water outlet provided adjacent to or within the facility for cleaning and hygiene purposes where organic waste is to be stored or composted on site.	Stride treglown							

Minimum Standard Check - One credit for EXCELLENT and ABOVE

Wst 05	Criteria	Adaptation to Climate Change	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Resilience of structure, fabric, building services and renewables installation	**1**	Conduct a climate change adaptation strategy appraisal using: 1.a: A systematic risk assessment to identify the place of expected extreme weather conditions arising from climate change on the building over its projected life cycle. The assessment covers the installation of building services and renewable systems, as well as structural and fabric resilience aspects and includes (see Methodology): 1.a.i Hazard identification 1.a.ii Hazard assessment 1.a.iii Risk estimation 1.a.iv Risk evaluation 1.a.v Risk management	Gleeds	**1**	**0.60**		**1**			
	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.	Gleeds							
	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	Project Team							

Wst 06	Criteria	Designing for disassembly and adaptability	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Design for disassembly and functional adaptability recommendations	**1**	Conduct a study to explore the ease of disassembly and the functional adaptation potential of different design scenarios (see Methodology) by the end of Concept Design	Stride Treglown	**1**	**0.60**		**1**			Final report needed
	2	Develop recommendations or solutions (see Methodology) based on the study (criterion 1), during or prior to Concept Design, that aim to enable and facilitate disassembly and functional adaptation								
Credit 2- Disassembly and functional adaptability - implementation	**3**	Achieve criteria 1 and 2	Stride Treglown	**1**	**0.60**		**1**			
	4	Provide an update, during Technical Design, on: 4.a: How the recommendations or solutions proposed by Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing to the assessor 4.b: Changes to the recommendations and solutions during the development of the Technical Design								
	5	Produce a building adaptability and disassembly guide to communicate the characteristics allowing functional adaptability and disassembly to prospective tenants								
			TOTAL CREDITS	**10**		**0**	**8**	**1**	**1**	
			SCORE EQUIVALENT	**6.00**	**6.00**	**0.00**	**4.80**	**0.60**	**0.60**	

Land use and Ecology

LE 01	Criteria	Site Selection	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Previously occupied land	**1**	At least 75% of proposed development's footprint is on an area of land which has previously been occupied	Stride Treglown	**1**	**1.00**		**1**			
Credit 2 - Contaminated land	**2**	A contaminated land professional's site investigation, risk assessment and appraisal has deemed land within the site to be affected by contamination. The site investigation, risk assessment and appraisal have identified: 2.a: The degree of contamination 2.b: The contaminant sources or types 2.c: The options for remediating sources of contamination which present an unacceptable risk	F&G/MPL	**1**	**1.00**			**1**		
	3	The client or principal contractor confirms that remediation of the site will be carried out in accordance with the remediation strategy and its implementation plan as recommended by the contaminated land professional	Main Contractor							

LE 02	Criteria	Identifying and Understanding the Risks and Opportunities for the Project	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Prerequisite - Assessment route selection	1	An assessment route for the project has been determined using BREEAM Guidance Note GN34 BREEAM Ecological Risk Evaluation Checklist								Ecologist to produce BREEAM specific review.
	2	The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site								Ecologist to produce BREEAM specific review.
Survey and evaluation	Route 1 - Project team member route (1 credit available)									
	3	Route 1 Completion of the BREEAM Ecological Risk Evaluation Checklist indicates Assessment route 1 can be used as the assessment (see Methodology)	Ecologist							
	Route 2 - Ecologist route (2 credits available)		Ecologist							
	4	An appropriate individual is appointed at a project stage that ensures early involvement in site configuration and, where necessary, can influence strategic planning decisions	Ecologist							
	5	Prior to the completion of the preparation and brief, an appropriate level of survey and evaluation (see Assessment route 2: For sites where complex ecological systems are likely to be present) has been carried out to determine the ecological baseline of the site, taking account of the zone of influence to establish: 5.a: Current and potential ecological value and condition of the site, and related areas within the zone of influence 5.b: Direct and indirect risks to current ecological value 5.c: Capacity and feasibility for enhancement of the ecological value of the site and, where relevant, areas within the zone of influence	Ecologist							
	6	Data are collated and shared with project team to inform the site preparation, design or construction works	Ecologist	2	2.00		2			Ecologist to produce BREEAM specific review.
Determining the ecological outcomes for the site (Routes 1 and 2)	7	Survey and evaluation criteria (criteria 3-6) relevant to the chosen route have been achieved	Ecologist							
	8	During Concept Design, the project team liaise and collaborate with representative stakeholders to identify and consider ecological outcome for the sites (appropriate to the scale and type of development) for the project	Ecologist							
	9	When determining the ecological outcome for the site, this must involve the identification, appraisal and selection of specific solutions and measures sufficiently early to influence key project planning decisions. This must be done in accordance with the following hierarchy of action: 9.a: avoidance 9.b: protection 9.c: reduction or limitation of negative impacts 9.d: on site compensation and, 9.e: enhancement, considering the capacity and feasibility within the site, or where viable, off-site	Ecologist							
	10	Following this the optimal ecological outcome for the site is selected after liaising with representative stakeholders and the project team	Ecologist							

LE 03	Criteria	Managing Negative Impacts on Ecology	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Prerequisite - Identification and understanding the risks and	1	**LE02 has been achieved**								Ecologist to produce BREEAM specific review.
	2	**The client or contractor has confirmed that compliance is monitored against all relevant UK, and EU or International legislation relating to the ecology of the site**								Ecologist to produce BREEAM specific review.
Credit 1 - Planning, liaison, implementation and data	3	Roles and responsibilities have been clearly defined, allocated and implemented to support successful delivery of project outcomes at an early enough stage to influence the concept design or design brief	Ecologist	1	1.00		1			Ecologist to produce BREEAM specific review.
	4	Site preparation and construction works have been planned for and are implemented at an early project stage to optimise benefits and outputs	Ecologist							
	5	The project team liaising and collaborating with representative stakeholders, taking into consideration data collated and shared, have implemented solutions, and measures have been selected (see LE 02 Identifying and understanding the risks and opportunities for the project), during site preparation and construction works	Ecologist							
Credits 3 - 4 - Managing negative impacts of the project	**Route 1 (1 credit)**		Ecologist	2	2.00		2			Ecologist to produce BREEAM specific review.
	6	Negative impacts from site preparation and construction works have been managed according to the hierarchy (see Methodology) and no net impact has resulted	Ecologist							
	Route 2 (up to two credits)		Ecologist							
	7	Negative impacts from site preparation and construction works have been managed according to the hierarchy (see Assessment route 2: For sites where complex ecological systems are likely to be present) and either: 7.a: No overall loss of ecological value has occurred (2 credits) OR 7.b: The loss of ecological value has been limited as far as possible (1 credit)	Ecologist							
Minimum Standard Check - One credit for VERY GOOD, EXCELLENT and OUTSTANDING										

LE 04	Criteria	Change and enhancement of ecological value	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Prerequisite - Identifying and understanding the risks and opportunities for the project	1	LE 03 has been achieved. Including the following, specific to the aims of this issue: 1.a: Roles and responsibilities have been clearly defined, allocated and implemented to support successful delivery of project outcomes 1.b: Site preparation and construction works have been planned for and implemented at a stage that is sufficiently early in the project to optimise benefits and outputs								Ecologist to produce BREEAM specific review.
	2	The client or contractor confirms compliance is monitored against all relevant UK, EU or international legislation relating to the ecology of the site								
One credit - Enhancement of ecology		**Route 1 only**		1	1.00		1			Ecologist to produce BREEAM specific review.
	3	The project team liaising and collaborating with representative stakeholders, taking into consideration data collated and shared, have implemented solutions and measures based on recommendations from recognised 'local' ecological expertise, specialist input and guidance to inform the adoption of locally relevant ecological solutions and measures which enhance the site								
	4	Data collated is provided to the local environmental records centres nearest to, or relevant for, the site								
One credit - Liaison, implementation and data collation		**Route 2 only**	Ecologist							
	5	The project team liaising and collaborating with representative stakeholders, taking into consideration data collated and shared, have implemented solutions and measures selected in a way that enhances ecological value in the following order: 5.a: On site, and where this is not feasible 5.b: Off site within the zone of influence	Ecologist							
Up to 3 credits - Enhancement of ecology		**Route 2 only**	Ecologist	3	3.00		3			Ecologist to produce BREEAM specific review.
	6	Credits are awarded on a scale of 1 to 3, based on the calculation of the change in ecological value occurring as a result of the project. This must be calculated in accordance with the process set out in either GN 35 - BREEAM, CEEQUAL, HQM Ecology Assessment Issues - Route 1 or GN 36 - BREEAM, CEEQUAL, HQM Ecology Assessment Issues -Route 2 (whichever is applicable to the project)	Ecologist							

LE 05	Criteria	Long term ecology management and maintenance	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Prerequisite - Roles and responsibilities, implementation, statutory obligations	1	**The client or contractor has confirmed that compliance is being monitored against all relevant UK, EU and international standards relating to the ecology of the site**								
	2	**Where pursued, LE 04 has been achieved, including the following specific aims of this issue:** **2.a: Roles and responsibilities have been clearly defined, allocated and implemented to support successful delivery of project outcomes** **2.b: Site preparation and construction works have been planned for and implemented at a stage that is sufficiently early in the project to optimise benefits and outputs**								Ecologist to produce BREEAM specific review.
Route 1 - 1 credit available (criterion 1-6 met), Route 2 - 2 credits available			Ecologist							Ecologist to produce BREEAM specific review.
Credit 1 - Planning, liaison, data, monitoring and review management and maintenance	3	The project team liaise and collaborate with representative stakeholders, taking into consideration data collated and shared, on solutions and measures implemented to: 3.a: monitor and review implementation and the effectiveness 3.b: develop and review management and maintenance solutions, actions or measures	Ecologist	**1**	**1.00**		**1**			Ecologist to produce BREEAM specific review.
	4	In support of the above and to help ensure their continued relevance over the period of the project the following should be considered: 4.a: Monitoring and reporting on the ecological outcomes for site implemented at the design and construction stage 4.b: Monitoring and reporting of outcomes and successes from the project 4.c: Arrangements for the ongoing management of landscape and habitat connected to the project (on and, where relevant, off site) 4.d: Maintaining the ecological value of the site and its relationship or connection to its zone of influence 4.e: Maintaining the site in line with any substantially linked activities, e.g. ecosystems benefits (LE 02) 4.f: Remedial or other management actions are carried out which relate to those identified in LE 02, LE 03 and LE 04	Ecologist							
	5	As part of the tenant or building owner information supplied, include a section on Ecology and Biodiversity to inform the owner or occupant of local ecological features, value and biodiversity on or near the site	Ecologist							
Credit 2 - Landscape and ecology management plan (or similar) development	6	Landscape and ecology management plan, or similar, is developed in accordance with BS 42020:2013 covering as a minimum the first five years after project completion and includes: 6.a: Actions and responsibilities, prior to handover, to give to relevant individuals 6.b: The ecological value and condition of the site over the development life 6.c: Identification of opportunities for ongoing alignment with activities external to the development project and which supports the aims of BREEAM's Strategic Ecology Framework 6.d: Identification and guidance to trigger appropriate remedial actions to address previously unforeseen impacts 6.e: Clearly defined and allocated roles and responsibilities	Ecologist	**1**	**1.00**		**1**			Ecologist to produce BREEAM specific review.
	7	The landscape and management plan or similar is updated as appropriate to support maintenance of the ecological value of the site	Ecologist							
			TOTAL CREDITS	**13**		**0**	**12**	**1**	**0**	
			SCORE EQUIVALENT	**13.00**	**13.00**	**0.00**	**12.00**	**1.00**	**0.00**	

Pollution

Pol 01	Criteria	Impact of Refrigerants	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
	1	**Three credits** - No refrigerant use within the installed plant or systems OR		2	1.33			2		
Prerequisite	2	**All systems with electric compressors comply with the requirements of BS EN 378:2016 (parts 2 and 3). Refrigeration system containing ammonia comply with the Institute of Refrigeration Ammonia Refrigeration Systems code of practice**	H&K							
Credits 1 to 3 - Reduction of Greenhouse Gas Emissions	3	**Two credits**: The direct effect life cycle CO_2 equivalent emissions (DELC) of ≤100 CO_2 -eq/kW. For systems which provide cooling and heating, the worst performing output based on the lower of kW cooling output and kW heating output is used to complete the calculation OR	H&K							
	4	All refrigerants used have a global warming potential (GWP) ≤10								
	5	**One credit:** Systems using refrigerants have a DELC of ≤1000kgCO_2 -eq/kW cooling and heating capacity								
Credit 4 - Leak detection	6	All systems are hermetically sealed or only use environmentally benign refrigerants OR	H&K	1	0.67			1		
	7	Where the systems are not hermetically sealed: 7.a: Systems have: 7.a.i A permanent automated refrigerant leak detection system, that is robust and tested, and capable of continuously monitoring for leaks OR 7.a.ii An inbuilt automated diagnostic procedure for detecting leakage is enabled 7.b: In the event of a leak, the system must be capable of automatically responding and managing the remaining refrigerant charge to limit loss of refrigerant								

Pol 02	Criteria	Local Air Quality	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credits 1 to 2 - Improvement of Air Quality	1	All heating and hot water is supplied by non-combustion systems. For example, only powered by electricity OR alternatively;	H&K	2	1.33		2			
	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. The measurements must be provided by manufacturers, following the labelling requirements of the European directive 2009/125/EC. No credits can be awarded for Pol 02 if any of the combustion appliances are not covered in Table 12.4 and Table 12.5	H&K							
	3	Emissions from all installed combustion plant that provide space heating and domestic hot water do not exceed the levels set in Table 1.21 and Table 1.22	H&K							

Pol 03	Criteria	Flood and Surface Water Management	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Prerequisite	1	**An appropriate consultant is appointed to carry out and demonstrate the development's compliance with all criteria**								
Credit 1 and 2 - Flood resilience	2	**Two credits: Low flood risk** A site-specific flood risk assessment (FRA) confirms the development is in a flood zone that is defined as having a low annual probability of flooding. The FRA takes all current and future sources of flooding into consideration	Airey & Coles	**2**	**1.33**		**2**			
	3	**One credit: Medium or high flood risk** 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								
	4	To increase the resilience and resistance of the development to flooding, one of the following must be achieved: 4.a: The ground level of the building and access to both the building and the site, are designed (or zoned) so they are at least 600mm above the design flood level of the site's flood zone 4.b: The final design of the building and the wider site reflects the recommendations made by an appropriate consultant in accordance with the hierarchy approach outlined in section 5 of BS 8533:2017								
Prerequisite - Surface water run-off	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	Airey & Coles							
Credit 3 - SW Runoff (Rate)	6	Drainage measures are specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) shows a 30% improvement for the developed site compared with the pre-developed site. This should comply at the 1-year and 100-year return period events.	Airey & Coles	**1**	**0.67**		**1**			
	7	Relevant maintenance agreements for the ownership, long term operation and maintenance of all SuDS in place								
	8	Calculations include an allowance for climate change. This should be made in accordance with current best practice planning guidance								

Credit 4 - SW Runoff (Volume)	**9**	Flooding of property will not occur in the event of local drainage system failure (caused either by extreme rainfall or a lack of maintenance); AND	Airey & Coles	**1**	**0.67**		**1**			
		EITHER								
	10	Drainage design measures are specified so that the post-development run-off volume, over the development lifetime, is no greater than it would have been prior to the assessed site's development. This must be for the 100-year 6-hour event, including an allowance for climate change								
	11	Any additional predicted volume of run-off for this event is prevented from leaving the site by using infiltration or other SuDs techniques								
		OR (only where criteria 10 and 11 cannot be achieved)								
	12	Justification from the appropriate consultant indicating why the above criteria cannot be achieved, i.e. where infiltration or other SuDs techniques are not technically viable options								
	13	Drainage design measures are specified so that the post-development peak rate of run-off is reduced to the limiting discharge. The limiting discharge is defined as the highest flow rate from the following options: 13.a: The pre-development one-year peak flow rate 13.b: The mean annual flow rate (Qbar) 13.c: 2L/s/ha For the one-year peak flow rate, the one-year return period event criterion applies								
	14	Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDs are in place								
	15	For either option, above calculations must include an allowance for climate change; this should be made in accordance with current best practice planning guidance								
Credit 5 Minimising watercourse pollution	**16**	There is no discharge from the developed site for rainfall up to 5mm (confirmed by the appropriate consultant)	Airey & Coles	**1**	**0.67**			**1**		
	17	Areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate SuDS techniques								
	18	Areas with a high risk of contamination or spillage of substances, such as petrol and oil, have separators (or an equivalent system) are installed in surface water drainage systems								
	19	Chemical or liquid gas storage areas have a means of containment fitted to the site drainage system (i.e. shut-off valves). This is to prevent the escape of chemicals to natural watercourses in the event of a spillage or bunding failure								
	20	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								
	21	A comprehensive and up to date drainage plan of the site will be made available for the building or site occupiers								
	22	Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place								
	23	All external storage and delivery areas are designed and detailed in accordance with the current best practice planning guidance								

Pol 04	Criteria	Reduction of Night Time Light Pollution	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Reducing light pollution, energy consumption and nuisance	**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	H&K	**1**	**0.67**		**1**			
	2	The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the Institution of Lighting Professionals (ILP) Guidance notes for the reduction of obtrusive light, 2011	H&K							
	3	All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00	H&K							
	4	If safety and 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	H&K							
	5	Illuminated advertisements are designed in compliance with ILP PLG05 The Brightness of Illuminated Advertisements	H&K							

Pol 05	Criteria	Reduction of Noise Pollution	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 1 - Reducing Noise pollution	**1**	There are no noise-sensitive areas within the assessed building or within 800 m radius of the assessed site OR		**1**	**0.67**		**1**			
	2	Where there are noise-sensitive areas within the assessed building or noise-sensitive areas within 800 m radius of the assessed site, a noise impact assessment compliant with BS 4142:2014 is commissioned. Noise levels must be measures or determined for: 2.a: Existing background noise levels: 2.a.i at the nearest of most exposed noise-sensitive development to the proposed assessed site 2.a.ii including existing plant on a building, where the assessed development is an extension to the building 2.b: Noise rating level from the assessed building	Apex Acoustics							
	3	The noise impact assessment must be carried out by a suitably qualified acoustic consultant	Apex Acoustics							
	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	Apex Acoustics							
	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 this criterion	AA/Contractor/H&K							
			TOTAL CREDITS	**12**		**0**	**8**	**4**	**0**	
			SCORE EQUIVALENT	**8.00**	**8.00**	**0.00**	**5.33**	**2.67**	**0.00**	

Innovation

Man 01	Criteria	Project Brief and Design (Simple buildings only)	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
EXEMPLARY	Credit 1	Criterion 8-9 have been achieved		1	1				1	
	Credit 2	Criterion 10-11 have been achieved		1	1				1	

Man 03	Criteria	Responsible Construction Practices	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
EXEMPLARY	23	Achieve all items in Table 4.1	Main Contractor	1	1		1			
EXEMPLARY (Simple Buildings		Criterion 19-22 have been achieved Criterion 23 has been achieved		2	1				2	

Hea 01	Criteria	Visual Comfort	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
EXEMPLARY	15	Daylighting criteria have been met using either of the following options: 15.a: Relevant building areas meet exemplary daylight factors and the relevant criteria in Table 5.8 15.b: Relevant building areas meet exemplary average and minimum point daylight	Withheld	1	1				1	
	16	Lighting in each zone can be manually dimmed by occupants down to 20% of the maximum light output using dimmer switches positioned in accessible locations. Dimming and control gear should avoid flicker and noise	TBC	1	1			1		TBC

Hea 02	Criteria	Indoor Air Quality	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
EXEMPLARY	11	Three of the product types listed meet the emission limits, testing requirements and any additional requirements listed in Table 5.12. Where wood-based products are not one of the three selected product types, all wood-based products used for internal fixtures and fittings must be testing and classified as formaldehyde E1 class as a minimum	Withheld	1	1				1	

Hea 06	Criteria	Security	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
EXEMPLARY	4	A compliant risk based security rating scheme has been used - SABRE. The performance against the scheme has been confirmed by independent assessment and verification.	Withheld	1	1				1	

Ene 01	Criteria	Reduction of Energy Use and Carbon Emissions	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
EXEMPLARY	Up to two credits - Beyond zero net regulated carbon		Withheld							
	6	The building achieves an EPRnc ≥0.9 and zero net regulated CO_2 emissions	Withheld	5	5				5	
	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								
	Three credits - Carbon negative									
	9	The building is deemed carbon negative where >100% of carbon emissions from unregulated (and regulated) energy use are offset by energy generated from on-site and near-site LZC sources								

Wat 01	Criteria	Water Consumption	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
EXEMPLARY	7	Achieve criteria 1 to 4 (and if applicable 5 or 6)	Withheld							
	8	The water consumption (litres/person/day) for the assessed building achieves the 65% improvement described as exemplary performance in Table 8.1	Withheld	1	1				1	

Mat 01	Criteria	Environmental Impacts from Construction Products - Building Life Cycle Assessment (LCA)	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Credit 8 - Core building services options appraisal during Concept Design (all building types)	8	Criteria 3 and 4 are achieved	LCA Consultant/Project Team	1			1			
	9	During Concept Design identify opportunities for reducing environmental impacts as follows: 9.a: Carry out building LCA options appraisal of at least 3 significantly different core building services design options 9.b: Use a building LCA tool that is recognised by BREEAM (as suitable for assessing core building services during Concept Design) according to the methodology 9.c: As criteria 4.c to 4.f								
Credit 9 - LCA and LCC alignment (all building types)	10	Achieve criteria 3 to 5	LCA Consultant/Project Team	1				1		
	11	Achieve Elemental LCC plan and Component Level LCC options appraisal credits (Man02 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 Man02 Life cycle cost and service life planning: 2 The Elemental LCC plan								
	13	Include the design options appraised for criterion 5 during Concept Design in the 'Component level LCC option appraisal' (in Man02 Life cycle cost and service life planning).								
	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'								
Credit 10 - Third party verification (all building types)	15	Criteria 1 to 7 (as applicable to the building type) are achieved	LCA Consultant/Project Team	1	1		1			
	16	A suitably qualified third party carries out the building LCAs or produces a report verifying the building LCAs 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 the findings of the verification checks made by the suitably qualified third party in the report including, as a minimum, the quality requirements shown in Table 9.4								
	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								

Mat 03	Criteria	Responsible Sourcing of Construction Products	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
EXEMPLARY		≥50% of available points achieved including all of the following: Superstructure Internal finishes Substructure and hard landscaping Core building services	Withheld	1	1				1	

Wst 01	Criteria	Construction Waste Management	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
Exemplary	7	Non-hazardous construction waste generated, excluding demolition and excavation waste, is less than or equal to the exemplary level resource efficiency benchmarks (see Table 10.1)	Withheld	1	1				1	
	8	The percentage of non-hazardous construction, demolition and excavation waste (if relevant) diverted from landfill meets or exceeds the exemplary level percentage benchmarks in Table 10.2	Withheld							
	9	All key waste groups in Table 10.3 for division from landfill are covered in the RMP	Withheld							
	10	Waste data obtained from licensed external waste contractors is reliable and verifiable, by using data from EA/SEPA,EA Wales/NIEA Waste Return Forms or from a PAS 402:2013 compliant company	Withheld							

Wst 02	Criteria	Use of Recycled and Sustainably Sourced Aggregates	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
EXEMPLARY	7	The Project Sustainable Aggregate Points score meets or exceeds the exemplary level performance benchmark in Table 10.4	Withheld	1	1				1	

Wst 05	Criteria	Responding to climate change	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
EXEMPLARY		Meet criteria 1 to 3	Withheld	1	1				1	
		Meet criteria or achieve credits of the assessment issues given in Table 10.11	Withheld							

LE 02	Criteria	Identifying and Understanding the Risks and Opportunities for the Project	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
EXEMPLARY	11	Achieve criteria 8 to 10	Ecologist	1	1			1		Would need to review external areas
	12	When determining the optimal ecological outcome for the site consider, in addition to those outlined in criteria 8 to 10, the wider site sustainability-related activities and the potential for ecosystem service related benefits	Ecologist							
	13	Achieve the credits of the assessment issues outlined below: 13.a: Hea 07 Safe and healthy surroundings - Both credits 13.b: Pol 03 Flood and surface water management - Achieve credits for 'Surface water run-off' and 'Minimising watercourse pollution' 13.c: Pol 05 Reduction of noise pollution	Project team							

LE 04	Criteria	Identifying and Understanding the Risks and Opportunities for the Project	Responsibility	Credits	Value (%)	Awarded	Targeted	Possible	Withheld	Comments
EXEMPLARY	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.	Ecologist	1	1			1		

TOTAL CREDITS	10		0	3	2	5
SCORE EQUIVALENT	10	10	0	3	2	5

OVERALL SCORE			6.19	69.15	11.86	22.81

PREDICTED RATING	75.34
PREDICTED + POSSIBLE	87.19

Appendix 2 - Energy Statement

hulley & kirkwood
consulting engineers




Summerland Street

Exeter

Energy Statement

Planning Issue

September 2023

Hulley & Kirkwood Consulting Engineers Ltd

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Prepared By: EK

Authorised By: SH

Revision: B

Project No: P0573

Date: September 2023

Summerland Street

Exeter

Energy Statement

Planning Issue

September 2023

REV	DESCRIPTION	PREPARED BY	DATE
A	Initial Issue	EK	March 2023
B	Planning Resubmission	EK	September 2023

CONTENTS

Executive Summary

This Energy Statement has been submitted to demonstrate compliance with the following energy and carbon project specific related drivers for the proposed Summerland Street development.

The energy and carbon project specific related drivers are:

- Building Regulations: Conservation of fuel and power - Approved Document Part L 2021, Volume 2: New buildings other than dwellings

- Exeter City Council (ECC) Core Strategy (adopted February 2012) and policies CP13, CP14 and CP15

- BREEAM UK New Construction (NC) Version 6.0, Ene 01 (Reduction of Energy Use and Carbon Emissions) "Excellent" Rating Performance

The above requirements are demonstrated in this statement by assessing the most appropriate options within three principal categories:

- Passive Options (to *maximise the energy efficiency of fabric)*
- Good Practice Energy Saving Technology Options (*to reduce the energy load of the development)*
- Low Zero Carbon/ Renewable Energy Technology Options *(to deliver on-site low carbon and/ or renewable energy systems)*

Section 3.0 outlines these options, highlighting that in addition to the passive measures and energy saving technologies proposed to be incorporated, the inclusion of air source heat pump(s) for providing heating and domestic hot water coupled with photovoltaic panels (including for future provision for district heating connection) will comply with the Building Regulations Part L 2021, relevant ECC policies' and BREEAM UK NC Version 6.0 Ene 01 Excellent requirements.

1.0 Introduction

Hulley and Kirkwood Consulting Engineers have been appointed to provide a statement for the proposed Summerland Street development to demonstrate the recommended means of compliance with the relevant Exeter City Council planning policies.

1.1 Site Review

The project includes for the demolition of existing buildings and the erection of a 147 bed-space co-living development (up to 6 storeys in height) and associated work.

The building has been assessed to include low carbon and renewable energy generation to achieve reduced energy and carbon emission levels.

The key energy requirements of the development arise from the heating and hot water demands and the electrical load associated with both the building operation and plug-in loads. Proposals should address the hot water demand, heat load and/or the electrical loads of the development.

1.2 The Scheme Solution

The current scheme adopts a passive approach coupled with energy saving technologies to minimise the energy usage, where possible. The envelope will be highly insulated and air tight for minimising the heating energy consumption.

Section 3.0 details an assessment of the LZC/ renewable technologies that have been considered for the site with explanations of which technologies are considered suitable for further development, and which have been excluded due to the site constraints and suitability for the project.

The recommended options to be developed during the design stage are:

- Air Source Heat Pump(s) (ASHPs) (air to water) for heating and hot water
- Photovoltaic Panels (PVs)
- Future provision for district heating connection

Exact sizes of the ASHP(s) to be determined at detailed design stages.

2.0 Project Specific Energy and Carbon Emission Benchmarks

The servicing strategy is driven by the following energy and carbon project specific requirements:

- **Building Regulations:** Conservation of fuel and power - Approved Document Part L 2021, Volume 2: New buildings other than dwellings.

- **Exeter City Council Core Strategy** (adopted February 2012) and relevant policies, i.e.:

  Policy CP13 Decentralised Energy:

  CP13: Decentralised Energy Networks will be developed and brought forward. New development (either new build or conversion) with a floorspace of at least 1,000 square metres, or comprising ten or more dwellings, will be required to connect to any existing, or proposed, Decentralised Energy Network in the locality to bring forward low and zero carbon energy supply and distribution. Otherwise, it will be necessary to demonstrate that it would not be viable or feasible to do so. Where this is the case, alternative solutions that would result in the same or better carbon reduction must be explored and implemented, unless it can be demonstrated that they would not be viable or feasible.

  Policy CP14 Renewable and Low Carbon Energy:

  New development (either new build or conversion) with a floorspace of at least 1,000 sq. metres, or comprising ten or more dwellings, will be required to use decentralised and renewable or low carbon energy sources, to cut predicted CO_2 emissions by the equivalent of at least 10% over and above those required to meet the building regulations current at the time of building regulations approval, unless it can be demonstrated that it would not be viable or feasible to do so.

  Policy CP15 Sustainable Construction:

  All non-domestic development will be required to achieve BREEAM 'Very Good' standards increasing to 'Excellent' standards from 2013. Non-domestic buildings are expected to be zero carbon from 2019.

- BREEAM UK New Construction Version 6.0, Ene 01 (Reduction of Energy Use and Carbon Emissions) 'Excellent' rating minimum performance standards.

3.0 Passive/ Energy Reducing/ LZC & Renewable Energy Technology Options Appraisal

This section reviews and analyses the principal sustainable and low zero carbon/ renewable technologies that are deemed appropriate for the proposed development.

Key:
☆ = low ☆☆☆☆☆ = high

3.1 Passive Options

This category recommends the investigation of the site layout, building orientation and design, thermal insulation levels and construction practices, all of which are proposed to be incorporated within the development proposals.

These proposals will result in minimising the development's energy consumption/carbon footprint by reducing solar overheating (avoiding comfort cooling where possible) and decreasing heat losses (fabric and infiltration), while maximising natural daylight.

Item	Description	Suitability	Capital Cost
Increased Insulation	Increased thermal insulation to the building reduces heat losses and subsequently plant sizing. **The targeted U-values for the proposed development are in excess of BRs Part L 2021 values and therefore can result in reduced heating energy consumption. The average U-values for all elements of the proposed new building are recommended as below:** • **External Walls: 0.15 W/m²K** • **Ground Floor: 0.14 W/m²K** • **Roof: 0.15 W/m²K** • **Glazing: 1.4 W/m²K** ○ **All areas- g value: 0.48, light transmittance: 0.76*** ○ **Ground floor areas and top floor KLD - g value: 0.28, light transmittance: 0.60*** * in line with the initial Overheating: Approved Document O assessment carried out for the project	☆☆☆☆☆	☆☆
Construction Processes	The Building Regulations require a maximum of 8 m³/h/m² at 50 pascals for the air leakage rates from a new building; the lower this figure the less energy is lost from the inside of a building to outside.	☆☆☆☆☆	☆

	With good construction processes and approved thermal bridging values incorporated it is anticipated that an infiltration rate of 3 $m^3/h/m^2$ at 50 Pascals can be targeted.		
Window Design	In addition to consideration of the site layout, and building orientation/design, increased levels of glazing (window design) allows more daylight to enter a building, potentially reducing the dependency upon artificial light and provide better well-being of the occupants. **Optimum window sizes when combined with efficient lighting controls can offer increased energy savings. An initial Overheating: Approved Document O assessment has been completed to ensure that the proposals cover the overheating mitigation requirements of the building regulations.**	☆☆☆☆☆	☆☆

3.2 Good Practice Energy Saving Technology Options

This category extols the benefits of employing energy saving technologies considered appropriate to be incorporated within the development proposals.

Item	Description	Suitability	Capital Cost
Inverter Controlled Pump Motors	The close matching of pump power to the required pump performances will provide significant reductions in (electric) energy demand. **The primary and secondary circulation pumps within the development present a good opportunity to achieve these reductions.**	☆☆☆☆☆	☆☆
Comprehensive Sub-Metering Facilities	The installation of sub-meters correctly located within building services systems can provide essential information regarding energy usage, permitting close monitoring (and hence reducing energy wastage) to be achieved. **It is proposed to provide energy usage and monitoring also in line with the BREEAM UK NC Version 6.0 requirements.**	☆☆☆☆☆	☆☆
Water Flowrate Regulation	The reduction of water usage/wastage is obviously important, and combined with a saving in the energy used to heat the water makes this option more attractive. **The regulation of water flowrates to appliances are proposed to be incorporated within the water services.**	☆☆☆☆☆	☆

Lighting Design	High efficiency luminaires utilising long life lamps with dimmable low loss ballasts / LED technology provide an effective energy saving over conventional luminaires. **LED technology is proposed to be incorporated throughout the development, with presence linked control within general and circulation areas.**	☆☆☆☆☆	☆☆☆

3.3 Renewable and Low Zero Carbon Energy Technology Options

The following renewable and/ or low zero carbon energy technologies were given initial consideration for use within the scheme. The reasons for excluding certain technologies or including for further assessment are listed below.

Item	Description	Suitability	Capital Cost
Wind Turbines	Electrical generation from wind turbine units, either individually or grouped together to form a 'wind farm'. Wind turbines are also available in a scaled down form that can be mounted on buildings. **Due to the limited site area, the wind turbine(s) would have to be located on the top of the proposed development, resulting in significant visual impact. The restricted site and location do not render this option worthy of further consideration.**	☆	☆☆☆
Solar Thermal Panels	External panels which can be mounted on the roof or in an open space through which a medium is passed to absorb heat energy from the sun. The heat can be used to supplement a development's hot water production. **This option has benefits to the scheme, as there will be demand for hot water within the building. However, the visual impact and reflections on the surrounding areas will need to be assessed. Also, additional plant space will be required for placing the pre-heating buffer vessels. Therefore, this technology is not deemed appropriate for the building.**	☆☆☆	☆☆☆☆
Photovoltaic Panels	External panels which can be mounted on the roof or integrated into the façade of buildings, or in any open space, subject to planning permission. The panels convert the energy of the sun directly into electricity. The electricity can be used to supplement the building's power supply. **PV panels are deemed to be an appropriate technology for this development (especially for offsetting the energy required to run the air source heat pump(s)), although the visual impact and estimated service/ access space requirements would need to be addressed.**	☆☆☆☆	☆☆☆

Biomass Boiler	Biomass boilers burn biological material such as wood pellets or logs in place of fossil fuels to serve the heating and hot water demands of a development. Pellet or chip biomass boilers generally have a hopper attached in which the fuel is loaded and automatically feeds into the boiler. The hopper will need to be refilled on a regular basis depending on demand and the size of the hopper. Log boilers typically require manual loading at an increased frequency due to the need for positioning the logs correctly. A steady fuel source is vital, ideally within a 50mile radius, so that carbon emission reductions are not cancelled out by transport pollution. **Biomass boilers require constant maintenance and attention to ensure that they are working correctly and efficiently. Therefore, there are significant logistical, operational and storage implications. Additional plant space for the biomass boiler and its storage would also be required. For the above reasons this technology is not deemed appropriate for the development.**	☆☆	☆☆☆☆
Combined Heat & Power CHP	CHP is a process that uses a fuel source to generate electricity and utilises the heat produced as a by-product to meet a heating demand. The fuel for this process is typically natural gas, but can also be biogas, biomass, gas oil, or hydrogen fuel cells, amongst others. The electricity generated can be utilised by the building operators or exported to the grid, or a combination of the two. **There is a Client preference for eliminating the use of gas, therefore this technology is not deemed appropriate for the development.**	☆☆☆	☆☆☆
Centralised District Heating	A district heating system, or heat network, is a system for distributing heat to different residential or commercial properties. The heat is generated at a centralised location and can be extended to serve a particular development or building via below ground pipework and a heat exchanger. The heat can be used to satisfy a building's heating and hot water demand. **Currently there are no appropriate district heating schemes in the local vicinity. However, future provision connection can be incorporated in the scheme.**	☆☆☆☆	☆☆

Ground Source Heat Pumps (GSHP)	A technology that uses the constant temperature of the ground to provide low grade hot water for use in building heating systems. Pipework is buried in the ground either in a horizontal 'slinky' configuration or a vertical 'u-tube' utilising bore holes. Water is passed through the ground loops where it absorbs the heat from the ground. The water is used to raise the temperature of a refrigerant which is in turn elevated further by the heat pump to provide heat to the heating system. **A large area of surrounding land would be required to make this option viable, or a 'pile' arrangement could be considered depending upon ground conditions. The site would experience significant external disruption, as well as high associated capital cost. Therefore, the use of a GSHP is not deemed appropriate for the scheme.**	☆☆	☆☆☆☆
Air Source Heat Pumps (ASHP)	An ASHP is a refrigerant based system that absorbs or rejects heat from/to the external air. In air-to-water systems the refrigerant passes through a heat exchanger to provide hot or chilled water for either space heating, domestic hot water generation or comfort cooling. In air-to-air systems the heat exchanger transfers the heat to air. Direct expansion (DX) split units provide either heating or cooling to one zone/appliance. Variable Refrigerant Flow (VRF) systems can provide simultaneous heating and cooling to multiple areas at the same time. **With the reductions in the carbon emission factor of electricity, ASHP(s) are considered a viable and future proof alternative to gas in terms of total carbon footprint. However, consideration will need to be given to electrical infrastructure upgrades for the increased load demand. For the above reasons this technology is deemed appropriate for the development.**	☆☆☆☆	☆☆☆

From an initial review of the project against the options highlighted above, it is recommended that the following low zero carbon and renewable technologies are considered for implementation within this scheme:

- Air Source Heat Pump(s) for heating and hot water (the exact size is to be determined at detailed design stages)
- Photovoltaic Panels (PVs)
- Future provision for district heating connection

3.4 Selected Options

After careful assessment the following options are considered to be the most appropriate and practicable, and are recommended to be incorporated within this scheme;

Passive Options

- Increased thermal insulation
- Low air infiltration losses
- High levels of natural daylight

Good Practice Energy Saving Technologies

- Inverter driven motors, for variable power output matched to actual usage (not on/off)
- Comprehensive sub-metering facilities
- Water flowrate regulation
- Lighting controls incorporating presence linking
- Low energy LED lamp technology

Low Zero Carbon/ Renewable Technologies

- Air Source Heat Pump(s) for heating and hot water
- Photovoltaic Panels (PVs)
- Future provision for district heating connection

4.0 Energy Compliance Modelling

Preliminary BRUKL (Building Regulations Part L 2021) calculations using dynamic simulation modelling (IESVE) have been carried out by incorporating the passive, good practice energy saving and LZC/ renewable energy options as described in Section 3.0.

4.1 Energy Compliance Modelling Input Assumptions

To provide an understanding of the inputs/ assumptions, the principal design criteria used to produce the proposed energy compliance model are as follows:

Input	Proposed
Building Regulations:	England Building Regulations Part L 2021
BRUKL compliance check version:	V6.1. e.1
Calculation engine version:	7.0.22
Location:	Exeter
Compliance weather file:	PLYMOUTH_TRY.epw (compliant weather file closest to site)
Model geometry	Model geometry based on proposed Architectural planning drawings
Air permeability @50pa	3 $m^3/(h.m^2)$
U-values	Glazing: 1.4 $W/(m^2K)$ [inc. frame] All areas- g value: 0.48, light transmittance: 0.76 Ground floor areas and top floor KLD - g value: 0.28, light transmittance: 0.60 Rooflights: 2.1 $W/(m^2K)$
	External walls: 0.15 $W/(m^2K)$
	Roof: 0.15 $W/(m^2K)$
	Ground floor: 0.14 $W/(m^2K)$
	Doors: 1.6 $W/(m^2K)$
Lamp efficacy and lighting controls for all areas:	105 lm/cW (average) with presence detection in circulation areas
Ventilation strategy	MVHR in all occupied areas • Studios: SFP 1.1 W/l/s, heat recovery efficiency: 90% or better • KLDs: SFP 1.0 W/l/s, heat recovery efficiency: 87% or better • Ground Floor Non-standard accommodation areas: SFP 1.3 W/l/s, heat recovery efficiency: 85% or better
Power factor correction unit:	YES
Building Management System (warn out of range values):	YES
ASHP(s) SCOP	3.3 or better for heating 3.4 or better for hot water
VRV in non-standard accommodation areas and KLDs	SCOP: 3.5, SEER: 5.0, EER: 3.5
PV system	Generating 26,500 kWh/annum (subject to detailed design, requirement may reduce)

4.2 Energy Compliance Modelling Outputs

Based on the inputs detailed in Section 4.2 and subject to detailed design, it is anticipated that 7 credits (in excess of the minimum Ene 01 requirements for Excellent rating) can be achieved under Ene 01 BREEAM UK NC Version 6.0.

Target CO_2 Emission Rate - TER ($kgCO_2/m^2.annum$)	Building CO_2 Emission Rate – BER ($kgCO_2/m^2.annum$)	Expected EPC Rating	Policy CP14 10% Carbon Offset Achieved?	Policy CP 15 Ene01 'Excellent' rating achieved?
2.96	2.64	A	YES (11%)	YES (7 credits and an EPR of 0.727)

5.0 Conclusion

The proposed scheme (as detailed in this report) is expected to comply with the following energy and carbon project specific related drivers:

- **Building Regulations:** Conservation of fuel and power - Approved Document Part L 2021, Volume 2: New buildings other than dwellings

- **Exeter City Council Core Strategy** (adopted February 2012) and relevant policies, i.e.:

    - **CP13**: The requirements of Policy CP13 are achieved based on future provision for district heating connection.
    - **CP14:** The requirements of Policy CP14 are achieved based on compliance with the relevant to the scheme Part L requirements as detailed above with the inclusion of renewable (PVs) and low carbon energy sources ASHP, to cut predicted CO_2 emissions by the equivalent of at least 10% over and above those required to meet the building regulations current at the time of building regulations approval.
    - **CP15:** The proposed development achieves the Ene 01 (Reduction of energy use and carbon emissions) 'Excellent' rating minimum performance standards under the BREEAM UK New Construction Version 6.0 scheme.

Appendix A: Initial BRUKL Output Document

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Summerland Street As designed

Date: Wed Aug 23 11:50:49 2023

Administrative information

Building Details

Address: Summerland Street, Exeter,

Certifier details

Name: Eleni Kalyva

Telephone number: 01752255575

Address: Hulley & Kirkwood, Studio 5-11, Millbay Road, Plymouth, PL1 3LF

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.22

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.22

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

Foundation area [m²]: 792.55

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

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	2.96	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	2.64	
Target primary energy rate (TPER), $kWh_{pe}/m^2.annum$	31.8	
Building primary energy rate (BPER), $kWh_{pe}/m^2.annum$	28.08	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

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

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.16	0.35	FC000000:Surf[7]
Floors	0.18	0.15	0.29	BT000010:Surf[2]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.15	0.15	ST000020:Surf[0]
Windows** and roof windows	1.6	1.4	1.6	CC000000:Surf[3]
Rooflights***	2.2	2.1	2.1	FC000000:Surf[3]
Personnel doors^	1.6	1.6	1.6	CC000001:Surf[3]
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

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

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

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

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

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

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

Air permeability	Limiting standard	This building
m³/(h.m²) at 50 Pa	8	3

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Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m²]	4822.4	4822.4
External area [m²]	5124.5	4967.8
Weather	PLY	PLY
Infiltration [m³/hm²@ 50Pa]	3	3
Average conductance [W/K]	1877.06	1886.59
Average U-value [W/m²K]	0.37	0.38
Alpha value* [%]	29.54	10

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

Building Use

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	3.13	3.58
Cooling	0.22	0.15
Auxiliary	3.31	1.78
Lighting	5.95	6.28
Hot water	11.78	9.59
Equipment*	12.88	12.88
TOTAL**	**24.39**	**21.4**

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

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	5.49	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*5.49*	*0*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	40.65	38.41
Primary energy [kWh_{PE}/m²]	28.08	31.8
Total emissions [kg/m²]	2.64	2.96

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