Market Hall, Queens Market Rhyl

BREEAM New Construction 2018 (Retail): Pre-assessment

04-Aug-20

Assessor: Kat Radford

BDP.

Credit targeted

Credit not targeted / cannot be achieved

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
MANAGEMENT (1 credit = 0.52%)								
Man 01: Project brief and design								
Project Delivery Planning	Man 01-01	**1**	**0**		1. Prior to completion of the Concept Design, the project delivery stakeholders (see comments) meet to identify and define for each key phase of project delivery: a. Roles b. Responsibilities c. Contributions 2. Consider each one of the following items when defining roles, responsibilities and contributions for each key phase of the project: a. End user requirements b. Aims of the design and design strategy c. Particular installation and construction requirements/limitations d. Occupiers budget and technical expertise in maintaining any proposed systems e. Maintainability and adaptability of the proposals f. Operational energy (see Ene 01 for further details) g. Requirements for the production of project and end user documentation h. Requirements for commissioning, training and aftercare support. 3. The project team demonstrate how the project delivery stakeholder's contributions and the consultation process outcomes influence the following: a. Initial Project Brief b. Project Execution Plan c. Communication Strategy d. Concept Design.	Project Manager	2	Requires input from a contractor, or someone with substantial contracting experience in project similar to the proposed works. The design team have confirmed that these criteria have not been met.

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Stakeholder consultation (interested parties)	Man 01-02	**1**	**0**		4. Prior to completion of the Concept Design, the design team consults with all interested parties (see comments) on matters that cover the minimum consultation content: 1. Functionality, build quality and impact (including aesthetics). 2. Provision of appropriate internal and external facilities (for future building occupants and visitors or users). 3. Management and operational implications. 4. Maintenance resources implications. 5. Impacts on the local community, e.g. local traffic or transportation impact. 6. Opportunities for shared use of facilities and infrastructure with the community or appropriate stakeholders. 7. Compliance with statutory (national or local) consultation requirements. 8. Energy use and sustainability measures. 9. Implementing principles and processes that deliver an inclusive and accessible design. In the case of educational building types, minimum content also includes: 10. How the building or grounds could best be designed to facilitate learning and provide a range of social spaces appropriate to the needs of a diverse range of pupils, students and other users, including people of all abilities. In the case of building types containing technical areas or functions, e.g. laboratories, workshops etc., minimum content also includes: 11. The end users' broad requirements for such facilities, including appropriate sizing, optimisation and integration of equipment and systems.	Project Manager	2	The design team confirmed that this was not undertaken at Stage 2. *Interested parties include: 1. Actual or intended building users (if known) including facilities management staff or those responsible for the day-to-day operation of the building and grounds. 2. Representative consultation group from the existing community (if the building is a new development in an existing community) or for a community still under construction. 3. Existing partnerships and networks that have knowledge of, and experience of working on, existing buildings of the same type. 4. Potential users of any shared facilities, e.g. operators of clubs and community groups. AND the following where relevant: 5. In educational building types, representatives of local education authorities, board of governors etc. 6. Local or national historic or heritage groups (over and above any requirements relating to statutory consultees). 7. Specialist service and maintenance contractors or representatives where the building function has particular technical requirements in complex environments, e.g. buildings containing laboratories.
					5. Demonstrate how the stakeholder contributions and consultation exercise outcomes influence the Initial Project Brief and Concept Design.			
					6. Prior to completion of the detailed design (RIBA Stage 4, Technical Design or equivalent), all interested parties (see Definitions on page 40 of guidance manual) give and receive consultation feedback.		4	
BREEAM AP (Concept Design)	Man 01 pre	**-**	**-**	**-**	8. The project team, including the client, formally agree strategic performance targets early in the design process with the support of the BREEAM AP where appointed).			
	Man 01-03	**1**	**1**		9. Involve a BREEAM AP in the project at an appropriate time and level to: a. Work with the project team, including the client, to consider the links between BREEAM issues and assist them in maximising the project's overall performance against BREEAM, from their appointment and throughout Concept Design. b. Monitor progress against the performance targets (see Definitions on page 37) agreed under criterion 8 throughout all stages after their appointment where decisions critically impact BREEAM performance. c. Proactively identify risks and opportunities related to the achievement of the targets agreed under criterion 8. d. Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team.	Client / BREEAM Assessor	2	Although a BREEAM AP was not appointed at Stage 2, BDP's involvement is likely to fulfil the requirements for this credit.
BREEAM AP (Developed Design)	Man 01-04	**1**	**1**		10. Criteria 8 and 9 are achieved.	Client / BREEAM Assessor	4	
					11. Involve the BREEAM AP in the project at an appropriate time and level to: a. Work with the project team, including the client, to consider links between BREEAM issues and to assist them in maximising the project's overall performance against BREEAM throughout developed design. b. Monitor progress against the performance targets agreed under criterion 8, throughout all stages where decisions critically impact the specification and tendering process and the BREEAM performance. c. Proactively identify risks and opportunities related to the achievement of the targets agreed under criterion 8. d. Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team.			

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Man 02: Life Cycle Cost and Service Life Planning								
Elemental life cycle cost (LCC)	Man 02-01	**2**			1. A competent person carries out an outline, entire asset LCC plan at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) together with any design options appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:2008.	Cost Consultant	2	The design team confirmed that this was not completed at Stage 2.
					2. The elemental LCC plan: a. Provides an indication of future replacement costs over a period of analysis as required by the client (e.g. 20,30,50 or 60 years); b. Includes service life, maintenance and operation cost estimates. The study period should ideally be agreed by the client, in line with the design life expectancy of the building. However, where the life expectancy of the building is not yet formally agreed (due to being at very early design stages), the default design life of 60 years should be used for modelling purposes (in line with the UK default).	Cost Consultant		
					3. Demonstrate, using appropriate examples provided by the design team, how the elemental LCC plan has been used to influence building and systems design/specification to minimise life cycle costs and maximise critical value.	Design Team		
Component level LCC Option Appraisal	Man 02-02	**1**	**1**		4. A competent person develops a component level LCC options appraisal by the end of Process Stage 4 (equivalent to Technical Design – RIBA Stage 4) in line with PD 156865:2008. The component level LCC includes (where present): a. Envelope, e.g. cladding, windows, and/or roofing b. Services, e.g. heat source cooling source, and/or controls c. Finishes, e.g. walls, floors and/or ceilings d. External spaces, e.g. alternative hard landscaping, boundary protection The component level LCC option appraisal should review all of the above component types (where present). However, you do not need to consider every single example cited under each component; only a selection of those most likely to draw valued comparisons. This is to ensure that a wide range of options are considered and help focus the analysis on components which would benefit the most from the appraisal.	Cost Consultant	4	
					5. Demonstrate, using appropriate examples provided by the design team, how the component level LCC options appraisal has been used to influence building and systems design/specification to minimise life cycle costs and maximise critical value.	Design Team		
Capital cost reporting	Man 02-03	**1**	**1**		6. Report the capital cost for the building in pounds per square metre of gross internal floor area (£k/m2), as part of the submission to BRE. The capital cost for the building includes the expenses related to the initial construction of the building: – Construction, including preparatory works, materials, equipment and labour – Site management – Construction financing – Insurance and taxes during construction – Inspection and testing Costs related to land procurement, clearance, design, statutory approvals and post occupancy aftercare are not included.	Contractor		

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Man 03: Responsible Construction Practices								
Pre-requisite	Man 03-pre	-	-	-	1. All timber and timber based products used during the construction process of the project are 'Legally harvested and traded timber'.	Contractor		
Environmental management	Man 03-01	**1**	**1**		3. All parties who at any stage manage the construction site (e.g. the principal contractor, the demolition contractor) operate an EMS covering their main operations. The EMS must: a. Be third party certified, to ISO 14001:2015/EMAS or equivalent standard; or b. In compliance with BS 8555:2016 have: i. Appropriate structure ii. Reached implementation stage phase four 'implementation and operation of the environmental management system' iii. Completed defined phase audits one to four.	Contractor		The principal contractor should be ISO 14001 accredited.
					4. All parties who at any point manage the construction site (e.g. the principal contractor, the demolition contractor) implement best practice pollution prevention policies and procedures on site in accordance with Working at construction and demolition sites: PPG6, Pollution Prevention Guidelines.			
BREEAM AP (Site)	Man 03-02 pre	-	-	-	5. The client and the contractor formally agree performance targets.	Project Manager		
	Man 03-02	**1**	**1**		6. Involve a BREEAM AP in the project at an appropriate time and level to: a. Work with the project team, including the client, to consider the links between BREEAM issues and assist them in achieving and if possible going beyond the design intent, to maximise the project's performance against the agreed performance targets throughout the Construction, Handover and Close Out stages. b. Monitor construction progress against the performance targets agreed under criterion 5 above throughout all stages where decisions critically impact BREEAM performance. c. Proactively identify risks and opportunities related to the procurement and construction process and the achievement of the targets agreed under criterion 5. d. Provide feedback to the constructors and the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team and the provision to the assessor.	Contractor		
Responsible Construction Management	Man 03-03	**2**	**2**		7. Achieve items listed as required for one credit in table 4.1 of the guidance manual. Two credits: 8. Achieve criterion 7 9. Achieve six additional items in table 4.1 of the guidance manual.	Contractor		

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Monitoring of construction-site impacts	Man 03-04	**2**	**2**		10. Responsibility has been assigned to an individual(s) for monitoring, recording and reporting energy use, water consumption and transport data (where measured) resulting from all on-site construction processes (and dedicated off-site manufacturing) throughout the build programme. To ensure the robust collection of information, this individual(s) must have the appropriate authority and responsibility to request and access the data required. Where appointed, the BREEAM AP could perform this role.	Contractor		
					First Monitoring Credit - Utility consumption **Energy consumption** 11. Achieve criterion 10. 12. Set targets for the site energy consumption in kWh (and where relevant, litres of fuel used) as a result of the use of construction plant, equipment (mobile and fixed) and site accommodation. 13. Monitor and record date for the energy consumption described in criterion 12. 14. Report the total carbon dioxide emissions (total kgCO2/project value) from the construction process via the BREEAM Projects (for the purposes of potential future BREEAM performance benchmarking). **Water consumption** 15. Achieve criterion 10. 16. Set targets for the potable water consumption (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 described in criterion 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 (for the purposes of potential future BREEAM performance benchmarking).	Contractor		
					Second Credit - Transport of construction materials and waste 19. Achieve Criterion 10. 20. Set targets for transportation movements and impacts resulting from delivery of the majority of construction materials to site and construction waste from site. As a minimum cover: 20.a. Transport of materials from the point of supply to the building site, including any transport, intermediate storage and point of supply. Monitor as a minimum: 20.a.i. Materials used in major building elements (e.g. those defined in BREEAM issue Mat01 Environmental impacts from construction products - Building life cycle assessment (LCA). 20.a.ii. Ground works and landscaping materials. 20.b. Transportation of construction waste from the construction gate to waste disposal processing or recovery centre gate. This monitoring must cover the construction waste groups outlined in the project's resource management plan. 21. Monitor and record data for the transportation movement as described in criterion 20. 22. Using the collated data, report separately for materials and waste, the total transport-related carbon dioxide emissions ($kgCO_2$-eq) plus total distance travelled (km) via BREEAM Projects (for the purposes of potential future BREEAM performance benchmarking).	Contractor		
Exemplary level criteria	Man 03-Ex	**1**		**1**	23. Achieve all items in Table 4.1 of the guidance manual.	Contractor		

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Man 04: Commissioning and handover								
Commissioning and testing schedule and responsibilities	Man 04-01	**1**	**1**		1. Prepare a schedule of commissioning and testing. The schedule identifies a suitable timescale for commissioning and re-commissioning of all complex and non-complex building services and control systems and for testing and inspecting building fabric. 2. The schedule identifies the appropriate standards for all commissioning activities to be conducted, where applicable, in accordance with: a. Current Building Regulations b. BSRIA guidelines c. CIBSE guidelines d. Other appropriate standards (see Methodology) Exclude from the assessment any process or manufacture-related equipment specified as part of the project. However, include such equipment in cases where they form an integral part of the building HVAC services, such as some heat recovery systems. 3. Where a building management system (BMS) is specified: a. Carry out the commissioning of air and water systems when all control devices are installed, wired and functional b. Include physical measurements of room temperatures, off-coil temperatures and other key parameters, as appropriate, in Commissioning results. c. The BMS or controls installation should be running in auto with satisfactory internal conditions prior to handover d. All BMS schematics and graphics (if BMS is present) are fully installed and functional to user interface prior to handover e. Fully train the occupier or facilities team in the operation of the system. 4. Appoint an appropriate project team member to monitor and programme pre-commissioning, commissioning and testing. Where necessary include, re-commissioning activities on behalf of the client. 5. The principal contractor accounts for the commissioning and testing programme, responsibilities and criteria within their budget and the main programme of works. Allow the required time to complete all commissioning and testing activities prior to handover,	Contractor		**Mandatory for Very Good**
Commissioning - design and preparation	Man 04-02	**1**	**1**		6. Achieve criteria 1-5. 7. During the design stage, the client or the principal contractor appoints an appropriate project team member provided they are not involved in the general installation works for the building services systems: with responsibility for: a. Undertaking design reviews and giving advice on suitability for ease of commissioning. b. Providing commissioning management input to construction programming and during installation stages. c. Management of commissioning, performance testing and handover or post-handover stages. For buildings with complex building services and systems, this role needs to be carried out by a specialist commissioning manager.	Contractor		
Testing and inspecting building fabric	Man 04-03	**1**	**1**		8. Achieve criteria 1-5. 9. Complete post-construction testing and inspection to quality-assure the integrity of the building fabric, including continuity of insulation, avoidance of thermal bridging and air leakage paths (this is through airtightness testing and a thermographic survey). A suitably qualified professional undertakes the survey and testing in accordance with the appropriate standard. 10. Rectify any defects identified during post-construction testing and inspection prior to building handover and close out. Any remedial work must meet the required performance characteristics for the building or element as defined at the design stage.	Contractor		
Handover	Man 04-04	**1**	**1**		11. Prior to handover, develop two building user guides for the following users: a. A non-technical user guide for distribution to the building occupiers b. A technical user guide for the premises facilities managers c. A draft copy is developed and discussed with users first (where the building occupants are known) to ensure the guide is most appropriate and useful to potential users. 12. Prepare two training schedules timed appropriately around handover and proposed occupation plans for the following users: a. A non-technical training schedule for the building occupiers b. A technical training schedule for the premises facilities managers.	Contractor		**Criterion 11 is mandatory for Very Good**

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Man 05: Aftercare								
Aftercare support	Man 05-01	**1**	**1**		1. Provide aftercare support to the building occupiers through having in place operational infrastructure and resources. This includes as a minimum: a. A meeting between the aftercare support team or individual, and the building occupier or management team (prior to initial occupation, or as soon as possible thereafter) to: i. Introduce the aftercare support available, including the content of the building user guide (where it exists) and training schedule. ii. Present key information on the building including the design intent and how to use the building to ensure it operates as efficiently and effectively as possible. b. On-site facilities management training including: i. a walkabout of the building AND ii. introduction and familiarisation with the building systems, their controls and how to operate them in accordance with the design intent and operational demands. c. Provide initial aftercare support for at least the first month of building occupation, e.g. weekly attendance on-site, to support building users and management (the level of frequency will depend on the complexity of the building and building operations). d. Provide longer term aftercare support for occupiers for at least the first 12 months from occupation, e.g. a helpline, nominated individual or other appropriate system to support building users/management. 2. Establish operational infrastructure and resources to coordinate the collection and monitoring of energy and water consumption data for a minimum of 12 months, once the building is substantially occupied. This facilities analysis of discrepancies between actual and predicted performance, with a view to adjusting systems and/or user behaviours accordingly.	Contractor		
Commissioning - implementation	Man 05-02	**1**	**1**		3. Complete the following commissioning activities over a minimum 12-month period, once the building becomes substantially occupied: a. Complex systems - Specialist Commissioning Manager will: i. Identify changes made by the owner or operator that might have caused impaired or improved performance. ii. Test all building services under full load conditions, i.e. heating equipment in mid-winter, cooling and ventilation equipment in mid-summer and under part load conditions (spring and autumn). iii. Where applicable, carry out testing during periods of extreme (high or low) occupancy. iv. Interview building occupants (where they are affected by the complex services) to identify problems or concerns regarding the effectiveness of the systems. v. Produce monthly reports comparing sub-metered energy performance to the predicted one (see Ene01 Reduction of energy use and carbon emissions). vi. Identify inefficiencies and areas in need of improvement. vii. Re-commission systems (following any work needed to serve revised loads), and incorporate any revisions in operating procedures into the operations and maintenance (O&M) manuals. b. Simple systems (naturally ventilated) - external consultant/aftercare team/facilities manager will: i. Review thermal comfort, ventilation, and lighting, at three, six and nine month intervals after initial occupation, either by measurement or occupant feedback. ii. Identify deficiencies and areas in need of improvement. iii. Re-commission systems and incorporate any relevant revisions in operating procedures into the O&M manuals.	Contractor		

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Post occupancy evaluation	Man 05-03	**1**	**1**		4. The client or building occupier makes a commitment to carry out a post-occupancy evaluation (POE) exercise one year after building is substantially occupied. This gains comprehensive in-use performance feedback and identifies gaps between design intent and in-use performance. The aim is to highlight any improvements or interventions that need to be made and inform operational processes. 5. An independent party carries out the POE covering: a. A review of the design intent and construction process (review of design, procurement, construction and handover processes) b. Feedback from a wide range of building users including facilities management on the design and environmental conditions of the building covering: i. Internal environmental conditions (light, noise, temperature, air quality) ii. Control, operation and maintenance iii. Facilities and amenities iv. Access and layout v. Energy and water consumption vi. Other relevant issues 6. The independent party provides a report with lessons learned to the client and building occupiers. 7. The client or building occupier commits funds to pay for the POE in advance. This requires an independent party to be appointed to carry out the POE. Evidence of the appointment of the independent party and schedule of responsibilities which fulfils the BREEAM criteria are acceptable to demonstrate compliance.	Client		
HEALTH AND WELLBEING (1 credit = 0.78%)								
Hea 01: Visual Comfort								
Control of Glare from Sunlight	Hea 01-01	**1**	**1**		1. Identify areas at risk of glare using a glare control assessment, The glare control assessment also justifies any areas deemed not at risk of glare. 2. A glare control strategy designs out potential glare in all relevant building areas where risk has been identified. This should be achieved through building form and layout or building design measures. 3. The glare control strategy does not increase energy and consumption used for lighting. This is achieved by: a. Maximising daylight levels in all weather, cloudy or sunny AND b. Ensuring the use or location of shading does not conflict with the operation of lighting control systems.	Architect		Compliant shading measures for meeting glare control criteria can include: – building-integrated measures (e.g. overhangs or fins) – occupant-controlled devices such as opaque Venetian or close weave fabric blinds, (where the openness factor of blinds is 1% or less, and where the fabric light transmittance value is < 0.1 (10%)) – external shading or brise soleil.
Daylighting	Hea 01-02	**2**	**0**	**2**	4. Daylighting criteria have been met using either of the following options: a. The relevant building areas meet good practice daylight factor(s) and other criterion as outlined in Table -5.1 and Table - 5.2: 1 credit: minimum 35% of sales areas achieve point daylight factors of 2% or mored. 1 credit: In all other occupied spaces, achieve a minimum 2% daylight factor in at least 80% (m2) of relevant building areas (and either compliance with the uniformity ration requirements OR view of sky and room depth criteria in Table 5.2.) OR b. The relevant building areas meet good practice average and minimum point daylight illuminance criteria as outlined in Table - 5.3.	Architect / Lighting Consultant		Daylight calculations should be undertaken at an early stage to allow this to inform the design. It is assumed that daylight calculations will not be undertaken.

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View Out	Hea 01-03	**1**	**0**		5. 95% of the floor area in relevant building areas is within 8m of an external wall. The external wall has a window or permanent opening that provides an adequate view out. 6.The window/opening must be ≥ 20% of the surrounding wall area (refer to Relevant definitions in the Additional information section). Where the room depth is greater than 8m, compliance is only possible where the percentage of window/opening is the same as, or greater than, the values in Table 1.0 of BS 8206:part 2.	Architect		This credit can be difficult to achieve in larger buildings. Compliance must be demonstrated for the percentage of the floor area in each relevant building area, rather than the percentage of the total relevant building area in the building. Based on the depth of the building and nature of the design, it is thought that will not be achieved.
Internal and external lighting levels, zoning and control	Hea 01-03	**1**	**1**		**Internal Lighting** 8. Internal lighting in all relevant areas of the building is designed to provide illuminance (lux) levels and colouring rendering index in accordance with the SLL code for lighting 2012. and any other relevant industry standard. Internal lighting should be appropriate to the tasks undertaken, accounting for building user concentration and comfort levels. 9. For areas where computer screens are regularly used, the lighting design complies with CIBSE Lighting Guide 7 sections 2.4, 2.13, 2.15, 2.20, and 6.10 to 6.20. This gives recommendations highlighting: a. Limits to the luminance of the luminaires to avoid screen reflections. (Manufacturers' data for the luminaires should be sought to confirm this.) b. Any area where surface is used to reflect light in to a space such as uplighting, the recommendations refer to the luminance of the lit ceiling rather than the luminaire; a design team calculation is usually required to demonstrate this. c. Recommendations for direct lighting, ceiling illuminance, and average wall illuminance. **External Lighting** 10. All external lighting located within the construction zone is specified in accordance with BS5489-1:2013 Code for the practice for the design of road lighting. Lighting of roads and public amenity areas and BS EN 12464-2:2014 Light and lighting - lighting of work places - Part 2: Outdoor workplaces. External lighting should provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night. 11. Where no external light fittings are specified (either separate from or mounted on the external building façade of roof), the criteria relating to external lighting do not apply and the credit can be awarded on the basis of compliance with criteria 8-9. **Zoning and occupant control** 12. Internal lighting is zoned to allow for occupant control. Zoning is in accordance with the criteria below for relevant areas present within the building: a. In office areas, zones of no more than four workplaces b. Workstations adjacent to windows/atria and other building areas separately zoned and controlled c. Seminar and lecture rooms: zoned for presentation and audience areas d. Library spaces: separate zoning of stacks, reading and counter areas e. Teaching space or demonstration area f. Whiteboard or display screen g. Auditoria: zoning of seating areas, circulation space and lectern area h. Dining, restaurant, café areas: separate zoning of servery and seating/dining areas i. Retail: separate zoning of display and counter areas j. Bar areas: separate zoning of bar and seating areas k. Wards or bedded areas: zoned lighting control for individual bed spaces and control for staff over groups of bed spaces l. Treatment areas, dayrooms, waiting areas: zoning of seating and activity areas and circulation space with controls accessible to staff.	MEP		It is assumed that these criteria will be met.
Exemplary level criteria	Hea 01-03 EX	**1**	**0**	**1**	15. To achieve an exemplary performance credit for daylighting: Daylighting criteria have been met using either of the following options: a. Relevant building areas meet exemplary daylight factors and the relevant criteria in Table 5.8 of the guidance manual. b. Relevant building areas meet exemplary average and minimum point daylight illuminance criteria in Table 5.9 of the guidance manual.	Architect / Lighting Consultant		
	Hea 01-03 EX	**1**	**0**	**1**	16. To achieve an exemplary performance credit for Internal and external lighting levels, zoning and control: 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.	MEP		

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Hea 02: Indoor Air Quality								
Pre-Requisite	Hea 02-Pre	-	-	-	Indoor air quality (IAQ) plan: 1. A site-specific indoor air quality plan has been produced and implemented in accordance with the guidance in Guidance Note GN06. The objective of the plan is to facilitate a process that leads to design, specification and installation decisions and actions that minimise indoor air pollution during occupation of the building. The indoor air quality plan must consider the following a. Removal of contaminant sources b. Dilution and control of contaminant sources (where present, consideration is given to the air quality requirements of specialist areas such as laboratories) c. Procedures for pre-occupancy flush out. d. Third party testing an analysis. e. Maintaining good indoor air quality in-use.	MEP / Architect		03.08.2020 Stage 3 review: This report hasn't yet been commissioned. BDP to relay requirements to team.
Ventilation	Hea 02-01	**1**	**0**	**1**	2. The building has been designed to minimise the indoor concentration and recirculation of pollutants in the building as follows: a. Provide fresh air into the building in accordance with the criteria of the relevant standard for ventilation b. Ventilation pathways are designed to minimise the ingress and build-up of air pollutants inside the building c. Where present, HVAC systems must incorporate suitable filtration to minimise external air pollution, as defined in BS EN 13779:2007 Annex A3. The specified filters should achieve a minimum Indoor Air Quality of IDA2. d. Areas of the building subject to large and unpredictable or variable occupancy patterns have carbon dioxide (CO_2) or air quality sensors specified and : i. In mechanically ventilated buildings or spaces: sensors are linked to the mechanical ventilation system and provide demand-controlled ventilation to the space. ii. In naturally ventilated buildings or spaces: sensors either have the ability to alert the building owner or manager when CO_2 levels exceed the recommended set point, or are linked to controls with the ability to adjust the quantity of fresh air, i.e. automatic opening windows or roof vents. e. For naturally ventilated or mixed mode buildings, the design demonstrates that the ventilation strategy provides adequate cross flow of air to maintain the required thermal comfort conditions and ventilation rates in accordance with CIBSE AM10.	MEP		Compliance with this credit should be investigated by the design team.
Emissions from construction products	Hea 02-02	**2**	**2**		**One credit:** 3. Three out of the five product types meet the emission limits, testing requirements and any additional requirements listed in Table 5.11 of the guidance manual. Where wood-based products are not one of the three selected product types, all wood-based products used for internal fixtures fittings must be tested and classified as formaldehyde E1 class as a minimum. **Two credits:** 4. All of the product types listed meet the emission limits, testing requirements and any additional requirements listed in Table 5.11 of the guidance manual.	Architect		In order to achieve enough points to achieve BREEAM Very Good it is thought that both credits will be targeted.
Post construction indoor air quality measurement	Hea 02-03	**1**	**1**		5. The formaldehyde concentration indoor air is measured post construction (but pre-occupancy) and does not exceed 100µg/ m³ averaged over 30 minutes. (World Health Organisation guidelines for indoor air quality: Selected pollutants, 2010). 6. The formaldehyde sampling and analysis is performed in accordance with ISO 16000-2 and 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 500µg/ m³ over 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 TVOC and formaldehyde levels to within the above limits. 10. The measured concentration levels of formaldehyde (µg/ m³) are reported via the BREEAM Scoring and Reporting Tool.	Contractor		

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Exemplary level criteria	Hea 02-Ex	**1**	**0**	**1**	11. Three of the product types listed meet the emission limits, testing requirements and any additional requirements listed in Table 5.12 of the guidance manual. Where wood-based products are not one of the three selected product types, all wood-based products used for internal fixtures and fittings must be tested and classified as formaldehyde E1 class as a minimum,	Architect		
Hea 04: Thermal Comfort								
Thermal Modelling	Hea 04-01	**1**	**1**		1. Thermal modelling has been carried out using software in accordance with CIBSE AM11 Building Energy and Performance Modelling. 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). 3. The modelling demonstrates that: a. For air conditioned buildings, summer and winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design, Table 1.5; or other appropriate industry standard (where this sets a higher or more appropriate requirement/level for the building type). b. For naturally ventilated buildings: i. Winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design, Table 1.5; or other appropriate industry standard (where this sets a higher or more appropriate requirement/level for the building type). ii. The building is designed to limit the risk of overheating, in accordance with the adaptive comfort methodology outlined in CIBSE TM52: The limits of thermal comfort: avoiding overheating in European buildings or CIBSE TM59: Design methodology for the assessment of overheating risk in homes. One credit: 4. For air conditioned buildings, the PMV (predicted mean vote) and PPD (predicted percentage of dissatisfied) indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool.	MEP		
Design for Future Thermal Comfort	Hea 04-02	**1**	**1**		5. Criteria 1 to 4 are achieved. 6. The thermal modelling demonstrates that the relevant requirements set out in criteria 3 are achieved for a projected climate change environment. 7. Where criterion 6 is not met, the project team demonstrated how the building has been adapted or designed to be easily adapted in future using passive design solutions in order to subsequently meet the requirements under criterion 6. 8. For air conditioned buildings, the PMV and PPD indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool.	MEP		03.08.2020 Stage 3 review: BDP to confirm if this is met.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Thermal zoning and controls	Hea 04-03	**1**	**1**		9. Criteria 1 to 4 are achieved 10. The thermal modelling analysis (criteria 1 to 4) has informed the temperature control strategy for the building and its users. 11. The strategy for proposed heating/cooling system(s) demonstrates that it has addressed the following: a. Zones within the building and how the building services could efficiently and appropriately heat or cool these areas. For example consider the different requirements for the central core of a building compared with the external perimeter adjacent to the windows. b. The degree of occupant control required for these zones, based on discussions with the end user (or alternatively building type or use specific design guidance, case studies, feedback) considers: b.i. User knowledge of building services b.ii. Occupancy type, patterns and room functions (and therefore appropriate level of control required) b.iii. How the user is likely to operate or interact with the system(s), e.g. are they likely to open windows, access thermostatic radiator valves (TRV) on radiators, change air-conditioning settings etc. b.iv. The user expectations (this may differ in the summer and winter) and degree of individual control (i.e. obtaining the balance between occupant preferences, for example some occupants like fresh air and others dislike draughts). c. How the proposed systems will interact with each other (where there is more than one system) and how this may affect the thermal comfort of the building occupants. d. The need or otherwise for an accessible building user actuated manual override for any automatic systems.	MEP		
Hea 05: Acoustic Performance								
Acoustic Performance	Hea 05-01	**3**	**2**	**1**	1. The building meets the appropriate acoustic performance standards and testing requirements defined in Table 5.14 of the guidance manual which defines criteria for the acoustic principles of: a. Sound insulation b. Indoor ambient noise level c. Room acoustics. OR 2. A suitably qualified acoustician (SQA) is appointed to define a bespoke set of performance requirements for all function areas in the building. The bespoke performance requirements use the three acoustic principles defined in criterion Hea05 Acoustic Performance - Criterion 1, setting out the performance requirements for each and the testing regime required.	Acoustician / Contractor		It is thought that at least 2 of the 3 available credits will be achieved.
Hea 06: Security								
Security of Site and Building	Hea 06-01	**1**	**0**	**1**	1. A suitably qualified security specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) during or prior to Concept Design (RIBA Stage 2 or equivalent). The purpose of the SNA will be to identify attributes of the proposal, site and surroundings which may influence the approach to security for the development. 2. The SQSS develops a set of security controls and recommendations for incorporation into the proposals. These controls and recommendations shall directly relate to the threats and assets identified in the preceding SNA. 3. The controls and recommendations shall be incorporated into proposals and implemented in the as-built development. Any deviation from those controls and recommendations shall be justified and agreed with the SQSS.	Architect / Security Consultant MEP / Architect	2	Where the SNA is undertaken after RIBA Stage 2, the credit can still be achieved providing the SQSS confirms that no security measures cannot be implemented due to late consultation. The design team confirmed that this hasn't been undertaken however they will investigate the requirements and it is likely that this credit will be pursued (however it is to remain as a potential for now).
Exemplary Level Criteria	Hea 06-Ex	**1**	**0**		4. To achieve an exemplary level performance credit: A compliant based risk security rating scheme has been used. The performance against the scheme has been confirmed by independent assessment and verification.	Architect		SABRE is currently recognised as a compliant scheme.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Hea 07: Safe and Healthy Surroundings								
Safe Access	Hea 07-01	**1**	**0**	**1**	1. Where external site areas form part of the assessed development the following apply: Dedicated and safe cycle paths are provided from the site entrance to any cycle storage, and connect to off-site cycle paths where applicable. 2. Dedicated and safe footpaths are provided on and around the site providing suitable links for the following: a. The site entrance to the building entrance b. Car parks (where present) to the building entrance c. The building to outdoor space d. Connecting to off-site paths where applicable. 3. Pedestrian drop-off areas are designed off, or adjoining to, the access road and should provide direct access to other footpaths. 4. Where vehicle delivery access to drop-off areas form part of the assessed development, the following apply: a. pedestrian and cyclist paths b. outside amenity areas accessible to building users and general public 5. There is a dedicated parking or waiting area for goods vehicles with appropriate separation from the manoeuvring area and staff and visitor car parking. 6. Parking and turning areas are designed for simple manoeuvring according to the type of delivery vehicle likely to access the site, thus avoiding the need for repeated shunting.	Architect / Landscape Architects		This can be harder to achieve on larger sites, however the design team should endeavour to implement these criteria.
Outside Space	Hea 07-02	**1**	**1**		7. There is an outside space providing building users with an external amenity area.	Architect / Landscape Architects		Current site drawings confirm sufficient external public space to be provided. The space is of an appropriate size to provide enough amenity for the predicted number of building users during coffee or lunch breaks to gather, socialise, relax and connect with the natural environment. The space is predominantly intended for building staff, but can be used by other building users where relevant and beneficial to the building users. The outside space must: – be an outdoor landscaped area, for example a garden, balcony or terrace; the majority of the space should be open to the sky – have appropriate seating areas and be non-smoking, – be located to ensure it is accessible to all building users and avoids areas that will have disturbances from sources of noise (e.g. building services, car parks, busy roads, delivery areas etc.).

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
ENERGY (1 credit = 0.64%)								
Ene 01: Reduction of energy use and carbon emissions								
Energy Performance	Ene 01-01	**9**	**3**	**2**	1. Calculate an Energy Performance Ratio for New Constructions (EPRNC). Compare the EPRNC achieved with the benchmarks in Table 6.1 in the guidance manual and award the corresponding number of BREEAM credits.	MEP		It is thought that at least 3 of the available 9 credits will be achieved.
Prediction of Operational Energy Consumption	Ene 01-02	**4**		**4**	2. Involve relevant members of the design team in an energy design workshop focusing on operational energy performance (methodology to be provided)	MEP / Design Team		Requires TM54 modelling.
					3. Undertake additional energy modelling during the design and post-construction stage to generate predicted operational energy consumption figures. (see Prediction of operational energy consumption on page 125 of the guidance manual - assessor to provide.)	MEP		
					4. Report predicted energy consumption targets by end use, design assumptions and input data (with justifications).			
					5. Carry out a risk assessment to highlight any significant design, technical and process risks that should be monitored and managed throughout the construction and commissioning process.			
Exemplary level criteria	Ene 01-Ex	**2**			6. The building achieves an EPR NC ≥ 0.9 and zero net regulated CO_2 emissions.	MEP		These credits should be investigated.
					7. Energy generation from on-site and near-site LZC sources is sufficient to offset carbon emissions from regulated energy use plus a percentage of emissions from unregulated energy use.			
					8. Award the exemplary credits based on the percentage of additional emissions from unregulated energy that are offset by LZC sources. (Table 6.2 guidance manual).			
	Ene 01-Ex	**3**			9. The building is deemed carbon negative where >100% (see Table 6.2 guidance manual) of carbon emissions from unregulated (and regulated) energy use are offset by energy generated from on-site and near-site LZC sources.	MEP		
	Ene 01-Ex	**2**	**0**	**2**	10. Achieve maximum available credits in Ene 02 Energy monitoring.	MEP		
					11. The client or building occupier commits funds to pay for the post occupancy stage. This requires an assessor to be appointed and to report on the actual energy consumption compared with the targets set in criterion 4.			
					12. The energy model (criterion 3) is: 12.a. Submitted to BRE and 12.b. Retained by the building owner.			
Ene 02: Energy Monitoring								
Sub-metering of end-use categories	Ene 02-01	**1**	**1**		1. Install energy metering systems so at least 90% of the estimated annual energy consumption of each fuel is assigned to the end-use categories.	MEP		**Mandatory for Very Good**
					2. Meter the energy consumption in buildings according to the total useful floor area: a. If the area is greater than 1,000m², by end-use category with an appropriate energy monitoring and management system. b. If the area is less than 1,000m², use either: i. an energy monitoring and management system or ii. separate accessible energy sub-meters with pulsed or other open protocol communication outputs, for future connection to an energy monitoring and management system			
					3. Building users can identify the energy consuming end users, for example through labelling or data outputs.			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Sub-metering of high energy load and tenancy areas	Ene 02-02	**1**	**1**		4. Monitor a significant majority of the energy supply with: a. An accessible energy monitoring and management system for: i. tenanted areas or ii. Relevant function areas or departments in single occupancy buildings OR b. Separate accessible energy sub-meters with pulsed or other open protocol communication outputs for future connection to an energy monitoring and management system for: i tenanted areas ii. relevant function areas or departments in single occupancy buildings. 5. Sub-meter per floor plate in large single occupancy or single-tenancy buildings with one homogenous function, for example hotel bedrooms, offices.	MEP		It is assumed that this will be targeted.
Ene 03: External Lighting								
	Ene 03-01	**1**	**1**		1. No external lighting (which includes lighting on the building, at entrances and signs). OR 2. External light fittings within the construction zone with: a. Average initial efficacy of not less than 70 luminaire lumens per circuit Watt. b. Automatic control to prevent operation during daylight hours. c. Presence detection in areas of intermittent pedestrian traffic.	MEP		
Ene 04: Low carbon design								
Passive design analysis	Ene 04-01	**1**	**1**		1. Achieve the first credit Hea 04 Thermal comfort: One credit - Thermal modelling to demonstrate that the building design delivers appropriate thermal comfort levels in occupied spaces. 2. The project design team analyses the proposed building design and development during concept design to identify opportunities for the implementation of passive design measures. 3. Implement passive design measures to reduce the total heating, cooling, mechanical ventilation, lighting loads and energy consumption in line with the passive design analysis findings. 4. Quantify the reduced total energy demand and carbon dioxide (CO_2) emissions resulting from the passive design measures.	MEP	2	03.08.2020 Stage 3 review: This report hasn't yet been commissioned. BDP to relay requirements to team.
Free Cooling	Ene 04-02	**1**		**1**	5. Achieve the passive design analysis credit. 6. Include free cooling analysis in the passive design analysis carried out under criterion 2. 7. Identify opportunities for the implementation of free cooling solutions. 8. The building is naturally ventilated or uses any combination of the free cooling strategies listed in free cooling analysis.	MEP		Design team to confirm compliance.
Low and zero carbon feasibility study	Ene 04-03	**1**	**1**		9. An energy specialist completes a feasibility study by the end of the concept design. 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. 11. Specify local LZC technologies for the building or development in line with the feasibility study recommendations. 12. Quantify the reduced regulated carbon dioxide (CO_2) emissions resulting from the feasibility study.	MEP	2	03.08.2020 Stage 3 review: This report hasn't yet been commissioned. BDP to relay requirements to team.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Ene 05: Energy Efficient Cold Storage								
Refrigeration Energy Consumption	Ene 05-01	**1**	**1**		1. Design, install and commission the refrigeration system: a. In accordance with the Code of Conduct for carbon reduction in the refrigeration retail sector and BS EN 378-2:2016. busing robust and tested refrigeration systems or components included on the Enhanced Capital Allowance Energy Technology Product List or and equivalent list. 2. Commission the refrigeration plant in compliance with the commissioning criteria in BREEAM issue Man 04 Commissioning and handover.	MEP / Contractor		The design team have confirmed that a walk in fridge is currently specified. If this is scoped out of the design, providing there is no other commercial or industrial scale cold storage within the development, this issue will be scoped out. It is assumed that at least 1 of the 2 available credits under this issue will be targeted.
Indirect Greenhouse Gas Emissions	Ene 05-02	**1**		**1**	3. Achieve criteria 1 and 2. 4. Demonstrate a saving in indirect greenhouse gas emissions (CO_2-eq) from the installed refrigeration system over the course of its operational life.	Contractor		
Ene 06: Energy Efficient Transportation Systems								
Energy Consumption	Ene 06-01	**1**	**1**		1. For specified lifts, escalators and moving walks (transportation types) : 1.a. Analyse the transportation demand and usage patterns for the building to determine the optimum number and size of lifts, escalators and/or moving walks. b. Calculate the energy consumption in accordance with BS EN ISO 25745 Energy performance of lifts, escalators and moving walks, Part 2 : Energy calculation and classification for lifts (elevators) and/or Part 3 - Energy calculation and classification for escalators and moving walks, for one of the following: i. At least two types of system (for each transportation type required); OR ii. An arrangement of systems (e.g. for lifts, hydraulic, traction, machine room-less lift (MRL)); OR iii. A system strategy which is 'fit for purpose'. c. Consider the use of regenerative drives, subject to the requirements in the guidance manual. d. Specify the transportation system with the lowest energy consumption.	Lift Consultant / Architect / Contractor / TBC		It is thought these credits will be required to achieve Very Good.
Energy efficient features	Ene 06-02	**1**	**1**		2. Criterion 1 is achieved. 3. Specify the following three energy efficient features for each lift: a. A standby condition for off-peak periods. b. The lift car lighting and display lighting provides an average luminous efficacy, (across all fittings in the car) of > 70 luminaire lumens/circuit Watt. c. The lift uses a drive controller capable of variable speed, variable-voltage, and variable-frequency (VVVF) control of the drive motor. 4. Specify regenerative drives where their use is demonstrated to save energy.	MEP / Contractor		As above.
Ene 08: Energy Efficient Equipment								
	Ene 08-01	**2**	**0**	**2**	1. Identify the building's unregulated energy consuming loads and estimate their contribution to the total annual unregulated energy consumption of the building, assuming a typical/standard specification. 2. Identify the systems and/or processes that use a significant proportion of the total annual unregulated energy consumption of the building. 3. Demonstrate a meaningful reduction in the total annual unregulated energy demand of the building. Table 6.5 in the guidance manual 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 should justify how a meaningful reduction will be achieved for these contributors.	Client / MEP		Potential credits, however they are typically difficult to achieve. Sources of unregulated energy (for BREEAM Ene 08 purposes) include: - Data centres - IT-intensive operating areas - Domestic - scale appliances (white goods) - Kitchen and catering facilities

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
TRANSPORT (1 credit = 0.83%)								
Tra 01: Transport Assessment and Travel Plan								
Travel Plan	Tra 01-01	**2**		**2**	1. No later than Concept Design stage, undertake a site-specific transport assessment (or develop a travel statement) and draft travel plan, which can demonstrably be used to influence the site layout and built form.	Transport Consultant	2	The existing statement is largely compliant. It is likely that this credit will therefore be achieved, however it has been requested that it remain as a potential for now.
					2. The site-specific travel assessment or statement covers as a minimum: a. Existing travel patterns and opinions of existing building or site users towards cycling and walking, identifying constraints and opportunities if relevant. b Travel patterns and transport impacts of future building users c. Current local environments for walkers and cyclists (accounting for visitors who may be accompanied by young children.) d. Reporting the number and type of existing accessible amenities, see table 7.1 in the guidance manual, within 500m of the site. e. Disabled access (accounting for varying levels of disability and visual impairment). f. Calculation of the existing public transport Accessibility Index. g. Current facilities for cyclists.			
					3. Following a transport assessment (in accordance with the requirements set out in criteria 2), develop a site-specific travel plan that provides a long term management strategy which encourages more sustainable travel. The travel plan includes measures to increase or improve more sustainable modes of transport and movement of people and goods during the building's operation.	Transport Consultant		
					4. If the occupier is known, involve them in the development of the travel plan.	Client		
					5. Demonstrate that the travel plan will be implemented and supported by the building's management in operation.			
Tra 02: Sustainable Transport Measures								
Sustainable Transport Measures	Tra 02-Pre	**-**	**-**	**-**	1. A travel plan is developed in line with the Tra 01 criteria.	Architect		As the accessibility index is <25, each Tra 02 point equates to 1 credit. There is 1 point for having an AI >8. The assessor has calculated the site's AI as 6.54 however it is thought that this is due to the revised timetables following lockdown. This may increase as / if services return to normal. Cycle storage: There are different requirements for 'large retail' and 'small retail'. Currently assumed this will be classed as small retail. If so, a total of 4 spaces are required within the proximity of the building (required for staff only). For large retail, 1 space per 10 staff and 1 per 20 public parking spaces are required. The team have confirmed that 20 spaces are to be provided (10 dedicated to the market hall). Separate staff spaces are encouraged but are not essential providing there are at least 10 customer cycle spaces. The design team confirmed that cyclist facilities will not be provided to the market hall.
	Tra 02-01	**10**	**3**	**2**	2. Identify the sustainable transport measures in table 7.4 of the guidance manual			
					3. Award credits according to the Accessible Index of the project and the total number of points achieved for the options implemented. (See table 7.3 of the guidance manual.)* * Current targeted points include: - Provide a real-time public transport information system in a publically accessible area, to allow building users access to up-to-date information on the available public transport and transport infrastructure. This may include signposting to public transport, cycling, walking infrastructure or local amenities. (1 point) - At least 3 existing and compliant amenities are present (this will be achieved). (1 point) - Provide compliant cycle spaces (1 credit)			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
WATER (1 credit = 0.78%)								
Wat 01: Water Consumption								
Water Consumption	Wat 01-01	**5**	**3**	**2**	1. Use the BREEAM Wat 01 calculator to assess the efficiency of the domestic water-consuming components. 2. Use the standard Wat01 method to compare the water consumption (litres/person/day) for the assessed building against a baseline performance. Award BREEAM credits based upon the following: 1 credit: 12.5% 2 credits: 25% 3 credits: 40% 4 credits: 50% 5 credits: 55% Where it is not possible to use the standard method, and for some building types, complete the assessment using the alternative Wat 01 method. 3. If a greywater or rainwater system is specified, use its yield in L/person/day to offset potable water demand from components. 4. If a greywater or rainwater system is specified and installed: a. Greywater systems in compliance with BS 8525-1:2010 Greywater systems - Part 1 Code of Practice. b. Rainwater systems in compliance with BS 8515:2009+A1:2013 Rainwater harvesting systems - Code of practice Achieve Assessment scope - Criterion 6 on page 201, if you intend to pursue a post occupancy stage certification.	Architect		**At least 1 credit must be achieved for Very Good certification** It is thought that at least 3 of the 5 available credits will be targeted.
Exemplary level criteria	Wat 01-Ex	**1**	**0**		To achieve an exemplary performance credit: 7. Achieve criteria 1 to 4. 8. The water consumption (litres/person/day) for the assessed building achieves the 65% improvement described as exemplary performance in Table 8.1 of the guidance manual.	Architect		Rainwater or greywater harvesting would be required.
Wat 02: Water Monitoring								
Water Monitoring	Wat 02-01	**1**	**1**		1. The specification of a water meter on the mains water supply to each building; this includes instances where water is supplied via a borehole or other private source. 2. Water-consuming plant or building areas, consuming 10% or more of the building's total water demand: a. Fit easily accessible sub-meters OR b. Install water monitoring equipment integral to the plant or area. 3.For each meter (main and sub): a. Install a pulsed or other open protocol communication output AND b. Connect it to an appropriate utility monitoring and management system e.g. a building management system (BMS), for the monitoring of water consumption. If there is no BMS system in operation at Post-Construction stage, award credits provided that the system used enables connection when the BMS becomes operational. 4. In buildings with swimming pools, or large water tanks and aquariums, fit separate sub-meters on the water supply of the above and any associated changing facilities (toilets, showers etc.) irrespective of their water consumption levels. 5. In buildings containing laboratories, fit a separate water meter on the water supply to any process cooling loop for 'plumbed in' laboratory process equipment, irrespective of their water consumption levels. 6. *Additionally for those pursuing a post occupancy stage certification:* The water monitoring strategy used enables the identification of all water consumption for sanitary uses as assessed under Wat 01 (litres/person/day) if a post occupancy stage certification is sought.	MEP		**Criterion 1 is mandatory** 03.08.2020 Stage 3 review: BDP to review metering strategy to confirm compliance. On sites with multiple units, fit separate submeters on the water supply to the following areas (where present): – Each individual unit supplied with water – Common areas (covering the supply to toilet blocks) – Service areas (covering the supply to outlets within storage, delivery, waste disposal areas etc.) – Ancillary or separate buildings to the main development with water supply.

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Wat 03: Water Leak Detection and Prevention								
Leak detection system	Wat 03-01	**1**	**1**		1. Install a leak detection system capable of detecting a major water leak: a. On the utilities water supply within the buildings, to detect any major leaks within the buildings AND b. Between the buildings and the utilities water supply, to detect any major leak between the utilities supply and the buildings under assessment. 2. The leak detection system is: a. A permanent automated water leak detection system that alerts the building occupants to the leak OR an inbuilt automated diagnostic procedure for detecting leaks. b. Activated when the flow of water passing through the water meter or data logger is at a flow rate above a pre-set maximum for a pre-set period of time. This usually involves installing a system which detects higher than normal flow rates at meters or sub-meters. It does not necessarily require a system that directly detects water leakage along part or the whole length of the water supply system. c. Able to identify different flow and therefore leakage rates e.g. continuous, high or low level, over set time periods. Although high and low level leakage rates are not specified, the leak detection equipment installed must have the flexibility to distinguish between different flow rates to enable it to be programmed to suit the building type and owners or occupiers usage patterns. d. Programmable to suit the owner's or occupiers water consumption criteria. e. Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers. Where there is physically no space for a leak detection system between the utilities water meter and the building, alternative solutions can be used, provided that a major leak can still be detected.	MEP		
Flow control devices	Wat 03-02	**1**	**1**		2. Install flow control devices that regulate the supply of water to each WC area/sanitary facility according to demand, in order to minimise undetected wastage and leaks from sanitary fittings and supply pipework.	MEP		
Wat 04: Water Efficient Equipment								
Water efficient equipment	Wat 04-01	**1**	**1**		1. Identify all water demands from users other than those considered under Wat 01 that could be realistically mitigated or reduced. Where there is no water demand from uses other than domestic -style, sanitary use components in the building, this issue is not applicable. 2. Identify systems or processes to reduce the relevant water demand (criterion 1) and establish, through either good practice design or specification, a demonstrable reduction in the total water demand of the building.	Architect		For the purposes of this BREEAM Issue, non-domestic scale, non- sanitary water uses refer to any building integrated water uses not assessed under Wat 01. This includes, but is not limited to the following: – Swimming pools – Recreational hot tubs and hydrotherapy pools – Equipment used for irrigation – Vehicle wash equipment – Project-specific industrial processes – Water filtration and treatment processes – Building services (e.g. cooling towers and humidification systems. It is assumed that irrigation will be required but that this will be done by hand.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
MATERIALS (1 credit = 1.07%)								
Mat 01: Life Cycle Impacts								
Superstructure	Mat 01-01	**6**	**0**		**Option appraisal during Concept Design (all building types).** 4. During Concept Design, identify opportunities for reducing environmental impacts as follows: a. Carry out building LCA options appraisal of 2 to 4 significantly different superstructure design options (applicable to the Concept Design stage) b. Use a building LCA tool that is recognised by BREEAM (as suitable for assessing superstructure during Concept Design) according to the methodology. c. For each design option, fulfil the same functional requirements specified by the client and all statutory requirements (to ensure functional equivalency). d. Integrate the LCA options appraisal activity within the wider design decision-making process. Record this in an options appraisal summary document. e. Record the following in the Mat 01/02 Results Submission Tool: The differences between the design options; the design option selected by the client to be progressed beyond Concept Design; the reasons for selecting it and the reasons for not selecting the other design options. f. Submit the Mat 01/02 Results Submission Tool to BRE at the end of Concept Design, and before planning permission is applied for (that includes external material or product specifications). If the building LCA tool recognised by BREEAM and used for criteria 3 to 5 (and 6 to 9, if pursued) is not an IMPACT Compliant LCA tool and criteria 1 to 2 are applicable, then BREEAM Simplified Building LCA tool (or an IMPACT Compliant LCA tool) shall be used for criteria 1 to 2.	Architect / BREEAM Assessor	2	These credits cannot be achieved where the analysis hasn't been carried out and evidence uploaded to the BRE prior to completion of RIBA Stage 2.
					Options appraisal during Technical Design (all building types) 5. During Technical Design identify opportunities for reducing environmental impacts as follows: a. Carry out building LCA options appraisal of 2 to 3 significantly different superstructure design options (based on the selected Concept Design option and as applicable to the Technical Design stage). b. Use a building LCA tool that is recognised by BREEAM (as suitable for assessing superstructure during Technical Design) according to the methodology. c. As criteria 4.c. to 4.e. above. Where an options appraisal summary document was produced during Concept Design, update it to include the Technical Design options. d. Submit the Mat 01/02 Results Submission Tool to BRE at the end of Technical Design. Where a project has not achieved criteria 3 and 4, criterion 5 may still be achieved.	Architect / BREEAM Assessor	4	2 credits may be available.
Substructure and Hard Landscaping options appraisal During Concept Design	Mat 01-02	**1**	**0**		6. Criteria 3 and 4 are achieved. 7. During Concept Design identify opportunities for reducing environmental impacts as follows: a. Carry out building LCA options appraisal of a combined total of at least six significantly different substructure or hard landscaping design options (at least two shall be substructure and at least two shall be hard landscaping). b. Using a building LCA tool that is recognised by BREEAM (as suitable for assessing substructure and hard landscaping during Concept Design) according to the methodology. c As criteria 4.c. to 4.f.	Landscape Architect / C&S Engineers / BREEAM Assessor	2	As per issue Mat 01-01, this credit is no longer available.
Exemplary Performance Criteria	Mat 01-Ex1	**1**	**0**		8. Criteria 3-4 are achieved. 9.During Concept Design, identify opportunities for reducing environmental impacts as follows: a. Carry out building LCA options appraisal of at least 3 significantly different core building services design options. b. Use a building LCA tool that is recognised by BREEAM (as suitable for assessing core building services during Concept Design) according to the methodology. c. As criteria 4.c.to 4.f.	MEP / BREEAM Assessor	2	As per issue Mat 01-01, this credit is no longer available.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Exemplary Performance Criteria	Mat 01-Ex2	**1**	**0**		10. Achieve criteria 3 to 5.	Cost Consultant / Architect / MEP / BREEAM Assessor		As per issue Mat 01-01, this credit is no longer available.
					11. Achieve the Elemental LCC plan and Component Level LCC options appraisal credits (Man 02 Life cycle cost and service life planning).			
					12. Include design options appraised for criteria 3 to 4 (and 6 to 7 and 8 to 9, if pursued) during Concept Design in Assessment scope- The elemental LCC plan.			
					13. Include the design options appraised for criterion 5 during Concept Design in the 'Component Level LCC option appraisal' (in Man 02 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'.			
	Mat 01-Ex3	**1**	**0**		15.Criteria 1 to 7 (As applicable to the building type) are achieved.	TBC		
					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 of the guidance manual.			
					18. Include details of the suitable 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 02: Environmental Impacts from Construction Products - Environmental Product Declarations (EPD)								
Specification of products with a recognised EPD	Mat 02-01	**1**	**1**		1. Specify construction products with EPD that achieve a total EPD points score of at least 20, according to methodology.	Architect / Contractor		
					2. Enter the details of each EPD into the Mat 01/02 Results Submission Tool, including the material category classification. The mat 01/02 results submission tool will verify the EPD points score and credit award.	BREEAM assessor		
Mat 03: Responsible Sourcing of Construction Products								
Ensuring Sustainable Procurement	Mat 03-Pre	**-**	**-**	**-**	1. All timber and timber based products used on the project is ' Legally harvested and traded timber' as per the UK government's Timber Procurement Policy (TPP)	Contractor		**Criterion 1 is mandatory** If a sustainable procurement plan was in place at Stage 1 then Mat 03-01 could be available.
	Mat 03-01	**1**		**1**	2. A sustainable procurement plan must be used by the design team to guide specification towards sustainable construction products. The plan must: a. Be in place before Concept Design b. Include sustainability aims, objectives for the credit to be awarded but justification must be provided for targets that are not achieved. c. Include a requirement for assessing the potential to procure construction products locally. There must be a policy to procure construction products locally where possible. d. Include details of procedures in place to check and verify the effective implementation of the sustainable procurement plan. In addition if the plan is applied to several sites or adopted at an organisational level it must: e. Identify the risks and opportunities of procurement against a broad range of social, environmental and economic issues following the process set out in BS ISO 20400:2017.	Architect	1	
Measuring responsible sourcing	Mat 03-02	**3**	**2**	**1**	3. Use the Mat 03 calculator tool and methodology to determine the number of credits achieved for the construction products specified or procured. Credits are awarded in proportion to the scope of the assessment and the number of points achieved. (Use table 9.10 in the guidance manual).	Contractor		

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Mat 05: Designing for durability and resilience								
Designing for durability and resilience	Mat 05-01	**1**	**1**		**Protecting vulnerable parts of the building from damage** 1. Protection measures are incorporated into the building's design and construction to reduce damage to the building's fabric or materials in case of accidental or malicious damage occurring. These measures must provide protection against: a. Negative impacts of high user numbers in relevant areas of the building (e.g. corridors, lifts, stairs, doors etc.) b. Damage from any vehicle or trolley movements within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas. c. External building fabric damage by vehicle. Protection where parking or manoeuvring areas are within 1 metre of the building facade and where delivery areas or routes are within 2 metres of the facade i.e. specifying bollards or protection rails. d. Potential malicious damage to building materials and finishes in public and common areas where appropriate.	Architect / Landscape Architects		Key exposed building elements in the context of this issue are those adding up to at least 80% by area of each of the following categories: 1. External walls and cladding 2. Roof or balconies 3. Glazing: windows, skylights 4. Hard landscaping
					Protecting exposed parts of the building from material degradation 2. Key exposed building elements have been designed and specified to limit long and short term degradation due to environmental factors. This can be demonstrated through one of the following: a. The element or product achieving an appropriate quality or durability standard or design guide, see Table 9.14 of the guidance manual. If none are available use BS 7543:2015 as the default appropriate standard. OR b. A detailed assessment of the element's resilience when exposed to the applicable material degradation and environmental factors.			
					3. Include convenient access to the roof and façade for cost-effective cleaning, replacement and repair in the building's design.			
					4. Design the roof and façade to prevent water damage, ingress and detrimental ponding. See Table 9.14 in the guidance manual for an example list of relevant industry durability and quality standards.			
Mat 06: Material efficiency								
Material efficiencies	Mat 06-01	**1**	**1**		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: a. Preparation and Brief b Concept Design c. Developed Design d Technical design e. Construction	Architect	1 to 5	
					2. Develop and record the implementation of material efficiency during: a. Developed Design b. Technical Design c. Construction			
					3. Report the targets and actual material efficiencies achieved.			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
WASTE (1 credit = 0.60%)								
Wst 01: Construction Waste Management								
Pre-Demolition Audit	Wst 01-01	**1**	**0**	**1**	1. Complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition. This must be used to determine whether refurbishment or reuse is feasible and, in the case of demolition, to maximise the recovery of material for subsequent high grade or value applications. The audit must cover the content of pre-demolition audit scope and: a. Be carried out at Concept Design stage (RIBA Stage 2) by a competent person prior to strip-out or demolition works. b. Guide the design, consider materials for reuse and set targets for waste management. c. Engage all contractors in the process of maximising high grade reuse and recycling opportunities. d. Compare actual waste arisings and waste management routes used with those forecast and investigate significant deviations from planned targets.	Project Manager / Demolition Contractor	2	It is thought that a pre-demolition audit was not undertaken. Pre-demolition audit competent person: An individual who has appropriate knowledge of buildings, waste and options for reuse and recycling of different waste streams. Ideally this would be a demolition contractor, but could also be the main contractor.
					2. Make reference to the audit in the resource management plan (RMP).	Contractor		
Construction resource efficiency	Wst 01-02	**3**	**2**	**1**	3. Prepare a compliant Resource Management Plan (RMP) covering: a. Non-hazardous waste materials (from on-site construction and dedicated off-site manufacturer or fabrication) including demolition and excavation waste. b. Accurate data records on waste arising's and waste management routes.	Contractor		
					4. Meet or improve upon the benchmarks below for non-hazardous construction waste, excluding demolition and excavation waste: Amount of waste generated per 100m2 GIFA: 1 credit: ≤ 13.3m3 actual volume (not bulk) / ≤ 11.1 tonnes 2 credits: ≤ 7.5m3 actual volume (not bulk) / ≤ 6.5 tonnes 3 credits: ≤ 3.4m3 actual volume (not bulk) / ≤ 3.2 tonnes Exemplary level: ≤ 1.6m3 actual volume (not bulk) / ≤ 1.9 tonnes			
Diversion of resources from landfill	Wst 01-03	**1**	**1**		5. Meet, where applicable, the diversion from landfill benchmarks below for non-hazardous construction waste and demolition and excavation waste generated: Non-demolition: 70% volume / 80% tonnage Demolition: 80% volume / 90% tonnage Excavation: n/a			
					6. Sort waste materials into separate key waste groups as per Table 10.3 of the guidance manual, either on-site or through a licensed contractor for recovery.			
Exemplary Performance Criteria	Wst 01-Ex	**1**	**0**	**1**	7. Non-hazardous construction waste generated, excluding demolition and excavation waste is less than or equal to the exemplary level resource efficiency benchmarks: Exemplary level: ≤ 1.6m2 actual volume (not bulk) / ≤ 1.9 tonnes	Contractor		
					8. The percentage of non-hazardous construction (on-site and dedicated off-site manufacture/fabrication), demolition and excavation waste (if relevant) diverted from landfill meets or exceeds the exemplary level percentage benchmarks outlined below: Non-demolition: 85% volume / 90% tonnage Demolition: 85% volume / 95% tonnage Excavation: 95% volume / 95% tonnage			
					9. All key waste groups in Table 10.3 of the guidance manual, for diversion from landfill are covered in the RMP.			
					10. Waste data obtained from licenced external waste contractors is reliable and verifiable, by using data from EA/SEPA/EA Wales/NIEA Waste Return Forms or from PAS 402:2013 compliant company.			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Wst 02: Recycled Aggregates								
Pre-Requisite	Wst 02-Pre	-	-	-	1. If demolition occurs on site, to encourage the reuse of site-won material on site, complete a pre-demolition audit of any existing buildings, structures or hard surfaces in accordance with Assessment scope- Criterion 1 and Assessment Scope - Criterion 2	Pre-demolition contractor		03.08.2020 Stage 3 review: Curtins to review if these credits can be achieved. Assessor has issued calculator tool and methodology.
Sustainable Aggregate Points	Wst 02-01	1	0	1	2. Identify all aggregate uses and types on the project Table 10.5, and Table 10.6 in the guidance manual. 3. Determine the quantity in tonnes for each identified use and aggregate type. 4. Identify the region in which the aggregate source is located. 5. Calculate the distance in kilometres travelled by all aggregates by transport type. 6. Enter the information into the BREEAM Wst 02 calculator to calculate the Project Sustainable Aggregate points. The corresponding number of BREEAM credits will be awarded (refer to Table 10.4 in the guidance manual).	C&S Engineers		
Exemplary Performance Criteria	Wst 02-Ex	1	0		To achieve an exemplary performance credit: 7. The Project Sustainable Aggregate Points score meets or exceeds the exemplary level performance benchmark in Table 10.4 of the guidance manual.	C&S Engineers		
Wst 03: Operational Waste								
Operational Waste	Wst 03-01	1	1		1. Provide a dedicated space for the segregation and storage of operational recyclable waste generated. The space is: a. Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams b. Accessible to building occupants or facilities operators for the deposit of materials and collections by waste management contractors c. Of a capacity appropriate to the building type, size, number of units (if relevant) and predicted volumes of waste that will arise from daily/weekly operational activities and occupancy rates.			For shopping centres and retail parks there must be adequate space to cater for each tenant and their potential recyclable waste volumes. Tenants that occupy a large proportion of the centre, i.e. 'flagship tenants', must have their own dedicated compliant facilities. For smaller non-flagship tenant units, compliant central or common facilities on site or dedicated spaces for individual units will meet the assessment criteria for this BREEAM issue.
					2. For consistent and large amounts of operational waste generated, provide: a. Static waste compactors or balers; situated in a service area or dedicated waste management space b. Vessels for composting suitable organic waste OR adequate spaces for storing segregated food waste and compostable organic material for collection and delivery to an alternative composting facility c. A water outlet provided adjacent to or within the facility for cleaning and hygiene purposes where organic waste is to be stored or composted on site.	Architect		
Wst 05: Adaptation to climate change								
Resilience of structure, fabric, building services and renewables installation	Wst 05-01	1	1		1. Conduct a climate change adaptation strategy appraisal using: a. A systematic risk assessment to identify the impact of expected extreme weather conditions arising from climate change on the building over its projected life cycle. The assessment covers the installation of building services and renewable systems, as well as structural and fabric resilience aspects and includes: i. Hazard identification ii. Hazard assessment iii. Risk estimation iv. Risk evaluation v. Risk management.	Architect / MEP / C&S Engineers	2	
					2. Develop recommendations or solutions based on the climate change adaptation strategy appraisal, before or during concept design, that aim to mitigate the identified impact.			
					3. Provide an update during Technical Design demonstrating how the recommendations or solutions proposed at Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing by the assessor.	Architect / MEP / C&S Engineers	4	

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Exemplary Criteria	Wst 05-Ex	**1**	**0**	**1**	Achievement of the following criteria demonstrates a holistic approach to the design and construction of the building's life cycle to mitigate against the impacts of climate change. To achieve an exemplary level performance credit: 4. Meet criteria 1-3. 5. Meet the criteria or achieve credits of the assessment issues given below: - Hea 04: Criterion 6 - Ene 01: Minimum 6 credits - Ene 04: Passive design credit - Wat 01: Minimum 3 credits - Mat 05: Criteria 2 - 4 - Pol 03: Minimum 1 credit for flood resilience and 2 credits under Surface Water Runoff	Design Team		
Wst 06: Design for Disassembly and Adaptability								
Recommendations	Wst 06-01	**1**	**1**		1. Conduct a study to explore the ease of disassembly and the functional adaptation potential of different design scenarios by the end of Concept Design. 2. Develop recommendations or solutions based on the study during or prior to Concept Design, that aim to enable and facilitate disassembly and functional adaptation.	Architect	2	
Implementation	Wst 06-02	**1**	**1**		3. Achieve criteria 1 and 2. 4. Provide an update, during Technical Design, on: a. How the recommendations or solutions proposed by Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing to the assessor. b. Changes to the recommendations and solutions during the development of the Technical Design, 5. Produce a building adaptability and disassembly guide to communicate the characteristics allowing functional adaptability and disassembly to prospective tenants.	Architect	4	
LAND USE AND ECOLOGY (1 credit = 1.00%)								
LE 01: Site Selection								
Previously Occupied Land	LE 01-01	**1**	**1**		1. At least 75% of the proposed development's footprint is on an area of land which has previously been occupied.	Architect		100% of the site is on previously developed land and as such this will be achieved.
Contaminated Land	LE 01-02	**1**	**0**	**1**	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: a. The degree of contamination b. The contaminant sources/types c. The options for remediating sources of contamination which present an unacceptable risk. 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.	C&S Engineers		It is assumed that the site is not significantly contaminated.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
LE 02: Ecological Risks and Opportunities								
Pre-Requisite (Statutory Obligations)	LE 02-Pre	-	-	-	1. The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.	Contractor		It is assumed that Route 2 will be used as there is potential to influence ecology / green infrastructure. Where criterion 2 is not completed at Stage 1, this can occur later providing the ecologist's input can influence the design. This credit is required in order to achieve any credits under LE 03.
Survey and evaluation	LE 02-01	**1**	**1**		**Foundation route (Route 1)** 1. The site is evaluated using the BREEAM Ecological Risk Evaluation Checklist (Guidance Note 34) confirming that the Foundation route can be used.	Design Team		
					Comprehensive route (Route 2) 2. A Suitably Qualified Ecologist (SQE) carries out a survey and evaluation (see Methodology) for the site early enough to influence site preparation works, layout and, where necessary, strategic planning decisions (typically Preparation and brief stage) (see Definitions).	Ecologist / Design Team	1	
					3. The SQE's survey and evaluation determines the site's ecological baseline, including: a. Current and potential ecological value and condition of the site and related areas within the Zone of Influence. b. Direct and indirect risks to current ecological value from the project. c. Capacity and feasibility for enhancement of the site's ecological value and, where relevant, areas within the Zone of Influence.	Ecologist / Design Team		
					4. Recommendations and data collected from the survey and evaluation are shared with appropriate project team members to influence decisions made for activities during site preparation, design and construction works, which can support ecological features.			
Determining Ecological Outcomes	LE 02-02	**1**	**1**		5. Achieve the LE 02-01 "Survey and Evaluation" credit.	Ecologist / Project Manager	2	This credit is required in order to achieve any further credits under issue LE 03.
					6. The project team liaise and collaborate with representative stakeholders early enough to influence key planning decisions (typically Concept Design stage), to: a. Identify the optimal ecological outcomes for the site. b. Identify, appraise and select measures to meet the optimal ecological outcomes for the site (criterion 7a), in line with the mitigation hierarchy of action, according to the route being used: <u>Comprehensive Route (Route 2):</u> 1. Avoidance 2. Protection 3. Reduction or limitation of negative impacts 4. On site compensation and 5. Enhancement, considering the capacity and feasibility within the site, or where viable, offsite.			
Exemplary level criteria	LE 02-Ex	**1**	**0**	**1**	7. Achieve credit LE 02-02.	Design Team		
					9. Wider sustainability related activities and potential ecosystem service benefits are considered as part of determining the optimal ecological outcomes for the site (criterion 6), including the areas outlined in the Methodology in the BREEAM guidance manual.			
					13. Achieve the credits of the assessment issues outlined below: 13. Both Hea 07 credits 13. Pol 03 credits for 'surface water run-off' and 'minimising watercourse pollution'. 13. Pol 05			

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LE 03: Managing Impacts on Ecology								
Pre-Requisite	LE 03-Pre	-	-	-	1. LE 02's 'Survey and evaluation and Determining ecological outcomes' criteria have been achieved using the Foundation route (Route 1) or the Comprehensive route (Route 2).	Design Team		This must be achieved in order to award LE 03-02. "Further planning" refers to defining and allocating roles and responsibilities towards promoting and protecting ecology, allocating resources (time, money), and putting in place procedures for monitoring effectiveness etc.
Planning and measures on-site	LE 03-01	**1**	**1**		2. Further planning to avoid and manage negative ecological impacts on-site is carried out (see Methodology in guidance manual) early enough to influence the concept design and design brief as well as site preparation planning (typically Concept Design stage).	Design Team	2	
					3. On-site measures for managing negative ecological impacts during site preparation and construction are implemented in-practice (e.g. mitigation measures to protect existing ecological features) (see Methodology in guidance manual).	Contractor		
					4 Criteria 2-3 are based on input from the project team in collaboration with representative stakeholders and data collated as part of the 'Determining ecological outcomes' in LE 02 Ecological risks and opportunities (see Methodology).	Design Team		
Managing Negative Impacts of the Project	LE 03-02	**2**	**2**		**Route 1 (one credit)** 5. Criteria 2 and 3 have been achieved. 6. Negative impacts from site preparation and construction works are managed according to the mitigation hierarchy (see Methodology in guidance manual) and no overall loss (see Definitions) of ecological value has occurred.	Ecologist / Contractor / Design Team		This credit is required to achieve credits under LE 04 and LE 05.
					Route 2 (up to two credits) 7. Criteria 2-4 have been achieved. 8. Negative impacts from site preparation and construction works have been managed according to the mitigation hierarchy, in line with the SQE's recommendations (see Methodology) and, either: a No overall loss of (see Definitions) ecological value has occurred (two credits). OR where criterion 8.a is not possible: b. The loss of ecological value has been minimised (Minimising Loss) (one credit)			
LE 04: Ecological Change and Enhancement								
Pre-Requisite	LE 04-Pre	-	-	-	1. Criterion 6 (for Foundation route) or 8 (for Comprehensive route) in LE 03 has been achieved.	Design Team		At least 1 credit is required to achieve any credits under LE 05. a. Minimising loss of ecological value (one credit - percentage score of 75-94) b. No net loss of ecological value (two credits - percentage score of 95-104) c. Net gain of ecological value (three credits - percentage score of 105-109)
					2. The client or contractor confirms compliance is monitored against all relevant UK, EU or international legislation relating to the ecology of the site.	Contractor		
Change and enhancement of ecology	LE 04-01	**3**	**2**	**1**	**Comprehensive route (Route 2) only** 3. Up to three credits are awarded based on the change in ecological value occurring as a result of the project. This must be calculated in accordance with the process set out in GN36 - BREEAM, CEEQUAL and HQM Ecology Calculation Methodology – Route 2. Credits are awarded in line with the Reward Scale table in GN36 where there are no residual impacts on protected sites or irreplaceable habitats.	Ecologist / Design Team		

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Ecological Enhancement	LE 04-02	**1**	**1**		**Comprehensive route (Route 2) only** 4. Measures have been implemented that enhance ecological value, which are based on input from the project team and SQE in collaboration with representative stakeholders and data collated as part of the 'Determining ecological outcomes' in LE 02 (see Methodology). Measures are implemented in the following order: a. On site, and where this is not feasible, b. Off site within the Zone of Influence.	Ecologist / Contractor / Landscape Architect		
					5. Data collated are analysed and where potentially valuable, provided to the local environmental records centres nearest to, or relevant for, the site.			
Exemplary level criteria	LE 04-EX	**1**	**0**	**1**	7 The change in ecological value occurring is calculated in accordance with the process set out in GN36 - BREEAM, CEEQUAL and HQM Ecology Calculation Methodology – Route 2. The credit is awarded as follows: a. Significant net gain of ecological value (percentage score of 110 or above)	Ecologist / Landscape Architect		
LE 05: Long Term Ecological Management and Maintenance								
Pre-Requisite	LE 05-Pre	**-**	**-**	**-**	1 The client or contractor has confirmed that compliance is being monitored against all relevant UK, EU and international standards relating to the ecology of the site.	Contractor		
					2. The following must be achieved, according to the route being assessed: a. Foundation route (Route 1) - Criterion 6 in LE 03 has been achieved. b. Comprehensive route (Route 2) - Criterion 8 in LE 03 has been achieved, and at least one credit under LE 04 for 'Change and Enhancement of Ecology' has been awarded.			
Planning, liaison, data, monitoring and review management and maintenance	LE 05-01	**1**	**1**		3. Measures have been implemented to manage and maintain ecology throughout the project. These measures are based on input from the project team in collaboration with representative stakeholders and data collated as part of the 'Determining ecological outcomes' in LE 02 (see Methodology). To ensure the optimal ecological outcomes agreed in LE 02 are met in-practice, these measures must monitor and review the effectiveness of the mitigation and enhancement measures in place for LE 03 & LE 04 to ensure they are implemented.	Contractor / Design Team		
					4. A section on Ecology and Biodiversity has been included as part of the tenant or building owner information supplied, to inform the owner or occupant of local ecological features, value and biodiversity on or near the site. This should include detailed management and maintenance plans as required by landscape and asset managers as well as relevant parts of the handover information for occupiers written in a format that encourages understanding and supportive behaviours.	Ecologist / Contractor / Design Team		
Landscape and Ecology Management Plan (or similar) development	LE 05-02	**1**	**1**		5. A Landscape and Ecology Management Plan, or equivalent, has been developed in accordance with BS 42020:2013 Section 11.1(213) covering at least the first five years after project completion as a minimum and including: a. Actions and responsibilities of relevant individuals prior to handover b. The ecological value and condition of the site at handover and how this is expected to develop and change over time c. Identification of opportunities for ongoing alignment with activities beyond the development project, which support the aims of BREEAM's Strategic Ecology Framework d. Identification and guidance to trigger appropriate remedial actions to address previously unforeseen impacts e. Clearly defined and allocated roles and responsibilities for delivering the plan	Ecologist / Landscape Architect		
					6. The landscape and management plan or similar will be updated to support maintenance of the ecological value of the site (see sections relating to Maintenance and Monitoring in CIEEM, CIRIA, IEMA, for helpful guidance).	Client		

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POLLUTION (1 credit = 0.66%)								
Pol 01: Impact of Refrigerants								
Impact of refrigerant	Pol 01-01	**2**	**0**	**2**	**Three credits - No refrigerant use** 1. Where the building does not require the use of refrigerants within its installed plant/systems. OR alternatively, where the building does require the use of refrigerants, the three credits can be awarded as follows: **Pre-requisite** 2. All systems (with electric compressors) must comply with the requirements of BS EN 378:2016 (parts 2 and 3) and where refrigeration systems containing ammonia comply with the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice **Two credits - Impact of refrigerant** 3. Where the systems using refrigerants have Direct Effect Life Cycle CO2 equivalent emissions (DELC CO2e) of ≤ 100 kgCO2e/kW cooling/heating capacity. For systems which provide cooling and heating, the worst performing output based on the lower of kW cooling output and kW heating output is used to complete the calculation. To calculate the DELC CO2e please refer to the Relevant definitions in the Additional information section and the Methodology section. OR 4. Where air-conditioning or refrigeration systems are installed the refrigerants used have a Global Warming Potential (GWP) ≤10. OR **One credit - Impact of refrigerant** 5. Where the systems using refrigerants have Direct Effect Life Cycle CO2equivalent emissions (DELC CO2e) of ≤ 1000 kgCO 2e/kW cooling/heating capacity.	MEP		03.08.2020 Stage 3 review: This will be influenced by the manufacturer's rather than MEP. To be addressed in Stage 4 design. 03.08.2020: Pol 01 calculator tool issued to BDP for review.
Leak detection	Pol 01-02	**1**	**1**		6. All systems are hermetically sealed or only use environmentally benign refrigerants. OR 7. Where the systems are not hermetically sealed: a. Systems have: i. A permanent automated refrigerant leak detection system, that is robust and tested, and capable of continuously monitoring for leaks. OR ii. An inbuilt automated diagnostic procedure for detecting leakage is enabled. b. In the event of a leak, the system must be capable of automatically responding and managing the remaining refrigerant charge to limit loss of refrigerant (see automatic isolation and containment of refrigerant).	MEP		03.08.2020 Stage 3 review: This will be provided.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Pol 02: Local Air Quality								
Local Air Quality	Pol 02-01	**2**	**2**		1. All heating and hot water is supplied by non-combustion systems. For example, only powered by electricity OR alternatively; 2. Emissions from all installed combustion plant that provide space hearing and domestic hot water do not exceed the levels set in Table 12.4 and Table 12.5 in the guidance manual (assessor to provide). The measurements must be provided by manufacturers, following the labelling requirements of the European Directive 2009/125/EC. No credits can be awarded for Pol02 if any of the combustion appliances are not covered in Table 12.4 and Table 12.5 in the guidance manual. 3. Emissions from all installed combustion plant that provide space heating and domestic hot water do not exceed the levels set in table 12.4 and 12.15 of the guidance manual.	MEP		It is thought that use of the ASHPs will secure these 2 credits.
Pol 03: Flood and Surface Water Management								
Flood resilience	Pol 03-01	**2**	**2**		1. An appropriate consultant is appointed to carry out and demonstrate the development's compliance with all criteria. Two credits - Low flood risk 2. A site-specific flood risk assessment (FRA) confirms that the development is in a flood zone that is defined as having low annual probability of flooding. The FRA takes all current and future sources of flooding into consideration. One credit - Medium/high flood risk 3. A site-specific FRA confirms the development is in a flood zone that is defined as having a medium or high annual probability of flooding and is not in a functional floodplain. The FRA must take all current and future sources of flooding into consideration. For smaller sites, refer to Level of detail required in the FRA for smaller sites which overrides criterion 2. 4. To increase the resilience of the development to flooding, one of the following must be achieved: a. The ground level of the building and access to both the building and the site, are designed (or zoned) so they are at least 600mm above the design flood level of the site's flood zone. b. The final design of the building and wider site reflects the recommendations made by an appropriate consultant with the hierarchy approach outlined in section 5 of BS 8533:2017.	C&S Engineers		03.08.2020 Stage 3 review: Curtins confirmed that the site is at a low risk of flooding from all sources and as such these 2 credits will be achieved.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Surface Water Run-off	Pol 03-Pre	-	-	-	5. Surface water run-off design solutions must be bespoke, i.e. they must take account of the specific site requirements and natural or man-made environment of and surrounding the site. The priority levels detailed in the Methodology must be followed, with justification given by the appropriate consultant where water is allowed to leave the site.	C&S Engineers		03.08.2020 Stage 3 review: Curtins confirmed that Pol 03-02 will be achieved (with a 95% improvement as they're limiting runoff to greenfield rates), and that Pol 03-03 will be achieved by default. Brownfield sites: Where the man-made impermeable area draining to the watercourse (natural or municipal) has decreased or remains unchanged post-development, the volume of run-off requirements (criteria 11-16) can be considered as met. Volume calculations will not need to be provided. Instead, drawings clearly showing the impermeable areas of the site draining to the watercourse should be provided for the pre- and post-development scenarios. Figures must also be given (ideally on the drawings) to show a comparison between the areas of drained impermeable surfaces pre- and post-development. In this instance, it is still recommended that any opportunities identified to reduce surface water run-off are implemented.
	Pol 03-02	1	1		**One credit - Surface water run-off - Rate** 6. For brownfield sites, drainage measures are specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) shows a 30% improvement for the developed site compared with the predeveloped site. This should comply at the 1-year and 100-year return period events. 7. For Greenfield sites, drainage measures are specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) is no greater for the developed site than it was for the pre-development site. This should comply at the 1-year and 100-year return period events. 8. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Sustainable Drainage Systems (SuDs) are in place. 9. Calculations include an allowance for climate change. This should be made in accordance with the current best practice planning guidance.	C&S Engineers		
	Pol 03-03	1	1		**One credit - Surface Run-off - Volume** 10. Flooding of property will not occur and in the event of local drainage system failure (caused by either extreme rainfall or a lack of maintenance); AND EITHER 11. Drainage design measures are specified so that the post-development run-off volume, over the development lifetime, is no greater than it would have been prior to the assessed site's development. This must be for the 100-year-6-hour event, including an allowance for climate change. 12. Any additional predicted volume 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 for this credit cannot be achieved): 13. Justification from the appropriate consultant indicating why the above criteria cannot be achieved, i.e. where infiltration or other SuDS techniques are not technically viable options. 14. Drainage design measures are specified so that that post-development peak run-off is reduced to the limiting discharge. The limiting discharge is defined as the highest flow rate from the following options: a. the pre-development one-year peak flow rate b. The mean annual flow rate (Qbar) c 2L/s/ha. For the one-year peak flow rate, the one-year return period event criterion applies. 15. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS are in place. 16. For either option, above calculations must include an allowance for climate change; this should be made in accordance with current best practice planning guidance.	C&S Engineers		
Minimising Water Course Pollution	Pol 03-04	1	0		17. There is no discharge from the developed site for rainfall up to 5mm (confirmed by the Appropriate Consultant). 18. Areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate SuDS techniques. 19. Areas with a high risk of contamination of spillage of substances, such as petrol and oil have separators (or an equivalent system) are installed in surface water drainage systems. 20. Chemical or liquid gas storage areas have a means of containment fitted to the site drainage system (i.e. shut-off valves). This is to prevent the escape of chemicals to natural watercourses in the event of spillage or bunding failure. 21. All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as the SuDS manual and other relevant industry best practice. They must be bespoke solutions taking account of the specific site requirements and natural or man-made environment of and surrounding the site. 22. A comprehensive and up to date drainage plan of the site will be made available for the building or site occupiers. 23. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place. 24. All external storage and delivery areas are designed and detailed in accordance with the current best practice planning guidance.	C&S Engineers		03.08.2020 Stage 3 review: Criterion 17 will not be met.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 59.00%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Pol 04: Reduction of Night Time Light Pollution								
	Pol 04-01	**1**	**1**		1. External lighting pollution has been eliminated through effective design that removes the need for external lighting. This does not adversely affect the safety and security of the site and its users. OR alternatively, where the building does have external lighting one credit can be awarded as follows:	MEP		Awarded.
					2. The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the Institution of Lighting Professionals (LP) Guidance notes for the reduction of obtrusive light, 2011.			
					3. All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00			
					4. If safety or security lighting is provided and will be used between 23:00 and 07:00, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP guidance notes.			
					5. Illuminated advertisements are designed in compliance with IPL PLG05 The Brightness of Illuminated Advertisement.			
Pol 05: Reduction of noise pollution								
	Pol 05-01	**1**	**1**		1. There are no noise-sensitive areas within the assessed building or within 800m radius of the assessed site. OR	Acoustician		
					2. Where there are noise-sensitive areas within the assessed building or noise-sensitive areas within 800m radius of the assessed site, a noise impact assessment compliant with BS4142:2014 is commissioned. Noise levels must be measured or determined for: a. Existing background noise levels: i. at the nearest or most exposed noise-sensitive development to the proposed assessed site. ii. Including existing plant on a building, where the assessed development is an extension to the building. b. Noise rating level from the assessed building			
					3. The noise impact assessment must be carried out by a suitably qualified acoustic consultant.			
					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.	Contractor		
					5. If the noise sources from the assessed building are greater than the levels described in criterion 4, measures have been installed to attenuate the noise at its source to a level where it will comply with the criterion.			

Queens Market Rhyl (Phases 1, 2 and 3)

Sustainability Statement

Date: August 2020
Rev: Planning Issue
Ref: P3001013-SUS
Doc No: QMR-BDP-ZZ-XX-MS-YS-01

Rev	Description	Issued by	Date	Reviewed by	Date
-	Draft	KR and MD	30.07.2020	KR	30.07.2020
1	Planning Issue	KR and MD	05.08.2020	KR	05.08.2020
2	Planning Issue	KR and MD	06.08.2020	KR	06.08.2020

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1. Introduction

This Sustainability Statement has been produced on behalf of ION Development to support the planning application for Phases 1, 2 and 3 of Queens Market, Rhyl. The site, based in Rhyl, Denbighshire, is a key part of the Council's regeneration strategy for Rhyl town centre. The regeneration strategy is guided by the need to reinvent the seaside resort town and reverse many years of decline. The Council has developed a strategy for urban transformation including improvements to the public realm, economic incentives and the promotion of mixed-use development, building restoration and upgraded movement connections across the town. A central theme of the strategy is the restoration of lost connections between the town and its spectacular beach.

The scheme will consist of a new food hall, market area and associated ancillary spaces accommodated with the existing Queens Arcade building. It will provide a new event space forming an extension of the market hall to host a variety of uses ranging from seasonal activities, festivals, performances and exhibitions. The demolition of buildings no longer fit for purpose will allow for the creation of a mixed use scheme offering residential units above a new ground floor frontage consisting of retail, food, and beverage units alongside a new commercial office element offering a one-stop-shop for public services and library space.

The project is split into three phases:

- Phase 1: Market spine (including food hall and associated ancillary space)
- Phase 2 (a and b): Office and library and Block 1 (residences with ground floor retail)
- Phase 3: Blocks 2 and 3 (residences and ground floor retail)

This statement seeks to address the requirements of the Denbighshire County Council Local Development Plan (2006 – 2021) and Denbighshire Local Development Plan (2018 – 2033 – Draft Preferred Strategy), demonstrating how the proposals will comply with the environmental standards set out in terms of sustainable development.

A separate Energy and Part L report has been developed by BDP (Building Physics and MEP), detailing the energy saving and efficiency measures incorporated within the proposed development, based on current levels of design and information available. A summary of the key points are presented in this statement. The Energy and Part L report is included in full in Appendix 2.

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

2. Planning Policy and Drivers

The following planning policies, as detailed within the Local Development Plans, are addressed within this report:

Denbighshire Local Development Plan (2018 – 2033 – Draft Preferred Strategy)

- **Transport and Accessibility**: Developments will be expected to make provision for active travel and green infrastructure as part of their design, and link into wider networks.

- **Waste Management:** Proposals must support the prevention of waste in the first instance and, where this is not possible, minimise the impact on the environment through re-use and recycling of waste.

- **Natural and Built Environment:** All proposals must contribute towards the preservation and, where possible, the enhancement of the natural and built environment.

Denbighshire County Council Local Development Plan (2006 – 2021)

- **Policy RD1 (Sustainable development and good standard design):** The following relevant requirements are reported within this statement:

  Development proposals will be supported within development boundaries provided that all the following criteria are met:

  xi) Satisfies physical or natural environmental considerations relating to land stability, drainage and liability to flooding, water supply and water abstraction from natural watercourses.
  xiii) Incorporates suitable landscaping measures, including where appropriate hard and soft landscaping treatment, the creation and/or protection of green and blue corridors, mature landscaping, and arrangements for subsequent maintenance. Landscaping should create a visually pleasant, sustainable and biodiversity rich environmental that protects and enhances existing landscape features and also creates new features and areas of open space that reflect local character and sense of place.
  xiv) Has regard to the generation, treatment and disposal of waste.

  The remaining requirements of this policy will be reported by others, as appropriate.

- **Policy VOE 6 (Water management):** All development will be required to incorporate water conservation measures, where practicable.

  All development will be required to eliminate or reduce surface water runoff from the site, where practicable. The run-off rates from the site should maintain or reduce pre-development rates.

- **Policy VOE 10 (Renewable energy technologies):** Development proposals which promote the provision of renewable energy technologies may be supported providing they are located as to minimise visual, noise and amenity impacts and demonstrate no unacceptable impact upon the interests of nature conservation, wildlife, natural and cultural heritage, landscape, public healthy and residential amenity. In areas that are visually sensitive, including AONB, Conservation Areas, World Heritage Sites and Buffer Zones in close proximity to historic buildings, visually intrusive technologies will not be permitted unless it can be demonstrated that there is no negative impact on the designation or there is an overriding public need for the development.

Furthermore, in line with national policy objectives and as detailed in Chapter 7 of the Plan, all new non-residential developments over 1,000m^2 on a site over 1ha must meet BREEAM 'Very Good' standards, including meeting the mandatory energy (Ene 01) credits for BREEAM Excellent (currently 4 credits under the BREEAM New Construction 2018 scheme).

3. Sustainability Design Response

The following sections aim to demonstrate the project response the sustainability requirements of the Local Development Plans, and report on the additional sustainability features incorporated into the design.

3.1 BREEAM

A BREEAM pre-assessment exercise has been undertaken for the market hall. Pre-assessments have not yet been undertaken for the remaining phases due to the design of these sections still being in the early stages. It is anticipated, however, that a similar approach will be adopted for the non-residential buildings and residential buildings, noting that BREEAM is only applicable to non-residential buildings and as such not all criteria are appropriate for dwellings.

The design for the proposed market hall applies a wide range of environmental design proposals, as described throughout this report. The Denbighshire County Council Local Development Plan (2006 – 2021) requires developers to demonstrate the incorporation of sustainable construction techniques, including the application of BREEAM 'Very Good' standards.

In addition to compliance with a number of mandatory criteria, BREEAM Very Good requires the design team to achieve a minimum BREEAM score of 55%. Following a review of existing site information and workshop with the design team and developer, a score of 60.28% is anticipated under the BREEAM New Construction 2018 (Retail) scheme. Exceeding the target score provides a buffer should any future changes to design occur or constraints be realised that prevent particular credit criteria from being met. An additional 33.23% worth of credits have been highlighted as being potentially achievable, either requiring further investigation by the design team, or potential changes to the design itself.

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

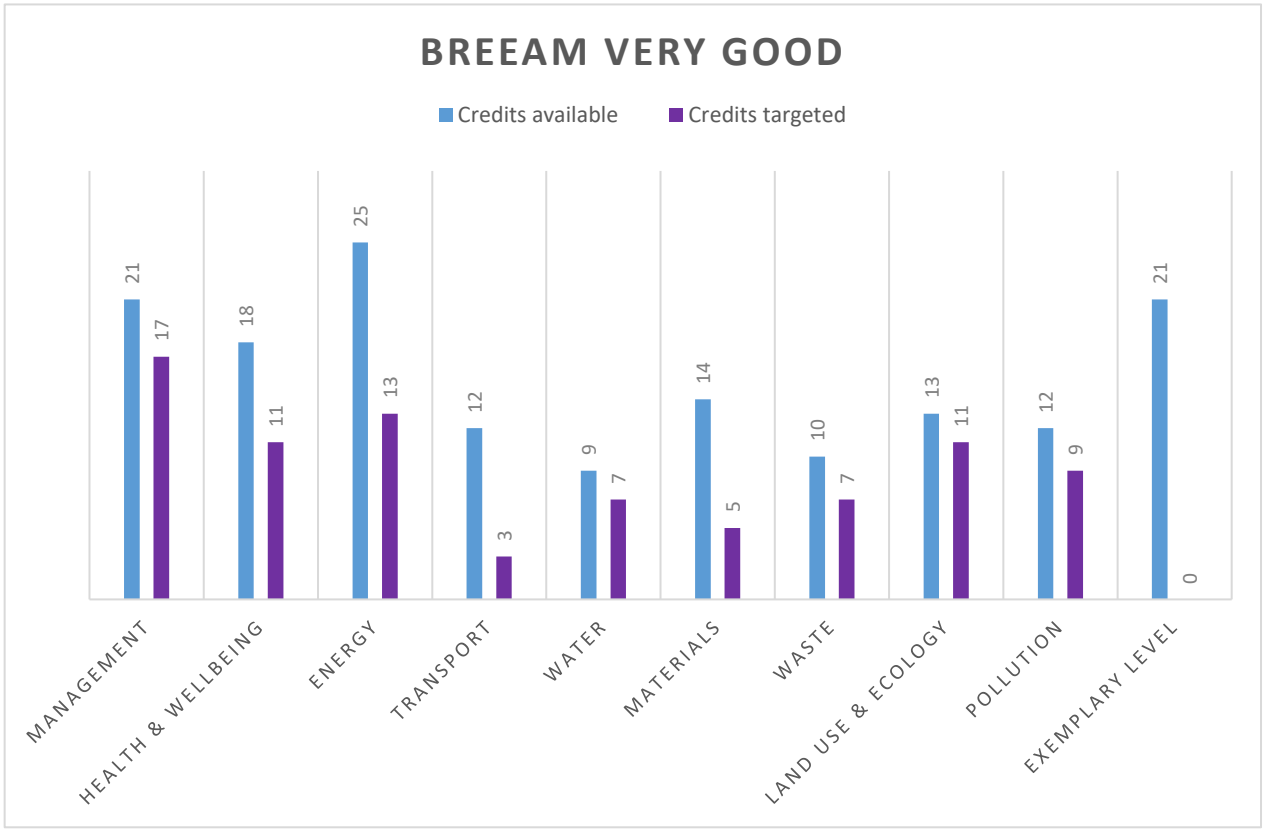

Figure 1: Strategy for achieving BREEAM 'Very Good'

Table 1: Summary score sheet

Category	Credit score (% per credit)	Issue	Credits		
			Available	Targeted	Potential
Management	0.52%	Man 01: Project design and brief	4	2	-
		Man 02: Life cycle cost and service life planning	4	2	-
		Man 03: Responsible construction practices	6	6	-
		Man 04: Commissioning and handover	4	4	-
		Man 05: Aftercare	3	3	-
Health and Wellbeing	0.78%	Hea 01: Visual comfort	5	2	2
		Hea 02: Indoor air quality	4	3	1
		Hea 03: Safe containment in laboratories	n/a	n/a	n/a
		Hea 04: Thermal comfort	3	3	-
		Hea 05: Acoustic performance	3	2	1
		Hea 06: Security	1	-	1
		Hea 07: Safe and healthy surroundings	2	1	1
Energy	0.64%	Ene 01: Reduction of energy use and carbon emissions	13	5	2
		Ene 02: Energy monitoring	2	2	-
		Ene 03: External lighting	1	1	-
		Ene 04: Low carbon design	3	2	1
		Ene 05: Energy efficient cold storage	2	1	1
		Ene 06: Energy efficient transportation systems	2	2	-
		Ene 07: Energy efficient laboratory systems	n/a	n/a	n/a
		Ene 08: Energy efficient equipment	2	-	2
Travel	0.83%	Tra 01: Transport assessment and travel plan	2	-	2
		Tra 02: Sustainable transport measures	10	3	2
Water	0.78%	Wat 01: Water consumption	5	3	2
		Wat 02: Water monitoring	1	1	-
		Wat 03: Water leak detection	2	2	-
		Wat 04: Water efficient equipment	1	1	-
Materials	1.07%	Mat 01: Environmental impacts from construction products – building life cycle assessment	7	-	-
		Mat 02: Environmental impacts from construction products	1	1	-
		Mat 03: Responsible sourcing of construction products	4	2	2
		Mat 05: Designing for durability and resilience	1	1	-
		Mat 06: Material efficiency	1	1	-
Waste	0.60%	Wst 01: Construction waste management	5	3	2
		Wst 02: Use of recycled and sustainably sourced aggregates	1	-	1
		Wst 03: Operational waste	1	1	-
		Wst 04: Speculative finishes	n/a	n/a	n/a
		Wst 05: Adaptation to climate change	1	1	-
		Wst 06: Design for durability and disassembly	2	2	-

Category	Credit score (% per credit)	Issue	Credits		
			Available	Targeted	Potential
Land Use and Ecology	1.00%	LE 01: Site selection	2	1	1
		LE 02: Ecological risks and opportunities	2	2	-
		LE 03: Managing impacts on ecology	3	3	-
		LE 04: Ecological change and enhancement	4	3	1
		LE 05: Long term ecological management and maintenance	2	2	-
Pollution	0.66%	Pol 01: Impact of refrigerants	3	1	2
		Pol 02: Local air quality	2	2	-
		Pol 03: Flood and surface water management	5	4	-
		Pol 04: Reduction of night time pollution	1	1	-
		Pol 05: Reduction of noise pollution	1	1	-
Innovation and exemplary level credits	1.00%	Innovation and exemplary level credits	10	0	10
		Target weighted score rating:	**60.28% 'Very Good'**		
		Additional 'potential' credits (weighted rating)	**33.23%**		

In achieving BREEAM Very Good, the following mandatory requirements will be met:

- Commissioning – test schedule and responsibilities: A schedule of testing and commissioning, developed in line with the appropriate standards and identifying suitable timescales for relevant activities, is required. An appropriate team member will be appointed to monitor and programme pre-commissioning, commissioning and testing (and where relevant, re-commissioning). This ensures that the building operates as expected, reducing the performance gap between predicted design performance and actual as-built performance.

- Building user guide: The provision of a compliant building user guide allows facilities managers, building owners and tenants to better understand the functionality of the building and how to ensure it performs at optimum levels.

- Energy sub-metering: The separate sub-metering of major energy consuming systems (e.g. domestic hot water, space heating, cooling, ventilation, small power and lighting) allows managers and occupants to monitor operational energy consumption by fuel and end-use categories to identify poor performance and changes in consumption patterns. This also allows them to take steps to minimise the performance gap between predicted and actual energy consumption.

- Water consumption: Low water consuming fittings (e.g. taps, toilets and showers) will be specified to achieve a minimum 12.5% improvement in potable water consumption over a notional baseline. It is anticipated that the market hall will exceed this, achieving a 40% improvement.

- Water meters: A water meter, connected to the BMS, must be provided on the mains supply to the building.

- Responsible sourcing of timber: 100% of timber and timber-based products used on the project (including site timber) must be 'legal' and 'sustainable', as per the UK Government's Timber Procurement Policy.

For further details about each credit, please refer to the BREEAM pre-assessment in Appendix 1 of this report.

The sustainability features of the design which will assist in achieving a Very Good rating, as well as the sustainability features of the remaining phases, are discussed in the following sections. As previously discussed, although these sections focus largely on the market hall, it is anticipated that a similar approach will be taken for the remaining non-residential buildings, and residential buildings (as appropriate).

3.2. Management

The adoption of sustainable management practices in connection with design, construction, commissioning, handover and aftercare are being promoted throughout the project, ensuring that robust sustainability objectives are set and followed through into the operation of the building. It further ensures that sustainability is embedded throughout key stages of the design, procurement and initial occupation, from the initial project brief stage to the appropriate provision of aftercare. Key management issues that have been and will be incorporated into the project (in line with BREEAM criteria) are as follows:

- BDP have been employed as Sustainability Consultants since RIBA Stage 1 to assist in optimising the general sustainability credentials and performance of the development, and to assist in setting and managing targets. Within the BDP team are BREEAM Advisory Professionals who will assist the design team in ensuring that BREEAM Very Good is achieved in an efficient manner.

- An elemental lifecycle analysis shall be undertaken for the market hall to assist in improving design, specification, maintenance and operation by encouraging the use of life cycle costing.

- The principal contractor will be required to achieve the full 6 credits under issue Man 03 'Responsible Construction Practices', requiring the site to be managed in an environmentally and socially considerate and responsible manner. They will be required to operate a third party certified environmental management scheme (ISO 14001), in addition to operating and implementing best practice pollution prevention policies and procedures on site in accordance with Pollution Prevention Guidelines, Working at construction and demolition sites: PPG6. All timber used during the construction process of the project will be 'legally harvested and traded timber'. Throughout construction, the principal contractor will be required to monitor, report and analyse results against set targets for the following:

    - Energy consumption as a result of the use of construction plant, equipment (mobile and fixed) and the site accommodation (in both kWh and litres of fuel, where relevant).
    - Potable water consumption (m^3) arising from the use of construction plant, equipment (mobile and fixed) and site accommodation.
    - Transport movements and impacts resulting from the delivery of the majority of construction materials to site and construction waste from site (recorded in total distance travelled in km and total carbon dioxide emissions in $kgCO_2eq$).

- A robust commissioning and handover process will ensure building services and fabric defects are identified and rectified, thereby ensuring that the market hall operates as designed, especially with regards to energy and water consumption.

3.3 Transport

The development has strong public transport links, being situated approximately 0.3 miles walking distance from Rhyl bus station and train station. Accessible public transport, in addition to the proposed cycle storage and cyclist facilities will reduce the need for car based travel to and from the site, thereby reducing the overall emissions associated with the development. In line with BREEAM requirements, it is also anticipated that real-time information on public transport will be provided in publically accessible areas to encourage use and provide information on walking and cycling routes.

Furthermore, BREEAM recognises that access to local amenities further reduces the need for car based transport. The site's central location provides access to a number of additional amenities within 500m walking distance:

- Bank and cash machine (Lloyds Bank, approximately 0.1m from the site)
- Access to outdoor open space (beach front directly opposite the site)
- Post office (approximately 120yds from the site)
- Pharmacy (Boots, approximately 0.1m from the site)
- Doctors surgery (Kings House Surgery, 500m from the site)

The transport assessment, undertaken by Mott MacDonald (report ref: 399989-001-A), further confirms that the site is highly accessible by public transport, walking and cycling, and that the development is unlikely to have any adverse impacts in terms of additional trip generation as visitors to the food hall, exhibition space, library, food and beverage units, and retail elements will be linked to trips to other amenities and employment areas across Rhyl. Staff trips will make up only a small proportion of the overall trip generation of the development, however, as detailed in the Framework Travel Plan (detailed within the transport assessment report), a range of measures will be promoted to encourage sustainable transport. No parking is proposed as part of the development, however there is ample publically available parking capacity for residents, visitors and staff should they wish to make use these.

The Framework Travel Plan measure will be communicated to staff and residents to make them aware of the sustainable travel options available to them, reducing the potential use of car travel.

3.4 Water

3.4.1 Potable water consumption

Due to increasing population densities and relatively high levels of water consumption, much of the UK is at risk of water shortages which are likely to increase over time as rainfall patterns change due to climate change. Reducing water consumption is therefore crucial. In line with BREEAM requirements, the following measures will be implemented within the market hall and external areas to reduce potable water consumption:

- Through the specification of low water consuming taps, showers, WCs, and dishwashers, a 40% improvement in potable water consumption shall be achieved (over the notional baseline).

- The design will incorporate water sub-metering, including the separate sub-metering of individual outlets. In addition to allowing large water consumers to be identified (with a view to reducing this consumption, where appropriate), sub-metering will allow for changes in consumption to be identified and dealt with as appropriate, thereby minimising risks of systems failures.

- Water leak detection systems will be specified. Water leakage within customer's properties represents 6% of the total public water supply in England and Wales. This is equivalent to 25% of the total water leakage, with the remainder being attributed to water distribution systems of the supply companies. The water leak detection systems will be linked to the BMS and will alert building occupants when a leak is detected.

- Flow control devices will be installed to 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.

- Planting will either rely solely on precipitation or watering by hand. As confirmed in the Drainage Strategy report prepared by Curtins (ref: 074024-CUR-00-XX-RP-C-0001 rev V01), the drainage system will provide any tree planting with sufficient watering to ensure healthy growth and reduce maintenance requirements, thereby reducing any need for fixed irrigation systems. Alternatively, any unregulated water demands associated with irrigation will be reduced, e.g. through the use of non-potable water (through rainwater collection) or use of soil-moisture sensors.

3.4.2 Surface water runoff

As the existing site is 100% impermeable, the peak rate and volume of surface water runoff will not increase as a result of the development. As per the Drainage Strategy report prepared by Curtins (ref: 074024-CUR-00-XX-RP-C-0001 rev V01), the current discharge rate from the site is 138 litres/second. Based on the current strategy, the development will discharge a maximum of 4.45 litres/second in all storms up to the 1 in 100-year event +40% for climate change, providing a betterment of 95%. The peak flow under each return period is as follows:

- 1 year: 3.9 litres/second

- QBAR: 4.45 litres/second
- 30 year: 7.9 litres/second
- 100 year + 40% climate change: 9.65 litres/second

To achieve this, restriction flow control is proposed on the final SW chamber prior to connection to the Welsh Water (WW) sewer.

As per the Drainage Strategy report, surface water re-use is currently deemed unsuitable for the development, however as the M&E design develops it is possible that some rainwater could be collected from roof areas and used for maintenance or irrigation.

Although infiltration tests have confirmed that infiltration-based SUDs solutions are not possible for the site, permeable paving and tree pits (and associated underground attenuation tanks) are proposed. In addition to reducing surface water runoff, the permeable paving and tree pits will also assist in removing any contaminants present in attenuated surface water runoff, therefore improving water quality.

3.5 Materials

Although the materials specifications are yet to be confirmed, it is anticipated that the market hall will have a steel frame and cross laminated timber (CLT) mezzanine. Other materials to be specified include brick and timber. The sustainability credentials of these materials are discussed below:

- Steel: Amongst its numerous sustainability credentials, steel is easily reused and recycled, and typically contains a high percentage of recycled material. Steel is unique in that it can be recycled without losing any of its strength or durability. It is also a highly durable material requiring little maintenance, and is resistant to most environmental conditions that are problematic for other materials.

- Cross laminated timber (CLT): CLT is a low impact material with a much lower embodied carbon footprint compared to alternatives such as concrete and steel. Its overwhelming advantage lies in carbon sequestration, with the timber acting as a carbon store and beginning life as a carbon-negative material. Taking into account material, transport, site work and end-of-life, a steel framed CLT building generates nearly half the $C0_2$ emission per square meter as a reinforced concrete one. Furthermore, it is durable and easy to recycle at the end of the building's life.

- Brick: Bricks are essentially 100% recyclable and often reusable at the end of the building's life cycle, thereby distributing their environmental impact over an extended lifespan and promoting the circular economy. There is also an opportunity to introduce recycled content.

- Timber: Timber has the lowest embodied carbon compared to other building materials, it is truly renewable, durable and easily maintained.

In addition to the use of these sustainable materials, the principal contractor will be required to procure materials from manufacturer's who can demonstrate they have been responsibility sourced (e.g. they will need to be BES 6001 or ISO 14001 accredited). They will also need to procure products with Environmental Performance Declaration (EPD certificates). All timber used on the site and with the building will need to be legally harvested and traded, and will be PEFC or FSC certified.

Finally, where buildings are demolished, opportunities for the use of demolition materials will be explored.

3.6 Waste

3.6.1 Operational waste management

As per the BREEAM Wst 03 credit (Operational Waste) criteria, the design will incorporate dedicated space for the segregation and storage of operational recyclable waste. The current strategy allows for 50% of refuse capacity to be dedicated to recyclable waste storage. Composting facilities or additional space to allow for the storage of food waste for collection and delivery to an alternative composting facility will be provided, thereby further reducing waste to landfill.

3.6.2 Construction waste management

Sustainable waste management during construction will be led by the BREEAM credits Wst 01 (Construction Waste Management) which requires the principal contractor to operate a resource management plan (RMP) to promote resource efficiency and prevent illegal waste activities. Resource efficiency includes minimising waste at source to ensure clients, designers and principal contractors assess the use, reuse and recycling of materials and products on the site. The RMP will be written in line with best practice and will define:

- Target benchmarks for resource efficiency
- Procedures and commitments for minimising non-hazardous waste in line with the target benchmark
- Procedures for minimising hazardous waste
- A waste minimisation target and details of waste minimisation actions to be undertaken
- Procedures for estimating, monitoring, measuring and reporting hazardous and non-hazardous site waste.
- Procedures for sorting, reusing and recycling construction waste into defined waste groups, either on-site or through a licensed external contractor
- Procedures for reviewing and updating the plan
- The name or job title of the individual responsible for implementing the above.

As per the BREEAM requirements, the principal contractor will be required to limit the generation of non-hazardous construction waste to ≤7.5m^3 / ≤11.1 tonnes per 100m^2 gross internal floor area and divert at least 80% (tonnage) of non-demolition, and 90% (tonnage) demolition non-hazardous waste from landfill.

3.7 Land Use and Ecology

Enfys Ecology were appointed to carry out a preliminary bat roost assessment, nesting bird check and emergence surveys. As concluded within their report (ref: EE.578.19.PL v1), no evidence of bats was observed, nor were any recorded during the nocturnal emergence surveys. Although evidence of nesting birds, namely swallows, was recorded, it has been advised that as to protect them, no works shall take place during the bird nesting season (April - September). If works are to take place, nesting bird checks will be required.

Following a meeting with the Council's ecologist, and as recommended by Enfys Ecology within their report, it is anticipated that the following ecological and biodiversity enhancement measures shall be implemented:

- Integrated bird / swift boxes
- Wildflower planting (4500m^2 of wildflower habitat to be created offsite)
- Provision of 50 standard trees including native fruiting / flowering species within the Rhyl area.

Moving forward, further on-site measures and recommendations for off-site mitigation will be agreed with the developer and Enfys Ecology. This will support the BREEAM ambitions and credits targeted under the Land Use and Ecology section, which will require the following actions to be carried out:

- Risks and opportunities relevant to ecology to be agreed and strategies put in place to manage these throughout design and construction.
- Agree optimal ecological outcomes for the site, including further onsite and off-site ecological enhancement.

- Consider the use of biodiversity features with regards to improving local ecosystem services.
- Achieve an increase in ecological value post construction.
- Ensure the principal contractor has measures in place to promote and protect ecology throughout the construction stage.

As the site currently comprises residential and commercial properties with no vegetation, the introduction of soft landscaping and planting in the public seating areas will have a positive impact on local ecology and biodiversity.

3.8 Pollution

All systems using refrigerants will be include refrigerant leak detection systems. The typical refrigerants used in building cooling systems are major greenhouse gases that are often more potent that carbon dioxide in their contribution to global warming and climate change. As such, the provision of leak detection will limit the potential release of refrigerant gasses into the atmosphere.

Furthermore, the use of air ASHPs for hot water and space heating, as opposed to boilers, will result in fewer NOx emissions emitted into the atmosphere.

To reduce night time light pollution, the external lighting strategy will be designed in accordance with Table 2 of the Institution of Lighting Professionals (ILP) Guidance notes for the reduction of intrusive light (2011). All external lighting, with the exception of safety and security lighting, will be designed so that it is automatically switched off between the hours of 23:00 and 07:00. If safety or security lighting is required during these hours, this part of the lighting system will comply with the lower levels of lighting recommended in Table 2 of the ILP guidance notes.

As there are noise-sensitive areas within close proximity to the site, the noise levels from any external plant associated with the market hall, as measured in the locality of the nearest or most exposed noise-sensitive development, will be at least 5dB lower than the background noise through the day and night.

3.9 Energy

3.9.1 Market hall

The energy strategy for the market hall is summarised in the BDP Energy and Part L report (see Appendix 2). This confirms that through the following measures, a 24% improvement in carbon emission over Part L 2013 is achieved:

- Heating, cooling and domestic hot water is provided to the building via efficient air source heat pumps (ASHPs).
- Efficient light fittings and controls are specified throughout.
- A 200m^2 PV roof mounted solar array is provided.

Building fabric U-values and remaining details can be found in the Energy and Part L report.

The Part L / BRUKL report confirms that as a result of the energy efficiency measures, 5 BREEAM credits are achieved under issue Ene 01 (Energy Performance), thereby exceeding the minimum requirements for BREEAM Excellent.

In addition to the use of ASHPs and PVs on the scheme, the following additional energy efficiency measures shall be implemented, in line with BREEAM requirements:

- Energy sub-metering will be provided to the market hall to allow for the separate sub-metering of major energy loads. This also provides the possibility to sub-meter different tenancy areas.

- All internal lighting will be LEDs with presence and absence detection and daylight dimming, as required. External lighting will also be LED and will have automatic controls to prevent operation during daylight hours. External light fittings will be specified so that the average initial efficacy is not less than 70 luminaire lumens per circuit Watt.

- Where commercially sized cold storage units are provided by the developer, these shall be energy efficient in line with BREEAM criteria.

- Lifts: If lifts are to be specified, the size and number of lifts shall be informed by a traffic analysis. Any specified lifts will operate on standby condition during off-peak periods, use lift car lighting and display lighting which provides an average luminous efficacy of >70 luminaire lumens / circuit Watt, and uses a drive controller capable of variable speed, variable voltage, and variable frequency control of the drive motor.

3.9.2 Delivery of a low carbon development (all phases)

Whilst the above information considers the energy efficiency and energy efficient features associated with the market hall, the delivery of a low carbon development for the site will be adopted to support Denbighshire County Council's declaration of a climate change emergency and commitment to becoming zero carbon by 2030. The following sections outline the current strategy and concept study for achieving low operational carbon.

3.9.2.1 Reduce operational carbon

Operational carbon is that which is associated with energy used for heating, cooling, cooking, lighting and plug-loads, but excludes commercial process loads and transport (e.g. electric vehicle charging).

Best practice design for low energy use in buildings follows the energy hierarchy, as detailed in Figure 2. This seeks to limit demand through passive measures and efficient fabric, prior to considering systems' optimisation to satisfy demand, renewable technologies and offsets.

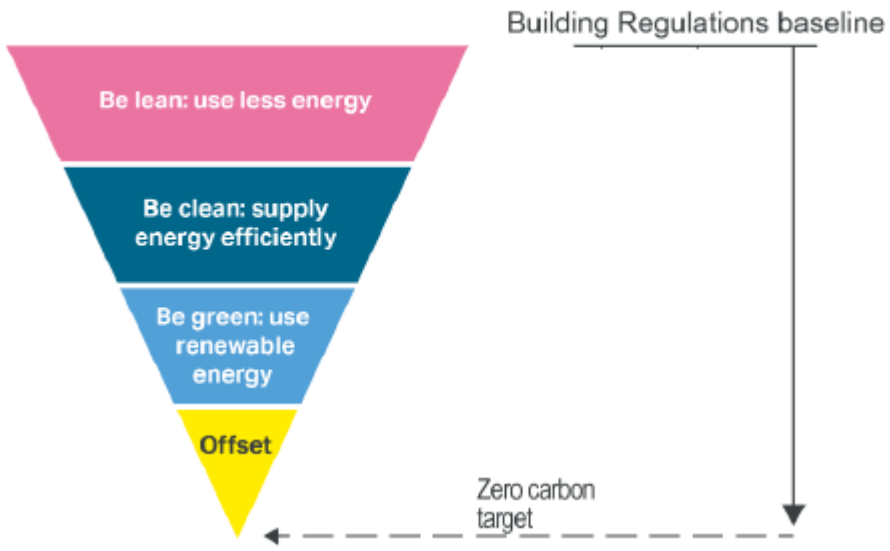

Figure 2: Energy hierarchy

3.9.2.2 Operational targets and benchmarks

LETI guidance provides both a top-down and bottom-up approach in accordance with best practice design strategies, establishing Energy Use Intensity (EUI) targets for each building architype. These targets are more ambitions than current standards and Building Regulations as indicated in Figures 3 and 4. LETI advise that the EUI targets must be met before any other energy reduction measures can be considered.

Figure 3: LETI EUI targets

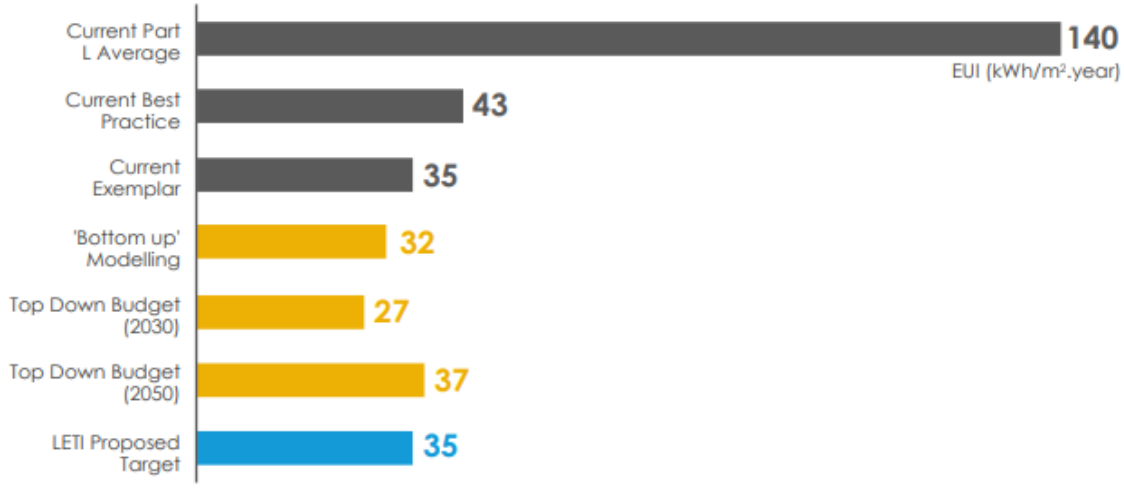

Figure 2: LETI residential derived target

Additional targets for heat loss and space heating demand are summarised in Table 2.

Table 2: LETI recommendations for EUI, peak heat loss and space heating

	Residential	Non-domestic (Office)
EUI (kWh/m²/yr)	35	55
Peak heat loss (W/m²)	15	15
Space heating (kWh/m²/yr)	10	10

In order to achieve these targets, LETI provides recommendations and identifies opportunities to reduce energy consumption as detailed in the Figure 5.

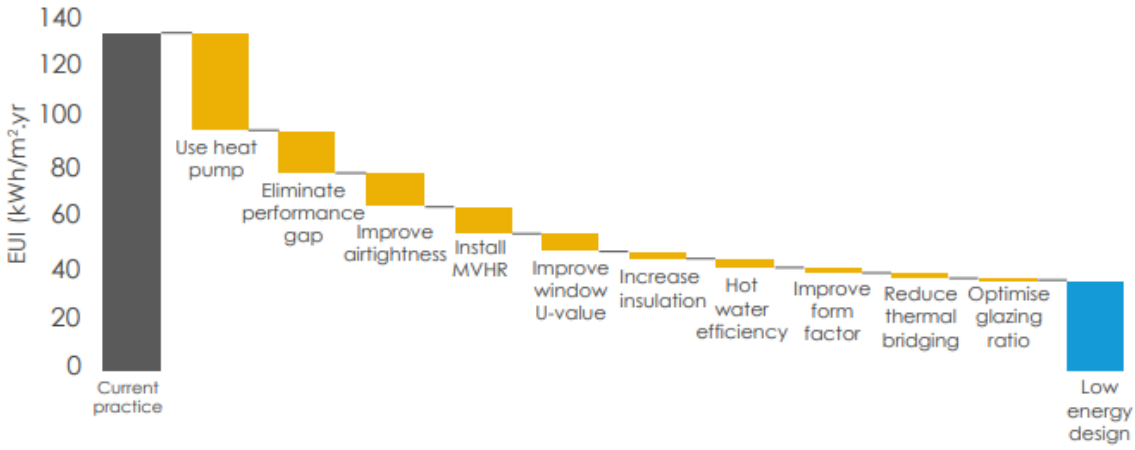

Figure 5: LETI opportunities to reduce energy consumption in a new residential development

3.9.2.3 Operational energy modelling

The impact of these measures have been reviewed by developing a building energy model which takes into account the project's anticipated usage, architecture and HVAC servicing strategy. A dynamic simulation model was used as follows:

- Software used: IES Virtual Environment 2018
- Network airflow has been modelled
- Near field shading (local buildings) has been modelled
- Current model follows a low resolution 'massing' convention. That is, rather than capturing every space in detail the model is defined in generic blocks
- HVAC was modelled with basic 'Apache systems'
- The geometry for the Market Hall is based on the architectural drawings current at July 2020 while for the other buildings on the documents provided in January 2020

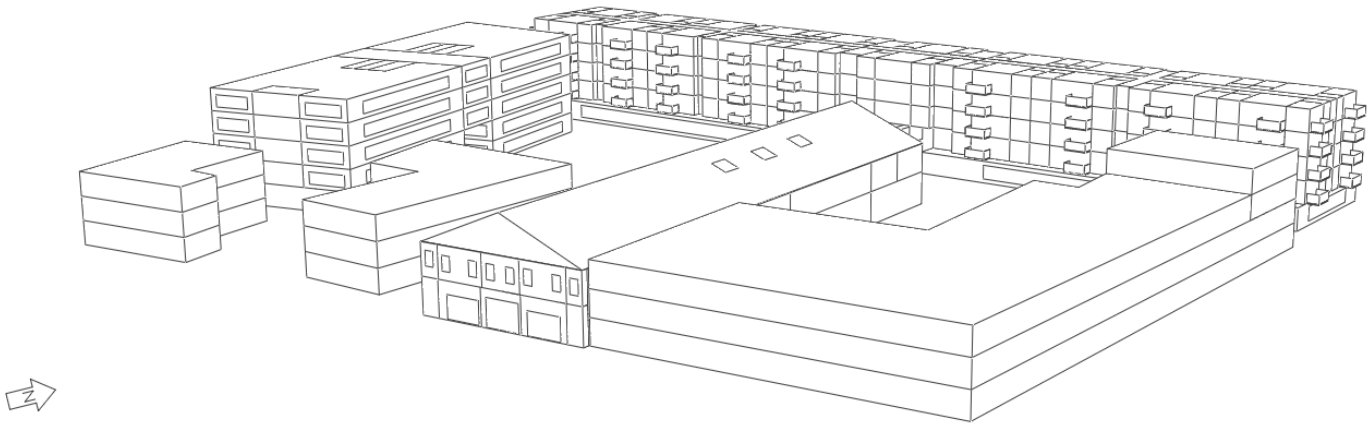

Figure 6: IES VE Model

The fabric and system efficiency measures used within the model are summarised in Tables 3 and 4.

Table 3: Fabric efficiency measures

Parameter	Details
U-values	**New building elements:** Walls 0.12 W/m2K Floor 0.10 W/m2K Roof 0.10 W/m2K Exposed ceilings/floors 0.13 W/m2K Windows 1.0 (triple glazing) W/m2K Doors 1.00 W/m2K **Market Hall retained building elements:** Wall: 2.00 W/m2K Windows: 4.65 W/m2K
Air tightness	Market Hall: 0.25 ach All other buildings: 0.1 ach
Thermal bridging	Non-repeating thermal bridging has been included as 10% of the above U-values according to NCM modelling requirements
G-value of glass	Residential: 0.5 Non-domestic:0.3
Windows	Residential: openable windows and external shading

Table 4: System efficiency measures

Parameter	Details
MVHR	Residential: Background ventilation, 90% efficiency, SFP 0.8 W/l/s, flow rate 1 ach, duct length<2m Non-domestic: MVHR 86% efficiency, SFP 1.0 W/l/s, flow rate 10l/s/person; AHU HR 70% efficiency, SFP 1.6 W/l/s, flow rate 10l/s/person
Heat Pump	Residential: SCOP 2.8 Non-domestic: SCOP 4.0, SEER 5.5
Domestic Hot water	Residential: 68 l/person/day, 10% distribution loss Non-domestic: as NCM templates, 15% distribution loss Market Hall 1000 l hot water storage, 0.0047 kWh/l/day loss
Set-points	Residential: Heating 20 deg C Non-domestic: Heating 20 deg C, Cooling 25 deg C
Lighting power density	Average 4.5 W/m2 using NCM profiles
Equipment power density	Residential: As NCM profiles lower than 4 W/m2 Non-domestic: ICT 0.5 W/m2, total equipment lower than 8 W/m2

3.9.3.4 Results Residential

Energy is lost through the building elements during winter as heat via conduction, infiltration and through the ventilation system (Figure 7). Insulation and air tightness membranes can prevent heat loss and increase the energy performance of the envelope. Following the implementation of energy efficiency measures the heat loss remains relatively low and meets the 15 W/m^2 LETI target.

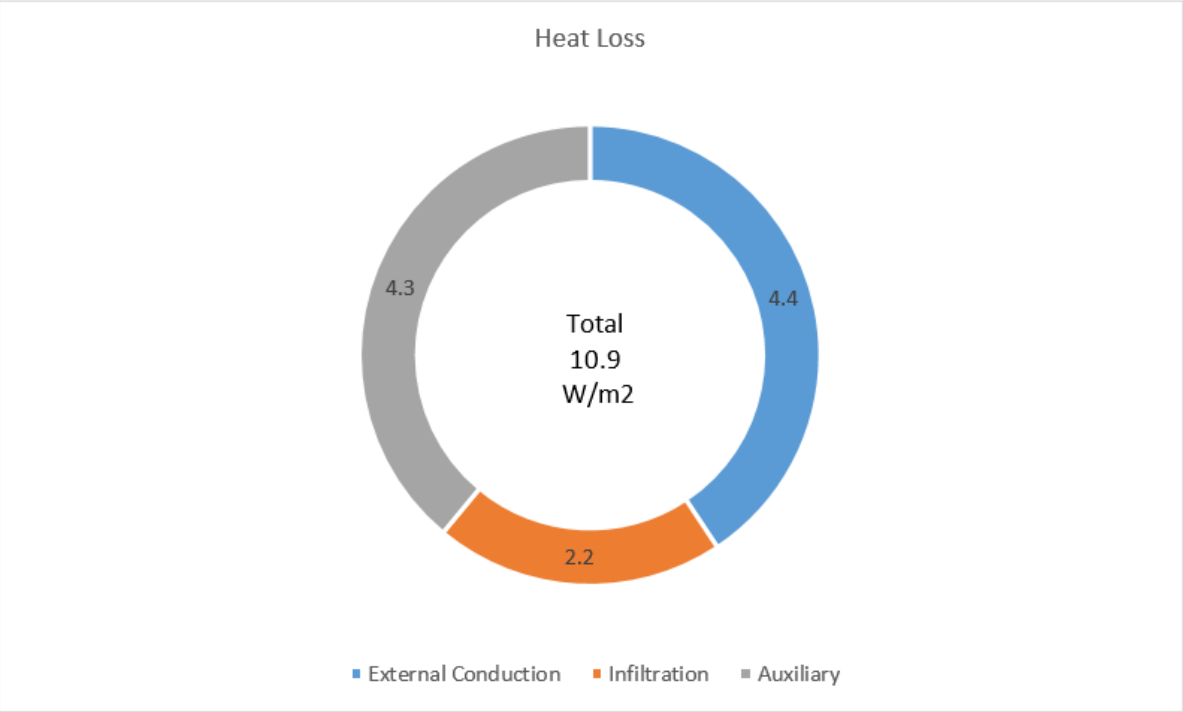

Figure 7: Residential heat loss breakdown

The apartment's space heating demand has been minimised through a combination of passive design measures and inclusion of energy efficient building services and remains below the 15 kWh/m^2/year target. The end use energy required for domestic hot water is dominant followed by lighting energy. Overall, the EUI target is 33.9 kWh/m^2/year, surpassing the LETI residential target (Figure 8).

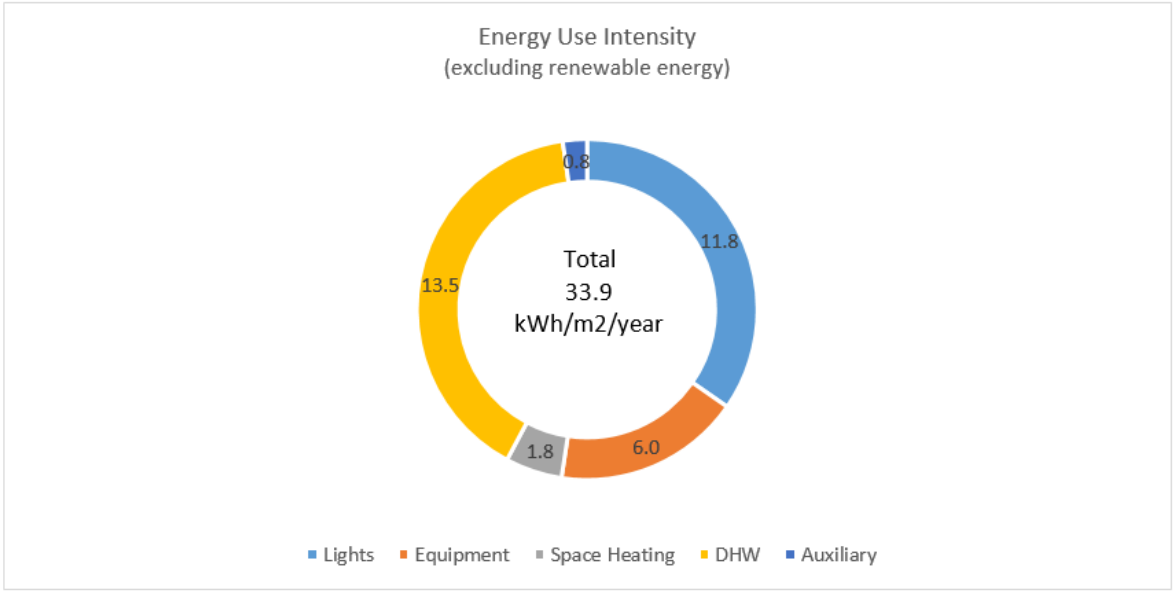

Figure 8: Residential end use intensity breakdown

3.9.3.5 Results Non-domestic

LETI guidance has been provided for residential developments, offices and schools. Currently it does not include retail spaces such as the ones located at the ground floor within the residential block or food halls. However, all non-domestic buildings (including the food hall and commercial spaces) have been simulated and assessed against the LETI targets.

As indicated in Figure 9, the peak heat loss target is exceeded by a factor of 2 due to the inclusion of the food hall which has a high form factor (high envelope surface relative to its floor area). Also, due to the heritage and conservation status of the Market Hall South façade the building elements do not benefit from the same thermal improvement as new elements. The office block has been checked separately and will meet the LETI architype target for peak heat loss.

Similar to the residential development, the space heating demand will remain below 10 kWh/m^2/year, meeting the LETI targets through the mix of passive design measures and inclusion of efficient services.

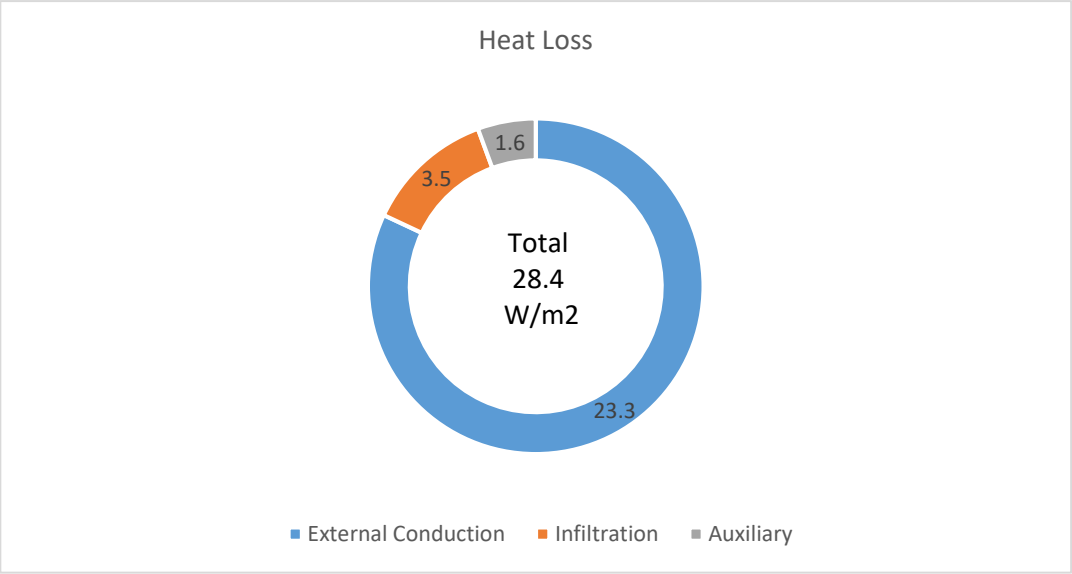

Figure 9: Non-domestic heat loss breakdown

The EUI for all non-domestic buildings (food-hall and commercial spaces included) has been reduced to 39.7 kWh/m^2/year, meeting the LETI office architype overall and space heating targets. Adjustments following systems integration may result in changes to the end use energy presented in the following chart.

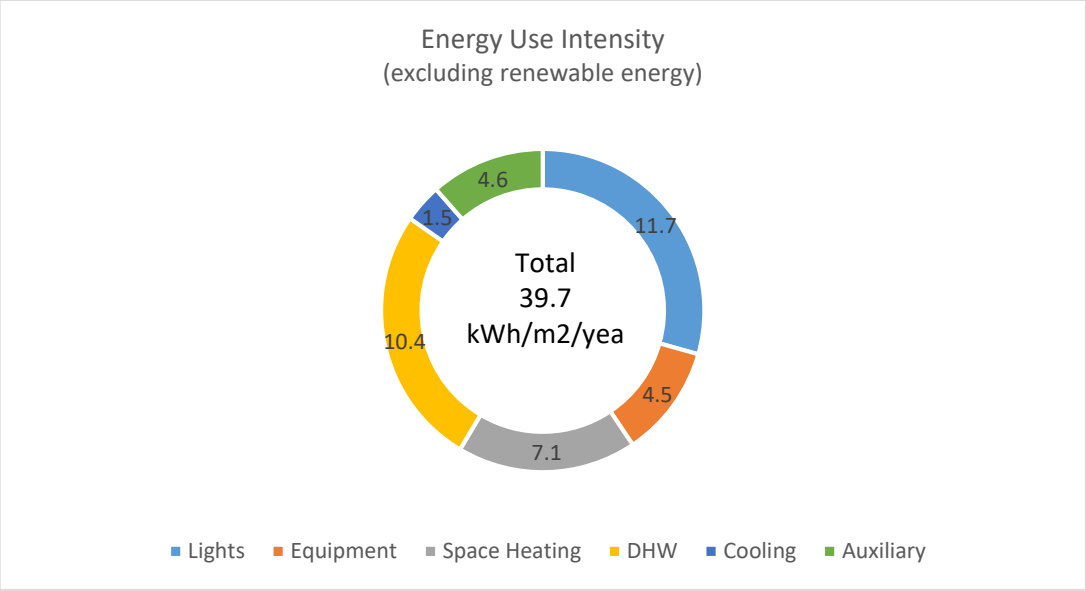

Figure 10: Non-domestic end use intensity breakdown

3.9.3.6 Site-wide results

The combined outcome for residential and non-domestic buildings results in the end-use energy detailed within Figure 11.

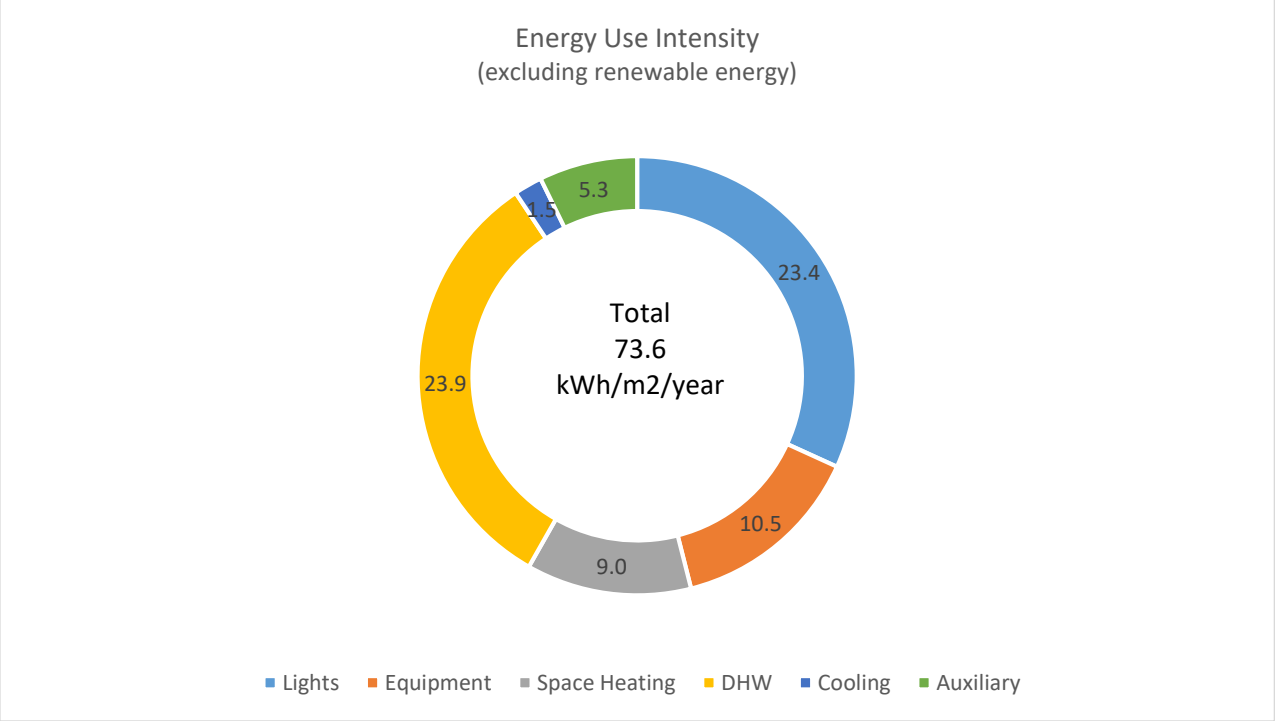

Figure 11: Domestic and Non-domestic end use intensity breakdown combined

3.9.3.7 Renewables

After reducing the operational energy of the building through optimisation of the building fabric and efficient building services and operation, the UKBGC Net Zero approach requires maximisation of zero carbon energy provision through renewable technologies. The project will promote the use of renewable and low/zero carbon technologies in accordance with the following hierarchy:

- On-site renewable technologies
- Near-site network opportunities
- Off-site opportunities and the use of energy storage technologies

Where projects are looking to utilise off-site renewable energy there is a requirement to demonstrate 'additionality', meaning that the procurement of the low/zero carbon energy is contributing to additional capacity, rather than using existing capacity.

Where renewable energy is supplied to the project it should commit to Power Purchase Agreements (PPAs) for electricity, certified low-carbon district heating/cooling and certified green gas (e.g. biogas from sustainable sources). This provides a long term contract between a generator and consumer of renewable energy.

A solar PV array located on the roofs of the building blocks with the following specifications has been included within the energy simulations:

- Area (residential): Approximately 70% of roof space, 1000m^2
- Area (non-domestic): Approximately 70% of roof space, 1200m^2
- Orientation: Azimuth 180deg, 30deg inclination
- Efficiency: 20%, 10% electrical conversion loss

Considering the specifications included in this document, the entire development will use 73.6kWh/m^2/year energy and will generate 44.3kWh/m^2 renewables energy. This results in a site-wide residual energy consumption of 29.3kWh/m^2/year which could be mitigated through further energy optimisation as well as offset and offsetting solutions.

Further energy modelling studies (such as TM54 Evaluating Operational Energy performance of Buildings at Design Stage and TM59 Assessment of Overheating Risk in Homes) are required to assess the thermal comfort requirements with the actual building usage and analyse in more detail systems integration and performance which may result in a different outcome.

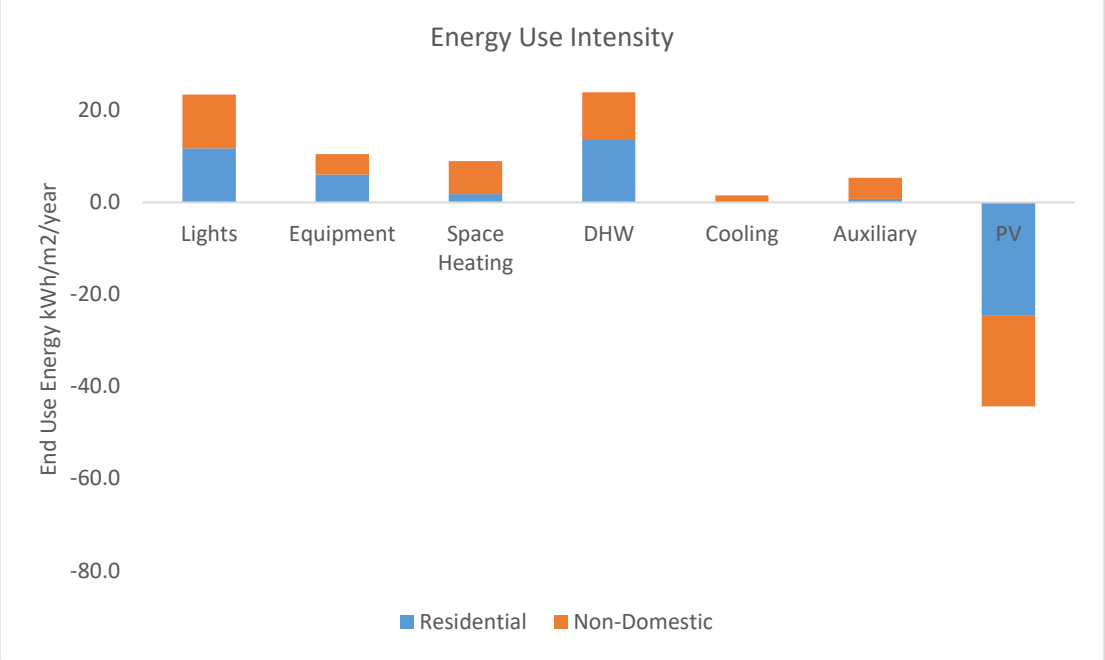

Figure 12: Site-wide end use energy intensity (including renewables)

4. Conclusion

Alongside the Energy and Part L Report prepared by BDP (Appendix 2), this Sustainability Statement seeks to respond to a number of policies listed within the Denbighshire County Council Local Development Plan (2006 – 2021) and Denbighshire Local Development Plan (2018 – 2033 – Draft Preferred Strategy) relevant to energy efficiency, renewable energy, sustainable transport, waste management, ecology and biodiversity, waste and water management, and a requirement for all non-residential developments over 1,000m^2 on a site over 1ha must meet BREEAM 'Very Good' standards.

Following a review of site information and a BREEAM workshop, in addition to exceeding the minimum energy requirements for BREEAM Excellent (which requires 4 credits, and 5 are currently achieved), the market hall is expected to achieve a BREEAM score of 60.28%, equating to a rating of 'Very Good'. This provides a buffer over the minimum 55% required for BREEAM Very Good, allowing the rating to remain secure should any future changes to design occur or constraints be realised that prevent particular credit criteria from being met. An additional 33.23% worth of credits have been highlighted as being potentially achievable, either requiring further investigation by the design team, or potential changes to the design itself. The targeted BREEAM criteria demonstrate how the building and wider development will comply with the Local Plan criteria for transport, biodiversity, surface water, renewable energy, water consumption and waste minimisation (through both design and operation).

As per the details in the Energy and Part L report (see Appendix 2), through the specification of the following measures and renewable technologies, the market hall achieves a 24% improvement in carbon emission over Part L 2013:

- Heating, cooling and domestic hot water is provided to the building via efficient air source heat pumps (ASHPs).
- Efficient light fittings and controls are specified throughout.
- A 200m^2 PV roof mounted solar array is provided.

Although energy calculations for the remaining phases can only be undertaken once the designs have progressed, a strategy for delivering a low carbon development, accounting for all phases, has been proposed. Adopting the LETI guidance and approach, with the specifications included in this document, the entire development will use 73.6kWh/m^2/year energy and will generate 44.3kWh/m^2 through renewable energy. This results in a site-wide residual energy consumption of 29.3kWh/m^2/year which could be mitigated through further energy optimisation as well as offset and offsetting solutions.

Appendix 1: BREEAM Tracker

Market Hall, Queens Market Rhyl

BREEAM New Construction 2018 (Retail): Pre-assessment

06-Aug-20

Assessor: Kat Radford

BDP.

Credit targeted

Credit not targeted / cannot be achieved

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
MANAGEMENT (1 credit = 0.52%)								
Man 01: Project brief and design								
Project Delivery Planning	Man 01-01	**1**	**0**		1. Prior to completion of the Concept Design, the project delivery stakeholders (see comments) meet to identify and define for each key phase of project delivery: a. Roles b. Responsibilities c. Contributions 2. Consider each one of the following items when defining roles, responsibilities and contributions for each key phase of the project: a. End user requirements b. Aims of the design and design strategy c. Particular installation and construction requirements/limitations d. Occupiers budget and technical expertise in maintaining any proposed systems e. Maintainability and adaptability of the proposals f. Operational energy (see Ene 01 for further details) g. Requirements for the production of project and end user documentation h. Requirements for commissioning, training and aftercare support. 3. The project team demonstrate how the project delivery stakeholder's contributions and the consultation process outcomes influence the following: a. Initial Project Brief b. Project Execution Plan c. Communication Strategy d. Concept Design.	Project Manager	2	Requires input from a contractor, or someone with substantial contracting experience in project similar to the proposed works. The design team have confirmed that these criteria have not been met.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Stakeholder consultation (interested parties)	Man 01-02	**1**	**0**		4. Prior to completion of the Concept Design, the design team consults with all interested parties (see comments) on matters that cover the minimum consultation content: 1. Functionality, build quality and impact (including aesthetics). 2. Provision of appropriate internal and external facilities (for future building occupants and visitors or users). 3. Management and operational implications. 4. Maintenance resources implications. 5. Impacts on the local community, e.g. local traffic or transportation impact. 6. Opportunities for shared use of facilities and infrastructure with the community or appropriate stakeholders. 7. Compliance with statutory (national or local) consultation requirements. 8. Energy use and sustainability measures. 9. Implementing principles and processes that deliver an inclusive and accessible design. In the case of educational building types, minimum content also includes: 10. How the building or grounds could best be designed to facilitate learning and provide a range of social spaces appropriate to the needs of a diverse range of pupils, students and other users, including people of all abilities. In the case of building types containing technical areas or functions, e.g. laboratories, workshops etc., minimum content also includes: 11. The end users' broad requirements for such facilities, including appropriate sizing, optimisation and integration of equipment and systems.	Project Manager	2	The design team confirmed that this was not undertaken at Stage 2. *Interested parties include: 1. Actual or intended building users (if known) including facilities management staff or those responsible for the day-to-day operation of the building and grounds. 2. Representative consultation group from the existing community (if the building is a new development in an existing community) or for a community still under construction. 3. Existing partnerships and networks that have knowledge of, and experience of working on, existing buildings of the same type. 4. Potential users of any shared facilities, e.g. operators of clubs and community groups. AND the following where relevant: 5. In educational building types, representatives of local education authorities, board of governors etc. 6. Local or national historic or heritage groups (over and above any requirements relating to statutory consultees). 7. Specialist service and maintenance contractors or representatives where the building function has particular technical requirements in complex environments, e.g. buildings containing laboratories.
					5. Demonstrate how the stakeholder contributions and consultation exercise outcomes influence the Initial Project Brief and Concept Design.			
					6. Prior to completion of the detailed design (RIBA Stage 4, Technical Design or equivalent), all interested parties (see Definitions on page 40 of guidance manual) give and receive consultation feedback.		4	
BREEAM AP (Concept Design)	Man 01 pre	**-**	**-**	**-**	8. The project team, including the client, formally agree strategic performance targets early in the design process with the support of the BREEAM AP where appointed).	Client / BREEAM Assessor	2	Although a BREEAM AP was not appointed at Stage 2, BDP's involvement is likely to fulfil the requirements for this credit.
	Man 01-03	**1**	**1**		9. Involve a BREEAM AP in the project at an appropriate time and level to: a. Work with the project team, including the client, to consider the links between BREEAM issues and assist them in maximising the project's overall performance against BREEAM, from their appointment and throughout Concept Design. b. Monitor progress against the performance targets (see Definitions on page 37) agreed under criterion 8 throughout all stages after their appointment where decisions critically impact BREEAM performance. c. Proactively identify risks and opportunities related to the achievement of the targets agreed under criterion 8. d. Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team.			
BREEAM AP (Developed Design)	Man 01-04	**1**	**1**		10. Criteria 8 and 9 are achieved.	Client / BREEAM Assessor	4	
					11. Involve the BREEAM AP in the project at an appropriate time and level to: a. Work with the project team, including the client, to consider links between BREEAM issues and to assist them in maximising the project's overall performance against BREEAM throughout developed design. b. Monitor progress against the performance targets agreed under criterion 8, throughout all stages where decisions critically impact the specification and tendering process and the BREEAM performance. c. Proactively identify risks and opportunities related to the achievement of the targets agreed under criterion 8. d. Provide feedback to the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team.			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Man 02: Life Cycle Cost and Service Life Planning								
Elemental life cycle cost (LCC)	Man 02-01	**2**			1. A competent person carries out an outline, entire asset LCC plan at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) together with any design options appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:2008.	Cost Consultant	2	The design team confirmed that this was not completed at Stage 2.
					2. The elemental LCC plan: a. Provides an indication of future replacement costs over a period of analysis as required by the client (e.g. 20,30,50 or 60 years); b. Includes service life, maintenance and operation cost estimates. The study period should ideally be agreed by the client, in line with the design life expectancy of the building. However, where the life expectancy of the building is not yet formally agreed (due to being at very early design stages), the default design life of 60 years should be used for modelling purposes (in line with the UK default).	Cost Consultant		
					3. Demonstrate, using appropriate examples provided by the design team, how the elemental LCC plan has been used to influence building and systems design/specification to minimise life cycle costs and maximise critical value.	Design Team		
Component level LCC Option Appraisal	Man 02-02	**1**	**1**		4. A competent person develops a component level LCC options appraisal by the end of Process Stage 4 (equivalent to Technical Design – RIBA Stage 4) in line with PD 156865:2008. The component level LCC includes (where present): a. Envelope, e.g. cladding, windows, and/or roofing b. Services, e.g. heat source cooling source, and/or controls c. Finishes, e.g. walls, floors and/or ceilings d. External spaces, e.g. alternative hard landscaping, boundary protection The component level LCC option appraisal should review all of the above component types (where present). However, you do not need to consider every single example cited under each component; only a selection of those most likely to draw valued comparisons. This is to ensure that a wide range of options are considered and help focus the analysis on components which would benefit the most from the appraisal.	Cost Consultant	4	
					5. Demonstrate, using appropriate examples provided by the design team, how the component level LCC options appraisal has been used to influence building and systems design/specification to minimise life cycle costs and maximise critical value.	Design Team		
Capital cost reporting	Man 02-03	**1**	**1**		6. Report the capital cost for the building in pounds per square metre of gross internal floor area (£k/m2), as part of the submission to BRE. The capital cost for the building includes the expenses related to the initial construction of the building: – Construction, including preparatory works, materials, equipment and labour – Site management – Construction financing – Insurance and taxes during construction – Inspection and testing Costs related to land procurement, clearance, design, statutory approvals and post occupancy aftercare are not included.	Contractor		

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Man 03: Responsible Construction Practices								
Pre-requisite	Man 03-pre	-	-	-	1. All timber and timber based products used during the construction process of the project are 'Legally harvested and traded timber'.	Contractor		
Environmental management	Man 03-01	**1**	**1**		3. All parties who at any stage manage the construction site (e.g. the principal contractor, the demolition contractor) operate an EMS covering their main operations. The EMS must: a. Be third party certified, to ISO 14001:2015/EMAS or equivalent standard; or b. In compliance with BS 8555:2016 have: i. Appropriate structure ii. Reached implementation stage phase four 'implementation and operation of the environmental management system' iii. Completed defined phase audits one to four.	Contractor		The principal contractor should be ISO 14001 accredited.
					4. All parties who at any point manage the construction site (e.g. the principal contractor, the demolition contractor) implement best practice pollution prevention policies and procedures on site in accordance with Working at construction and demolition sites: PPG6, Pollution Prevention Guidelines.			
BREEAM AP (Site)	Man 03-02 pre	-	-	-	5. The client and the contractor formally agree performance targets.	Project Manager		
	Man 03-02	**1**	**1**		6. Involve a BREEAM AP in the project at an appropriate time and level to: a. Work with the project team, including the client, to consider the links between BREEAM issues and assist them in achieving and if possible going beyond the design intent, to maximise the project's performance against the agreed performance targets throughout the Construction, Handover and Close Out stages. b. Monitor construction progress against the performance targets agreed under criterion 5 above throughout all stages where decisions critically impact BREEAM performance. c. Proactively identify risks and opportunities related to the procurement and construction process and the achievement of the targets agreed under criterion 5. d. Provide feedback to the constructors and the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. e. Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team and the provision to the assessor.	Contractor		
Responsible Construction Management	Man 03-03	**2**	**2**		7. Achieve items listed as required for one credit in table 4.1 of the guidance manual. Two credits: 8. Achieve criterion 7 9. Achieve six additional items in table 4.1 of the guidance manual.	Contractor		

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Monitoring of construction-site impacts	Man 03-04	**2**	**2**		10. Responsibility has been assigned to an individual(s) for monitoring, recording and reporting energy use, water consumption and transport data (where measured) resulting from all on-site construction processes (and dedicated off-site manufacturing) throughout the build programme. To ensure the robust collection of information, this individual(s) must have the appropriate authority and responsibility to request and access the data required. Where appointed, the BREEAM AP could perform this role.	Contractor		
					First Monitoring Credit - Utility consumption **Energy consumption** 11. Achieve criterion 10. 12. Set targets for the site energy consumption in kWh (and where relevant, litres of fuel used) as a result of the use of construction plant, equipment (mobile and fixed) and site accommodation. 13. Monitor and record date for the energy consumption described in criterion 12. 14. Report the total carbon dioxide emissions (total kgCO2/project value) from the construction process via the BREEAM Projects (for the purposes of potential future BREEAM performance benchmarking). **Water consumption** 15. Achieve criterion 10. 16. Set targets for the potable water consumption (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 described in criterion 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 (for the purposes of potential future BREEAM performance benchmarking).	Contractor		
					Second Credit - Transport of construction materials and waste 19. Achieve Criterion 10. 20. Set targets for transportation movements and impacts resulting from delivery of the majority of construction materials to site and construction waste from site. As a minimum cover: 20.a. Transport of materials from the point of supply to the building site, including any transport, intermediate storage and point of supply. Monitor as a minimum: 20.a.i. Materials used in major building elements (e.g. those defined in BREEAM issue Mat01 Environmental impacts from construction products - Building life cycle assessment (LCA). 20.a.ii. Ground works and landscaping materials. 20.b. Transportation of construction waste from the construction gate to waste disposal processing or recovery centre gate. This monitoring must cover the construction waste groups outlined in the project's resource management plan. 21. Monitor and record data for the transportation movement as described in criterion 20. 22. Using the collated data, report separately for materials and waste, the total transport-related carbon dioxide emissions ($kgCO_2$-eq) plus total distance travelled (km) via BREEAM Projects (for the purposes of potential future BREEAM performance benchmarking).	Contractor		
Exemplary level criteria	Man 03-Ex	**1**		**1**	23. Achieve all items in Table 4.1 of the guidance manual.	Contractor		

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Man 04: Commissioning and handover								
Commissioning and testing schedule and responsibilities	Man 04-01	**1**	**1**		1. Prepare a schedule of commissioning and testing. The schedule identifies a suitable timescale for commissioning and re-commissioning of all complex and non-complex building services and control systems and for testing and inspecting building fabric. 2. The schedule identifies the appropriate standards for all commissioning activities to be conducted, where applicable, in accordance with: a. Current Building Regulations b. BSRIA guidelines c. CIBSE guidelines d. Other appropriate standards (see Methodology) Exclude from the assessment any process or manufacture-related equipment specified as part of the project. However, include such equipment in cases where they form an integral part of the building HVAC services, such as some heat recovery systems. 3. Where a building management system (BMS) is specified: a. Carry out the commissioning of air and water systems when all control devices are installed, wired and functional b. Include physical measurements of room temperatures, off-coil temperatures and other key parameters, as appropriate, in Commissioning results. c. The BMS or controls installation should be running in auto with satisfactory internal conditions prior to handover d. All BMS schematics and graphics (if BMS is present) are fully installed and functional to user interface prior to handover e. Fully train the occupier or facilities team in the operation of the system. 4. Appoint an appropriate project team member to monitor and programme pre-commissioning, commissioning and testing. Where necessary include, re-commissioning activities on behalf of the client. 5. The principal contractor accounts for the commissioning and testing programme, responsibilities and criteria within their budget and the main programme of works. Allow the required time to complete all commissioning and testing activities prior to handover,	Contractor		**Mandatory for Very Good**
Commissioning - design and preparation	Man 04-02	**1**	**1**		6. Achieve criteria 1-5. 7. During the design stage, the client or the principal contractor appoints an appropriate project team member provided they are not involved in the general installation works for the building services systems: with responsibility for: a. Undertaking design reviews and giving advice on suitability for ease of commissioning. b. Providing commissioning management input to construction programming and during installation stages. c. Management of commissioning, performance testing and handover or post-handover stages. For buildings with complex building services and systems, this role needs to be carried out by a specialist commissioning manager.	Contractor		
Testing and inspecting building fabric	Man 04-03	**1**	**1**		8. Achieve criteria 1-5. 9. Complete post-construction testing and inspection to quality-assure the integrity of the building fabric, including continuity of insulation, avoidance of thermal bridging and air leakage paths (this is through airtightness testing and a thermographic survey). A suitably qualified professional undertakes the survey and testing in accordance with the appropriate standard. 10. Rectify any defects identified during post-construction testing and inspection prior to building handover and close out. Any remedial work must meet the required performance characteristics for the building or element as defined at the design stage.	Contractor		
Handover	Man 04-04	**1**	**1**		11. Prior to handover, develop two building user guides for the following users: a. A non-technical user guide for distribution to the building occupiers b. A technical user guide for the premises facilities managers c. A draft copy is developed and discussed with users first (where the building occupants are known) to ensure the guide is most appropriate and useful to potential users. 12. Prepare two training schedules timed appropriately around handover and proposed occupation plans for the following users: a. A non-technical training schedule for the building occupiers b. A technical training schedule for the premises facilities managers.	Contractor		**Criterion 11 is mandatory for Very Good**

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Man 05: Aftercare								
Aftercare support	Man 05-01	**1**	**1**		1. Provide aftercare support to the building occupiers through having in place operational infrastructure and resources. This includes as a minimum: a. A meeting between the aftercare support team or individual, and the building occupier or management team (prior to initial occupation, or as soon as possible thereafter) to: i. Introduce the aftercare support available, including the content of the building user guide (where it exists) and training schedule. ii. Present key information on the building including the design intent and how to use the building to ensure it operates as efficiently and effectively as possible. b. On-site facilities management training including: i. a walkabout of the building AND ii. introduction and familiarisation with the building systems, their controls and how to operate them in accordance with the design intent and operational demands. c. Provide initial aftercare support for at least the first month of building occupation, e.g. weekly attendance on-site, to support building users and management (the level of frequency will depend on the complexity of the building and building operations). d. Provide longer term aftercare support for occupiers for at least the first 12 months from occupation, e.g. a helpline, nominated individual or other appropriate system to support building users/management. 2. Establish operational infrastructure and resources to coordinate the collection and monitoring of energy and water consumption data for a minimum of 12 months, once the building is substantially occupied. This facilities analysis of discrepancies between actual and predicted performance, with a view to adjusting systems and/or user behaviours accordingly.	Contractor		
Commissioning - implementation	Man 05-02	**1**	**1**		3. Complete the following commissioning activities over a minimum 12-month period, once the building becomes substantially occupied: a. Complex systems - Specialist Commissioning Manager will: i. Identify changes made by the owner or operator that might have caused impaired or improved performance. ii. Test all building services under full load conditions, i.e. heating equipment in mid-winter, cooling and ventilation equipment in mid-summer and under part load conditions (spring and autumn). iii. Where applicable, carry out testing during periods of extreme (high or low) occupancy. iv. Interview building occupants (where they are affected by the complex services) to identify problems or concerns regarding the effectiveness of the systems. v. Produce monthly reports comparing sub-metered energy performance to the predicted one (see Ene01 Reduction of energy use and carbon emissions). vi. Identify inefficiencies and areas in need of improvement. vii. Re-commission systems (following any work needed to serve revised loads), and incorporate any revisions in operating procedures into the operations and maintenance (O&M) manuals. b. Simple systems (naturally ventilated) - external consultant/aftercare team/facilities manager will: i. Review thermal comfort, ventilation, and lighting, at three, six and nine month intervals after initial occupation, either by measurement or occupant feedback. ii. Identify deficiencies and areas in need of improvement. iii. Re-commission systems and incorporate any relevant revisions in operating procedures into the O&M manuals.	Contractor		

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Post occupancy evaluation	Man 05-03	**1**	**1**		4. The client or building occupier makes a commitment to carry out a post-occupancy evaluation (POE) exercise one year after building is substantially occupied. This gains comprehensive in-use performance feedback and identifies gaps between design intent and in-use performance. The aim is to highlight any improvements or interventions that need to be made and inform operational processes. 5. An independent party carries out the POE covering: a. A review of the design intent and construction process (review of design, procurement, construction and handover processes) b. Feedback from a wide range of building users including facilities management on the design and environmental conditions of the building covering: i. Internal environmental conditions (light, noise, temperature, air quality) ii. Control, operation and maintenance iii. Facilities and amenities iv. Access and layout v. Energy and water consumption vi. Other relevant issues 6. The independent party provides a report with lessons learned to the client and building occupiers. 7. The client or building occupier commits funds to pay for the POE in advance. This requires an independent party to be appointed to carry out the POE. Evidence of the appointment of the independent party and schedule of responsibilities which fulfils the BREEAM criteria are acceptable to demonstrate compliance.	Client		
HEALTH AND WELLBEING (1 credit = 0.78%)								
Hea 01: Visual Comfort								
Control of Glare from Sunlight	Hea 01-01	**1**	**1**		1. Identify areas at risk of glare using a glare control assessment, The glare control assessment also justifies any areas deemed not at risk of glare. 2. A glare control strategy designs out potential glare in all relevant building areas where risk has been identified. This should be achieved through building form and layout or building design measures. 3. The glare control strategy does not increase energy and consumption used for lighting. This is achieved by: a. Maximising daylight levels in all weather, cloudy or sunny AND b. Ensuring the use or location of shading does not conflict with the operation of lighting control systems.	Architect		Compliant shading measures for meeting glare control criteria can include: – building-integrated measures (e.g. overhangs or fins) – occupant-controlled devices such as opaque Venetian or close weave fabric blinds, (where the openness factor of blinds is 1% or less, and where the fabric light transmittance value is < 0.1 (10%)) – external shading or brise soleil.
Daylighting	Hea 01-02	**2**	**0**	**2**	4. Daylighting criteria have been met using either of the following options: a. The relevant building areas meet good practice daylight factor(s) and other criterion as outlined in Table -5.1 and Table - 5.2: 1 credit: minimum 35% of sales areas achieve point daylight factors of 2% or mored. 1 credit: In all other occupied spaces, achieve a minimum 2% daylight factor in at least 80% (m2) of relevant building areas (and either compliance with the uniformity ration requirements OR view of sky and room depth criteria in Table 5.2.) OR b. The relevant building areas meet good practice average and minimum point daylight illuminance criteria as outlined in Table - 5.3.	Architect / Lighting Consultant		Daylight calculations should be undertaken at an early stage to allow this to inform the design. It is assumed that daylight calculations will not be undertaken.

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View Out	Hea 01-03	**1**	**0**		5. 95% of the floor area in relevant building areas is within 8m of an external wall. The external wall has a window or permanent opening that provides an adequate view out. 6.The window/opening must be ≥ 20% of the surrounding wall area (refer to Relevant definitions in the Additional information section). Where the room depth is greater than 8m, compliance is only possible where the percentage of window/opening is the same as, or greater than, the values in Table 1.0 of BS 8206:part 2.	Architect		This credit can be difficult to achieve in larger buildings. Compliance must be demonstrated for the percentage of the floor area in each relevant building area, rather than the percentage of the total relevant building area in the building. Based on the depth of the building and nature of the design, it is thought that will not be achieved.
Internal and external lighting levels, zoning and control	Hea 01-03	**1**	**1**		**Internal Lighting** 8. Internal lighting in all relevant areas of the building is designed to provide illuminance (lux) levels and colouring rendering index in accordance with the SLL code for lighting 2012. and any other relevant industry standard. Internal lighting should be appropriate to the tasks undertaken, accounting for building user concentration and comfort levels. 9. For areas where computer screens are regularly used, the lighting design complies with CIBSE Lighting Guide 7 sections 2.4, 2.13, 2.15, 2.20, and 6.10 to 6.20. This gives recommendations highlighting: a. Limits to the luminance of the luminaires to avoid screen reflections. (Manufacturers' data for the luminaires should be sought to confirm this.) b. Any area where surface is used to reflect light in to a space such as uplighting, the recommendations refer to the luminance of the lit ceiling rather than the luminaire; a design team calculation is usually required to demonstrate this. c. Recommendations for direct lighting, ceiling illuminance, and average wall illuminance. **External Lighting** 10. All external lighting located within the construction zone is specified in accordance with BS5489-1:2013 Code for the practice for the design of road lighting. Lighting of roads and public amenity areas and BS EN 12464-2:2014 Light and lighting - lighting of work places - Part 2: Outdoor workplaces. External lighting should provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night. 11. Where no external light fittings are specified (either separate from or mounted on the external building façade of roof), the criteria relating to external lighting do not apply and the credit can be awarded on the basis of compliance with criteria 8-9. **Zoning and occupant control** 12. Internal lighting is zoned to allow for occupant control. Zoning is in accordance with the criteria below for relevant areas present within the building: a. In office areas, zones of no more than four workplaces b. Workstations adjacent to windows/atria and other building areas separately zoned and controlled c. Seminar and lecture rooms: zoned for presentation and audience areas d. Library spaces: separate zoning of stacks, reading and counter areas e. Teaching space or demonstration area f. Whiteboard or display screen g. Auditoria: zoning of seating areas, circulation space and lectern area h. Dining, restaurant, café areas: separate zoning of servery and seating/dining areas i. Retail: separate zoning of display and counter areas j. Bar areas: separate zoning of bar and seating areas k. Wards or bedded areas: zoned lighting control for individual bed spaces and control for staff over groups of bed spaces l. Treatment areas, dayrooms, waiting areas: zoning of seating and activity areas and circulation space with controls accessible to staff.	MEP		It is assumed that these criteria will be met.
Exemplary level criteria	Hea 01-03 EX	**1**	**0**	**1**	15. To achieve an exemplary performance credit for daylighting: Daylighting criteria have been met using either of the following options: a. Relevant building areas meet exemplary daylight factors and the relevant criteria in Table 5.8 of the guidance manual. b. Relevant building areas meet exemplary average and minimum point daylight illuminance criteria in Table 5.9 of the guidance manual.	Architect / Lighting Consultant		
	Hea 01-03 EX	**1**	**0**	**1**	16. To achieve an exemplary performance credit for Internal and external lighting levels, zoning and control: 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.	MEP		

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Hea 02: Indoor Air Quality								
Pre-Requisite	Hea 02-Pre	-	-	-	Indoor air quality (IAQ) plan: 1. A site-specific indoor air quality plan has been produced and implemented in accordance with the guidance in Guidance Note GN06. The objective of the plan is to facilitate a process that leads to design, specification and installation decisions and actions that minimise indoor air pollution during occupation of the building. The indoor air quality plan must consider the following a. Removal of contaminant sources b. Dilution and control of contaminant sources (where present, consideration is given to the air quality requirements of specialist areas such as laboratories) c. Procedures for pre-occupancy flush out. d. Third party testing an analysis. e. Maintaining good indoor air quality in-use.	MEP / Architect		03.08.2020 Stage 3 review: This report hasn't yet been commissioned. BDP to relay requirements to team.
Ventilation	Hea 02-01	**1**	**0**	**1**	2. The building has been designed to minimise the indoor concentration and recirculation of pollutants in the building as follows: a. Provide fresh air into the building in accordance with the criteria of the relevant standard for ventilation b. Ventilation pathways are designed to minimise the ingress and build-up of air pollutants inside the building c. Where present, HVAC systems must incorporate suitable filtration to minimise external air pollution, as defined in BS EN 13779:2007 Annex A3. The specified filters should achieve a minimum Indoor Air Quality of IDA2. d. Areas of the building subject to large and unpredictable or variable occupancy patterns have carbon dioxide (CO_2) or air quality sensors specified and : i. In mechanically ventilated buildings or spaces: sensors are linked to the mechanical ventilation system and provide demand-controlled ventilation to the space. ii. In naturally ventilated buildings or spaces: sensors either have the ability to alert the building owner or manager when CO_2 levels exceed the recommended set point, or are linked to controls with the ability to adjust the quantity of fresh air, i.e. automatic opening windows or roof vents. e. For naturally ventilated or mixed mode buildings, the design demonstrates that the ventilation strategy provides adequate cross flow of air to maintain the required thermal comfort conditions and ventilation rates in accordance with CIBSE AM10.	MEP		Compliance with this credit should be investigated by the design team.
Emissions from construction products	Hea 02-02	**2**	**2**		**One credit:** 3. Three out of the five product types meet the emission limits, testing requirements and any additional requirements listed in Table 5.11 of the guidance manual. Where wood-based products are not one of the three selected product types, all wood-based products used for internal fixtures fittings must be tested and classified as formaldehyde E1 class as a minimum. **Two credits:** 4. All of the product types listed meet the emission limits, testing requirements and any additional requirements listed in Table 5.11 of the guidance manual.	Architect		In order to achieve enough points to achieve BREEAM Very Good it is thought that both credits will be targeted.
Post construction indoor air quality measurement	Hea 02-03	**1**	**1**		5. The formaldehyde concentration indoor air is measured post construction (but pre-occupancy) and does not exceed 100µg/ m³ averaged over 30 minutes. (World Health Organisation guidelines for indoor air quality: Selected pollutants, 2010). 6. The formaldehyde sampling and analysis is performed in accordance with ISO 16000-2 and 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 500µg/ m³ over 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 TVOC and formaldehyde levels to within the above limits. 10. The measured concentration levels of formaldehyde (µg/ m³) are reported via the BREEAM Scoring and Reporting Tool.	Contractor		

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Exemplary level criteria	Hea 02-Ex	**1**	**0**	**1**	11. Three of the product types listed meet the emission limits, testing requirements and any additional requirements listed in Table 5.12 of the guidance manual. Where wood-based products are not one of the three selected product types, all wood-based products used for internal fixtures and fittings must be tested and classified as formaldehyde E1 class as a minimum,	Architect		
Hea 04: Thermal Comfort								
Thermal Modelling	Hea 04-01	**1**	**1**		1. Thermal modelling has been carried out using software in accordance with CIBSE AM11 Building Energy and Performance Modelling. 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). 3. The modelling demonstrates that: a. For air conditioned buildings, summer and winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design, Table 1.5; or other appropriate industry standard (where this sets a higher or more appropriate requirement/level for the building type). b. For naturally ventilated buildings: i. Winter operative temperature ranges in occupied spaces are in accordance with the criteria set out in CIBSE Guide A Environmental design, Table 1.5; or other appropriate industry standard (where this sets a higher or more appropriate requirement/level for the building type). ii. The building is designed to limit the risk of overheating, in accordance with the adaptive comfort methodology outlined in CIBSE TM52: The limits of thermal comfort: avoiding overheating in European buildings or CIBSE TM59: Design methodology for the assessment of overheating risk in homes. One credit: 4. For air conditioned buildings, the PMV (predicted mean vote) and PPD (predicted percentage of dissatisfied) indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool.	MEP		
Design for Future Thermal Comfort	Hea 04-02	**1**	**1**		5. Criteria 1 to 4 are achieved. 6. The thermal modelling demonstrates that the relevant requirements set out in criteria 3 are achieved for a projected climate change environment. 7. Where criterion 6 is not met, the project team demonstrated how the building has been adapted or designed to be easily adapted in future using passive design solutions in order to subsequently meet the requirements under criterion 6. 8. For air conditioned buildings, the PMV and PPD indices based on the above modelling are reported via the BREEAM assessment scoring and reporting tool.	MEP		03.08.2020 Stage 3 review: BDP to confirm if this is met.

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Thermal zoning and controls	Hea 04-03	**1**	**1**		9. Criteria 1 to 4 are achieved 10. The thermal modelling analysis (criteria 1 to 4) has informed the temperature control strategy for the building and its users. 11. The strategy for proposed heating/cooling system(s) demonstrates that it has addressed the following: a. Zones within the building and how the building services could efficiently and appropriately heat or cool these areas. For example consider the different requirements for the central core of a building compared with the external perimeter adjacent to the windows. b. The degree of occupant control required for these zones, based on discussions with the end user (or alternatively building type or use specific design guidance, case studies, feedback) considers: b.i. User knowledge of building services b.ii. Occupancy type, patterns and room functions (and therefore appropriate level of control required) b.iii. How the user is likely to operate or interact with the system(s), e.g. are they likely to open windows, access thermostatic radiator valves (TRV) on radiators, change air-conditioning settings etc. b.iv. The user expectations (this may differ in the summer and winter) and degree of individual control (i.e. obtaining the balance between occupant preferences, for example some occupants like fresh air and others dislike draughts). c. How the proposed systems will interact with each other (where there is more than one system) and how this may affect the thermal comfort of the building occupants. d. The need or otherwise for an accessible building user actuated manual override for any automatic systems.	MEP		
Hea 05: Acoustic Performance								
Acoustic Performance	Hea 05-01	**3**	**2**	**1**	1. The building meets the appropriate acoustic performance standards and testing requirements defined in Table 5.14 of the guidance manual which defines criteria for the acoustic principles of: a. Sound insulation b. Indoor ambient noise level c. Room acoustics. OR 2. A suitably qualified acoustician (SQA) is appointed to define a bespoke set of performance requirements for all function areas in the building. The bespoke performance requirements use the three acoustic principles defined in criterion Hea05 Acoustic Performance - Criterion 1, setting out the performance requirements for each and the testing regime required.	Acoustician / Contractor		It is thought that at least 2 of the 3 available credits will be achieved.
Hea 06: Security								
Security of Site and Building	Hea 06-01	**1**	**0**	**1**	1. A suitably qualified security specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) during or prior to Concept Design (RIBA Stage 2 or equivalent). The purpose of the SNA will be to identify attributes of the proposal, site and surroundings which may influence the approach to security for the development. 2. The SQSS develops a set of security controls and recommendations for incorporation into the proposals. These controls and recommendations shall directly relate to the threats and assets identified in the preceding SNA. 3. The controls and recommendations shall be incorporated into proposals and implemented in the as-built development. Any deviation from those controls and recommendations shall be justified and agreed with the SQSS.	Architect / Security Consultant MEP / Architect	2	Where the SNA is undertaken after RIBA Stage 2, the credit can still be achieved providing the SQSS confirms that no security measures cannot be implemented due to late consultation. The design team confirmed that this hasn't been undertaken however they will investigate the requirements and it is likely that this credit will be pursued (however it is to remain as a potential for now).
Exemplary Level Criteria	Hea 06-Ex	**1**	**0**		4. To achieve an exemplary level performance credit: A compliant based risk security rating scheme has been used. The performance against the scheme has been confirmed by independent assessment and verification.	Architect		SABRE is currently recognised as a compliant scheme.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Hea 07: Safe and Healthy Surroundings								
Safe Access	Hea 07-01	**1**	**0**	**1**	1. Where external site areas form part of the assessed development the following apply: Dedicated and safe cycle paths are provided from the site entrance to any cycle storage, and connect to off-site cycle paths where applicable. 2. Dedicated and safe footpaths are provided on and around the site providing suitable links for the following: a. The site entrance to the building entrance b. Car parks (where present) to the building entrance c. The building to outdoor space d. Connecting to off-site paths where applicable. 3. Pedestrian drop-off areas are designed off, or adjoining to, the access road and should provide direct access to other footpaths. 4. Where vehicle delivery access to drop-off areas form part of the assessed development, the following apply: a. pedestrian and cyclist paths b. outside amenity areas accessible to building users and general public 5. There is a dedicated parking or waiting area for goods vehicles with appropriate separation from the manoeuvring area and staff and visitor car parking. 6. Parking and turning areas are designed for simple manoeuvring according to the type of delivery vehicle likely to access the site, thus avoiding the need for repeated shunting.	Architect / Landscape Architects		This can be harder to achieve on larger sites, however the design team should endeavour to implement these criteria.
Outside Space	Hea 07-02	**1**	**1**		7. There is an outside space providing building users with an external amenity area.	Architect / Landscape Architects		Current site drawings confirm sufficient external public space to be provided. The space is of an appropriate size to provide enough amenity for the predicted number of building users during coffee or lunch breaks to gather, socialise, relax and connect with the natural environment. The space is predominantly intended for building staff, but can be used by other building users where relevant and beneficial to the building users. The outside space must: – be an outdoor landscaped area, for example a garden, balcony or terrace; the majority of the space should be open to the sky – have appropriate seating areas and be non-smoking, – be located to ensure it is accessible to all building users and avoids areas that will have disturbances from sources of noise (e.g. building services, car parks, busy roads, delivery areas etc.).

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
ENERGY (1 credit = 0.64%)								
Ene 01: Reduction of energy use and carbon emissions								
Energy Performance	Ene 01-01	**9**	**5**	**2**	1. Calculate an Energy Performance Ratio for New Constructions (EPRNC). Compare the EPRNC achieved with the benchmarks in Table 6.1 in the guidance manual and award the corresponding number of BREEAM credits.	MEP		The current BRUKL report confirms that 5 credits are achieved.
Prediction of Operational Energy Consumption	Ene 01-02	**4**		**4**	2. Involve relevant members of the design team in an energy design workshop focusing on operational energy performance (methodology to be provided)	MEP / Design Team		Requires TM54 modelling.
					3. Undertake additional energy modelling during the design and post-construction stage to generate predicted operational energy consumption figures. (see Prediction of operational energy consumption on page 125 of the guidance manual - assessor to provide.)	MEP		
					4. Report predicted energy consumption targets by end use, design assumptions and input data (with justifications).			
					5. Carry out a risk assessment to highlight any significant design, technical and process risks that should be monitored and managed throughout the construction and commissioning process.			
Exemplary level criteria	Ene 01-Ex	**2**			6. The building achieves an EPR NC ≥ 0.9 and zero net regulated CO_2 emissions.	MEP		These credits should be investigated.
					7. Energy generation from on-site and near-site LZC sources is sufficient to offset carbon emissions from regulated energy use plus a percentage of emissions from unregulated energy use.			
					8. Award the exemplary credits based on the percentage of additional emissions from unregulated energy that are offset by LZC sources. (Table 6.2 guidance manual).			
	Ene 01-Ex	**3**			9. The building is deemed carbon negative where >100% (see Table 6.2 guidance manual) of carbon emissions from unregulated (and regulated) energy use are offset by energy generated from on-site and near-site LZC sources.	MEP		
	Ene 01-Ex	**2**	**0**	**2**	10. Achieve maximum available credits in Ene 02 Energy monitoring.	MEP		
					11. The client or building occupier commits funds to pay for the post occupancy stage. This requires an assessor to be appointed and to report on the actual energy consumption compared with the targets set in criterion 4.			
					12. The energy model (criterion 3) is: 12.a. Submitted to BRE and 12.b. Retained by the building owner.			
Ene 02: Energy Monitoring								
Sub-metering of end-use categories	Ene 02-01	**1**	**1**		1. Install energy metering systems so at least 90% of the estimated annual energy consumption of each fuel is assigned to the end-use categories.	MEP		**Mandatory for Very Good**
					2. Meter the energy consumption in buildings according to the total useful floor area: a. If the area is greater than 1,000m², by end-use category with an appropriate energy monitoring and management system. b. If the area is less than 1,000m², use either: i. an energy monitoring and management system or ii. separate accessible energy sub-meters with pulsed or other open protocol communication outputs, for future connection to an energy monitoring and management system			
					3. Building users can identify the energy consuming end users, for example through labelling or data outputs.			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Sub-metering of high energy load and tenancy areas	Ene 02-02	**1**	**1**		4. Monitor a significant majority of the energy supply with: a. An accessible energy monitoring and management system for: i. tenanted areas or ii. Relevant function areas or departments in single occupancy buildings OR b. Separate accessible energy sub-meters with pulsed or other open protocol communication outputs for future connection to an energy monitoring and management system for: i tenanted areas ii. relevant function areas or departments in single occupancy buildings. 5. Sub-meter per floor plate in large single occupancy or single-tenancy buildings with one homogenous function, for example hotel bedrooms, offices.	MEP		It is assumed that this will be targeted.
Ene 03: External Lighting								
	Ene 03-01	**1**	**1**		1. No external lighting (which includes lighting on the building, at entrances and signs). OR 2. External light fittings within the construction zone with: a. Average initial efficacy of not less than 70 luminaire lumens per circuit Watt. b. Automatic control to prevent operation during daylight hours. c. Presence detection in areas of intermittent pedestrian traffic.	MEP		
Ene 04: Low carbon design								
Passive design analysis	Ene 04-01	**1**	**1**		1. Achieve the first credit Hea 04 Thermal comfort: One credit - Thermal modelling to demonstrate that the building design delivers appropriate thermal comfort levels in occupied spaces. 2. The project design team analyses the proposed building design and development during concept design to identify opportunities for the implementation of passive design measures. 3. Implement passive design measures to reduce the total heating, cooling, mechanical ventilation, lighting loads and energy consumption in line with the passive design analysis findings. 4. Quantify the reduced total energy demand and carbon dioxide (CO_2) emissions resulting from the passive design measures.	MEP	2	03.08.2020 Stage 3 review: This report hasn't yet been commissioned. BDP to relay requirements to team.
Free Cooling	Ene 04-02	**1**		**1**	5. Achieve the passive design analysis credit. 6. Include free cooling analysis in the passive design analysis carried out under criterion 2. 7. Identify opportunities for the implementation of free cooling solutions. 8. The building is naturally ventilated or uses any combination of the free cooling strategies listed in free cooling analysis.	MEP		Design team to confirm compliance.
Low and zero carbon feasibility study	Ene 04-03	**1**	**1**		9. An energy specialist completes a feasibility study by the end of the concept design. 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. 11. Specify local LZC technologies for the building or development in line with the feasibility study recommendations. 12. Quantify the reduced regulated carbon dioxide (CO_2) emissions resulting from the feasibility study.	MEP	2	03.08.2020 Stage 3 review: This report hasn't yet been commissioned. BDP to relay requirements to team.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Ene 05: Energy Efficient Cold Storage								
Refrigeration Energy Consumption	Ene 05-01	**1**	**1**		1. Design, install and commission the refrigeration system: a. In accordance with the Code of Conduct for carbon reduction in the refrigeration retail sector and BS EN 378-2:2016. busing robust and tested refrigeration systems or components included on the Enhanced Capital Allowance Energy Technology Product List or and equivalent list. 2. Commission the refrigeration plant in compliance with the commissioning criteria in BREEAM issue Man 04 Commissioning and handover.	MEP / Contractor		The design team have confirmed that a walk in fridge is currently specified. If this is scoped out of the design, providing there is no other commercial or industrial scale cold storage within the development, this issue will be scoped out. It is assumed that at least 1 of the 2 available credits under this issue will be targeted.
Indirect Greenhouse Gas Emissions	Ene 05-02	**1**		**1**	3. Achieve criteria 1 and 2. 4. Demonstrate a saving in indirect greenhouse gas emissions (CO_2-eq) from the installed refrigeration system over the course of its operational life.	Contractor		
Ene 06: Energy Efficient Transportation Systems								
Energy Consumption	Ene 06-01	**1**	**1**		1. For specified lifts, escalators and moving walks (transportation types) : 1.a. Analyse the transportation demand and usage patterns for the building to determine the optimum number and size of lifts, escalators and/or moving walks. b. Calculate the energy consumption in accordance with BS EN ISO 25745 Energy performance of lifts, escalators and moving walks, Part 2 : Energy calculation and classification for lifts (elevators) and/or Part 3 - Energy calculation and classification for escalators and moving walks, for one of the following: i. At least two types of system (for each transportation type required); OR ii. An arrangement of systems (e.g. for lifts, hydraulic, traction, machine room-less lift (MRL)); OR iii. A system strategy which is 'fit for purpose'. c. Consider the use of regenerative drives, subject to the requirements in the guidance manual. d. Specify the transportation system with the lowest energy consumption.	Lift Consultant / Architect / Contractor / TBC		It is thought these credits will be required to achieve Very Good.
Energy efficient features	Ene 06-02	**1**	**1**		2. Criterion 1 is achieved. 3. Specify the following three energy efficient features for each lift: a. A standby condition for off-peak periods. b. The lift car lighting and display lighting provides an average luminous efficacy, (across all fittings in the car) of > 70 luminaire lumens/circuit Watt. c. The lift uses a drive controller capable of variable speed, variable-voltage, and variable-frequency (VVVF) control of the drive motor. 4. Specify regenerative drives where their use is demonstrated to save energy.	MEP / Contractor		As above.
Ene 08: Energy Efficient Equipment								
	Ene 08-01	**2**	**0**	**2**	1. Identify the building's unregulated energy consuming loads and estimate their contribution to the total annual unregulated energy consumption of the building, assuming a typical/standard specification. 2. Identify the systems and/or processes that use a significant proportion of the total annual unregulated energy consumption of the building. 3. Demonstrate a meaningful reduction in the total annual unregulated energy demand of the building. Table 6.5 in the guidance manual 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 should justify how a meaningful reduction will be achieved for these contributors.	Client / MEP		Potential credits, however they are typically difficult to achieve. Sources of unregulated energy (for BREEAM Ene 08 purposes) include: - Data centres - IT-intensive operating areas - Domestic - scale appliances (white goods) - Kitchen and catering facilities

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
TRANSPORT (1 credit = 0.83%)								
Tra 01: Transport Assessment and Travel Plan								
Travel Plan	Tra 01-01	**2**		**2**	1. No later than Concept Design stage, undertake a site-specific transport assessment (or develop a travel statement) and draft travel plan, which can demonstrably be used to influence the site layout and built form.	Transport Consultant	2	The existing statement is largely compliant. It is likely that this credit will therefore be achieved, however it has been requested that it remain as a potential for now.
					2. The site-specific travel assessment or statement covers as a minimum: a. Existing travel patterns and opinions of existing building or site users towards cycling and walking, identifying constraints and opportunities if relevant. b Travel patterns and transport impacts of future building users c. Current local environments for walkers and cyclists (accounting for visitors who may be accompanied by young children.) d. Reporting the number and type of existing accessible amenities, see table 7.1 in the guidance manual, within 500m of the site. e. Disabled access (accounting for varying levels of disability and visual impairment). f. Calculation of the existing public transport Accessibility Index. g. Current facilities for cyclists.			
					3. Following a transport assessment (in accordance with the requirements set out in criteria 2), develop a site-specific travel plan that provides a long term management strategy which encourages more sustainable travel. The travel plan includes measures to increase or improve more sustainable modes of transport and movement of people and goods during the building's operation.	Transport Consultant		
					4. If the occupier is known, involve them in the development of the travel plan.	Client		
					5. Demonstrate that the travel plan will be implemented and supported by the building's management in operation.			
Tra 02: Sustainable Transport Measures								
Sustainable Transport Measures	Tra 02-Pre	**-**	**-**	**-**	1. A travel plan is developed in line with the Tra 01 criteria.	Architect		As the accessibility index is <25, each Tra 02 point equates to 1 credit. There is 1 point for having an AI >8. The assessor has calculated the site's AI as 6.54 however it is thought that this is due to the revised timetables following lockdown. This may increase as / if services return to normal. Cycle storage: There are different requirements for 'large retail' and 'small retail'. Currently assumed this will be classed as small retail. If so, a total of 4 spaces are required within the proximity of the building (required for staff only). For large retail, 1 space per 10 staff and 1 per 20 public parking spaces are required. The team have confirmed that 20 spaces are to be provided (10 dedicated to the market hall). Separate staff spaces are encouraged but are not essential providing there are at least 10 customer cycle spaces. The design team confirmed that cyclist facilities will not be provided to the market hall.
	Tra 02-01	**10**	**3**	**2**	2. Identify the sustainable transport measures in table 7.4 of the guidance manual			
					3. Award credits according to the Accessible Index of the project and the total number of points achieved for the options implemented. (See table 7.3 of the guidance manual.)* * Current targeted points include: - Provide a real-time public transport information system in a publically accessible area, to allow building users access to up-to-date information on the available public transport and transport infrastructure. This may include signposting to public transport, cycling, walking infrastructure or local amenities. (1 point) - At least 3 existing and compliant amenities are present (this will be achieved). (1 point) - Provide compliant cycle spaces (1 credit)			

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WATER (1 credit = 0.78%)								
Wat 01: Water Consumption								
Water Consumption	Wat 01-01	**5**	**3**	**2**	1. Use the BREEAM Wat 01 calculator to assess the efficiency of the domestic water-consuming components. 2. Use the standard Wat01 method to compare the water consumption (litres/person/day) for the assessed building against a baseline performance. Award BREEAM credits based upon the following: 1 credit: 12.5% 2 credits: 25% 3 credits: 40% 4 credits: 50% 5 credits: 55% Where it is not possible to use the standard method, and for some building types, complete the assessment using the alternative Wat 01 method. 3. If a greywater or rainwater system is specified, use its yield in L/person/day to offset potable water demand from components. 4. If a greywater or rainwater system is specified and installed: a. Greywater systems in compliance with BS 8525-1:2010 Greywater systems - Part 1 Code of Practice. b. Rainwater systems in compliance with BS 8515:2009+A1:2013 Rainwater harvesting systems - Code of practice Achieve Assessment scope - Criterion 6 on page 201, if you intend to pursue a post occupancy stage certification.	Architect		**At least 1 credit must be achieved for Very Good certification** It is thought that at least 3 of the 5 available credits will be targeted.
Exemplary level criteria	Wat 01-Ex	**1**	**0**		To achieve an exemplary performance credit: 7. Achieve criteria 1 to 4. 8. The water consumption (litres/person/day) for the assessed building achieves the 65% improvement described as exemplary performance in Table 8.1 of the guidance manual.	Architect		Rainwater or greywater harvesting would be required.
Wat 02: Water Monitoring								
Water Monitoring	Wat 02-01	**1**	**1**		1. The specification of a water meter on the mains water supply to each building; this includes instances where water is supplied via a borehole or other private source. 2. Water-consuming plant or building areas, consuming 10% or more of the building's total water demand: a. Fit easily accessible sub-meters OR b. Install water monitoring equipment integral to the plant or area. 3.For each meter (main and sub): a. Install a pulsed or other open protocol communication output AND b. Connect it to an appropriate utility monitoring and management system e.g. a building management system (BMS), for the monitoring of water consumption. If there is no BMS system in operation at Post-Construction stage, award credits provided that the system used enables connection when the BMS becomes operational. 4. In buildings with swimming pools, or large water tanks and aquariums, fit separate sub-meters on the water supply of the above and any associated changing facilities (toilets, showers etc.) irrespective of their water consumption levels. 5. In buildings containing laboratories, fit a separate water meter on the water supply to any process cooling loop for 'plumbed in' laboratory process equipment, irrespective of their water consumption levels. 6. *Additionally for those pursuing a post occupancy stage certification:* The water monitoring strategy used enables the identification of all water consumption for sanitary uses as assessed under Wat 01 (litres/person/day) if a post occupancy stage certification is sought.	MEP		**Criterion 1 is mandatory** 03.08.2020 Stage 3 review: BDP to review metering strategy to confirm compliance. On sites with multiple units, fit separate submeters on the water supply to the following areas (where present): – Each individual unit supplied with water – Common areas (covering the supply to toilet blocks) – Service areas (covering the supply to outlets within storage, delivery, waste disposal areas etc.) – Ancillary or separate buildings to the main development with water supply.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Wat 03: Water Leak Detection and Prevention								
Leak detection system	Wat 03-01	**1**	**1**		1. Install a leak detection system capable of detecting a major water leak: a. On the utilities water supply within the buildings, to detect any major leaks within the buildings AND b. Between the buildings and the utilities water supply, to detect any major leak between the utilities supply and the buildings under assessment. 2. The leak detection system is: a. A permanent automated water leak detection system that alerts the building occupants to the leak OR an inbuilt automated diagnostic procedure for detecting leaks. b. Activated when the flow of water passing through the water meter or data logger is at a flow rate above a pre-set maximum for a pre-set period of time. This usually involves installing a system which detects higher than normal flow rates at meters or sub-meters. It does not necessarily require a system that directly detects water leakage along part or the whole length of the water supply system. c. Able to identify different flow and therefore leakage rates e.g. continuous, high or low level, over set time periods. Although high and low level leakage rates are not specified, the leak detection equipment installed must have the flexibility to distinguish between different flow rates to enable it to be programmed to suit the building type and owners or occupiers usage patterns. d. Programmable to suit the owner's or occupiers water consumption criteria. e. Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers. Where there is physically no space for a leak detection system between the utilities water meter and the building, alternative solutions can be used, provided that a major leak can still be detected.	MEP		
Flow control devices	Wat 03-02	**1**	**1**		2. Install flow control devices that regulate the supply of water to each WC area/sanitary facility according to demand, in order to minimise undetected wastage and leaks from sanitary fittings and supply pipework.	MEP		
Wat 04: Water Efficient Equipment								
Water efficient equipment	Wat 04-01	**1**	**1**		1. Identify all water demands from users other than those considered under Wat 01 that could be realistically mitigated or reduced. Where there is no water demand from uses other than domestic -style, sanitary use components in the building, this issue is not applicable. 2. Identify systems or processes to reduce the relevant water demand (criterion 1) and establish, through either good practice design or specification, a demonstrable reduction in the total water demand of the building.	Architect		For the purposes of this BREEAM Issue, non-domestic scale, non- sanitary water uses refer to any building integrated water uses not assessed under Wat 01. This includes, but is not limited to the following: – Swimming pools – Recreational hot tubs and hydrotherapy pools – Equipment used for irrigation – Vehicle wash equipment – Project-specific industrial processes – Water filtration and treatment processes – Building services (e.g. cooling towers and humidification systems. It is assumed that irrigation will be required but that this will be done by hand.

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MATERIALS (1 credit = 1.07%)								
Mat 01: Life Cycle Impacts								
Superstructure	Mat 01-01	**6**	**0**		**Option appraisal during Concept Design (all building types).** 4. During Concept Design, identify opportunities for reducing environmental impacts as follows: a. Carry out building LCA options appraisal of 2 to 4 significantly different superstructure design options (applicable to the Concept Design stage) b. Use a building LCA tool that is recognised by BREEAM (as suitable for assessing superstructure during Concept Design) according to the methodology. c. For each design option, fulfil the same functional requirements specified by the client and all statutory requirements (to ensure functional equivalency). d. Integrate the LCA options appraisal activity within the wider design decision-making process. Record this in an options appraisal summary document. e. Record the following in the Mat 01/02 Results Submission Tool: The differences between the design options; the design option selected by the client to be progressed beyond Concept Design; the reasons for selecting it and the reasons for not selecting the other design options. f. Submit the Mat 01/02 Results Submission Tool to BRE at the end of Concept Design, and before planning permission is applied for (that includes external material or product specifications). If the building LCA tool recognised by BREEAM and used for criteria 3 to 5 (and 6 to 9, if pursued) is not an IMPACT Compliant LCA tool and criteria 1 to 2 are applicable, then BREEAM Simplified Building LCA tool (or an IMPACT Compliant LCA tool) shall be used for criteria 1 to 2.	Architect / BREEAM Assessor	2	These credits cannot be achieved where the analysis hasn't been carried out and evidence uploaded to the BRE prior to completion of RIBA Stage 2.
					Options appraisal during Technical Design (all building types) 5. During Technical Design identify opportunities for reducing environmental impacts as follows: a. Carry out building LCA options appraisal of 2 to 3 significantly different superstructure design options (based on the selected Concept Design option and as applicable to the Technical Design stage). b. Use a building LCA tool that is recognised by BREEAM (as suitable for assessing superstructure during Technical Design) according to the methodology. c. As criteria 4.c. to 4.e. above. Where an options appraisal summary document was produced during Concept Design, update it to include the Technical Design options. d. Submit the Mat 01/02 Results Submission Tool to BRE at the end of Technical Design. Where a project has not achieved criteria 3 and 4, criterion 5 may still be achieved.	Architect / BREEAM Assessor	4	2 credits may be available.
Substructure and Hard Landscaping options appraisal During Concept Design	Mat 01-02	**1**	**0**		6. Criteria 3 and 4 are achieved. 7. During Concept Design identify opportunities for reducing environmental impacts as follows: a. Carry out building LCA options appraisal of a combined total of at least six significantly different substructure or hard landscaping design options (at least two shall be substructure and at least two shall be hard landscaping). b. Using a building LCA tool that is recognised by BREEAM (as suitable for assessing substructure and hard landscaping during Concept Design) according to the methodology. c As criteria 4.c. to 4.f.	Landscape Architect / C&S Engineers / BREEAM Assessor	2	As per issue Mat 01-01, this credit is no longer available.
Exemplary Performance Criteria	Mat 01-Ex1	**1**	**0**		8. Criteria 3-4 are achieved. 9.During Concept Design, identify opportunities for reducing environmental impacts as follows: a. Carry out building LCA options appraisal of at least 3 significantly different core building services design options. b. Use a building LCA tool that is recognised by BREEAM (as suitable for assessing core building services during Concept Design) according to the methodology. c. As criteria 4.c.to 4.f.	MEP / BREEAM Assessor	2	As per issue Mat 01-01, this credit is no longer available.

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Exemplary Performance Criteria	Mat 01-Ex2	**1**	**0**		10. Achieve criteria 3 to 5. 11. Achieve the Elemental LCC plan and Component Level LCC options appraisal credits (Man 02 Life cycle cost and service life planning). 12. Include design options appraised for criteria 3 to 4 (and 6 to 7 and 8 to 9, if pursued) during Concept Design in Assessment scope- The elemental LCC plan. 13. Include the design options appraised for criterion 5 during Concept Design in the 'Component Level LCC option appraisal' (in Man 02 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'.	Cost Consultant / Architect / MEP / BREEAM Assessor		As per issue Mat 01-01, this credit is no longer available.
	Mat 01-Ex3	**1**	**0**		15.Criteria 1 to 7 (As applicable to the building type) are achieved. 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 of the guidance manual. 18. Include details of the suitable 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.	TBC		
Mat 02: Environmental Impacts from Construction Products - Environmental Product Declarations (EPD)								
Specification of products with a recognised EPD	Mat 02-01	**1**	**1**		1. Specify construction products with EPD that achieve a total EPD points score of at least 20, according to methodology. 2. Enter the details of each EPD into the Mat 01/02 Results Submission Tool, including the material category classification. The mat 01/02 results submission tool will verify the EPD points score and credit award.	Architect / Contractor BREEAM assessor		
Mat 03: Responsible Sourcing of Construction Products								
Ensuring Sustainable Procurement	Mat 03-Pre	**-**	**-**	**-**	1. All timber and timber based products used on the project is ' Legally harvested and traded timber' as per the UK government's Timber Procurement Policy (TPP)	Contractor		**Criterion 1 is mandatory** If a sustainable procurement plan was in place at Stage 1 then Mat 03-01 could be available.
	Mat 03-01	**1**		**1**	2. A sustainable procurement plan must be used by the design team to guide specification towards sustainable construction products. The plan must: a. Be in place before Concept Design b. Include sustainability aims, objectives for the credit to be awarded but justification must be provided for targets that are not achieved. c. Include a requirement for assessing the potential to procure construction products locally. There must be a policy to procure construction products locally where possible. d. Include details of procedures in place to check and verify the effective implementation of the sustainable procurement plan. In addition if the plan is applied to several sites or adopted at an organisational level it must: e. Identify the risks and opportunities of procurement against a broad range of social, environmental and economic issues following the process set out in BS ISO 20400:2017.	Architect	1	
Measuring responsible sourcing	Mat 03-02	**3**	**2**	**1**	3. Use the Mat 03 calculator tool and methodology to determine the number of credits achieved for the construction products specified or procured. Credits are awarded in proportion to the scope of the assessment and the number of points achieved. (Use table 9.10 in the guidance manual).	Contractor		

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Mat 05: Designing for durability and resilience								
Designing for durability and resilience	Mat 05-01	**1**	**1**		**Protecting vulnerable parts of the building from damage** 1. Protection measures are incorporated into the building's design and construction to reduce damage to the building's fabric or materials in case of accidental or malicious damage occurring. These measures must provide protection against: a. Negative impacts of high user numbers in relevant areas of the building (e.g. corridors, lifts, stairs, doors etc.) b. Damage from any vehicle or trolley movements within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas. c. External building fabric damage by vehicle. Protection where parking or manoeuvring areas are within 1 metre of the building facade and where delivery areas or routes are within 2 metres of the facade i.e. specifying bollards or protection rails. d. Potential malicious damage to building materials and finishes in public and common areas where appropriate.	Architect / Landscape Architects		Key exposed building elements in the context of this issue are those adding up to at least 80% by area of each of the following categories: 1. External walls and cladding 2. Roof or balconies 3. Glazing: windows, skylights 4. Hard landscaping
					Protecting exposed parts of the building from material degradation 2. Key exposed building elements have been designed and specified to limit long and short term degradation due to environmental factors. This can be demonstrated through one of the following: a. The element or product achieving an appropriate quality or durability standard or design guide, see Table 9.14 of the guidance manual. If none are available use BS 7543:2015 as the default appropriate standard. OR b. A detailed assessment of the element's resilience when exposed to the applicable material degradation and environmental factors.			
					3. Include convenient access to the roof and façade for cost-effective cleaning, replacement and repair in the building's design.			
					4. Design the roof and façade to prevent water damage, ingress and detrimental ponding. See Table 9.14 in the guidance manual for an example list of relevant industry durability and quality standards.			
Mat 06: Material efficiency								
Material efficiencies	Mat 06-01	**1**	**1**		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: a. Preparation and Brief b Concept Design c. Developed Design d Technical design e. Construction	Architect	1 to 5	
					2. Develop and record the implementation of material efficiency during: a. Developed Design b. Technical Design c. Construction			
					3. Report the targets and actual material efficiencies achieved.			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
WASTE (1 credit = 0.60%)								
Wst 01: Construction Waste Management								
Pre-Demolition Audit	Wst 01-01	**1**	**0**	**1**	1. Complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition. This must be used to determine whether refurbishment or reuse is feasible and, in the case of demolition, to maximise the recovery of material for subsequent high grade or value applications. The audit must cover the content of pre-demolition audit scope and: a. Be carried out at Concept Design stage (RIBA Stage 2) by a competent person prior to strip-out or demolition works. b. Guide the design, consider materials for reuse and set targets for waste management. c. Engage all contractors in the process of maximising high grade reuse and recycling opportunities. d. Compare actual waste arisings and waste management routes used with those forecast and investigate significant deviations from planned targets.	Project Manager / Demolition Contractor	2	It is thought that a pre-demolition audit was not undertaken. Pre-demolition audit competent person: An individual who has appropriate knowledge of buildings, waste and options for reuse and recycling of different waste streams. Ideally this would be a demolition contractor, but could also be the main contractor.
					2. Make reference to the audit in the resource management plan (RMP).	Contractor		
Construction resource efficiency	Wst 01-02	**3**	**2**	**1**	3. Prepare a compliant Resource Management Plan (RMP) covering: a. Non-hazardous waste materials (from on-site construction and dedicated off-site manufacturer or fabrication) including demolition and excavation waste. b. Accurate data records on waste arising's and waste management routes.	Contractor		
					4. Meet or improve upon the benchmarks below for non-hazardous construction waste, excluding demolition and excavation waste: Amount of waste generated per 100m2 GIFA: 1 credit: ≤ 13.3m3 actual volume (not bulk) / ≤ 11.1 tonnes 2 credits: ≤ 7.5m3 actual volume (not bulk) / ≤ 6.5 tonnes 3 credits: ≤ 3.4m3 actual volume (not bulk) / ≤ 3.2 tonnes Exemplary level: ≤ 1.6m3 actual volume (not bulk) / ≤ 1.9 tonnes			
Diversion of resources from landfill	Wst 01-03	**1**	**1**		5. Meet, where applicable, the diversion from landfill benchmarks below for non-hazardous construction waste and demolition and excavation waste generated: Non-demolition: 70% volume / 80% tonnage Demolition: 80% volume / 90% tonnage Excavation: n/a			
					6. Sort waste materials into separate key waste groups as per Table 10.3 of the guidance manual, either on-site or through a licensed contractor for recovery.			
Exemplary Performance Criteria	Wst 01-Ex	**1**	**0**	**1**	7. Non-hazardous construction waste generated, excluding demolition and excavation waste is less than or equal to the exemplary level resource efficiency benchmarks: Exemplary level: ≤ 1.6m2 actual volume (not bulk) / ≤ 1.9 tonnes	Contractor		
					8. The percentage of non-hazardous construction (on-site and dedicated off-site manufacture/fabrication), demolition and excavation waste (if relevant) diverted from landfill meets or exceeds the exemplary level percentage benchmarks outlined below: Non-demolition: 85% volume / 90% tonnage Demolition: 85% volume / 95% tonnage Excavation: 95% volume / 95% tonnage			
					9. All key waste groups in Table 10.3 of the guidance manual, for diversion from landfill are covered in the RMP.			
					10. Waste data obtained from licenced external waste contractors is reliable and verifiable, by using data from EA/SEPA/EA Wales/NIEA Waste Return Forms or from PAS 402:2013 compliant company.			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Wst 02: Recycled Aggregates								
Pre-Requisite	Wst 02-Pre	-	-	-	1. If demolition occurs on site, to encourage the reuse of site-won material on site, complete a pre-demolition audit of any existing buildings, structures or hard surfaces in accordance with Assessment scope- Criterion 1 and Assessment Scope - Criterion 2	Pre-demolition contractor		03.08.2020 Stage 3 review: Curtins to review if these credits can be achieved. Assessor has issued calculator tool and methodology.
Sustainable Aggregate Points	Wst 02-01	1	0	1	2. Identify all aggregate uses and types on the project Table 10.5, and Table 10.6 in the guidance manual. 3. Determine the quantity in tonnes for each identified use and aggregate type. 4. Identify the region in which the aggregate source is located. 5. Calculate the distance in kilometres travelled by all aggregates by transport type. 6. Enter the information into the BREEAM Wst 02 calculator to calculate the Project Sustainable Aggregate points. The corresponding number of BREEAM credits will be awarded (refer to Table 10.4 in the guidance manual).	C&S Engineers		
Exemplary Performance Criteria	Wst 02-Ex	1	0		To achieve an exemplary performance credit: 7. The Project Sustainable Aggregate Points score meets or exceeds the exemplary level performance benchmark in Table 10.4 of the guidance manual.	C&S Engineers		
Wst 03: Operational Waste								
Operational Waste	Wst 03-01	1	1		1. Provide a dedicated space for the segregation and storage of operational recyclable waste generated. The space is: a. Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams b. Accessible to building occupants or facilities operators for the deposit of materials and collections by waste management contractors c. Of a capacity appropriate to the building type, size, number of units (if relevant) and predicted volumes of waste that will arise from daily/weekly operational activities and occupancy rates.			For shopping centres and retail parks there must be adequate space to cater for each tenant and their potential recyclable waste volumes. Tenants that occupy a large proportion of the centre, i.e. 'flagship tenants', must have their own dedicated compliant facilities. For smaller non-flagship tenant units, compliant central or common facilities on site or dedicated spaces for individual units will meet the assessment criteria for this BREEAM issue.
					2. For consistent and large amounts of operational waste generated, provide: a. Static waste compactors or balers; situated in a service area or dedicated waste management space b. Vessels for composting suitable organic waste OR adequate spaces for storing segregated food waste and compostable organic material for collection and delivery to an alternative composting facility c. A water outlet provided adjacent to or within the facility for cleaning and hygiene purposes where organic waste is to be stored or composted on site.	Architect		
Wst 05: Adaptation to climate change								
Resilience of structure, fabric, building services and renewables installation	Wst 05-01	1	1		1. Conduct a climate change adaptation strategy appraisal using: a. A systematic risk assessment to identify the impact of expected extreme weather conditions arising from climate change on the building over its projected life cycle. The assessment covers the installation of building services and renewable systems, as well as structural and fabric resilience aspects and includes: i. Hazard identification ii. Hazard assessment iii. Risk estimation iv. Risk evaluation v. Risk management.	Architect / MEP / C&S Engineers	2	
					2. Develop recommendations or solutions based on the climate change adaptation strategy appraisal, before or during concept design, that aim to mitigate the identified impact.			
					3. Provide an update during Technical Design demonstrating how the recommendations or solutions proposed at Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing by the assessor.	Architect / MEP / C&S Engineers	4	

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Exemplary Criteria	Wst 05-Ex	**1**	**0**	**1**	Achievement of the following criteria demonstrates a holistic approach to the design and construction of the building's life cycle to mitigate against the impacts of climate change. To achieve an exemplary level performance credit: 4. Meet criteria 1-3. 5. Meet the criteria or achieve credits of the assessment issues given below: - Hea 04: Criterion 6 - Ene 01: Minimum 6 credits - Ene 04: Passive design credit - Wat 01: Minimum 3 credits - Mat 05: Criteria 2 - 4 - Pol 03: Minimum 1 credit for flood resilience and 2 credits under Surface Water Runoff	Design Team		
Wst 06: Design for Disassembly and Adaptability								
Recommendations	Wst 06-01	**1**	**1**		1. Conduct a study to explore the ease of disassembly and the functional adaptation potential of different design scenarios by the end of Concept Design. 2. Develop recommendations or solutions based on the study during or prior to Concept Design, that aim to enable and facilitate disassembly and functional adaptation.	Architect	2	
Implementation	Wst 06-02	**1**	**1**		3. Achieve criteria 1 and 2. 4. Provide an update, during Technical Design, on: a. How the recommendations or solutions proposed by Concept Design have been implemented where practical and cost effective. Omissions have been justified in writing to the assessor. b. Changes to the recommendations and solutions during the development of the Technical Design, 5. Produce a building adaptability and disassembly guide to communicate the characteristics allowing functional adaptability and disassembly to prospective tenants.	Architect	4	
LAND USE AND ECOLOGY (1 credit = 1.00%)								
LE 01: Site Selection								
Previously Occupied Land	LE 01-01	**1**	**1**		1. At least 75% of the proposed development's footprint is on an area of land which has previously been occupied.	Architect		100% of the site is on previously developed land and as such this will be achieved.
Contaminated Land	LE 01-02	**1**	**0**	**1**	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: a. The degree of contamination b. The contaminant sources/types c. The options for remediating sources of contamination which present an unacceptable risk. 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.	C&S Engineers		It is assumed that the site is not significantly contaminated.

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LE 02: Ecological Risks and Opportunities								
Pre-Requisite (Statutory Obligations)	LE 02-Pre	-	-	-	1. The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.	Contractor		It is assumed that Route 2 will be used as there is potential to influence ecology / green infrastructure. Where criterion 2 is not completed at Stage 1, this can occur later providing the ecologist's input can influence the design. This credit is required in order to achieve any credits under LE 03.
Survey and evaluation	LE 02-01	**1**	**1**		**Foundation route (Route 1)** 1. The site is evaluated using the BREEAM Ecological Risk Evaluation Checklist (Guidance Note 34) confirming that the Foundation route can be used.	Design Team		
					Comprehensive route (Route 2) 2. A Suitably Qualified Ecologist (SQE) carries out a survey and evaluation (see Methodology) for the site early enough to influence site preparation works, layout and, where necessary, strategic planning decisions (typically Preparation and brief stage) (see Definitions).	Ecologist / Design Team	1	
					3. The SQE's survey and evaluation determines the site's ecological baseline, including: a. Current and potential ecological value and condition of the site and related areas within the Zone of Influence. b. Direct and indirect risks to current ecological value from the project. c. Capacity and feasibility for enhancement of the site's ecological value and, where relevant, areas within the Zone of Influence.	Ecologist / Design Team		
					4. Recommendations and data collected from the survey and evaluation are shared with appropriate project team members to influence decisions made for activities during site preparation, design and construction works, which can support ecological features.			
Determining Ecological Outcomes	LE 02-02	**1**	**1**		5. Achieve the LE 02-01 "Survey and Evaluation" credit.	Ecologist / Project Manager	2	This credit is required in order to achieve any further credits under issue LE 03.
					6. The project team liaise and collaborate with representative stakeholders early enough to influence key planning decisions (typically Concept Design stage), to: a. Identify the optimal ecological outcomes for the site. b. Identify, appraise and select measures to meet the optimal ecological outcomes for the site (criterion 7a), in line with the mitigation hierarchy of action, according to the route being used: <u>Comprehensive Route (Route 2):</u> 1. Avoidance 2. Protection 3. Reduction or limitation of negative impacts 4. On site compensation and 5. Enhancement, considering the capacity and feasibility within the site, or where viable, offsite.			
Exemplary level criteria	LE 02-Ex	**1**	**0**	**1**	7. Achieve credit LE 02-02.	Design Team		
					9. Wider sustainability related activities and potential ecosystem service benefits are considered as part of determining the optimal ecological outcomes for the site (criterion 6), including the areas outlined in the Methodology in the BREEAM guidance manual.			
					13. Achieve the credits of the assessment issues outlined below: 13. Both Hea 07 credits 13. Pol 03 credits for 'surface water run-off' and 'minimising watercourse pollution'. 13. Pol 05			

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
LE 03: Managing Impacts on Ecology								
Pre-Requisite	LE 03-Pre	-	-	-	1. LE 02's 'Survey and evaluation and Determining ecological outcomes' criteria have been achieved using the Foundation route (Route 1) or the Comprehensive route (Route 2).	Design Team		This must be achieved in order to award LE 03-02. "Further planning" refers to defining and allocating roles and responsibilities towards promoting and protecting ecology, allocating resources (time, money), and putting in place procedures for monitoring effectiveness etc.
Planning and measures on-site	LE 03-01	**1**	**1**		2. Further planning to avoid and manage negative ecological impacts on-site is carried out (see Methodology in guidance manual) early enough to influence the concept design and design brief as well as site preparation planning (typically Concept Design stage).	Design Team	2	
					3. On-site measures for managing negative ecological impacts during site preparation and construction are implemented in-practice (e.g. mitigation measures to protect existing ecological features) (see Methodology in guidance manual).	Contractor		
					4 Criteria 2-3 are based on input from the project team in collaboration with representative stakeholders and data collated as part of the 'Determining ecological outcomes' in LE 02 Ecological risks and opportunities (see Methodology).	Design Team		
Managing Negative Impacts of the Project	LE 03-02	**2**	**2**		**Route 1 (one credit)** 5. Criteria 2 and 3 have been achieved. 6. Negative impacts from site preparation and construction works are managed according to the mitigation hierarchy (see Methodology in guidance manual) and no overall loss (see Definitions) of ecological value has occurred.	Ecologist / Contractor / Design Team		This credit is required to achieve credits under LE 04 and LE 05.
					Route 2 (up to two credits) 7. Criteria 2-4 have been achieved. 8. Negative impacts from site preparation and construction works have been managed according to the mitigation hierarchy, in line with the SQE's recommendations (see Methodology) and, either: a No overall loss of (see Definitions) ecological value has occurred (two credits). OR where criterion 8.a is not possible: b. The loss of ecological value has been minimised (Minimising Loss) (one credit)			
LE 04: Ecological Change and Enhancement								
Pre-Requisite	LE 04-Pre	-	-	-	1. Criterion 6 (for Foundation route) or 8 (for Comprehensive route) in LE 03 has been achieved.	Design Team		At least 1 credit is required to achieve any credits under LE 05. a. Minimising loss of ecological value (one credit - percentage score of 75-94) b. No net loss of ecological value (two credits - percentage score of 95-104) c. Net gain of ecological value (three credits - percentage score of 105-109)
					2. The client or contractor confirms compliance is monitored against all relevant UK, EU or international legislation relating to the ecology of the site.	Contractor		
Change and enhancement of ecology	LE 04-01	**3**	**2**	**1**	**Comprehensive route (Route 2) only** 3. Up to three credits are awarded based on the change in ecological value occurring as a result of the project. This must be calculated in accordance with the process set out in GN36 - BREEAM, CEEQUAL and HQM Ecology Calculation Methodology – Route 2. Credits are awarded in line with the Reward Scale table in GN36 where there are no residual impacts on protected sites or irreplaceable habitats.	Ecologist / Design Team		

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Ecological Enhancement	LE 04-02	**1**	**1**		**Comprehensive route (Route 2) only** 4. Measures have been implemented that enhance ecological value, which are based on input from the project team and SQE in collaboration with representative stakeholders and data collated as part of the 'Determining ecological outcomes' in LE 02 (see Methodology). Measures are implemented in the following order: a. On site, and where this is not feasible, b. Off site within the Zone of Influence.	Ecologist / Contractor / Landscape Architect		
					5. Data collated are analysed and where potentially valuable, provided to the local environmental records centres nearest to, or relevant for, the site.			
Exemplary level criteria	LE 04-EX	**1**	**0**	**1**	7 The change in ecological value occurring is calculated in accordance with the process set out in GN36 - BREEAM, CEEQUAL and HQM Ecology Calculation Methodology – Route 2. The credit is awarded as follows: a. Significant net gain of ecological value (percentage score of 110 or above)	Ecologist / Landscape Architect		
LE 05: Long Term Ecological Management and Maintenance								
Pre-Requisite	LE 05-Pre	**-**	**-**	**-**	1 The client or contractor has confirmed that compliance is being monitored against all relevant UK, EU and international standards relating to the ecology of the site.	Contractor		
					2. The following must be achieved, according to the route being assessed: a. Foundation route (Route 1) - Criterion 6 in LE 03 has been achieved. b. Comprehensive route (Route 2) - Criterion 8 in LE 03 has been achieved, and at least one credit under LE 04 for 'Change and Enhancement of Ecology' has been awarded.			
Planning, liaison, data, monitoring and review management and maintenance	LE 05-01	**1**	**1**		3. Measures have been implemented to manage and maintain ecology throughout the project. These measures are based on input from the project team in collaboration with representative stakeholders and data collated as part of the 'Determining ecological outcomes' in LE 02 (see Methodology). To ensure the optimal ecological outcomes agreed in LE 02 are met in-practice, these measures must monitor and review the effectiveness of the mitigation and enhancement measures in place for LE 03 & LE 04 to ensure they are implemented.	Contractor / Design Team		
					4. A section on Ecology and Biodiversity has been included as part of the tenant or building owner information supplied, to inform the owner or occupant of local ecological features, value and biodiversity on or near the site. This should include detailed management and maintenance plans as required by landscape and asset managers as well as relevant parts of the handover information for occupiers written in a format that encourages understanding and supportive behaviours.	Ecologist / Contractor / Design Team		
Landscape and Ecology Management Plan (or similar) development	LE 05-02	**1**	**1**		5. A Landscape and Ecology Management Plan, or equivalent, has been developed in accordance with BS 42020:2013 Section 11.1(213) covering at least the first five years after project completion as a minimum and including: a. Actions and responsibilities of relevant individuals prior to handover b. The ecological value and condition of the site at handover and how this is expected to develop and change over time c. Identification of opportunities for ongoing alignment with activities beyond the development project, which support the aims of BREEAM's Strategic Ecology Framework d. Identification and guidance to trigger appropriate remedial actions to address previously unforeseen impacts e. Clearly defined and allocated roles and responsibilities for delivering the plan	Ecologist / Landscape Architect		
					6. The landscape and management plan or similar will be updated to support maintenance of the ecological value of the site (see sections relating to Maintenance and Monitoring in CIEEM, CIRIA, IEMA, for helpful guidance).	Client		

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POLLUTION (1 credit = 0.66%)								
Pol 01: Impact of Refrigerants								
Impact of refrigerant	Pol 01-01	**2**	**0**	**2**	**Three credits - No refrigerant use** 1. Where the building does not require the use of refrigerants within its installed plant/systems. OR alternatively, where the building does require the use of refrigerants, the three credits can be awarded as follows: **Pre-requisite** 2. All systems (with electric compressors) must comply with the requirements of BS EN 378:2016 (parts 2 and 3) and where refrigeration systems containing ammonia comply with the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice **Two credits - Impact of refrigerant** 3. Where the systems using refrigerants have Direct Effect Life Cycle CO2 equivalent emissions (DELC CO2e) of ≤ 100 kgCO2e/kW cooling/heating capacity. For systems which provide cooling and heating, the worst performing output based on the lower of kW cooling output and kW heating output is used to complete the calculation. To calculate the DELC CO2e please refer to the Relevant definitions in the Additional information section and the Methodology section. OR 4. Where air-conditioning or refrigeration systems are installed the refrigerants used have a Global Warming Potential (GWP) ≤10. OR **One credit - Impact of refrigerant** 5. Where the systems using refrigerants have Direct Effect Life Cycle CO2equivalent emissions (DELC CO2e) of ≤ 1000 kgCO 2e/kW cooling/heating capacity.	MEP		03.08.2020 Stage 3 review: This will be influenced by the manufacturer's rather than MEP. To be addressed in Stage 4 design. 03.08.2020: Pol 01 calculator tool issued to BDP for review.
Leak detection	Pol 01-02	**1**	**1**		6. All systems are hermetically sealed or only use environmentally benign refrigerants. OR 7. Where the systems are not hermetically sealed: a. Systems have: i. A permanent automated refrigerant leak detection system, that is robust and tested, and capable of continuously monitoring for leaks. OR ii. An inbuilt automated diagnostic procedure for detecting leakage is enabled. b. In the event of a leak, the system must be capable of automatically responding and managing the remaining refrigerant charge to limit loss of refrigerant (see automatic isolation and containment of refrigerant).	MEP		03.08.2020 Stage 3 review: This will be provided.

Title	Credit Ref	Credits available	Route to Very Good (min. 55%) 60.28%	Potential credits (min. 85%) 33.23%	Compliance Requirements	Responsibility	RIBA Stage	Comments
Pol 02: Local Air Quality								
Local Air Quality	Pol 02-01	**2**	**2**		1. All heating and hot water is supplied by non-combustion systems. For example, only powered by electricity OR alternatively; 2. Emissions from all installed combustion plant that provide space hearing and domestic hot water do not exceed the levels set in Table 12.4 and Table 12.5 in the guidance manual (assessor to provide). The measurements must be provided by manufacturers, following the labelling requirements of the European Directive 2009/125/EC. No credits can be awarded for Pol02 if any of the combustion appliances are not covered in Table 12.4 and Table 12.5 in the guidance manual. 3. Emissions from all installed combustion plant that provide space heating and domestic hot water do not exceed the levels set in table 12.4 and 12.15 of the guidance manual.	MEP		It is thought that use of the ASHPs will secure these 2 credits.
Pol 03: Flood and Surface Water Management								
Flood resilience	Pol 03-01	**2**	**2**		1. An appropriate consultant is appointed to carry out and demonstrate the development's compliance with all criteria. Two credits - Low flood risk 2. A site-specific flood risk assessment (FRA) confirms that the development is in a flood zone that is defined as having low annual probability of flooding. The FRA takes all current and future sources of flooding into consideration. One credit - Medium/high flood risk 3. A site-specific FRA confirms the development is in a flood zone that is defined as having a medium or high annual probability of flooding and is not in a functional floodplain. The FRA must take all current and future sources of flooding into consideration. For smaller sites, refer to Level of detail required in the FRA for smaller sites which overrides criterion 2. 4. To increase the resilience of the development to flooding, one of the following must be achieved: a. The ground level of the building and access to both the building and the site, are designed (or zoned) so they are at least 600mm above the design flood level of the site's flood zone. b. The final design of the building and wider site reflects the recommendations made by an appropriate consultant with the hierarchy approach outlined in section 5 of BS 8533:2017.	C&S Engineers		03.08.2020 Stage 3 review: Curtins confirmed that the site is at a low risk of flooding from all sources and as such these 2 credits will be achieved.

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Surface Water Run-off	Pol 03-Pre	-	-	-	5. Surface water run-off design solutions must be bespoke, i.e. they must take account of the specific site requirements and natural or man-made environment of and surrounding the site. The priority levels detailed in the Methodology must be followed, with justification given by the appropriate consultant where water is allowed to leave the site.	C&S Engineers		03.08.2020 Stage 3 review: Curtins confirmed that Pol 03-02 will be achieved (with a 95% improvement as they're limiting runoff to greenfield rates), and that Pol 03-03 will be achieved by default. Brownfield sites: Where the man-made impermeable area draining to the watercourse (natural or municipal) has decreased or remains unchanged post-development, the volume of run-off requirements (criteria 11-16) can be considered as met. Volume calculations will not need to be provided. Instead, drawings clearly showing the impermeable areas of the site draining to the watercourse should be provided for the pre- and post-development scenarios. Figures must also be given (ideally on the drawings) to show a comparison between the areas of drained impermeable surfaces pre- and post-development. In this instance, it is still recommended that any opportunities identified to reduce surface water run-off are implemented.
	Pol 03-02	1	1		**One credit - Surface water run-off - Rate** 6. For brownfield sites, drainage measures are specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) shows a 30% improvement for the developed site compared with the predeveloped site. This should comply at the 1-year and 100-year return period events. 7. For Greenfield sites, drainage measures are specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) is no greater for the developed site than it was for the pre-development site. This should comply at the 1-year and 100-year return period events. 8. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Sustainable Drainage Systems (SuDs) are in place. 9. Calculations include an allowance for climate change. This should be made in accordance with the current best practice planning guidance.	C&S Engineers		
	Pol 03-03	1	1		**One credit - Surface Run-off - Volume** 10. Flooding of property will not occur and in the event of local drainage system failure (caused by either extreme rainfall or a lack of maintenance); AND EITHER 11. Drainage design measures are specified so that the post-development run-off volume, over the development lifetime, is no greater than it would have been prior to the assessed site's development. This must be for the 100-year-6-hour event, including an allowance for climate change. 12. Any additional predicted volume 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 for this credit cannot be achieved): 13. Justification from the appropriate consultant indicating why the above criteria cannot be achieved, i.e. where infiltration or other SuDS techniques are not technically viable options. 14. Drainage design measures are specified so that that post-development peak run-off is reduced to the limiting discharge. The limiting discharge is defined as the highest flow rate from the following options: a. the pre-development one-year peak flow rate b. The mean annual flow rate (Qbar) c 2L/s/ha. For the one-year peak flow rate, the one-year return period event criterion applies. 15. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS are in place. 16. For either option, above calculations must include an allowance for climate change; this should be made in accordance with current best practice planning guidance.	C&S Engineers		
Minimising Water Course Pollution	Pol 03-04	1	0		17. There is no discharge from the developed site for rainfall up to 5mm (confirmed by the Appropriate Consultant). 18. Areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate SuDS techniques. 19. Areas with a high risk of contamination of spillage of substances, such as petrol and oil have separators (or an equivalent system) are installed in surface water drainage systems. 20. Chemical or liquid gas storage areas have a means of containment fitted to the site drainage system (i.e. shut-off valves). This is to prevent the escape of chemicals to natural watercourses in the event of spillage or bunding failure. 21. All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as the SuDS manual and other relevant industry best practice. They must be bespoke solutions taking account of the specific site requirements and natural or man-made environment of and surrounding the site. 22. A comprehensive and up to date drainage plan of the site will be made available for the building or site occupiers. 23. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place. 24. All external storage and delivery areas are designed and detailed in accordance with the current best practice planning guidance.	C&S Engineers		03.08.2020 Stage 3 review: Criterion 17 will not be met.

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Pol 04: Reduction of Night Time Light Pollution								
	Pol 04-01	**1**	**1**		1. External lighting pollution has been eliminated through effective design that removes the need for external lighting. This does not adversely affect the safety and security of the site and its users. OR alternatively, where the building does have external lighting one credit can be awarded as follows:	MEP		Awarded.
					2. The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the Institution of Lighting Professionals (LP) Guidance notes for the reduction of obtrusive light, 2011.			
					3. All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00			
					4. If safety or security lighting is provided and will be used between 23:00 and 07:00, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP guidance notes.			
					5. Illuminated advertisements are designed in compliance with IPL PLG05 The Brightness of Illuminated Advertisement.			
Pol 05: Reduction of noise pollution								
	Pol 05-01	**1**	**1**		1. There are no noise-sensitive areas within the assessed building or within 800m radius of the assessed site. OR	Acoustician		
					2. Where there are noise-sensitive areas within the assessed building or noise-sensitive areas within 800m radius of the assessed site, a noise impact assessment compliant with BS4142:2014 is commissioned. Noise levels must be measured or determined for: a. Existing background noise levels: i. at the nearest or most exposed noise-sensitive development to the proposed assessed site. ii. Including existing plant on a building, where the assessed development is an extension to the building. b. Noise rating level from the assessed building			
					3. The noise impact assessment must be carried out by a suitably qualified acoustic consultant.			
					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.	Contractor		
					5. If the noise sources from the assessed building are greater than the levels described in criterion 4, measures have been installed to attenuate the noise at its source to a level where it will comply with the criterion.			

Appendix 2: Energy and Part L Report

Queen’s Market Rhyl

Energy Report and Part L (BRUKL 2014)

Doc No: QMR-BDP-ZZ-XX-RP-YS-02
Issue: PLANNING ISSUE
Rev: P01
Date: 7/08/2020

BDP.

Revision	Date	Description	By	Checked
-	31/07/2020	DRAFT ISSUE	M. Dreossi	A. Rennox
P01	7/08/2020	PLANNING ISSUE	M. Dreossi	A. Rennox

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- The energy analysis has been performed to establish a strategy to adhere to Wales Building Regulations Part L2A (2014) and BREEAM energy targets.
- Heating, cooling and DHW is provided to the building via efficient air source heat pumps
- Efficient light fittings and controls are specified throughout
- A 200 m2 PV roof mounted solar array has been included within the analysis
- The assessment indicates 24% carbon emissions reductions over Part L Notional Building
- The analysis showed that 4 credits for BREEAM ENE01 can be achieved based on the parameters included in this report

Introduction

BDP has been commissioned to perform a Building Regulations Part L2A (2014) assessment of the Rhyl Market Hall. The Project is located between West Parade and Sussex Street to the North of Rhyl town.

The purpose of this report is to establish a strategy to adhere to Part L and the BREEAM targets. This is done taking into account the Project's anticipated usage, architecture, and HVAC servicing strategy.

Tools and Methods

A dynamic simulation model (DSM) approved by DCLG for Part L2A calculations was used.

- Network airflow was not modelled;
- Near field shading (local buildings) has been modelled;
- Note that the current model follows a low resolution 'massing' convention. That is, rather than capturing every space in detail the model is defined in generic blocks;
- HVAC was modelled with basic 'Apache systems'.

Software used: IES Virtual Environment 2018

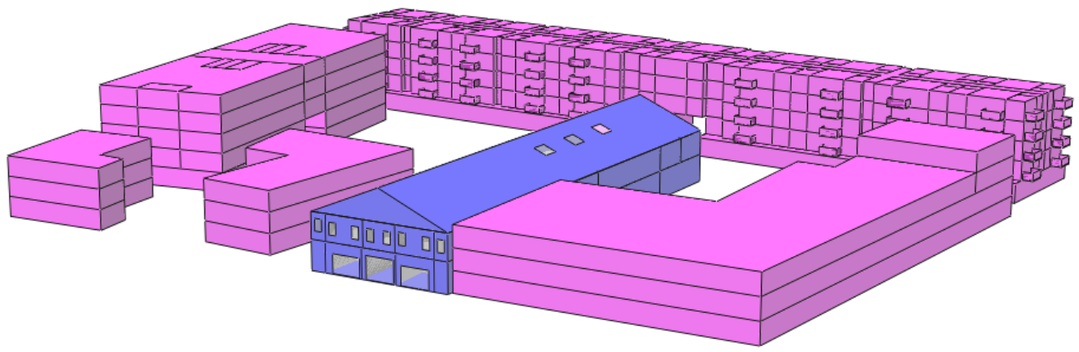
Design Inputs

Weather data

Cardiff Test Reference Year weather data (TRY) is used as per NCM requirement.

Geometry

The geometry is based on the Architectural CAD drawings current at July 2020.



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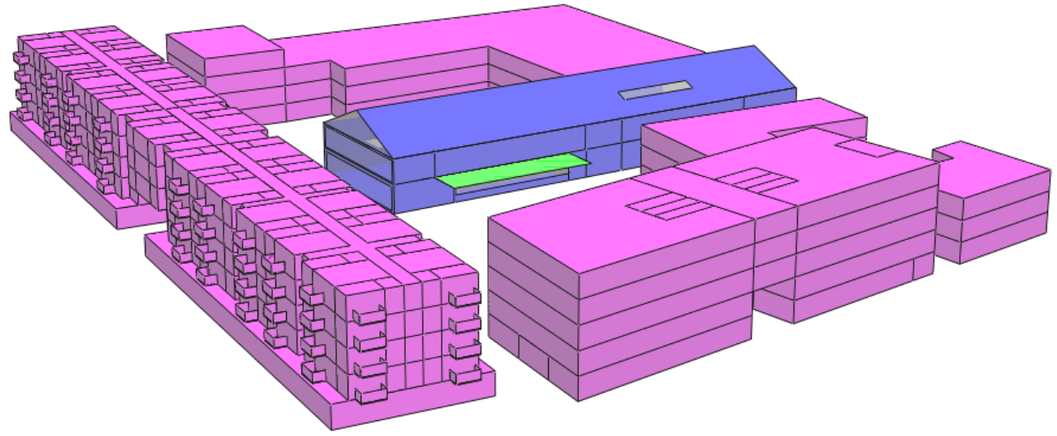

Figure: View from North West of analysis model

Envelope and constructions

Curtain wall

The strategy depends on spectrally selective solar control glazing. In comparison to reflective or absorptive solar control, spectrally selective glazing retains a relatively neutral appearance (it's usually slightly tinted) whilst simultaneously filtering out solar gain and allowing daylight in.

		u-value (glazing + framing)	g-value	Light transmission	Frame factor	Blinds
	Glazing Existing South facing facade	4.66	0.76	0.70	10%	NO
	All other new glazing	1.0	0.30	0.70	10%	NO
	Rooflights	1.8	0.55	0.70	15%	NO

Blinds

- Blinds have not been included at this stage;

Opaque construction elements

Element	Description	u-value
Internal ceilings	Suspended lightweight system	-
New external walls	Lightweight façade system	0.12
Existing external walls	Brickwork single leaf construction light plaster finish	1.95
Roof	Lightweight Roof	0.10
Ground Floor	Insulated ground slabs. U-values of ground slab calculated in accordance with BS EN ISO 13370.	0.10
Internal partitions	Generic lightweight stud partitions.	-

Air permeability

Air permeability is set at 3 $m^3/h/m^2$ @ 50 Pa.

HVAC

Underfloor Heating

NCM Type	Central heating using water
Heating Fuel	Electricity
Seasonal Eff.	3.4
Vent Heat Recovery Eff.	0.70
Used With CHP?	NO
Cooling/Ventilation Mechanism	Air conditioning
Seasonal EER (kW/kW)	3.8
Central System Specific Fan Power (SFP) W/(l/s)	1.60

DX Unit

NCM Type	Split/ Multi-Split System
Heating Fuel	Electricity
Seasonal Eff.	4.3
Vent Heat Recovery Eff.	0.86
Used With CHP?	NO
Cooling/Ventilation Mechanism	Air conditioning
Seasonal EER (kW/kW)	7.3 or higher
MVHR Specific Fan Power (SFP) W/(l/s)	1.0

VRF/FCU

NCM Type	Split/ Multi-Split System
Heating Fuel	Electricity
Seasonal Eff.	4.1
Vent Heat Recovery Eff.	0.86
Used With CHP?	NO
Cooling/Ventilation Mechanism	Air conditioning
Seasonal EER (kW/kW)	6.4 or higher
MVHR Specific Fan Power (SFP) W/(l/s)	1.0

Key features

- Heat pumps can provide simultaneously heating and cooling
- Rejected heat can be used in those space where there is a heating demand
- Air handling with low Specific Fan Power (SFP) of 1.6 W/l/s or less;
- Heat recovery efficiency greater than 80% and SFP of 1.0 W/l/s to all spaces provided with MVHR
- BMS with capability for Automatic Measurement and Targeting

Domestic Hot Water

- Generated by air source heat pump serving calorifiers via plate heat exchangers

Heating Fuel	Electricity
Seasonal efficiency	3.6
Storage 9l)	1000
Storage losses (kWh/l/day)	0.00470
Distribution losses (%)	10

Lighting

- Lighting is therefore expressed in terms of efficacy (i.e. 'luminaire lumens per circuit watt');
- Lighting efficacy is set to 80 luminaire-lumens per circuit watt in circulation areas and toilets, and 100 to all other spaces;
- Occupancy sensing controls are used in all ancillary areas;
- Parasitic power from control circuits is set to 1 W for every 20m^2;
- Display lighting efficacy in Reception areas > 35 luminaire lumens per circuit watt;
- BMS has capability for Automatic Measurement and Targeting

Location	Lighting efficacy	Controls
Circulation spaces/Toilets Storage	80	Occupancy sensing
Market/Event Hall, Offices, Commercial Units	100	

Other settings

- Power factor corrected for any inductive loads to be > 0.95
- BMS has capability for Automatic Measurement and Targeting

Low and zero carbon technologies

Photovoltaics are employed:

- Size: approximately 200 m^2
- Orientation: aligned close to south
- Inclination: 30°
- PV panel efficiency: 19%
- DC + inverter losses: 10%
- Location: Roof mounted
- Peak output: approx. 41 kW

Results

Criterion 1

Based on the inputs in this report, the proposed design was found to comply with Criterion 1 of Part L2A (2014) as below:

	($kgCO_2/m^2$/annum)		Improvement (%)
	BER	TER	
Carbon Emissions	24.7	32.5	24.0%

	(kWh/m^2/annum)		Improvement (%)
	BPEC	TPEC	
Primary Energy	229.7	237.2	3.2%

Appendix A – Screen Capture of BRUKL document

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m^2]	1942.8	1942.8
External area [m^2]	4298.5	4298.5
Weather	CAR	CAR
Infiltration [m^3/hm^2@ 50Pa]	3	3
Average conductance [W/K]	1445.16	1390.9
Average U-value [W/m^2K]	0.34	0.32
Alpha value* [%]	11.99	10

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

Building Use

% Area	Building Type
7	**A1/A2 Retail/Financial and Professional services**
93	**A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways**
	B1 Offices and Workshop businesses
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Institutions: Hospitals and Care Homes
	C2 Residential Institutions: Residential schools
	C2 Residential Institutions: Universities and colleges
	C2A Secure Residential Institutions
	Residential spaces
	D1 Non-residential Institutions: Community/Day Centre
	D1 Non-residential Institutions: Libraries, Museums, and Galleries
	D1 Non-residential Institutions: Education
	D1 Non-residential Institutions: Primary Health Care Building
	D1 Non-residential Institutions: Crown and County Courts
	D2 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/m^2]

	Actual	Notional
Heating	6.56	11.66
Cooling	1.33	2.13
Auxiliary	9.57	5.63
Lighting	31.54	41.22
Hot water	17.88	39.6
Equipment*	69.01	69.01
TOTAL**	66.89	100.24

* 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/m^2]

	Actual	Notional
Photovoltaic systems	17.97	6.36
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	102.81	84.69
Primary energy* [kWh/m^2]	229.74	237.2
Total emissions [kg/m^2]	24.7	32.5

* Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

Appendix B: BREEAM ENE 01, Energy & Carbon

The results have been input into the BREEAM reporting tool and yield the following results:

BREEAM UK New Construction 2014 Assessment Report: Assessment Issue Scoring

BREEAM® UK

Man | H&W | Energy | Transport | Water | Materials | Waste | LU&E | Pollution | Innovation

Ene 01 Calculator

Country of the UK where the building is located	Wales	Confirm building regulation and version used:	Wales Part L2A 2014

New Construction (Fully fitted)

Building floor area	1942	m2
Notional building heating and cooling energy demand	84.69	MJ/m2 yr
Actual building heating and cooling energy demand	102.81	MJ/m2 yr
Notional building primary energy consumption	237.20	kWh/m2 yr
Actual building primary energy consumption	229.74	kWh/m2 yr
Target emission rate (TER)	32.50	kgCO2/m2 yr
Building emission rate (BER)	24.70	kgCO2/m2 yr
Building emission rate improvement over TER	24.0%	
Heating & cooling demand energy performance ratio (EPR_{DEM})	0.000	
Primary consumption energy performance ratio (EPR_{PC})	0.082	
CO_2 Energy performance ratio (EPR_{CO2})	0.271	
Overall building energy performance ratio (EPR_{NC})	0.354	

Where specified, please confirm the energy production from onsite or near site energy generation technologies	17.97
Equivalent % of the building's 'regulated' energy consumption generated by carbon neutral sources and used to meet energy demand from 'unregulated' building systems or processes?	
Is the building designed to be 'carbon negative' ?	
If the building is defined as 'carbon negative' what is the total (modelled) renewable/carbon neutral energy generated and	

Total BREEAM credits achieved	4
Total contribution to overall building score	2.50%
Total BREEAM innovation credits achieved	0
Minimum standard(s) level	Very Good level

Queen’s Market Rhyl

Energy Report and Part L (BRUKL 2014)

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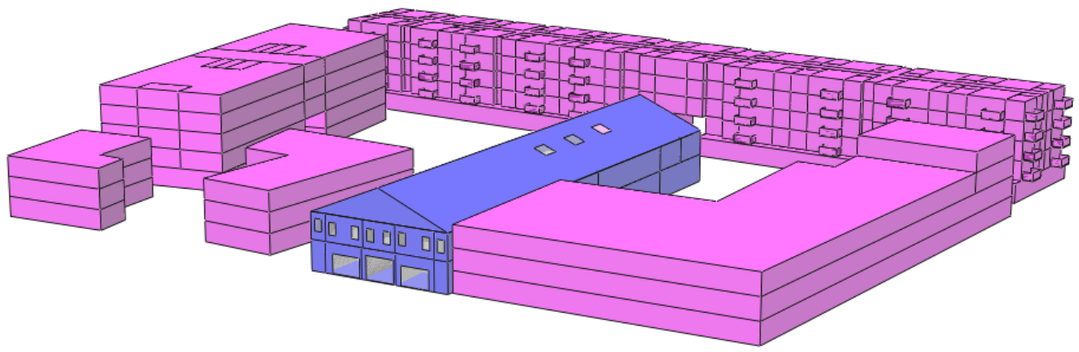

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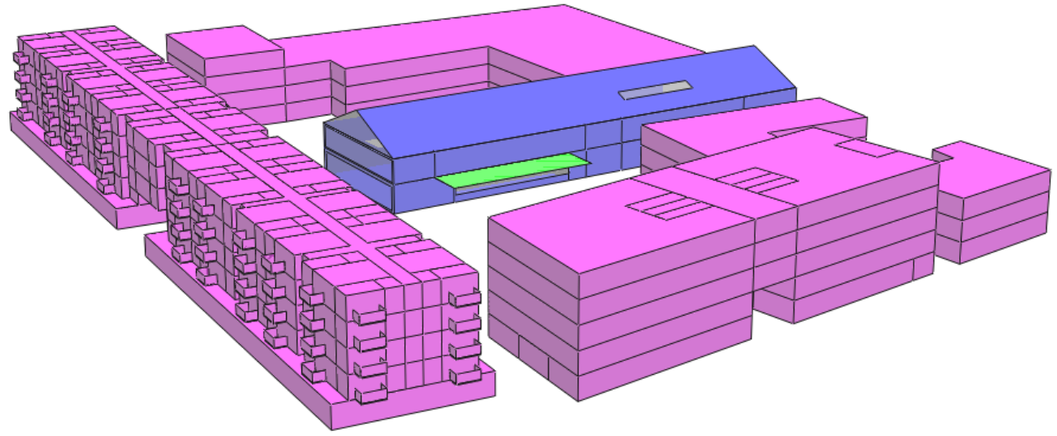

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Vent Heat Recovery Eff.	0.70
Used With CHP?	NO
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Total contribution to overall building score	2.50%
Total BREEAM innovation credits achieved	0
Minimum standard(s) level	Very Good level