BREEAM PRE-ASSESSMENT

Mixed Use Development

Former Shredded Wheat Factory

WELWYN GARDEN CITY

Prepared for:
Plutus Estates (WGC) Limited

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REPORT CONTENTS

EXECUTIVE SUMMARY

The **Building Research Establishments Environmental Assessment Method** (BREEAM) Scheme is the national standard for assessing the sustainability of new construction developments. BREEAM aims to differentiate between developments with higher environmental performance by providing a sustainability rating.

Plutus Estates (WGC) Limited is proposing a new mixed used development on the site of the former Shredded Wheat Factory in Welwyn Garden City. The proposed development has been pre-assessed against the relevant BREEAM protocols to demonstrate the overall sustainability credentials. This assessment has been carried out in order to provide the design team with an indication of likely performance given current design intent and an understanding of the sustainability considerations that will need to be taken into account in the developing detailed design stages.

This report has been prepared by Sol Environment Ltd in cooperation with the applicant and in accordance with the Welwyn Hatfield Borough Council Draft Local Plan (Proposed Submission dated August 2016) with particular reference to **Policy SADM 13: Sustainability Requirements** where all non-residential development with a floorspace of 1,000 square metres or more will be required to meet at least **BREEAM 'Excellent'** unless it is demonstrated that it is not technically feasible or viable to do so, in which case such proposals will be required to demonstrate a 'Very Good' rating.

Findings

Overall, all non-residential components of the development are likely to gain a ***BREEAM 'Excellent'*** rating using the BREEAM 2014 New Construction tool. This pre-assessment confirms that the development could achieve a total score of **74.29%** for the A1-A5 Retail, **73.24%** for the Gym, **74.46%** for the Offices and **73.24%** for the Arts Centre buildings confirming that all non-residential aspects of the development fall within the *'Excellent'* bracket of 70-85%.

Graphical summary of findings

The table below show a summary of the score achieved for each building assessed within the development.

Building	Score	Rating
A1-A5 Retail	74.29%	BREEAM NC Excellent (70-85%)
Block 4 Gym	73.24%	BREEAM RFO Excellent (70-85%)
Block 4 Office	74.46%	BREEAM RFO Excellent (70-85%)
Block 5 Arts Centre	73.24%	BREEAM RFO Excellent (70-85%)

1. INTRODUCTION: BREEAM

NOTE: Even though this development has been pre-assessed using both the BREEAM New Construction (NC) 2014 tool (for the new buildings) and the BREEAM Refurbishment and Fit-out (RFO) 2014 tool (for the existing refurbished buildings), for the sake of simplicity, the BREEAM scoring systems nominated in this report are based on the BREEAM NC 2014 Assessment tool. Although there are differences in the weightings and scoring between the NC and RFO 2014 Assessment tools the general methodology and process is similar, and it was not considered necessary to summarise both tools within this report.

1.1 Background

The Building Research Establishments Environmental Assessment Method ('BREEAM' hereafter) is an environmental assessment method for rating and certifying the performance of new construction projects. It is a national standard for use in the design and construction of all new developments with a view to encouraging continuous improvement in sustainable building techniques.

The BREEAM assessment tool is designed to evolve with increasingly tightening Building Regulations, and the development of technology and innovations, with the most recent version of BREEAM, placing a greater emphasis on overall life cycle efficiencies and stakeholder participation.

The BREEAM Scheme covers nine categories of sustainable design (each of which contains a number of environmental issues), comprising:

- Management;
- Health & Wellbeing;
- Energy;
- Transport;
- Water;
- Materials;
- Waste;
- Land Use and Ecology; and
- Pollution.

A further 'Innovations' section is provided to award developments that go above and beyond the levels set out in the standard criteria, where exemplary performance levels are achieved.

Each issue is a source of environmental impact which can be assessed against a performance target and awarded one or more credits. In addition to meeting minimum standards (which vary according to the BREEAM rating sought), achievement of the requirements in each design category scores a number of percentage points. The overall total percentage 'score' then determines the BREEAM Rating achieved by the assessed development.

1.2 Scoring System

Credits are available for each category meeting the specified levels of performance. The number of credits available in each category does not necessarily reflect the relative importance of the issues being assessed, and will vary depending on the developments' Scheme type. Before the final score is calculated, each of the scores in the nine categories is multiplied by an 'Issue Weighting Factor' before the final score is calculated (see Table 1.1). The Weighting Factors reflect the relative importance of each of the categories covered under BREEAM.

Table 1.1: BREEAM NC 2014 Issue Weighting Factors				
Environmental Impact Categories	No of Credits in Category	Environmental Weighting Factor (as % of total possible points score available)		
		Fully Fitted	Shell Only	Shell & Core
Category 1 – Management	21	12%	12.5%	11%
Category 2 – Health & Wellbeing	21	15%	10%	10.5%
Category 3 – Energy	31	15%	14.5%	15%
Category 4 – Transport	12	9%	11.5%	10%
Category 5 – Water	9	7%	4%	7.5%
Category 6 – Materials	14	13.5%	17.5%	14.5%
Category 7 – Waste	9	8.5%	11%	9.5%
Category 8 – Land Use & Ecology	10	10%	13%	11%
Category 9 – Pollution	13	10%	6%	11%
Total	**140**	**100%**	**100%**	**100%**

The BREEAM scoring runs from Unclassified to Outstanding, as depicted in Table 1.2 below.

Table 1.2: BREEAM Performance Ratings		
BREEAM Rating	Performance	Score
UNCLASSIFIED	Does not meet levels of standard good practice	<30
PASS	Top 75% of UK new non-domestic buildings (standard good practice)	30
GOOD	Top 50% of UK new non-domestic buildings (intermediate good practice)	45
VERY GOOD	Top 25% of UK new non-domestic buildings (advanced good practice)	55
EXCELLENT	Top 10% of UK new non-domestic buildings (best practice)	70
OUTSTANDING	Less than top 1% of UK new non-domestic buildings (innovator)	85

1.3 Minimum Standards

The BREEAM Rating is awarded on the basis of achieving both a set of mandatory minimum standards and a score level as set out above. The minimum standards vary depending on the Rating aspired. Before a development can start to be awarded points under BREEAM ***'Excellent'*** it must achieve minimum standards in the following categories:

- Man 03: Responsible Construction Practices - One Credit (Considerate Construction). There is a requirement for a development to achieve a single credit under this issue. This can be gained where the principal contractor has used a 'compliant' organisational, local or national considerate construction scheme and their performance against the scheme has been confirmed by independent assessment and verification.
- Man 04: Commissioning and Handover – Criterion 9 (Building User Guide). A Building User Guide (BUG) is developed prior to handover for distribution to the building occupiers and premises managers.
- Man 05: Aftercare – One Credit (Seasonal Commissioning). Seasonal commissioning activities appropriate to the buildings systems must be completed over a minimum 120month period, once the building becomes substantially occupied.
- Ene 01: Reduction of Energy Sue and Carbon Emissions – 5 Credits. To recognise and encourage buildings designed to minimise operational energy demand, primary energy consumption and CO2 emissions.
- Ene 02: Energy Monitoring – 1 credit (First Sub-Metering Credit). Energy metering systems are installed that enable at least 90% of the estimated annual energy consumption of each fuel to be assigned to the various end-use categories of energy consuming systems.
- Wat 01: Water Consumption – One Credit. A minimum performance improvement of 12.5% over the national baseline standard benchmark for efficiency of water consuming fittings. Consideration must therefore be given to specifying water efficient sanitary items and the use of recycled rainwater or grey water.
- Wat 02: Water Monitoring – Criterion 1. Water meters are to be specified on the mains water supply of each building under assessment, and include water supplied from borehole or private sources. Note that a credit is not achieved for compliance with this criterion only.
- Mat 03: Responsible Sourcing – Criterion 3. All timber to be used on the project must be sourced in accordance with the UK Governments Timber Procurement Policy, ensuring that timber and wood derived products will be legally and sustainably sourced as outlined in the CPET 2nd Edition 2006 Report.
- Wst 03: Operational Waste – One credit. To recognise and encourage the provision of dedicated storage facilities for a building's operational-related recyclable waste streams, so that this waste is diverted from landfill or incineration.
- LE 03: Minimising Impact on Site Ecology – One Credit. To minimise the impact of the development on existing site ecology. The change in ecological value is to be no greater than a score of minus nine (-9), as determined by a suitably qualified Ecologist.

1.4 BREEAM Assessment – a two-stage process

The BREEAM Scheme allows for a building to be assessed at the design stage and post-construction before the formal BREEAM Certification (and Rating) is awarded; this will ensure that the completed development meets sustainability performance as designed. During the certification assessment, which will lead to a formal BREEAM rating and certificate, the assessment stages are as follows:

1. An initial Design Stage certification – at this stage an Interim Certificate is issued, based on a provisional Rating.
2. A Post-Construction check is required to verify the rating in the 'as constructed' state before a final BREEAM Certificate can be issued.

The Design Stage assessment and Post-Construction Check must be carried out by a licensed assessor, who registers the assessment with the BRE.

This report forms the Pre-Assessment which is the initial stage of the Design Stage Certification process.

2. APPROACH & METHODOLOGY

In order to gain an understanding of the likely BREEAM rating achievable for the application Site, Sol Environment Ltd (Sol) were appointed by the client, Plutus Estates (WGC) Limited ('client' hereafter), to undertake a BREEAM pre-assessment for the non-residential components of the proposed redevelopment of the former Shredded Wheat Factory site in Welwyn Garden City.

In addition to this appointment Sol, as a registered BRE Accredited Professional and technical Advisor to the project, has provided design advice to the design team to ensure that the proposed development exceeds the minimum standards required by BREEAM.

The purpose of this pre-assessment report is to identify the strengths and weaknesses of the proposals in relation to the BREEAM criteria; to identify appropriate opportunities to ensure that the project achieves the aspired BREEAM 'Excellent' rating.

At the time of the pre-assessment, the proposed development is at RIBA Design Stage 2 'Concept Design'. At this early design stage, there is not sufficient detailed design information available to enable Design Stage BREEAM certification to be carried out and the BREEAM rating established as likely at pre-assessment cannot be formally awarded (see Section 6 for information on the formal assessment process).

The pre-assessment is intended to identify how the non-residential components of the development will score when the current designs are formally assessed under the BREEAM Scheme.

3. DEVELOPMENT SUMMARY & RATING

3.1 Rating Findings

The design team are committed to aiming to achieve a BREEAM 'Excellent' rating for the development, where possible. The finding of the pre-assessment predicts that the all non-residential components of the proposed development ***is likely to achieve BREEAM 'Excellent'***, with a provisional score of **74.29%** for the A1-A5 Retail, **71.30%** for the Gym, **72.52%** for the Offices and **71.30%** for the Arts Centre buildings confirming that all non-residential aspects of the development fall within the *'Excellent'* bracket of 70-85%.

In awarding this score, the following assumptions have been made:

- Energy / CO_2:
  - Water heating will be provided from the site wide community district heating system fuelled by a gas CHP – refer to Credit Ene 01;
  - Space heating and cooling will be provided from high efficiency VRF units (SEER 6.25) – refer to Credit Ene 01;
  - External lighting comprises adequate ratings, with dedicated energy efficient fittings and adequate controls – refer to Credit Ene 03;
- Transport:
  - Cycle storage facilities will be compliant with the space and security requirements in accordance with the BREEAM 2014 Technical Manual – refer to Credit Tra 03;
- Water:
  - High efficiency fittings are specified and installed to reduce the demand for potable water within the development - refer to Credit Wat 01;
- Materials:
  - The majority of the key building elements (by volume percentage) will achieve a Green Guide rating of A+ to A - refer to Credit Mat 01;
  - The Developer and Contractor will ensure that procurement practices are in accordance with corporate and government procurement policy – refer to Mat 03 / Mat 04;
- Waste:
  - The construction practices will be meet best practice guidelines to ensure waste efficiency benchmarks are met – refer to Credit Wst 01.

Sol has provided an assessment of the predicted BREEAM performance of the development (based on limited information available at outline stage). In addition, Section 5 identifies opportunities for improvement and the next step, dependant on those incorporated into the site design (and associated evidence is provided, see Appendix 1), would provide an improvement in BREEAM performance.

Although this report provides recommendations, specific requirements of BREEAM can easily be misinterpreted or excluded at design stage. It is noted that a BREEAM Accredited Professional has been appointed for the pre-planning application stages, however it is recommended therefore that this appointment is continued throughout all design stages to ensure the development proceeds in a manner that complies with the relevant requirements of BREEAM (*particularly those mandatory minimum requirements, which must be satisfied in order for the aspired rating to be certified*).

Table 3.1 below provides a summary of the BREEAM credits that are likely to be achieved, given current design intent as outlined by the design team.

This summary relates to the new build retail elements of the scheme and is based on the BREEAM NC 2014 assessment tool. Refer to the appendices for a detailed summary of the BREEAM RFO 2014 credits that are likely to be achieved, for parts of the development located in the existing buildings on the site.

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
Management							
Man 01	Project & Design Brief	4	0.57	4	**FIRST CREDIT** **Criteria 1-3 Stakeholder Consultation (Project Delivery)** 1. Prior to completion of the Concept Design (RIBA Stage 2), the project delivery stakeholders (client, building occupier, design team and principal contractor) have met to identify and define their roles, responsibilities and contributions for each of the key phases of project delivery. 2. In defining the roles and responsibilities for each key phase of the project, the following must be considered: 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. Requirements for the production of project and end user documentation g. Requirements for commissioning, training and aftercare support. 3. The project team demonstrate how the project delivery stakeholder contributions and the outcomes of the consultation process have influenced or changed the Initial Project Brief, including if	1/1 CREDIT TARGETED It is assumed due to the early engagement with BREEAM Assessor credit will be targeted. Design team to provide meeting minutes and or consultant plan outlining the roles and responsibilities of all members in the design team as well as stakeholders' contributions and the process outcomes.	PROJECT MANAGER

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					appropriate, the Project Execution Plan, Communication Strategy, and the Concept Design.		
					SECOND CREDIT **Criteria 4-7 Stakeholder Consultation (third party)** 4. Prior to completion of the Concept Design stage, all relevant third-party stakeholders have been consulted by the design team and this covers the minimum consultation content. 5. The project must demonstrate how the stakeholder contributions and outcomes of the consultation exercise have influenced or changed the Initial Project Brief and Concept Design. 6. Prior to completion of the detailed design (RIBA Stage 4, Technical Design), consultation feedback has been given to, and received by, all relevant parties. Additionally, for Education, Healthcare, Law courts and Major transport node building types only: 7. The consultation exercise used a method carried out by an independent party.	1/1 CREDIT TARGETED Design team to provide statement of community involvement and confirm that all consultation feedback will be given to and received by relevant parties prior to RIBA Stage 4.	PROJECT MANAGER
					THIRD CREDIT **Criteria 8-10 Sustainability Champion (design)** 8. A Sustainability Champion has been appointed to facilitate the setting and achievement of BREEAM performance targets for the project. The design stage Sustainability Champion is appointed to perform this	1/1 CREDIT TARGETED Sol Environment (certified Accredited Professional) have been appointed at the start of the project (Stage 1, Preparation and Brief stage) to facilitate all associate BREEAM performance and targets for the project.	PROJECT MANAGER / BREEAM AP

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					role during the feasibility stage (Stage 1, Preparation and Brief stage). 9. The defined BREEAM performance target(s) has been formally agreed between the client and design/project team no later than the Concept Design stage (RIBA Stage 2). 10. To achieve this credit at the interim design stage assessment, the agreed BREEAM performance target(s) must be demonstrably achieved by the project design. This must be demonstrated via the BREEAM assessor's design stage assessment report.	Project Manager to provide written confirmation outlining date of engagement between Sol and PM, as well as RIBA Stage programme confirming all dates are compliant with BRE criteria.	
					FOURTH CREDIT **Criteria 11-12 Sustainability Champion (monitoring progress)** 11. The Sustainability Champion criteria 8, 9 and 10 have been achieved. 12. A Sustainability Champion is appointed to monitor progress against the agreed BREEAM performance target(s) throughout the design process and formally report progress to the client and design team. To do this the Sustainability Champion must attend key project/design team meetings during the Concept Design, Developed Design and Technical Design stages, as defined by the RIBA Plan of Work 2013, reporting during, and prior to, completion of each stage, as a minimum. NOTE 3rd credit must have been achieved for the 4th credit to be awarded.	1/1 CREDIT TARGETED Sol Environment has been appointed as the BREEAM AP Assessor for the development and will therefore be monitoring all progress against relevant BREEAM guidance. Design team to provide meeting minutes showing Sol Environment engagement at key team meetings throughout Concept Design and Developed and Technical Design stages. RIBA Stage programme must also be provided ensuring compliance.	PROJECT MANAGER / BREEAM AP

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
Man 02	Life Cycle Cost & Service Life Planning	4	0.57	1	**FIRST & SECOND CREDITS (Elemental Life Cycle Cost (LCC))** **Criteria 1-2** 1. An elemental life cycle cost (LCC) analysis has been carried out at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) together with any design option appraisals in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:20081. 2. The LCC analysis shows: a. An outline LCC plan for the project based on the building's basic structure and envelope, appraising a range of options and based on multiple cash flow scenarios e.g. 20, 30, 50+ years; b. The fabric and servicing strategy for the project outlining services component and fit-out options (if applicable) over a 15-year period, in the form of an 'elemental LCC Plan'.	**0/2 CREDIT TARGETED** Design team confirm that a LCC assessment will not be undertaken and these credits will not be achievable	**NOT TARGETD**
					THIRD CREDIT (Component Level LCC Plan) **Criteria 3-4** 3. A component level LCC plan has been developed by the end of Process Stage 4 (equivalent to Technical Design – RIBA Stage 4) in line with PD 156865:2008 and includes the following component types (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	**0/1 CREDIT TARGETED** Design team confirm that a LCC assessment will not be undertaken and this credit will not be achievable	**NOT TARGETD**

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					d. External spaces, e.g. alternative hard landscaping, boundary protection. 4. Demonstrate, using appropriate examples provided by the design team, how the component level LCC plan has been used to influence building and systems design/specification to minimise life cycle costs and maximise critical value.		
					FOURTH CREDIT (Capital Cost Reporting) **Criteria 5** **5.** Report the capital cost for the building in pounds per square metre (£k/m2), via the BREEAM Assessment Scoring and Reporting tool, Assessment Issue Scoring tab, Management section.	1/1 CREDIT TARGETED It is assumed credit will be targeted. Design team to report on all predicted capital costs of the development via the BREEAM scoring and reporting tool.	CONTRACTOR / QS
Man 03	Responsible Construction Practices	6	0.57	6	**Criteria 1 Pre-Requisite** All timber and timber based products used on the project is 'Legally harvested and traded timber'	MINIMUM REQUIREMENT Criterion required to achieve any BREEAM rating. PRE-REQUISTE TARGETED Design team to provide written confirmation ensuring all timber and timber based products used on the project are 'Legally harvested and traded timber' as per BRE requirements. Tender prelims to include this requirement.	CONTRACTOR / M&E
					FIRST CREDIT (Environmental Management) **Criteria 2**	1/1 CREDIT TARGETED Criteria 2	CONTRACTOR / M&E

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					The principal contractor operates an environmental management system (EMS) covering their main operations. The EMS must be either: a. Third party certified, to ISO 14001/EMAS or equivalent standard; or b. Have a structure that is in compliance with BS 8555:2003 and has reached phase four of the implementation stage, 'implementation and operation of the environmental management system', and has completed phase audits one to four, as defined in BS 8555:2003. **Criteria 3** The principal contractor implements best practice pollution prevention policies and procedures on-site in accordance with Pollution Prevention Guidelines, Working at construction and demolition-sites: PPG6.	Contractor to provide written confirmation and certificates confirming that they operate an environmental management system (EMS) covering their main operations. Please review credit criteria column to identify compliant forms of EMS accepted by the BRE. **Criteria 3** Principal contractor must provide written confirmation outlining to the BRE Assessor that the best practice pollution prevention policies and procedures on-site are in accordance with Pollution Prevention Guidelines Working at construction and demolition-sites: PPG6.	
					SECOND CREDIT (Sustainability Champion) **Criteria 4-6** A Sustainability Champion is appointed to monitor the project to ensure ongoing compliance with the relevant sustainability performance/process criteria, and therefore BREEAM target(s), during the Construction, Handover and Close Out stages. To do this the Sustainability Champion will ideally visit the site regularly to carry out spot checks with the relevant authority to do so and require action to be taken to address shortcomings in compliance. They will monitor site activities with sufficient frequency to ensure that risks of noncompliance are minimised; and will report on	1/1 CREDIT TARGETED Sol Environment have been bought on in the early stages of the development as the Sustainability Champion. Sol will engage with both the design and construction teams to ensure they reach BREEAM target of 'Very Good' is achieved as per council requirements. Tender prelims to include this requirement.	CONTRACTOR / M&E

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					progress at relevant project team meetings including identifying potential areas of non-compliance and any action needed to mitigate. Defined BREEAM performance target to form a requirement of the principal contractor's contract and be achieved post construction.		
					THIRD & FOURTH CREDITS (CCS) **Criteria 7** Where the principal contractor has used a 'compliant' organisational, local or national considerate construction scheme and their performance against the scheme has been confirmed by independent assessment and verification. The BREEAM credits can be awarded as follows: a. One credit where the contractor achieves 'compliance' with the criteria of a compliant scheme. b. Two credits where the contractor significantly exceeds 'compliance' with the criteria of the scheme. Refer to the Relevant definitions section for a list of compliant schemes and therefore how performance, as determined by a compliant scheme, translates in to BREEAM credits.	MINIMUM REQUIREMENT 1 Credit required to achieve a BREEAM Excellent rating. 2/2 CREDITS TARGETED Contractor to ensure project is registered with a compliant CCS organisation and ensure a minimum of 2 credits is achieved. A CCS score of between 35 and 40 is required to achieve 2 credits (at least 7 in each of the five sections).	CONTRACTOR
					FIFTH & SIXTH CREDITS (Monitoring of Construction-site impacts) **Criteria 8-16** (2 credits): Responsibility has been assigned to an individual for monitoring, recording and reporting energy use, water	2/2 CREDITS TARGETED It is assumed all energy, water and transportation of construction materials to and from the site will be monitored and recorded by responsible individual.	CONTRACTOR

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					consumption and transport data (where measured) resulting from all on-site construction processes. • 1 credit for energy and water consumption monitoring • 1 credit for transport of construction materials and waste monitoring.	Tender prelims to include this requirement.	
					FIRST EXEMPLARY CREDIT (CCS 40+) **Criteria 18**: With reference to the considerate construction criterion 7, in addition to meeting the criteria for two credits, the contractor achieves compliance with the criteria of the compliant scheme to an exemplary level of practice.	**0/1 CREDITS TARGETED** It is assumed the credit will not be targeted. Design team to confirm.	**NOT TARGETED**
Man 04	Commissioning & Handover	4	0.57	3	**FIRST CREDIT** **Criteria 1-4 Commissioning and testing schedule responsibilities:** 1 credit awarded for appointment of project team to monitor and programme commissioning of all building services in line with BSRIA and CIBSE guidelines, on behalf of the Client.	1/1 CREDIT TARGETED Design team to provide written confirmation ensuring all building services to be monitored and programmed in line with the BSRIA and CIBSE guidelines. M&E Tender documentation to include this requirement .	CONTRACTOR / M&E
					SECOND CREDIT **Criteria 5-6 Commissioning Building Services:** For buildings with complex building services and systems, a specialist commissioning manager is appointed during the design stage with responsibility for: Undertaking design reviews and giving advice on commissioning; Providing commissioning management	1/1 CREDIT TARGETED Design team to ensure a specialist commissioning manager is appointed by design stage. M&E Tender documentation to include this requirement.	CONTRACTOR / M&E

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					input; Management of commissioning, performance testing and handover/post-handover stages. Where there are simple building services, this role can be carried out by an appropriate project team member. First credit required to achieve second credit		
					THIRD CREDIT **Criteria 7-9 Testing & Inspecting Building Fabric.** 1 credit can be awarded where the integrity of the building fabric is tested (including continuity of insulation, avoidance of thermal bridging and air leakage paths) through the completion of a thermographic survey as well as an air tightness test. Any defects identified in the thermographic survey or the airtightness testing reports are rectified prior to building handover and close out. First credit required to achieve third credit	**0/1 CREDIT TARGETED** Design team to confirm if credit is targeted.	**CONTRACTOR / M&E**
					FOURTH CREDIT **Criteria 10-11 Handover:** One credit can be awarded where a Building User Guide (BUG) is developed prior to handover for distribution to the building occupiers and premises managers.	**MINIMUM REQUIREMENT** BUG required to achieve a BREEAM Excellent rating. **1/1 CREDITS TARGETED** Design team to provide written confirmation stating Building User Guide will be provided at Handover ensuring all building occupiers and premises managers are fully informed on the buildings systems and controls.	**CONTRACTOR / TENANT**

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
Man 05	Aftercare	3	0.57	2 + 1	**Criteria 1-2 Aftercare Support:** 1. There is (or will be) operational infrastructure and resources in place to provide aftercare support to the building occupier(s), which includes the following as a minimum: a. A meeting programmed to: i. Introduce the aftercare team or individual to the aftercare support available, including the Building User Guide and training schedule/content; ii. Present key information about the building b. On-site facilities management training, to include a walkabout of the building and introduction to and familiarisation with the building systems; c. Initial aftercare support provision for at least the first month of building occupation, e.g. On-site attendance on a weekly basis to support building users and management (this could be more or less frequent depending on the complexity of the building and building operations). d. Longer term aftercare support provision for occupants for at least the first 12 months from occupation. 2. There is (or will be) operational infrastructure and resources in place to co-ordinate the collection and monitoring of energy and water consumption data or a minimum of 12 months, once the building is occupied. This is done to facilitate analysis of discrepancies between actual and predicted performance, with a view to adjusting systems and/or user behaviours accordingly.	1/1 CREDITS TARGETED It is assumed credit will be targeted. Tender prelims to include this requirement.	CONTRACTOR / TENANT

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					Criteria 3 Seasonal Commissioning: The following seasonal commissioning activities will be completed over a minimum 12-month period, once the building becomes substantially occupied: **a. Complex systems - Specialist Commissioning Manager**: i. Testing of all building services under full load conditions, i.e. heating equipment in mid-winter, cooling/ventilation equipment in mid-summer, and under part load conditions (spring/autumn). ii. Where applicable, testing should also be carried out during periods of extreme (high or low) occupancy. iii. Interviews with building occupants (where they are affected by the complex services) to identify problems or concerns regarding the effectiveness of the systems. iv. Re-commissioning of systems (following any work needed to serve revised loads), and incorporating any revisions in operating procedures into the operations and maintenance (O&M) manuals. **b. Simple systems (naturally ventilated)** - external consultant/aftercare team/facilities manager: i. Review thermal comfort, ventilation, and lighting, at three, six and nine month intervals after initial occupation, either by measurement or occupant feedback; ii. Take all reasonable steps to re-commission systems following the review to take account of deficiencies	MINIMUM REQUIREMENT 1 Credit required to achieve a BREEAM Excellent rating. 1/1 CREDITS TARGETED It is assumed credit will be targeted. Design team to confirm whether building will rely on complex or simple systems and adhere to the requirements outlined by BRE in credit criteria column. M&E Tender documentation to include full seasonal commissioning.	CLIENT / CONTRACTOR / M&E

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					identified and incorporate any relevant revisions in operating procedures into the O&M manuals		
					Criteria 4 Post Occupancy Evaluation: The client or building occupier makes a commitment to carry out a post-occupancy evaluation (POE) exercise one year after initial building occupation. This is done to gain in-use performance feedback from building users to inform operational processes, including re-commissioning activities, and maintain or improve productivity, health, safety and comfort. The POE is carried out by an independent party and needs to cover: 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. Other relevant issues; vi. Sustainability performance (energy / water consumption, performance of any sustainable features or technologies e.g. materials, renewable energy, rain- water harvesting etc.). **Criteria 5** The client or building occupier makes a commitment to carry out the appropriate dissemination of information on the building's post-occupancy performance. This is	**0/1 CREDITS TARGETED** It is assumed that this credit will not be targeted	**CLIENT / CONTRACTOR / M&E**

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					done to share good practice and lessons learned and inform changes in user behaviour, building operational processes and procedures, and system controls. Refer to compliance notes CN4, CN5 and CN5 for a definition of appropriate dissemination. This also provides advice on appropriate dissemination where the building or building information is commercially or security sensitive.		
					Criteria 6 Exemplary level criteria There is (or will be) operational infrastructure and resources in place to coordinate the following activities at quarterly intervals for the first three years of building occupation: a) Collection of occupant satisfaction, energy consumption and water consumption data. b) Analysis of the data to check the building is performing as expected and make any necessary adjustments to systems controls or to inform building user behaviours. c) Setting targets for reducing water and energy consumption and monitor progress towards these. d) Feedback any 'lessons learned' to the design team and developer for use in future projects. e) Provision of the actual annual building energy, water consumption and occupant satisfaction data to BRE.	1/1 EXEMPLARY CREDIT TARGETED It is assumed credit will be targeted. Tender prelims to include this requirement.	CLIENT / TENANT
Health and Wellbeing							

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
Hea 01	Visual Comfort	4	0.88	2	**Criteria 1-2 Glare Control** 1. The potential for disabling glare has been designed out of all relevant building areas using a glare control strategy, either through building form and layout and/or building design measures 2. The glare control strategy avoids increasing lighting energy consumption, by ensuring that: a. The glare control system is designed to maximise daylight levels under all conditions while avoiding disabling glare in the workplace or other sensitive areas. The system should not inhibit daylight from entering the space under cloudy conditions, or when sunlight is not on the facade. AND b. The use or location of shading does not conflict with the operation of lighting control systems.	1/1 CREDIT TARGETED Architect to provide compliant drawings showing the developments to have adopted a compliant glare control strategy as per BRE requirements.	ARCHITECT / TENANT
					Criteria 3 Daylighting: 1 credit – Occupied spaces to achieve an Average Daylight Factor (ADF) of ≥ 2%, for 80 % of area (m^2) of relevant spaces. In addition, a uniformity ratio of 0.4 (or minimum daylight factor of 0.8%), OR a view of sky (from 0.7m height) and the room depth criteria (based on room size, window head height and average reflectance of surfaces), are to be achieved.	0/1 CREDITS TARGETED Design team to review criteria and confirm if it is achievable during detailed design. It is expected that no credits will be achievable.	NOT TARGETED
					Criteria 4-6 View Out 95% of the floor area in relevant building areas is within 7m of a wall which has a window or permanent opening that provides an adequate view out.	0/1 CREDITS TARGETED Design team to review criteria and confirm if achievable during detailed design. It but it is expected that no credits will be achievable.	NOT TARGETED

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					The window/opening must be ≥ 20% of the surrounding wall area. Where the room depth is greater than 7m, 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 82061. In addition, the building type criteria in Table - 13 are applicable to view out criteria.		
					Criteria 7-11 Internal and External Lighting Levels, Zoning and Control One credit awarded where the following criteria are met: <u>Internal lighting</u> All fluorescent and compact fluorescent lamps are fitted with high frequency ballasts. Internal lighting in all relevant areas of the building is designed to provide an illuminance (lux) level appropriate to the tasks undertaken, accounting for building user concentration and comfort levels. This can be demonstrated through a lighting design strategy that provides illuminance levels in accordance with the SLL Code for Lighting 2012 and any other relevant industry standard. For areas where computer screens are regularly used, the lighting design complies with CIBSE Lighting Guide 72 sections 3.3, 4.6, 4.7, 4.8 and 4.9. 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. For up-lighting, the recommendations refer to the luminance of	1/1 CREDITS TARGETED It is assumed based on the type of the development, the credit will be targeted. Design team to provide internal and external lighting specs of the lights to be installed throughout all developments. M&E to ensure all lights are compliant with listed standards, as well as ensure zoning and occupant control.	M&E

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					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. <u>External lighting</u> All external lighting located within the construction zone is designed to provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night. To demonstrate this, external lighting provided is specified in accordance with BS 5489-1:2013 Lighting of roads and public amenity areas3 and BS EN 12464-2:2014 Light and lighting - Lighting of workplaces - Part 2: Outdoor workplaces. <u>Zoning and occupant control</u> Internal lighting is zoned to allow for occupant control (see Relevant definitions) 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.		

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					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.		
Hea 02	Indoor Air Quality	5	0.88	2	**Criteria 1-6 Minimising Sources of air pollution:** 1 credit available where an Indoor Air Quality plan has been produced (covering strategy for the removal, dilution & control, flush-out and testing of pollutants, third party testing & analysis, and maintaining indoor air quality in use). 1 credit is available where the building has been designed to minimise the concentration and recirculation of pollutants in the building as follows: Provide fresh air into the building in accordance with the criteria of the relevant standard for ventilation. Design ventilation pathways to minimise the build-up of air pollutants in air conditioned and mixed mode buildings/spaces: i. The building's air intakes and exhausts are over 10m apart and intakes are over 20m from sources of external pollution or designed in accordance with BS EN 13779:2007 Annex A2. ii. In naturally ventilated buildings/spaces openable windows/ventilators are over 10m from sources of external pollution.	2/5 CREDITS TARGETED It is assumed the 2/5 credits will be targeted. Credit 1 – Targeted Architect and M&E to prepare a compliant IAQ Plan. Credit 2 – Not Targeted Due to the likely proximity of the car-parking it is expected that air intakes will not be >10m from external sources of pollution Credit 3 – Targeted Architect will ensure that all products and finishes used will have low VOCs. Credit 4 – Not Targeted It is assumed that testing for VOCs and formaldehydes will not be conducted pre-occupation.	M&E / ARCHITECT

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					ii. Where present, HVAC systems must incorporate suitable filtration to minimise external air pollution, as defined in BS EN 13779:2007 Annex A. 1 Credit awarded where decorative paints and varnishes are specified to meet VOC emission standards to BS EN 1330:2001, and where other relevant materials meet VOC emission standards. 1 credit available where Post construction testing demonstrates Formaldehyde concentration is <100 micrograms/m^3 and Total VOC concentration is <300 micrograms/m^3. 1 credit available where the building is design with the ability to be adapted to be completely ventilated through natural ventilation	Credit 5 – Not Targeted It is assumed that due to the type of buildings and the likely large footprint this development will not be able to be adapted to rely solely on natural ventilation, therefore this credit is not achievable.	
Hea 03	Safe Containment in Laboratories	-	0.88	-	**Credit not applicable to Office or Other: Non-residential Institution type developments**		
Hea 04	Thermal Comfort	3	0.88	3	**Criteria 1-4 Thermal Modelling:** 1 credit available where thermal modelling has been carried out using software in accordance with CIBSE AM11 Building Energy and Environmental Modelling. 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	1/1 CREDITS TARGETED M&E consultant to provide Thermal Comfort Study confirming the operative temperature ranges to be achieved and maintained throughout each of the developments. The temperatures ranges must be in accordance with CIBSE AM11 Building Energy and Environmental Modelling.	M&E

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					b. For naturally ventilated/free running 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. ii. The building is designed to limit the risk of overheating, in accordance with CIBSE TM52. 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.		
					Criteria 6-8 Adaptability – for a projected climate change scenario. 1 credit available where first credit is achieved AND modelling accounts for a projected climate change environment. Where requirements are not met for the projected climate change environment, demonstrations of how the building has been adapted, and can be easily adapted in the future must be given.	1/1 CREDITS TARGETED It is assumed the credit will be targeted. M&E consultants to provide Thermal Modelling results ensuring all criteria for Projected Climate Change are met. Where criteria are not met, project team demonstrate how the design can be easily adapted in future using passive design solutions to subsequently meet the requirements.	M&E
					THIRD CREDIT (Thermal zoning and controls) **Criteria 9-10** First credit achieved and modelling analysis has informed the building temperature control strategy. **Criteria 11** The strategy for proposed heating/cooling system(s) demonstrates that it has addressed the following:	1/1 CREDITS TARGETED It is assumed the credit will be targeted. Design team to provide thermal modelling results ensuring all proposed heating/cooling systems are compliant with the criterion listed in credit criteria column.	M&E

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					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: i. User knowledge of building services ii. Occupancy type, patterns and room functions (and therefore appropriate level of control required) 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. 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 drafts). 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.		

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					d. The need or otherwise for an accessible building user actuated manual override for any automatic systems.		
Hea 05	Acoustic Performance (Sound Insulation)	3	0.88	3	**Up to two credits** Where the building meets the acoustic performance standards and testing requirements detailed in Table 23 (see Checklists and tables) for all relevant functional areas. **Up to three credits** Where a suitably qualified acoustician (see relevant definitions) is appointed to define a bespoke set of performance requirements for all function areas in the building using the three acoustic principles defined in criterion 1, setting out the performance requirements for each and the testing regime required.	3/3 CREDITS TARGETED It is assumed due to the scale of development that an acoustician will be engaged and a bespoke set of acoustic performance targets will be set.	ACOUSTICIAN
Hea 06	Safety and Security	2	0.88	2	**Criteria 1-10 Safe Access** 1 credit where external site areas form part of the assessed development the following apply: 1. Dedicated cycle paths provide direct access from the site entrance(s) to any cycle storage provided, without the need to deviate from the cycle path and, if relevant, connect to off-site cycle paths (or other appropriate safe route) where these run adjacent to the development's site boundary. 2. Footpaths on-site provide direct access from the site entrance(s) to the building entrance(s) and connect to public footpaths off-site (where existing), providing practical and convenient access to local transport nodes and other off-site amenities (where existing).	1/1 CREDITS TARGETED It is assumed due to the scale of development safe access criteria will be targeted. Architect to review criteria and confirm whether the listed measures, outlined in credit criteria column, can be adhered too throughout the site. Architect to provide updated landscape drawings showing the inclusion of the features within the proposed final design.	ARCHITECT

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					3. Where provided, drop-off areas are designed off/adjoining to the access road and provide direct access to pedestrian footpaths, therefore avoiding the need for the pedestrian to cross vehicle access routes. 4. Dedicated pedestrian crossings are provided where pedestrian routes cross vehicle access routes, and appropriate traffic calming measures are in place to slow traffic down at these crossing points. 5. For large developments with a high number of public users or visitors, pedestrian footpaths must be signposted to other local amenities and public transport nodes off-site (where existing). 6. The lighting for access roads, pedestrian routes and cycle lanes is compliant with the external lighting criteria defined in Hea 01 Visual comfort, i.e. in accordance with BS 5489-1:20131 Lighting of roads and public amenity areas. Where vehicle delivery access and drop-off areas form part of the assessed development, the following apply: 7. Delivery areas are not directly accessed through general parking areas and do not cross or share pedestrian and cyclist routes and other outside amenity areas accessible to building users and general public. 8. There is a dedicated parking/waiting area for goods vehicles with appropriate separation from the manoeuvring area and staff and visitor car parking. 9. 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.		

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					10. There is a dedicated space for the storage of refuse skips and pallets away from the delivery vehicle manoeuvring area and staff/visitor car parking (if appropriate given the building type/function)		
					Criteria 11-13 Security of Site & Building A Suitably Qualified Security Specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) during or prior to Concept Design (RIBA Stage 2) and develops a set of recommendations or solutions. These recommendations or solutions aim to ensure that the design of buildings, and associated spaces are planned, designed the and specified to address the issues identified in SNA. The recommendations or solutions proposed by the suitably qualified security specialist (SQSS) are implemented and any deviation from those recommendations or solutions will need to be justified, documented and agreed in advance with a suitably qualified security specialist.	1/1 CREDITS TARGETED Due to the scale of the development, as well as the purpose they will be providing it is assumed the credit will be targeted. Design team to provide written confirmation, confirming engagement of 'compliant security specialist' prior to RIBA Stage 2. All recommendations put forward by specialist must be taken on board into final design of the build.	SQSS / ARCHITECT / PROJECT MANAGER
Energy							
Ene 01	Reduction of CO_2 Emissions	12	0.65	5	**Criteria 1 – Energy Performance** Credits are awarded (from 1 to 12) based on the percentage performance improvement progressively better than the Target Emission Rate (TER), using the Approved Document L1A 2010 TER as a baseline. Benchmark minimum standards are as follows: 1-4 credits (BREEAM Pass/Good/Very Good); 5-7 credits (BREEAM Excellent); 8-12 credits (BREEAM Outstanding)	MINIMUM REQUIREMENT 5 Credits required to achieve a BREEAM 'Excellent'. 5/12 CREDITS TARGETED It is understood that the development will utilise high efficiency VRF space heating / cooling system with hot water heated via the site wide CHP; therefore, it is expected that at least 5 credits will be achievable.	M&E / ENERGY ASSESSOR

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					Credits are derived from the Energy Performance Ratio for New Constructions, using BREEAM Ene 01 calculator.		
Ene 02	Energy Monitoring	2	0.65	2	**FIRST CREDIT (Sub-metering of major energy consuming systems)** **Criteria 1-4** 1. Energy metering systems are installed that enable at least 90% of the estimated annual energy consumption of each fuel to be assigned to the various end-use categories of energy consuming systems. 2. The energy consuming systems in buildings with a total useful floor area greater than 1,000m2 are metered using an appropriate energy monitoring and management system. 3. The systems in smaller buildings are metered either with an energy monitoring and management system or with separate accessible energy sub-meters with pulsed or other open protocol communication outputs, to enable future connection to an energy monitoring and management system. 4. The end energy consuming uses are identifiable to the building users, for example through labelling or data outputs. N.B. All meters must be adequately labelled.	MINIMUM REQUIREMENT: First Credit is required to achieve BREEAM 'Very Good'. 1/1 CREDITS TARGETED M&E to provide design drawings ensuring all major energy consuming systems are metered appropriately. NOTE: Based on current area figures received from design team it is expected that no individual retail building will have an area greater than 1000m^2. Therefore, a BMS or appropriate energy monitoring and management system is NOT required as per criterion 2.	M&E
					SECOND CREDIT (Sub-metering of high energy load and tenancy areas) **Criteria 5** An accessible energy monitoring and management system or separate accessible energy sub-meters with	1/1 CREDITS TARGETED M&E to provide design drawings ensuring all major tenanted or function areas are metered appropriately.	M&E

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					pulsed or other open protocol communication outputs to enable future connection to an energy monitoring and management system are provided, covering a significant majority of the energy supply to tenanted areas or, in the case of single occupancy buildings, relevant function areas or departments within the building/unit.		
Ene 03	External lighting	1	0.65	1	**Criteria 1 – 3** 1 credit where either the building has been designed to operate without the need for external lighting (which includes on the building, signs and at entrances). OR alternatively, where the building does have external lighting, one credit can be awarded as follows: 1. The average initial luminous efficacy of the external light fittings within the construction zone is not less than 60 luminaire lumens per circuit Watt. 2. All external light fittings are automatically controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian traffic.	1/1 CREDITS TARGETED M&E Consultant to provide lighting specifications of all external lights to be fitted throughout the development. Specifications of light must be compliant to the criteria outlined by the BRE in credit criteria column. NOTE – The average initial luminous efficacy of the external light fittings within the construction zone should be no less than 60 luminaire lumens per circuit Watt.	M&E
Ene 04	Low or Zero Carbon Energy Technology	3	0.65	2	**Passive Design Analysis** **Criteria 1 – 3** **Pre-Requisite**- Credit 1 of Hea 04 must be achieved. An analysis of the proposed building design/development to influence decisions made during Concept Design stage and identify opportunities for the implementation of passive design solutions to reduce the total heating, cooling, mechanical ventilation and lighting loads and energy consumption in line with the findings of the passive	1/1 CREDITS TARGETED An energy strategy has been prepared as a part of the planning application submission. The energy strategy is also a detailed Passive Design Analysis and can be used to achieve compliance under this credit.	ENERGY ASSESSOR

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					design analysis and the analysis demonstrates a meaningful reduction in the total energy demand as a result.		
					SECOND CREDIT **Criteria 4 – 6 Free Cooling** 1 credit- The passive design analysis credit is achieved. The passive design analysis includes an analysis of free cooling and identifies opportunities for the implementation of free cooling solutions.	**0/1 CREDITS TARGETED** Free cooling opportunities have not been utilised within this development.	**NOT TARGETED**
					THIRD CREDIT **Criteria 7 – 8 - Low/Zero Carbon Feasibility Study.** A feasibility study has been carried out by the completion of the Concept Design stage by an energy specialist to establish the most appropriate recognised local (on-site or near-site) low or zero carbon (LZC) energy source(s) for the development. A local LZC technology/technologies are specified for the building/development that results in a meaningful reduction in regulated carbon dioxide.	**1/1 CREDITS TARGETED** Local Authority requires a 10% reduction in CO2 emissions through the use of LZC and renewable technologies. Therefore, it is assumed that this credit should be achievable. An energy Assessment has been prepared as part of the planning application.	**ENERGY ASSESSOR**
Ene 05	Energy Efficient Cold Storage	-	0.65	-	**FIRST CREDIT** **Criteria 1 – 2** 1 Credit where refrigeration system, it's controls & components have been designed, installed & commissioned in accordance with the 'Code of Conduct for Carbon Reduction in the Retail Refrigeration Sector' and BS EN 378-2 AND uses robust and tested refrigeration systems/components, defined as those	**No commercial/industrial sized refrigeration and storage systems within the development. Therefore, credit not applicable.**	**N/A**

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					included on the Enhanced Capital Allowance (ECA) Energy Technology Product List or an equivalent list AND refrigeration plant has been commissioned to comply with the criteria for commissioning outlined in BREEAM issue Man 04 Commissioning and Handover.		
					SECOND CREDIT **Criteria 3 – 4** A second credit is available where the first credit is achieved and the installed refrigeration system demonstrates a saving in indirect greenhouse gas emissions (CO_{2eq}.) with respect to the 'baseline' building through specification of technologies described in 'CO_2 emissions. saving options available when designing a new store/retail concept' (refer to The Carbon Trust Refrigeration Road Map)	**No commercial/industrial sized refrigeration and storage systems within the development. Therefore, credit not applicable.**	N/A

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
Ene 06	Energy Efficient Transportation Systems	3	0.65	3	**FIRST CREDIT** **Criteria 1 – Energy consumption** Where lifts, escalators and/or moving walks are specified: a) An analysis of the transportation demand and usage patterns for the building has been carried out to determine the optimum number and size of lifts, escalators and/or moving walks. b) The energy consumption has been calculated in accordance with BS EN ISO 25745 Part 2 for lifts (elevators) and/or Part 3 for escalators and moving walks, for one of the following: At least two types of system (for each transportation type required); OR An arrangement of systems (e.g. for lifts, hydraulic, traction, machine room-less lift (MRL)); OR A system strategy which is 'fit for purpose'. c) The use of regenerative drives should be considered, subject to the requirements in CN3.3. d) The transportation system with the lowest energy consumption is specified.	1/1 CREDITS TARGETED Design team to ensure that the vertical transportation needs of the development are appropriately assessed and that the proposed lift is the most efficient available for the buildings. Design team to provide documentation ensuring all measures listed in credit criteria column (a – d) have been addressed and acknowledged and selected specifically for the buildings purpose and demand to be expected.	M&E / LIFT SPECIALIST

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					SECOND & THIRD CREDIT **Criteria 2-8 – Energy efficient features** For each lift, the following three energy efficient features are specified: a. The lifts operate in a standby condition during off-peak periods; b. The lift car lighting and display lighting provides an average lamp efficacy, of > 55 lamp 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. AND Where the use of regenerative drives is demonstrated to save energy, they are specified.	2/2 CREDITS TARGETED Lift specialist / M&E consultant to provide detail manufactures spec of the lift to be fitted in development, and ensure the lift includes all of the energy efficient features specified in credit criteria column.	M&E / LIFT SPECIALIST
Ene 07	Energy Efficient Laboratory Systems	-	0.65	-	**CREDIT NOT APPLICABLE TO DEVELOPMENT**		
Ene 08	Energy Efficient Equipment	2	0.65	2	Two credits can be awarded the design team: 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 demand of the development and its operation. 3. Demonstrate a meaningful reduction in the total annual unregulated energy demand of the building. See Table - 28	2/2 CREDITS TARGETED It is assumed that the tenant will be involved in the BREEAM process and this credit will be achievable	TENANT

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					Note: Table - 28 contains solutions deemed to satisfy compliance for common examples of significant contributors to unregulated energy demand, for a number of different building types/functions.		
Ene 09	Drying Space	-	0.65	-	**CREDIT NOT APPLICABLE TO DEVELOPMENT**		
Transport							
Tra 01	Public Transport Accessibility	5	1.00	3	3 credits available. The public transport Accessibility Index (AI) is to be determined and used to verify the number of credits to be awarded, based on service provision from compliant transport nodes (bus services with stops within 650m of the building, and rail services with stations within 1000m), surrounding the site. OR 1 credit available where buildings have a fixed shift pattern and the occupier commits to provide a dedicated bus service.	3/5 CREDITS TARGETED The Welwyn Garden City train station is adjacent to the site (ie within 1000m from the site) and there any numerous bus stops within 650m from the site. Based on an initial desktop calculation it is expected that the site will have an accessibility index of at least 8; therefore, it is assumed that 3 credits are achievable	SOL
Tra 02	Proximity to Amenities	1	1.00	1	**RETAIL BUILDING TYPES CRITERIA (A1-A5)** 1 credit can be awarded where: • at least 2 of the following **core** amenities are within 500m: Food Outlet, Access to Cash, Access to a recreation/leisure facility for fitness sports; and • at least 1 of the following amenities (or another core amenity) is within 500m: Food Outlet, Access to Cash, Outdoor spaces (public, private, provided it is suitably sized), Recreation/ leisure facility, Postal	1/1 CREDITS TARGETED It is assumed that an ATM, a food outlet and a post box will be included within the new development area; therefore, this credit can be awarded.	SOL

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
					Facility, Community Facility, Pharmacy, Childcare facility or school.		
Tra 03	Cyclist Facilities	2	1.00	1	**FIRST CREDIT** 1 credit can be awarded where safe, secure, appropriately sized and weather-proof cycle storage is provided as follows: **SMALL RETAIL BUILDING TYPE CRITERIA (A1-A5)** 1 Space per 10 Staff **SECOND CREDIT** A Second credit can be awarded where 2 compliant cyclist facilities (showers, changing facilities & lockers, and drying space for clothes) are provided for every 10 staff.	1/2 CREDITS TARGETED It is assumed appropriate cyclist storage facilities will be provided but it is unlikely that the cyclist facilities credit till be targeted	ARCHITECT / SOL
Tra 04	Maximum Car Parking Capacity	-	1.00	-	**CREDIT NOT APPLICABLE TO RETAIL DEVELOPMENTS**		

Table 3.1: Credits likely to be achieved given current design intent							
Ref	Credit Title	Max avail. credits	% per credit	Likely credits	Credit criteria	Comments	Action for
Tra 05	Travel Plan	1	1.00	1	A travel plan has been developed as part of the feasibility and design stages and is structured to meet the specific needs of the site including (but not limited to) existing travel patterns and opinions of existing building or site users; predicted travel patterns and transport impacts; Current local environment for walkers and cyclists (accounting for visitors who may be accompanied by young children); Disabled access; Public transport links; Current facilities for cyclists. As well as measures to encourage the use of sustainable modes of transport and movement of people and goods during the buildings operation and use. If the occupier is known, they must be involved in the development of the travel plan and they must confirm that the travel plan will be implemented in operation.	1/1 CREDITS TARGETED It is assumed Travel Plan will be conducted for entire site. Design team to provide travel plan specific to proposed site and ensure all relevant criteria outlined in the BRE guidance is addressed.	TRANSPORT CONSULTANT

Water							
Wat 01	Water Consumption	5	0.78	3	Credits awarded using sanitary ware fitting specifications for water consuming components, and details of grey water/ rainwater systems to determine potable water consumption (litres/ person/ day). BREEAM Wat 01 calculator used to determine credits achieved. Credits awarded based on predicted water consumption, as a % improvement compared against national baseline performance benchmarks: 12.5% = 1 credit 25% = 2 credits 40% = 3 credits 50%= 4 credits 55% = 5 credits 65% = Exemplary Performance	MINIMUM REQUIREMENT First Credit required to achieve a BREEAM 'Good' rating. 3/5 CREDITS TARGETED Design team to provide product details of all sanitary ware fittings to be fitted into each of the new developments. Based on targeted credits, predicated water consumption must be 40% improvement compared against national baseline performance benchmarks.	ARCHITECT / M&E
Wat 02	Water Monitoring	1	0.78	1	**Criteria 1 – 4** One credit can be awarded where the following are met: 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. Water consuming plant or building areas, consuming 10% or more of the building's total water demand, are either fitted with easily accessible sub-meters or have water monitoring equipment integral to the plant or area. Each meter (main and sub) has a pulsed or other open protocol communication output to enable connection to an appropriate utility monitoring and management system, e.g. a building management system (BMS), for the monitoring of water consumption. If the site on which the building is located has an existing BMS, managed by the same occupier/owner (as the new building), the pulsed/digital water meter(s) for the new building must be connected to the existing BMS.	MINIMUM REQUIREMENT Criterion 1 required to achieve any BREEAM rating. 1/1 CREDITS TARGETED Design team to provide relevant design drawings confirming location of water meter and sub-meters throughout the building. Design team to provide manufactures spec ensuring meter can be connected to a BMS system. M&E Tender documentation to include this requirement.	M&E

Wat 03	Water Leak Detection and Prevention	2	0.78	2	**Leak Detection System** A leak detection system which is capable of detecting a major water leak on the mains water supply within the building and between the building and the utilities water meter is installed. The leak detection system must be: A permanent automated water leak detection system that alerts the building occupants to the leak OR an in-built automated diagnostic procedure for detecting leaks is installed. b. Activated when the flow of water passing through the water meter/data logger is at a flow rate above a pre-set maximum for a pre-set period of time. c. Able to identify different flow and therefore leakage rates, e.g. continuous, high and/or low level, over set time periods. d. Programmable to suit the owner/occupiers' water consumption criteria. e. Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers.	1/1 CREDITS TARGETED An appropriate leak detection system will be installed on mains water supply to the buildings. Design team to ensure system selected for the developments, must be compliant with BRE criteria listed in credit criteria column.	M&E
					Flow Control Devices 1 credit can be awarded when Flow control devices that regulate the supply of water to each WC area/facility according to demand are installed (and therefore minimise water leaks and wastage from sanitary fittings).	1/1 CREDITS TARGETED It is assumed PIR sensors will be installed throughout all toilets of each development, controlling the flow of water to each WC/facility according to the required demand.	
Wat 04	Water Efficient Equipment	1	0.78	1	1 credit awarded where the design team has identified all unregulated water demands that could be realistically mitigated or reduced. System(s) or processes have been identified to reduce the unregulated water demand, and demonstrate, through either good practice design or specification, a meaningful reduction in the total water demand of the building.	1/1 CREDITS TARGETED It is assumed that the landscaping will be irrigated through either precipitation alone or a compliant efficient irrigation system.	LANDSCAPE ARCHITECT

Materials							
Mat 01	Life Cycle Impact of Materials	5	0.96	4	Up to 6 are awarded through the specification of six key construction elements: external walls, windows, roof, upper floor slabs, Internal walls, and floor finishes, and their quantified environmental life cycle impact (based on Green Guide Ratings of each specified product/ material for each element). Life cycle Green House Gas emissions for each element are also to be reported (for 60-year building life). Credit level to be verified by Mat 01 calculator based on data to be provided. Areas and thicknesses, or volumes for each constituent element material to be provided.	4/5 CREDITS TARGETED Pre-assessment has assumed 4 credits will be targeted. Architect to ensure all external walls, windows, roof, upper floor slabs, Internal walls, and floor finishes used within the development achieve a BRE Green Guide Rating or B or better.	ARCHITECT
Mat 02	Hard Landscaping & Boundary Protection	1	0.96	1	Where at least 80% of all external hard landscaping and 80% of all boundary protection (by area) in the construction zone achieves an A or A+ rating, as defined in the Green Guide to Specification. Green Guide ratings for the specification(s) of each element can be found at www.thegreenguide.org.uk Access/approach roads and vehicle manoeuvring areas are to be excluded from assessment under this Issue.	1/1 CREDITS TARGETED It is assumed credit will be targeted. Architect to ensure >80% of all hard landscaping and boundary protection materials used within the development achieve an A or A+ BRE Green Guide Rating.	ARCHITECT
Mat 03	Responsible Sourcing of Materials	4	0.96	3	**Criteria 1 - Pre-requisite** All timber and timber based products used on the project is 'Legally harvested and traded timber'.	MINIMUM REQUIREMENT Criterion 1 required to achieve any BREEAM rating. PRE-REQUISTE TARGETED Design team to provide written confirmation ensuring all timber and timber based products used on the project are 'Legally harvested and traded timber' as per BRE requirements. Tender prelims to include this requirement.	CONTRACTOR

					Criteria 2 – Sustainable Procurement Plan 1 credit awarded when the principal contractor sources materials for the project in accordance with a documented sustainable procurement Plan.	1/1 CREDITS TARGETED Contractor to provide sustainable procurement plan outlining the materials sourced for the project and how they are responsibly sourced as per the BRE definition.	CONTRACTOR
					Up to 3 credits can be awarded where applicable materials are responsibly sourced as follows: 3 credits - ≥54% 2 credits - ≥36% 1 credits - ≥18% Exemplary credit available where ≥18% of materials are responsibly sourced.	2/3 CREDITS TARGETED Contractor to ensure at least 36% materials sourced for the project are responsibly sourced.	CONTRACTOR
Mat 04	Insulation	1	0.96	1	**One credit - Embodied impact** Any new insulation specified for use within the following building elements must be assessed: a. External walls; b. Ground floor; c. Roof; d. Building services. The Insulation Index for the building fabric and services insulation is the same as or greater than 2.5. See the Methodology section for a description of calculating the Insulation Index.	1/1 CREDITS TARGETED Design team to report on all insulation (building fabric and services insulation) used within the buildings within the development and that the total insulation has an Insulation Index of greater than 2.5.	ARCHITECT / M&E
Mat 05	Designing for Durability and Robustness.	1	0.96	1	**Criteria 1 – Protecting Vulnerable Parts of the Building from damage.** The building incorporates suitable durability and protection measures or designed features/solutions to prevent damage to vulnerable parts of the internal and external building and landscaping elements. This must include, but is not necessarily limited to:	1/1 CREDITS TARGETED It is assumed design team will be targeting the credit and ensuring all buildings are suitably protected from potential damage. Design team to provide letter of commitment outlining the measures which are to be implemented at final design (as listed in BRE criteria).	ARCHITECT

					a) Protection from the effects of high pedestrian traffic in main entrances, public areas and thoroughfares (corridors, lifts, stairs, doors etc.). b) Protection against any internal vehicular/trolley movement within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas. c) Protection against, or prevention from, any potential vehicular collision where vehicular parking and manoeuvring occurs within 1m of the external building façade for all car parking areas and within 2m for all delivery areas. **Criteria 2 – Protecting Exposed Parts of the Building Material Degradation.** The relevant building elements incorporate appropriate design and specification measures to limit material degradation due to environmental factors.		
Mat 06	Material Efficiency	1	0.96	0	**One Credit** **Criteria 1 – 2** Opportunities have been identified, and appropriate measures investigated and implemented, to optimise the use of materials in building design, procurement, construction, maintenance and end of life, The above is carried out by the design/construction team in consultation with the relevant parties (see CN3) at each of the following RIBA stages: a. Preparation and Brief; b. Concept Design; c. Developed Design; d. Technical Design; e. Construction.	**0/1 CREDITS TARGETED** It is assumed the criteria will not be targeted.	**NOT TARGETED**

Waste							
Wst 01	Construction Site Waste Management	4	1.06	3 (4)	Monitoring and reporting of waste generated on site in defined waste groups, and compliance with legal requirements as set in SWMP regulations 2008 for and with best practice. The plan should include the setting of targets to promote resource efficiency in accordance with guidance from WRAP, Envirowise, BRE and DEFRA. The plan must address diversion of waste from landfill. Credits are available for construction resource efficiency where non- hazardous construction waste is limited to a minimum 13.3m3 (or 11.1 tonnes) per 100m2 of Gross Internal Floor Area (1 Credit), 7.5m3 (or 6.5 tonnes) / 100m2 (2 credits), and 3.4m3 (or 3.2 tonnes) / 100m2 (3 credits). Note that the above efficiency benchmarks exclude demolition and excavation waste. One further credit is available where 70% volume (or 80% by weight) of non-demolition waste, and 80% volume (or 90% by weight) of demolition waste is diverted from landfill. All credits dependent on a compliant Site Waste Management Plan being in place.	3/4 CREDITS TARGETED It is assumed criteria will be targeted. Design team to report on the amount of waste which is generated on site, as well as the type of waste as outlined in SWMP regulations 2008. Design team to ensure all non-hazardous construction waste is limited to a maximum of at least 3.4m^3 (or 3.2 tonnes) / 100m^2 as per BRE requirements. NOTE – As the site is currently brownfield a pre-demolition audit will be required.	CONTRACTOR
Wst 02	Recycled Aggregates	1	1.06	1	**Criteria 1 – 6** 1 Credit available. Compliance can be shown via the specification of the following minimum levels of recycled / secondary aggregate use (relative to amount of high-grade aggregates used) for: • structural frame – 15%; • bitumen or hydraulically bound surfaces – 30%; • building foundations – 20%;	1/1 CREDITS TARGETED The contractor and civil sub-contractor will ensure that a total of 25% of ALL aggregates used on the site will come from recycled sources. This 25% must be made up of the following minimum amounts per use: • structural frame – 15%; • bitumen or hydraulically bound surfaces – 30%;	CONTRACTOR / CIVIL

					• concrete road surfaces – 15%; • pipe bedding – 100%; and • granular fill & capping – 100%. The total amount of recycled / secondary aggregate use (relative to amount of high-grade aggregates used) must be 25%. **Exemplary Criteria Applicable**	• building foundations – 20%; • concrete road surfaces – 15%; • pipe bedding – 100%; and • granular fill & capping – 100%.	
Wst 03	Operational Waste	1	1.06	1	1 Credit awarded where there is to be provision of dedicated storage facilities for operational (in use) related recyclable waste streams. Storage areas/ Bins must be labelled, accessible, and of an appropriate size and capacity. Where consistent generation of waste exists, the following should be provided; Static waste compactor or baler (within service or dedicated waste management space); A vessel for composting organic waste OR space for storing segregated food waste and compostable material, together with provision of a water outlet for cleaning.	MINIMUM REQUIREMENT: 1 credit is required to achieve BREEAM 'Excellent' 1/1 CREDITS TARGETED It is assumed the credit will be targeted for all developments. Design team to ensure/provide updated drawings confirming location of external waste facilities for each of the buildings, as well as ensure they are suitable size and clearly labelled to assist in the segregation of waste. Design team must ensure where there is a consistent stream of waste being generated e.g. Restaurants organic food waste, Hotel general day to day waste, a complainant form of waste facility is provided as listed in BRE credit criteria column.	ARCHITECT / TENANT
Wst 04	Speculative Floor and Ceiling Finishes	0	1.06	0	**NA – Speculative floor and ceiling finishes Office building types only** For tenanted areas (where the future occupant is not known), prior to full fit-out works, carpets, other floor finishes and ceiling finishes	**NA – Speculative floor and ceiling finishes Office building types only**	NOT TARGETED

					have been installed in a show area only. In a building developed for a specific occupant, that occupant has selected (or agreed to) the specified floor and ceiling finishes.		
Wst 05	Adaptation to Climate Change	1	1.06	0	**Criteria 1 – Structural and Fabric Resilience** Conduct a climate change adaptation strategy appraisal for structural and fabric resilience by the end of Concept Design (RIBA Stage 2 or equivalent), in accordance with the following approach: a. Carry out a systematic (structural and fabric resilience specific) risk assessment to identify and evaluate the impact on the building over its projected lifecycle from expected extreme weather conditions arising from climate change and, where feasible, mitigate against these impacts. The assessment should cover the following stages: i. Hazard identification; ii. Hazard assessment; iii. Risk estimation; iv. Risk evaluation; v. Risk management **EXEMPLARY CREDIT APPLICABLE**	**0/1 CREDIT TARGETED** It is assumed credit will not be targeted. Design team to confirm.	**NOT TARGETED**
Wst 06	Functional Adaptability	1	1.06	1	**One credit** **Criteria 1 – 2** 1. A building-specific functional adaptation strategy study has been undertaken by the client and design team by Concept Design (RIBA Stage 2 or equivalent), which includes recommendations for measures to be incorporated to facilitate future adaptation. 2. Functional adaptation measures have been implemented (RIBA Stage 4 or equivalent) in accordance with the functional adaptation strategy recommendations, where practical and cost effective. Omissions have been justified in writing to the assessor.	**1/1 CREDITS TARGETED** It is assumed the credit will be targeted for all developments. Design team to ensure that there is an adaptation strategy for the development that will allow the development to adapt use at a future date if required, without the need for demolition of or significant amendments to the development	**ARCHITECT**

Land Use and Ecology							
LE 01	Site Selection	2	1.00	1	**Previously occupied land - One credit** At least 75% of the proposed development's footprint is on an area of land which has previously been occupied by industrial, commercial or domestic buildings or fixed surface infrastructure.	1/1 CREDITS TARGETED The site is currently occupied by industrial; therefore, it is assumed that 100% of the building footprint will be located on previously occupied land	ARCHITECT
					Contaminated land - One credit 2. A contaminated land specialist'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 specialist.	0/1 CREDITS TARGETED The site is currently occupied by industrial; therefore, it is assumed that there will be some contamination on the site but without further investigation it is conservatively assumed that this credit will not be targeted	NOT TARGETED
LE 02	Ecological Value of Site & Protection of Ecological Features	2	1.00	2	**Ecological value of site - One credit** Land within the construction zone is defined as 'land of low ecological value' using either: The BREEAM checklist for defining land of low ecological value (see Checklists and tables below); OR A Suitably Qualified Ecologist (SQE) who has identified the land as being of 'low ecological value' within an ecological assessment report, based on a site survey. **NOTE**: Ecologist report required if Planning Authority required that an ecological survey or statement be	1/1 CREDITS TARGETED The site is currently occupied by industrial; therefore, it is assumed that the existing site will be determined by the ecologist to be of low ecological value with no features of ecological value	ECOLOGIST

					prepared or the assessment zone: • is within 2km of SAC, SPA or Ramsar site; • is within 500m of a SSSI; • is within 100m of ecological habitat (refer checklist); or • has ecological habitats present on site (refer checklist).		
					Protection of ecological features **Criteria 2 – 3** 2. All existing features of ecological value within and surrounding the construction zone and site boundary area are adequately protected from damage during clearance, site preparation and construction activities in line with BS42020: 20131. 3. In all cases, the principal contractor is required to construct ecological protection recommended by the SQE, prior to any preliminary site construction or preparation works (e.g. clearing of the site or erection of temporary site facilities).	1/1 CREDITS TARGETED It is assumed credit will be targeted. Ecologist to report on all existing features of ecological value (if there are any), and confirm how they are to be protected within the construction zone throughout development. All protection measures implemented must be in line with BS42020: 20131.	ECOLOGIST
LE 03	Mitigating Ecological Impact	2	1.00	2	**Two credits - Change in ecological value 1** The change in ecological value of the site is equal to or greater than zero plant species, i.e. no negative change, using the methods outlined in either (a) or (b) below: a. Determine the following information and input this data in to the BREEAM LE 03/LE 04 calculator: i. The broad habitat type(s) that define the landscape of the assessed site in its existing pre-developed state and proposed state (see Table - 53). ii. Area (m2) of the existing and proposed broad habitat types. OR b. Where a Suitably Qualified Ecologist (SQE) has been appointed and, based on their site survey, they confirm	MINIMUM REQUIREMENT: 1 credit is required to achieve BREEAM Very Good or better 1/2 CREDITS TARGETED It has been assumed that the proposed development will have a positive impact on the number of species on the site; therefore, it is assumed that 2 credits will be achievable. Evidence (Ecology Report) is required confirming the existing and proposed broad habitat types to be planted or uprooted, area (m2) of habitats, and	ECOLOGIST/ CONTRACTOR

					the following and either the assessor or ecologist inputs this data in to the BREEAM LE 03/LE 04 calculator: i. The broad habitat types that define the landscape of the assessed site in its existing pre-developed state and proposed state. ii. Area (m2) of the existing and proposed broad habitat plot types. iii. Average total taxon (plant species) richness within each habitat type. **One credit - Change in ecological value 2** 2. Where the change in ecological value of the site is less than zero but equal to or greater than minus nine plant species i.e.a minimal change, use the methods outlined in either 1 (a) or (b) above.	average total taxon (plant species) richness within each habitat type to be issued, confirming the change in ecological value throughout the site.	
LE 04	Enhancing Site Ecology	2	1.00	1 (2)	**One credit - Ecologist's report and recommendations** 1. A suitably qualified ecologist (SQE) has been appointed by the client or their project representative by the end of the Preparation and Brief stage (RIBA Stage 1 or equivalent) to advise on enhancing the ecology of the site at an early stage 2. The SQE has provided an Ecology Report with appropriate recommendations for the enhancement of the site's ecology at Concept Design stage (RIBA Stage 2 or equivalent). The report is based on a site visit/survey by the SQE (see also CN4). 3. The early stage advice and recommendations of the Ecology Report for the enhancement of site ecology have been, or will be, implemented in the final design and build.	NOTE – An ecologist is required to be engaged to achieve this credit. 1/1 CREDITS TARGETED All Ecologist's recommendations will be implemented	ECOLOGIST / LANDSCAPE ARCHITECT / CLIENT

					One credit - Increase in ecological value 4. The criteria of the first credit are met. 5. The recommendations of the Ecology Report for the enhancement of site ecology have been implemented in the final design and build, and the SQE confirms that this will result in an increase in ecological value of the site, with an increase of six plant species or greater (refer also to Compliance note CN8 for alternative means of compliance). 6. The increase in plant species has been calculated using the BREEAM LE 03/LE 04 calculators, using actual plant species numbers.	**0/1 CREDITS TARGETED** As the site is currently an industrial brownfield site, this credit may be achievable but without further investigation it cannot be assumed.	**NOT TARGETED**
LE 05	Long Term Impact on Biodiversity	2	1.00	2	**Criteria 1 – 3** 1. Where a Suitably Qualified Ecologist (SQE) is appointed prior to commencement of activities on-site and they confirm that all relevant UK and EU legislation relating to the protection and enhancement of ecology has been complied with during the design and construction process. 2. Where a landscape and habitat management plan, appropriate to the site, is produced covering at least the first five years after project completion in accordance with BS 42020:20131 Section 11.1. This is to be handed over to the building owner/occupants for use by the grounds maintenance staff. 3. Where additional measures to improve the assessed site's long term biodiversity are adopted, according to Table - 55.	**NOTE** – An ecologist is required to be engaged to achieve this credit. **2/2 CREDITS TARGETED** It is assumed credit will be targeted. Design Team to ensure the Ecologist engaged provides landscape and habitat management plan covering the first 5 years after project completion in accordance with BS 42020:20131 Section 11.1. If further measures are provided in accordance with Table 55, they must be adopted.	**ECOLOGIST / CLIENT**

Pollution							
Pol 01	Impact of Refrigerants	3	0.77	1	3 credit where the building uses no refrigerants. **OR**		
					PRE-REQUISITE All systems (with electric compressors) must comply with the requirements of BS EN 378:2008 (parts 2 and 3) and where refrigeration systems containing ammonia are installed, the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice.	MINIMUM REQUIREMENT Criterion required to achieve any BREEAM rating. It is assumed credit will be achieved. Tender Prelims to include this requirement.	M&E
					Criteria 3 – 4 Impact of Refrigerants – Up to two credits 2 credits can be awarded where the systems using refrigerants have Direct Effect Life Cycle CO2 equivalent emissions (DELC CO2e) of ≤100kgCO2e/kW cooling/heating capacity. 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	0/2 CREDITS TARGETED Design team to review criteria and confirm if it can be achieved throughout all buildings. At this, stage it is assumed that these credits will not be achievable	NOT TARGETED
					Criteria 5 – Impact of Refrigerant 1 credit can be awarded where the systems using refrigerants have Direct Effect Life Cycle CO2 equivalent emissions (DELC CO2e) of ≤1000kgCO2e/kW cooling/heating capacity.	0/1 CREDITS TARGETED Design team to review criteria and confirm if it can be achieved throughout all buildings.	NOT TARGETED

					Criteria 6-7 Leak Detection Where systems using, refrigerants have a permanent automated refrigerant leak detection system installed; OR where an in-built automated diagnostic procedure for detecting leakage is installed. In all instances a robust and tested refrigerant leak detection system must be installed and must be capable of continuously monitoring for leaks. The system must be capable of automatically isolating and containing the remaining refrigerant(s) charge in response to a leak detection incident.	1/1 CREDITS TARGETED It is assumed that if any refrigerants are used within the proposed developments (with a refrigerant charge of >6kg) the systems will have appropriate leak detection. Compliance Note CN3 Refrigerant charge of less than 6kg - For installations of small multiple hermetic systems only where the refrigerant charge in each unit is less than 6kg, the credit for leak detection and containment can be awarded by default. This is on the basis that the risk of a large refrigerant leak due to system failure is minimised, as individual leaks from each system will be small where leakage occurs, and therefore there is little life cycle benefit of requiring leak detection equipment on each small system.	M&E
Pol 02	NO_x Emissions	3	0.77	2	**ALL CREDITS** Credits are awarded where the space heating & hot water system has a dry NOx emission level (0% O_2 excess) limit of <100mg/ KWh boiler Class 4 (1 credit), or <70mg/kWh boiler Class 5 (2 credits) or <40 mg/kWh (3 credits).	2/3 CREDITS TARGETED It is conservatively assumed the boilers used will have a NOX level of <70mg/kWh and at least 2/3 credits will be targeted.	M&E
Pol 03	Surface Water Run-off	5	0.77	4	**Flood Resilience:** 2 Credits are available where a site-specific flood risk assessment (FRA) confirms the development is situated in a flood zone that is defined as having a low annual probability of flooding (in accordance with current best practice national planning guidance). The FRA must take all current and future sources of flooding into consideration OR	2/2 CREDITS TARGETED It is assumed that a detailed FRA will prepared and submitted with the planning / reserved matters application. An initial review of the EA website confirms that the site falls within Flood Zone 1 – land assessed as having a less than 1 in 1,000 annual probability of river or sea	FRA

					1 credit where a site-specific FRA confirms the development is situated in a flood zone that is defined as having a medium or high annual probability of flooding and is not in a functional floodplain (in accordance with current best practice national planning guidance). The FRA must take all current and future sources of flooding into consideration (see CN5). To increase the resilience and resistance 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 flood zone in which the assessed development is located; OR b. The final design of the building and the wider site reflects the recommendations made by an appropriate consultant in accordance with the hierarchy approach outlined in section 5 of BS 8533:2011	flooding (<0.1%); therefore, it is assumed that 2 credits will be achievable.	
					Surface Water Runoff: An Appropriate Consultant is appointed to carry out, demonstrate and/or confirm the development's compliance with the following criteria: Where drainage measures are specified to ensure 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. 6. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS are in place. 7. Calculations include an allowance for climate change; this should be made in accordance with current best practice planning guidance (see definitions).	**2/2 CREDITS TARGETED** The site is currently developed, brownfield land. To achieve these credits SUDS drainage measures are required to be implemented to ensure proposed surface water run-off rates and volumes do not exceed the existing runoff rates and volumes. It is assumed that calculations will be conducted and that these credits will be achievable.	

					Where flooding of property will not occur in the event of local drainage system failure (caused either by extreme rainfall or a lack of maintenance); AND EITHER 9. Drainage design measures are specified to ensure 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 for the 100-year 6-hour event, including an allowance for climate change (see criterion 14). 10. Any additional predicted volume of run-off for this event is prevented from leaving the site by using infiltration or other Sustainable Drainage System (SuDS) techniques. OR (only where criteria 9 and 10 for this credit cannot be achieved): 11. 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. 12. Drainage design measures are specified to ensure that the post development peak rate of run-off is reduced to the limiting discharge. The limiting discharge is defined as the highest flow rate from the following options: a. The pre-development 1-year peak flow rate; OR b. The mean annual flow rate Qbar; OR c. 2L/s/ha. Note that for the 1-year peak flow rate the 1-year return period event criterion applies (as described in the peak run-off criteria above). 13. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS are in place.		

					14. For either option, above calculations must include an allowance for climate change; this should be made in accordance with current best practice planning guidance.		
					Minimising Water Course Pollution: There is no discharge from the developed site for rainfall up to 5mm (confirmed by the Appropriate Consultant). 16. In areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate SuDS techniques. 17. Where there is a high risk of contamination or spillage of substances such as petrol and oil (see Compliance notes for a list of areas), separators (or an equivalent system) are installed in surface water drainage systems. 18. Where the building has chemical/liquid gas storage areas, a means of containment is fitted to the site drainage system (i.e. shut-off valves) to prevent the escape of chemicals to natural watercourses (in the event of a spillage or bunding failure). 19. All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as Pollution Prevention Guideline 3 (PPG 3)2 and/or where applicable the SUDS manual3. For areas where vehicle washing will be taking place, pollution prevention systems must be in accordance with Pollution Prevention Guidelines 13. 20. A comprehensive and up-to date drainage plan of the site will be made available for the building/site occupiers. 21. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place. 22. Where present, all external storage and delivery areas designed and detailed in accordance with the current	**0/1 CREDITS TARGETED** Design team to confirm if credit is targeted. At this stage it is assumed that this will not be achievable	

					best practice planning guidance (see Other information for further information).		
Pol 04	Reduction of Night Time Pollution	1	0.77	1	**Criteria 1-5** 1. Where external lighting pollution has been eliminated through effective design that removes the need for external lighting without adversely affecting the safety and security of the site and its users. OR alternatively, where the building does have external lighting, one credit can be awarded as follows: 2. The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the ILP Guidance notes for the reduction of obtrusive light, 2011. Buildings located in Scotland must comply with the light pollution criteria in the guidance note 'Controlling Light Pollution and Reducing Lighting Energy Consumption'. This can be demonstrated via completion of the checklists in Annexes B and C of the guidance note by a relevant member of the design team. 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's Guidance notes. 5. Illuminated advertisements, where specified, must be designed in compliance with ILE Technical Report 5 – The Brightness of Illuminated Advertisements	1/1 CREDITS TARGETED It is assumed full credit will be targeted. Design team to provide external lighting specification, and ensure all lighting to be installed external to the development is compliant with the criteria as listed in the credit criteria column.	M&E
Pol 05	Reduction of Noise Pollution	1	0.77	1	**One credit** 1. Where there are, or will be, no noise-sensitive areas or buildings within 800m radius of the assessed development. OR	1/1 CREDITS TARGETED The development is part of a masterplan that includes residential dwellings and will therefore be within 800m of noise sensitive areas. Design team to	ACOUST / M&E

					2. Alternatively, where the building does have noise-sensitive areas or buildings within 800m radius of the development, one credit can be awarded as follows: a. Where a noise impact assessment in compliance with BS 74451 has been carried out and the following noise levels measured/determined: i. Existing background noise levels at the nearest or most exposed noise-sensitive development to the proposed development or at a location where background conditions can be argued to be similar. ii. The rating noise level resulting from the new noise source (see CN4). 3. The noise impact assessment must be carried out by a suitably qualified acoustic consultant holding a recognised acoustic qualification and membership of an appropriate professional body. 4. The noise level from the proposed site/building, as measured in the locality of the nearest or most exposed noise sensitive development, is a difference no greater than +5dB during the day (07:00 to 23:00) and +3dB at night (23:00 to 07:00) compared to the background noise level. 5. Where the noise source(s) from the proposed site/building is 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 criterion 4.	ensure a noise impact assessment completed by a suitably qualified acoustician as per BRE definition, and ensure all measures outlined in Credit Criteria column are thoroughly addressed throughout the report.	

4. PERFORMANCE SUMMARY

4.1 A1-A5 Retail (BREEAM NC 2014)

The pre-assessment process identified the credits and consequent ratings likely to be achieved by the proposed new **A1-A4 Retail (BREEAM NC 2014 Commercial: Retail)** within the new buildings at the former Shredded Wheat Factory site in Welwyn Garden City.

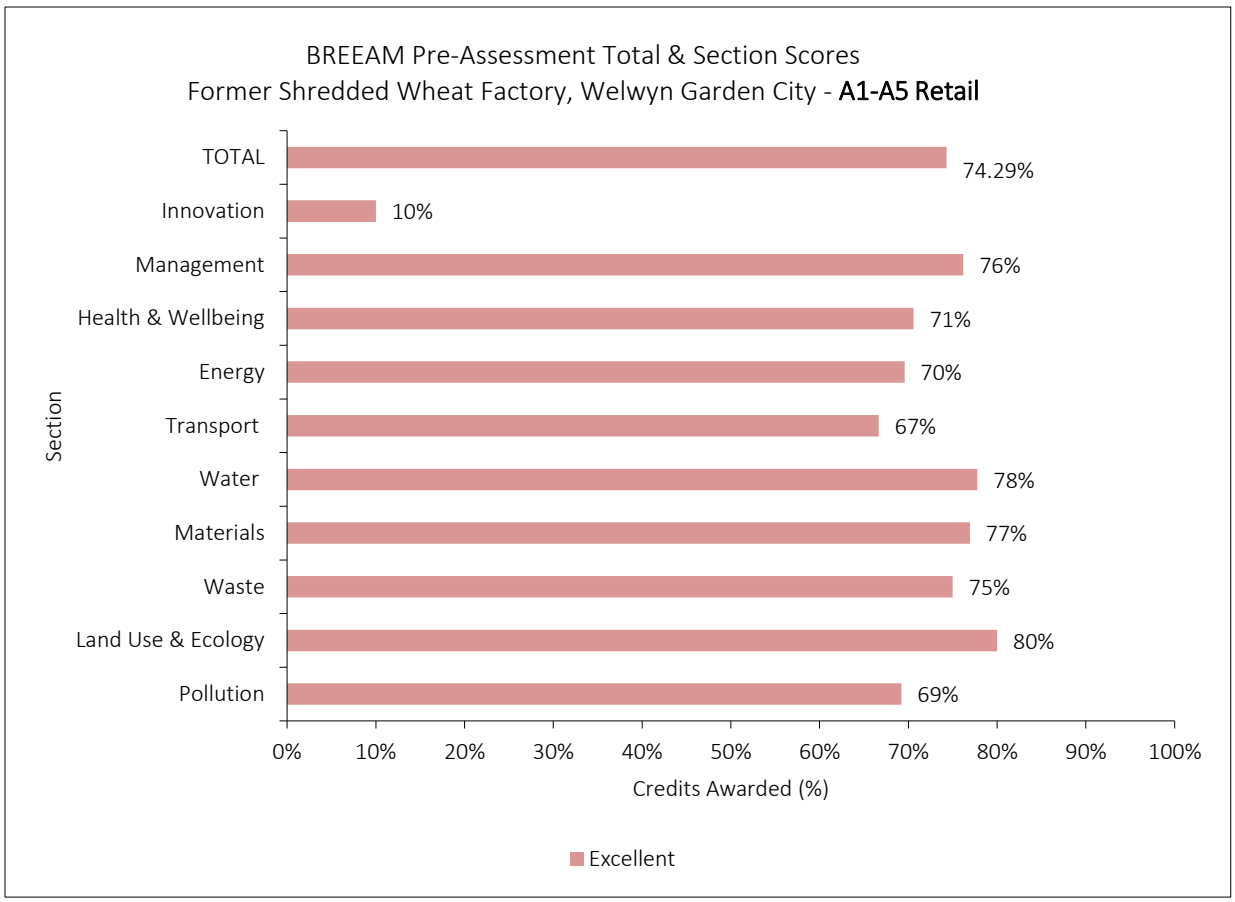

Figure 4.1: Predicted Percentage of the Total Score Targeted and a Breakdown of the Percentage of Credits Awarded in each Section for the development.

The proposed A1-A5 Retail portion of the development is likely to achieve a ***BREEAM 'Excellent'*** rating, given current design intent. The development is likely to achieve a total overall score of approximately **74.29%.**

4.2 Block 4 Gym (BREEAM RFO 2014)

The pre-assessment process identified the credits and consequent ratings likely to be achieved by the proposed new **Gym (BREEAM RFO 2014 Other: Assembly & Leisure)** located within the existing buildings at the former Shredded Wheat Factory site in Welwyn Garden City.

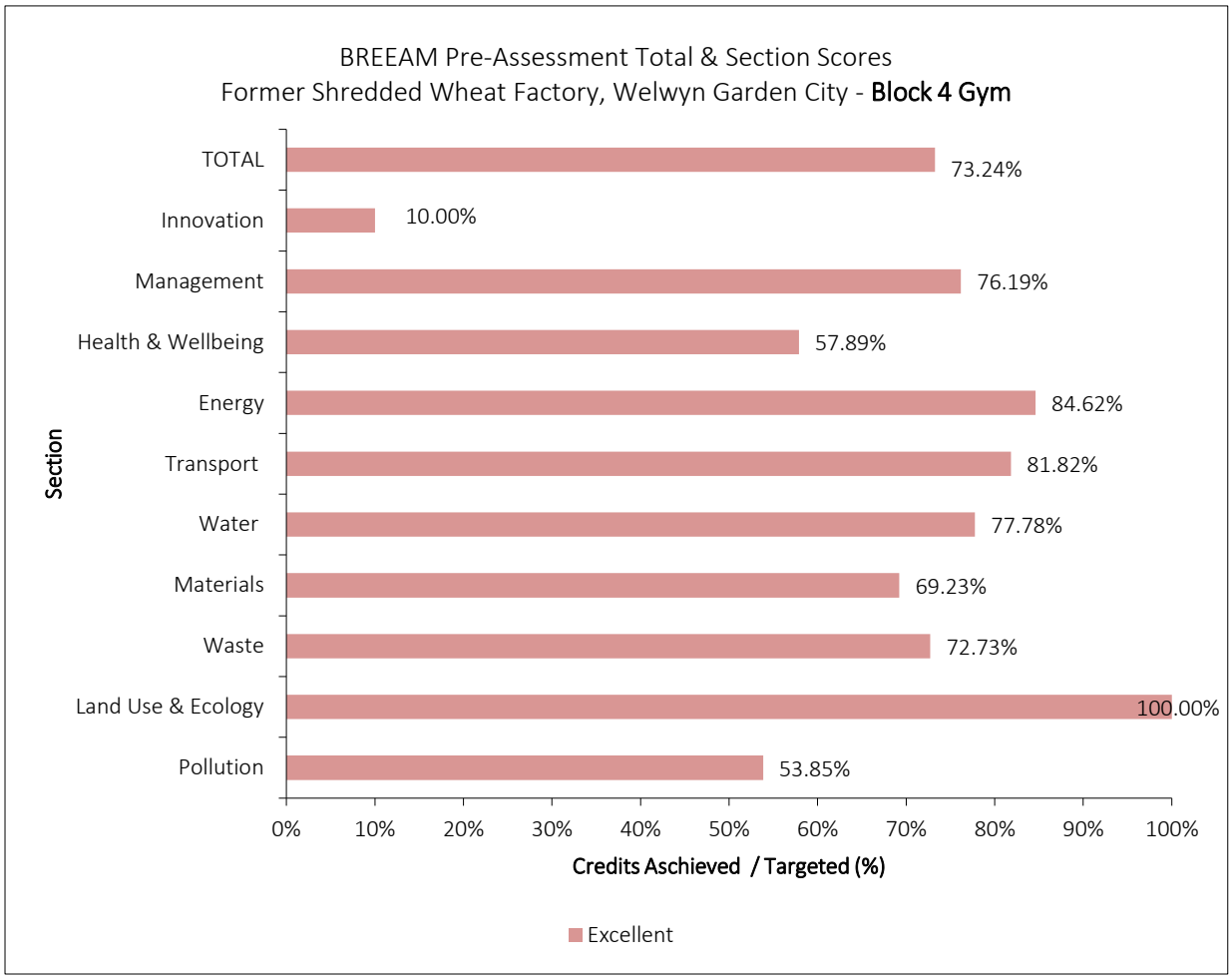

Figure 4.2: Predicted Percentage of the Total Score Targeted and a Breakdown of the Percentage of Credits Awarded in each Section for the development.

The proposed Gym portion of the development is likely to achieve a ***BREEAM 'Excellent'*** rating, given current design intent. The development is likely to achieve a total overall score of approximately **73.24%.**

4.3 Block 4 Offices (BREEAM RFO 2014)

The pre-assessment process identified the credits and consequent ratings likely to be achieved by the proposed new **Office (BREEAM RFO 2014 Commercial: Offices)** located within the existing buildings at the former Shredded Wheat Factory site in Welwyn Garden City.

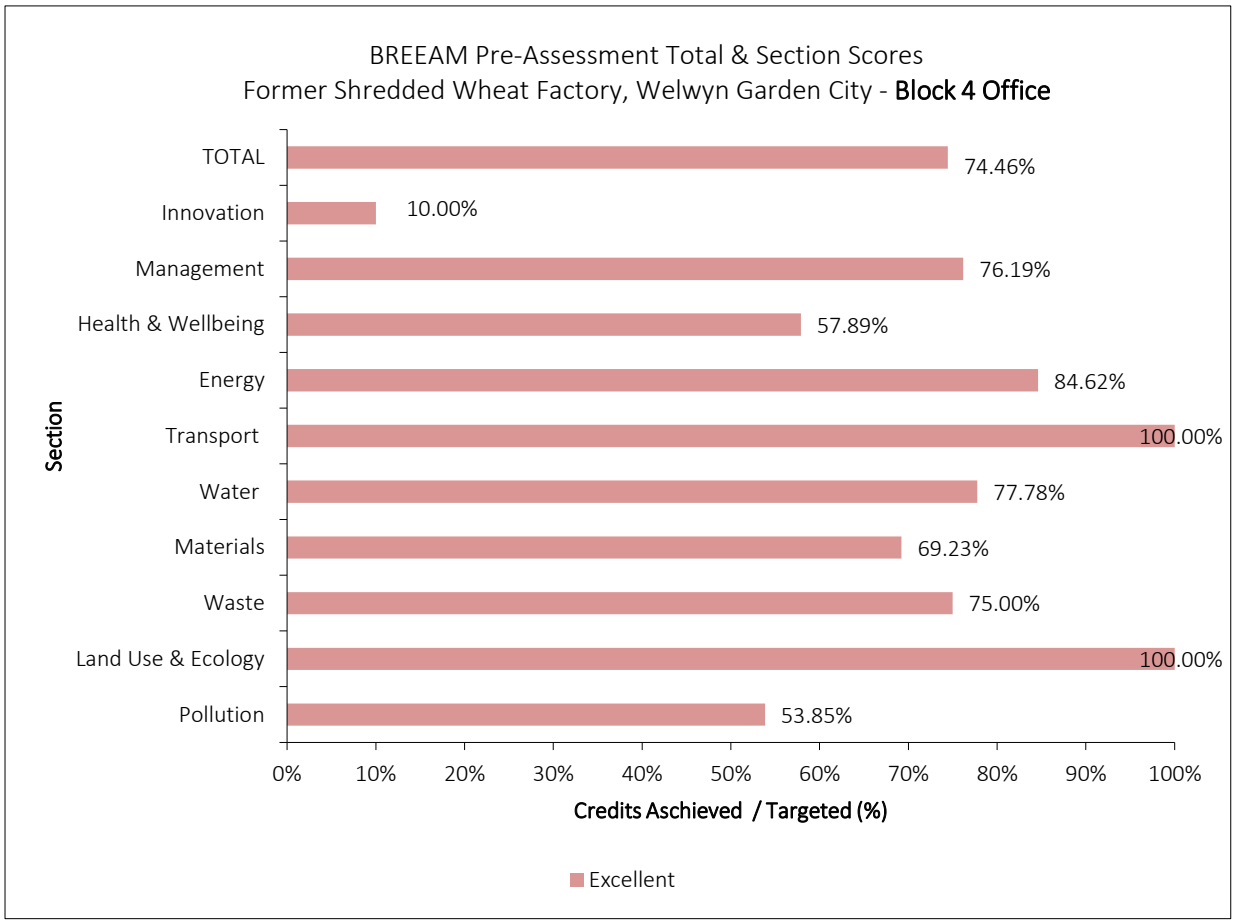

Figure 4.2: Predicted Percentage of the Total Score Targeted and a Breakdown of the Percentage of Credits Awarded in each Section for the development.

The proposed Office portion of the development is likely to achieve a BREEAM 'Excellent' rating, given current design intent. The development is likely to achieve a total overall score of approximately 74.46%.

4.4 Block 5 Arts Centre (BREEAM RFO 2014)

The pre-assessment process identified the credits and consequent ratings likely to be achieved by the proposed new **Arts Centre (BREEAM RFO 2014 Other: Non-residential Institution)** located within the existing buildings at the former Shredded Wheat Factory site in Welwyn Garden City.

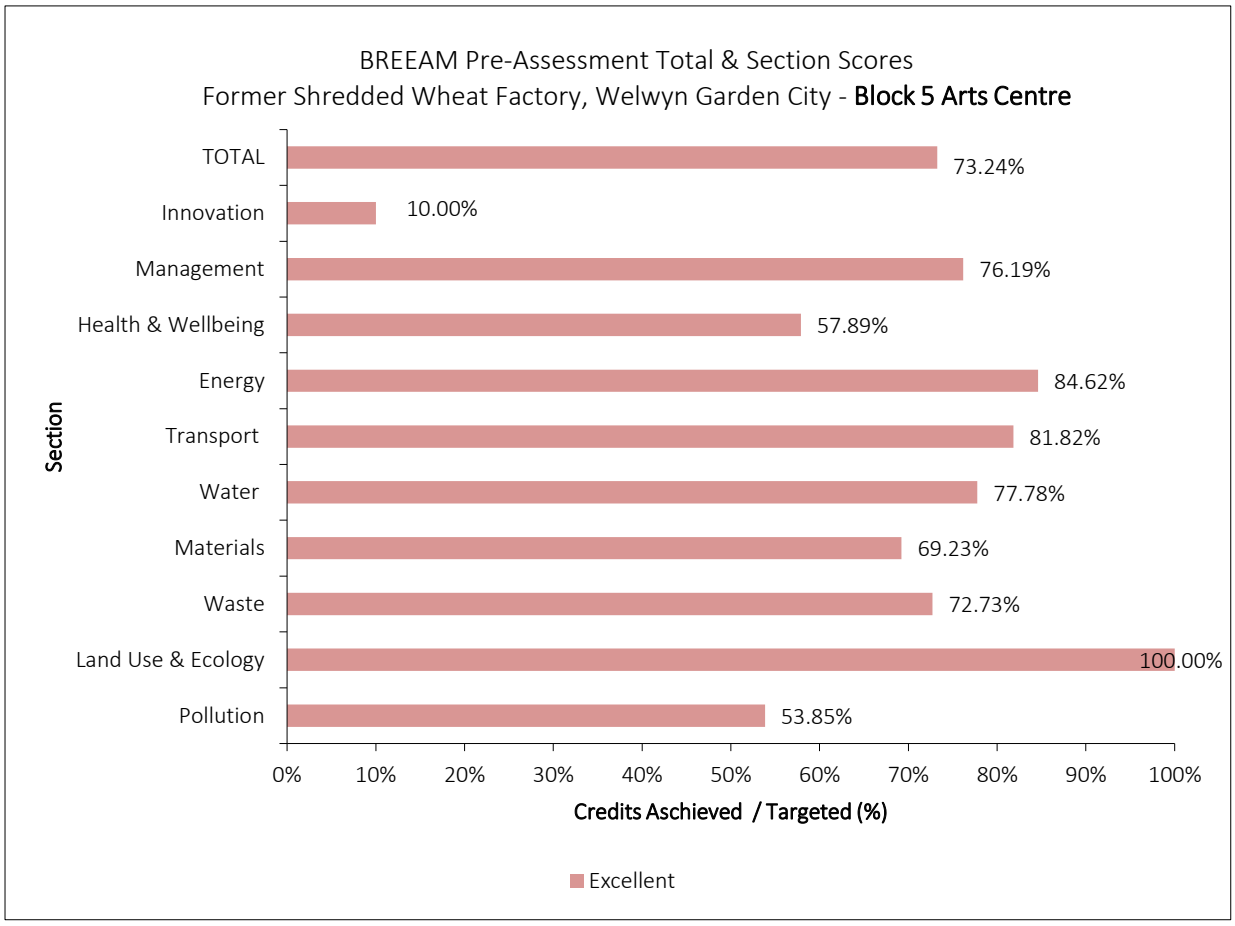

Figure 4.2: Predicted Percentage of the Total Score Targeted and a Breakdown of the Percentage of Credits Awarded in each Section for the development.

The proposed Arts Centre portion of the development is likely to achieve a ***BREEAM 'Excellent'*** rating, given current design intent. The development is likely to achieve a total overall score of approximately **73.24%.**

5. NEXT STEPS

5.1 Design Stage Assessment

The first stage of the BREEAM assessment is carried out on the detailed design. It is possible to undertake the design stage assessment during the period up to the issue of tender documents (RIBA Stages 1-4).

However, the evidence base is required to demonstrate that each credit can be awarded; therefore, to gain the most number of credits it is advisable to undertake the design stage assessment once the required information is available (see Appendix 1 for a list of the required evidence base). For example, details of all the sanitary fittings are required to be specified to calculate the score for the water consumption efficiency under BREEAM.

When the Assessor is satisfied with the performance under the BREEAM for the design stage assessment a report will be submitted to BRE to receive an 'Interim' BREEAM certification. This report will contain some documentary evidence together with an 'audit trail' for all specification, clauses, drawings, letters and reports.

5.2 Post Construction Stage Assessment

This can be carried out on the completed development. As part of this process, the Assessor will collate evidence (either documentary, photographic, or site survey evidence) to demonstrate that the development has been built in accordance with the details given at the Design Stage. This assessment is called a 'Post Completion Review Assessment' (PCR).

If changes have been made to the design following the design stage assessment (during the construction phase), that affects the BREEAM score, the Assessor will re-calculate the 'Final' score. This may be different to the Interim score. When the Assessor is satisfied with the performance under the BREEAM Scheme, they will submit a report to BRE to receive a 'Final' BREEAM Certification for the development.

5.3 Ongoing Consultation

Although this report provides recommendations, specific requirements of BREEAM can easily be misinterpreted or excluded at design stage, particularly in relation to the numerous standards with which the client must demonstrate compliance (such as CIBSE / ILE standards etc.) and the requirement to consult with various specialists (such as LZC / renewables' consultants, ecologists, acousticians etc.). It is therefore recommended that the relevant, competent third parties are engaged throughout all design stages in order to ensure the development proceeds in a manner that complies with the relevant requirements.

Appendix 1: Schedule of Evidence Requirements

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	Credit Title	Documentation required
Man 01	Sustainable Procurement	The following detailed documentary evidence is required for the anticipated Design Stage: • Scope, roles, responsibilities and timing of collaboration to be provided in the form of minutes, programme, responsibility schedule, or specification. • Training schedule, including scope and noting parties involved. • Where an Accredited Professional has been appointed; letter of appointment, programme indicating key work stages, correspondence demonstrating BREEAM as a regular agenda item and AP attendance; AP progress reports • Project Budget/ programme/ specification to confirm that a Thermographic survey is to be undertaken by a professional with Level 2 certification to noted standards, together with a written commitment to ensure remedial works will be implemented, and re-survey. • Appointment letter or responsibilities schedule, and relevant specification to confirm commissioning parameters, together with Contractor programme (noting timing of commissioning) and Commissioning Schedule. • Appointment letter and Commissioning Schedule for seasonal commissioning over 12 month period following completion. • Where there is a commitment to collect energy and water consumption data post occupation, evidence of this commitment/ requirement (via contract/ specification) to be provided. • Where there is a commitment to provide after care support and training, evidence of this commitment/ requirement (via contract/ specification) to be provided.
Man 02	Responsible Construction Practices	The following detailed documentary evidence is required for the anticipated Design Stage: • Specification clause or other confirmation of commitment from the contractor or developer to comply with the Considerate Constructors Scheme or equivalent local or national compliant scheme, and achieve formal certification under the scheme with confirmation to be provided to confirm either ‘compliance’ is achieved, or significantly exceeded; and

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	**Credit Title**	**Documentation required**
		• Confirmation that registration with the Considerate Constructor Scheme has taken place no later than the commencement of the construction phase.
Man 03	Construction Site Impacts	Project team to confirm compliance via specification/ contract or a signed letter of commitment to meet relevant criteria: • For monitoring and reporting use of energy, water and transport of construction materials and waste. • Confirmation of timber sourcing in line with UK Government Policy • A commitment for the contractor to operate an EMS to ISO 14001/EMAS or equivalent, and implement best practice regarding pollution prevention policies.
Man 04	Stakeholder participation	The design team is to provide the following information at Design Stage Assessment: • List of stakeholders consulted, together with a Consultation Plan with scope and programme. • Records of consultation meetings, with documentation/ information highlighting where outcomes have been incorporated. • Design & Access Statement, or access strategy, together with specifications/ design drawings highlighting where relevant facilities have been provided. • Specification clause or letter from the client confirming the provision of a Building User Guide, noting the contents and parameters to be included. • Signed documentation confirming a client commitment to provide a Post Occupancy Evaluation of the development detailing scope of the evaluation method, and with a commitment to ensure dissemination of information to relevant parties.
Man 05	Life cycle Cost and service life planning	Information to be provided at Design Stage: • Life Cycle Cost Analysis document with date of analysis to be noted • Feasibility stage appraisal

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	Credit Title	Documentation required
		• Details of strategic and systems level LCC Analysis to be provided, highlighting options and benefits of selections, and value of selection. • Relevant Specifications and drawings confirming selected elements included resulting from LCC analysis. • Updated LCC analysis to be provided, together with confirmation of timing of update • Copy of the maintenance strategy (or commitment to provide this), together with evidence demonstrating how the LCC Analysis informed the strategy
Hea 01	Visual Comfort	Specification to confirm mandatory standard criteria for high frequency ballasts to all fluorescent light fittings. Additionally, the following is to be provided at Design Stage assessment: • Scaled Design Drawings labelled with space use, and noting areas (m^2) • Daylight calculations with daylight factors, and uniformity ratios. • Design drawings and window schedules to, together with specifications to confirm window positions, views out and glare control mechanisms. • Lighting design drawings and information showing scope, locations and type of light fittings specified to all internal and external areas, with schedules and/ or lighting specifications confirming compliant lighting levels, performance and control criteria to relevant CIBSE and ILE standards.
Hea 02	Indoor Air Quality	• Indoor Air Quality Plan • Design drawings highlighting locations of intakes/ exhausts/ openable windows and their distances, relative to each other and to sources of potential pollution. • Relevant Specifications to be provided confirming compliance with ventilation standards; provision and type of CO2/ Air quality sensors (where relevant); and VOC Emission level testing standards to be met by specified materials

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	**Credit Title**	**Documentation required**
		• Design team/ client correspondence to confirm commitment to undertake post construction (pre-occupancy) testing for Formaldehyde and TVOC concentrations to relevant standards. • Letter from design team confirming the ventilation strategy details, and ventilation modelling software used for analysis. • Calculations/ results of ventilation modelling software • Specifications and Manufacturers technical literature for ventilation control mechanisms utilised.
Hea 03	Thermal Comfort	• Specification or design team correspondence confirming Thermal modelling criteria in line with CIBSE AM 11, with full dynamic analysis and that the results meet relevant standards • Thermal Modelling output • Time out range (TOR) data • Thermal Comfort strategy to be provided including information that demonstrates how this has informed the temperature control strategy, together with; • Specifications and drawings highlighting methods of occupant controls implemented from the thermal comfort strategy
Hea 04	Water Quality	Minimising risk of contamination • Specification to confirm compliance with the H&S Exec. The control of Legionnaires disease – Approved Code of Practice and Guidance • Specification also to confirm presence and scope of humidification systems. Provision of Drinking Water

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	**Credit Title**	**Documentation required**
		• Design drawings with locations of mains fed 'point of use' fresh drinking water provision identified.
Hea 05	Acoustic Performance	The following detailed documentary evidence is required for the anticipated Design Stage (DS): • Acousticians report and calculations • Letter confirming timing of appointment of the qualified acoustician, • Relevant specification / contract clauses defining acoustic performance criteria for relevant areas in the development • Where pre-completion testing will be carried out, a letter is required from the developer confirming the intent to: – Meet the relevant sound insulation performance levels – Use a Compliant Test Body to complete testing. • Where Robust Details will be used; – Confirmation that the Robust Details chosen will achieve the required performance standards for sound insulation (as applicable) Confirmation that the relevant plots are registered with Robust Details Ltd. (the Purchase Statement).
Hea 06	Safety and Security	Safe Access • Design drawings, including a scaled site plan and relevant sections of the specifications to be provided sufficient to demonstrate compliance with safe access criteria for the provision, detail, dimensions, and lighting of pedestrian, cycle routes and access roads. • Confirmation from design team that on site dedicated access footpaths and cycle routes are designed in accordance with NCN Guidelines and Local transport Note 2/28. Security of site and building

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	**Credit Title**	**Documentation required**
		• Text (specification clause, letter of instruction, formal letter from contractor to developer/assessor) confirming that an ALO/CPDA has been consulted to provide advice early in the design stage (RIBA stage C) to ensure that the requirements of Secured by Design are met; and • That the advice of the ALO/CPDA will be followed; and • Location and details of all recommended/specified security features such as external lighting, door/window locks, etc. and their third party certification levels (if applicable).
Ene 01	Reduction of CO2 Emissions	In order to establish the Energy Performance Ratio for New Constructions (for input to the Ene 01 Calculator) the following information is required at Design Stage: • A copy of the 'As designed' stage Building Regulations Part L approved software output document (BRUKL). • Proof of accreditation for 'accredited external renewable's'. For exemplary level criteria, the following information is required: • A copy of a report/ outputs confirming carbon neutral energy generation (kWh/yr); source of neutral energy; calculated estimate of energy consumption from unregulated systems; calculated estimate of exported energy surplus. • Confirmation from Client that any surplus carbon neutral energy generated by the development and exported will not be used to claim Renewable Obligation Certificates.
Ene 02	Energy Monitoring	• Detailed documentary evidence (specification or contract) and design drawings to confirm major energy consuming systems, and type, location and scope of energy monitoring system (either via BEMS and/ or pulsed output sub-meters).
Ene 03	External Lighting	• Relevant drawings showing: location of all external light fittings; and • Text (on drawings, specification, letter of instruction) describing location and type of all external light fittings.

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	Credit Title	Documentation required
Ene 04	Low or Zero Carbon Energy Technology	The following information will be required at Design Stage: • Feasibility study to be provided to confirm that appropriate analysis has been undertaken and recommendations made, with timing of the study noted. • Specifications and design drawings for Low or Zero Carbon technologies utilised. • Output calculations confirming carbon savings resulting from the specified LZC technology. • Life Cycle Assessment Analysis to include system lifetime carbon savings. • Detailed documentary evidence confirming that the specified low or zero carbon technologies: – Meet any additional requirements defined in Directive 2009/28/EC as applicable; and are – Certified under the Micro generation Certification Scheme (as applicable); or – Certified under the CHPQA standard (as applicable) Where free cooling system has been specified, a strategy is to be provided, together with output from the simulation modelling software. Evidence for this credit will be as per the first credit under Hea 03.
Ene 06	Energy Efficient Transportation Systems	Information to be provided for Design Stage assessment: • For Professional transportation system analysis report or study and/ or calculations to demonstrate selection of energy efficient systems. • Confirmation of transportation systems specified (lift/ escalator/ moving walkways) • Specifications sections, AND either manufacturers product technical data OR a letter of commitment from the system supplier/ manufacturer that their system complies with energy saving feature criteria

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	Credit Title	Documentation required
Ene 08	Energy Efficient Equipment	For demonstration of compliance, the design team are to determine the Function/ equipment group that will be responsible for the majority of the unregulated energy consuming use within the development. Once established, the following information is to be provided: • Relevant specification sections, drawings, documentation and/ or calculations sufficient to confirm compliance with the certification/ procurement Scheme or Standards relevant to the Function/ equipment Group (A-H) criteria listed within the BREEAM 2011 Technical Manual.
Tra 01	Public Transport Accessibility	Design Team information to be provided at Design Stage: • A scaled map showing the development site and building, with all relevant transport nodes identified. • Timetables for all bus/ train services operating from compliant nodes to be considered This information is required to be input to the Tra 01 calculator to establish the Accessibility Index for the development to determine the credits achieved.
Tra 02	Proximity to Amenities	Design Team information to be provided at Design Stage: • A scaled map showing the development site and building, with all amenities within 500m identified, with their type noted. • Routes to each amenity should be included, these to reflect actual travel paths. Where amenities are due to be developed, the Client is to confirm via letter the type, proximity and timescale for their development.
Tra 03	Cyclist Facilities	• Drawings and text (on drawings, specification, contract or letter of instruction) showing: – Location, type and size of storage; – Access to cycle storage (from highways and building entrance; any security measures installed; lighting design

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	**Credit Title**	**Documentation required**
		Plans and specification to demonstrate provisions of cyclist facilities should show: – Location, numbers, type and size of facilities provided – Where designated drying areas are provided, details of the ventilation strategy to be provided. Assumptions and calculations used to determine user numbers and hence cyclist provision should be shown.
Tra 05	Travel Plan	Relevant design stage information: • Travel Plan to be provided, together with a copy of the site-specific transport survey/ assessment data, with timing of the Plan to be stated. • Design drawings should be provided clearly noting where measures recommended within the Travel Plan have been incorporated. (Alternatively, where drawings are not available a letter from the Client can be provided confirming measures will be implemented). • A letter is required from either the Developer or the Occupier, where the building user is known, confirming that the Travel Plan will be implemented following occupation.
Wat 1	Water Consumption	• Completed Wat 01 Calculator based on information provided from specification and detailed documentary evidence showing: – Location, details and type of appliances/ fittings that use water in the dwelling including any specific water reduction equipment with the capacity / flow rate of equipment. – Location, size and details of any rainwater and grey water collection systems provided for use in the dwelling. Where detailed documentary evidence is not available at this stage; • Completed Wat 01 Calculator; and • A letter of instruction to a contractor/ supplier or a formal letter from the developer giving a specific undertaking, providing sufficient information to allow the water calculations to be completed.

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	**Credit Title**	**Documentation required**
Wat 2	Water Monitoring	Relevant Specification sections (or contract) and design drawings to be provided to confirm: • Scope of Mains water system • Location and type of water consuming plant systems • Location and type of water meters and sub-meters
Wat 03	Water Leak Detection and Prevention	Relevant Specification (or contract), design drawings and manufacturers technical data to be provided covering the following: • Location, scope and type of mains water leak detection systems, detailing capability and flexibility (programmability) of the specified detection system Where flow control devices are to be installed, information provided should identify: • Location and provision of WC facilities • Specification and scope of the flow control device(s) to be used (timed/ volume/ or presence controlled).
Wat 04	Water Efficient Equipment	Design Team information is to be provided confirming the scope of planting/ landscaping within the development site, and detailing the irrigation strategy to be implemented. Where irrigation is to be installed, relevant specification or drawing information is to be provided detailing method, scope and type of irrigation system and any sensor monitoring / water saving systems utilised. Confirmation is to be provided where irrigation systems are not used. Information should include specification details of any Vehicle Wash systems to be installed, detailing partial reclaim systems/ mechanisms used.
Mat 01	Life Cycle Impacts	• Completed Code Mat 01 Calculator Tool, • Areas and thicknesses, or volumes together with specifications for all key building elements at the design stage with the relevant Green Guide element numbers and ratings.

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	**Credit Title**	**Documentation required**
		• References stating the design or specification documentation used to complete the tool
Mat 02	Hard Landscaping and Boundary Protection	• Total area (m2) of external hard landscaping and boundary protection • Description (specification/ design drawings) of each applicable element and its materials. • Location and areas of each element, together with Green Guide ratings and element numbers.
Mat 03	Responsible Sourcing of Materials	In order to ensure sufficient credits can be awarded for this module, the following evidence is required for the anticipated Design Stage (DS): • Completed BREEAM Mat 03 Calculator Tool, showing building elements at the design stage • Detailed documentary evidence stating the materials specified in each element, with responsible sourcing Tier Level (1-7) allocated. Where materials are re-used, documentation stating specific materials to be re-used should be provided (supplier information or a letter from the developer is acceptable). Where materials are recycled, documentation stating specific recycled materials should be provided (a letter of intent to use suppliers who can provide an EMS certificate (or equivalent) for the recycling process is acceptable). Where certified materials will be used, the following evidence will be required: • A letter of intent from the developer or other detailed documentary evidence confirming the product shall be sourced from suppliers capable of providing certification to the level required for the particular tier claimed; or • A copy of the relevant certificate(s) as appropriate; – A copy of the timber scheme certificate (including CoC)

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	**Credit Title**	**Documentation required**
		– BES6001 certificate (or compliant sector standard certificate) – EMAS certificate – ISO14001 certificate. – In the absence of certification, confirmation that the company implements a formal EMS is compliant with BS 8555 2003 (or equivalent) and the EMS has completed audit phases 1 - 4 (as outlined in BS 8555). Where any timber is used, the client should provide written confirmation from the supplier/s confirming that: • All timber species and sources to be used in the development will be sourced in compliance with the UK Government. Timber Procurement Policy for legal and sustainable sourcing, OR • Provide chain of custody evidence in accordance with CPET requirements OR • Letter of intent/ Specification confirming that all timber will be procured in line with the policy.
Mat 04	Insulation	At Design Stage, the following information is required to demonstrate compliance with the Embodied Impact criteria for this Issue: • Design drawings and specification/ contract to confirm Locations, areas (m2) and thicknesses, or volumes (m3) and specifications for all insulation within applicable elements. • Manufacturers data to confirm thickness and thermal conductivity of all specified insulation products • Insulation Index, Green Guide ratings and element numbers are to be determined from the above information. • Mat 04 Calculator Tool output For compliance with the Responsible Sourcing criteria under this issue, information requirements are as Mat 03.

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	**Credit Title**	**Documentation required**
Mat 05	Designing for Robustness	The following is required to assess compliance with Design Stage criteria • Design drawings are to highlight those parts of the building identified as being vulnerable from vehicular / pedestrian movement. • Design drawings and specification to be provided to confirm where durability measures are to be incorporated (with locations shown or described)
Wst 01	Construction Waste Management	• A copy of the compliant SWMP containing the appropriate benchmarks, commitments and procedures for waste minimisation and diversion from landfill in line with best practice (as per guidance from DEFRA, BRE, and WRAP); or • Confirmation from the developer that a SWMP has/ will be produced and that it includes/will include benchmarks, procedures and commitments for minimising and diverting non- hazardous construction and demolition waste from landfill, and that they will be separated into key waste groups.
Wst 02	Recycled Aggregates	• Design team information (Drawings, Specifications) to confirm use of recycled and secondary aggregates within the applicable elements where high grade aggregates are used. • The Design team should also provide their calculations demonstrating the percentage use (by weight or volume of total high grade aggregate used within each element) of the recycled / secondary aggregates specified. • Documentation is to be provided confirming the source of recycled / secondary aggregates and that the source can provide quantities sufficient to meet amounts required by the specification.
Wst 03	Operational Waste	In order to satisfy the requirements for this Issue, the following evidence is required for the Design Stage (DS): • Information regarding the location, number, types and sizes of internal and external storage dedicated to recycled waste streams; • Design data showing how the facilities have been sized (based on net floor areas and building use) • Project team meeting minutes or letter confirming likely building waste streams and predicted volumes.

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	Credit Title	Documentation required
LE 01	Site Selection	The following detailed documentary evidence (drawings, report or site photographs) to demonstrate the re-use of land is required at Design Stage; • Type and duration of the previous land use, with end date noted • Total site area (m^2), together with Area/ footprint of previous land use • Proposed site plan showing total area of site, with location and footprint of the proposed development identified (to also identify any temporary works). In regard to the contaminated Land criteria the following is to be provided: • Land contamination report, as prepared by a specialist with • Design drawings of the site (existing and proposed) identifying the extent and type of contaminants present, with areas requiring remedial works to be clearly shown. • A letter from the Contractor (or from Client if not yet appointed), confirming that the remedial measures stated within the report will be implemented, detailing the remediation strategy and implementation plan.
LE 02	Ecological Value of Site & Protection of Ecological Features	Where a suitably qualified ecologist is appointed; • A copy of a report or letter from the ecologist highlighting the information required as set out in the BREEAM 2011 Technical Manual 'Relating Ecology Reports to BREEAM'; and • Detailed documentary evidence identifying the construction zone and how any areas of ecological value outside the construction zone will remain undisturbed in accordance with the ecologist's recommendations. Protection: The following evidence is required for the anticipated Design Stage; • Detailed documentary evidence confirming ecological features present and how they will be protected.
LE 03	Mitigating Ecological Impact	Where a suitably qualified ecologist is appointed; • Design site plan and survey drawings showing the existing and proposed development

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	**Credit Title**	**Documentation required**
		• Ecology Report noting information as required within the BREEAM Ecology Checklist (Appendix F) relating to LE 03, OR • Completed BREEAM Ecology Checklist (by the Ecologist), accompanied by a letter from the Client or design team with details of how the ecologists recommendations for mitigating ecological impact will be implemented.
LE 04	Enhancing Site Ecology	An Ecology Report is to be produced, and includes reporting on the enhancement and protection of the site ecology; • Design site plan and survey drawings showing the existing and proposed development • Ecology Report noting information as required within the BREEAM Ecology Checklist (Appendix F) relating to LE 04, OR • Completed BREEAM Ecology Checklist (by the Ecologist), accompanied by a letter from the Client or design team with details of how the ecologists recommendations for enhancing site ecology will be implemented. Either option should also provide details of any increase in the ecological value of the site in terms of plant species pre and post development.
LE 05	Long Term Impact on Biodiversity	Where a suitably qualified ecologist has been appointed; • Design site plan and survey drawings showing the existing and proposed development • Ecology Report noting information as required within the BREEAM Ecology Checklist (Appendix F) relating to LE 05, OR • Completed BREEAM Ecology Checklist (by the Ecologist) AND • A copy of the Habitat management plan, or specification/ contract/ client letter to confirm a commitment to produce and implement the plan, with the required scope noted. • The Ecologists report should also identify where any of the Additional Criteria listed within the BREEAM 2011 Manual are not relevant to this site. The Report should also note how the key recommendations and relevant Additional Criteria can be achieved, to include timing of actions to help mitigate ecological impact of the works.

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	**Credit Title**	**Documentation required**
Pol 1	Impact of Refrigerants	Documentary evidence to be provided confirming the presence or absence of refrigerants within the proposed development. If present, M&E Specification or letter to confirm details of relevant refrigerant type/ properties and system information. A Copy of the Pol 01 Calculator output is also required.
Pol 2	NOx Emissions	The following detailed documentary (specification) evidence is required for the anticipated Design Stage (DS): • The primary and any secondary heating systems and flue type; and • Dry NOx levels and/or boiler class of the primary and any secondary heating systems. Where NOx calculation is required due to presence of heat pump systems within the development, copies of calculations (as detailed in the methodology based on design stage outputs) should be provided, in order to establish contributing NOx emissions.
Pol 03	Surface Water Run off	Flood Risk For low (Zone 1), medium (Zone 2) or high (Zone 3a) flood risk areas: • A Flood Risk Assessment (prepared according to good practice guidance as outlined in PPS25 Development and Flood Risk) which shows there is a medium or high risk of flooding; and • Site plans indicating the design flood level, the range of ground levels of the development, car parking areas and site access (lowest to highest), showing that the criteria (finished entrance floor levels and access routes being at least 600 mm above the design flood level) are met, along with any notes explaining the function of any areas lying below the design flood level; and (where medium or high risk) • Confirmation from the local planning authority that the development complies with PPS25 and is appropriately flood resilient and resistant, and has managed any residual risk safely. Where the site is under the protection of flood defences and the flood risk category of the site is reduced: Written confirmation from the Environment Agency of the reduction in flood risk category. Surface Water Runoff:

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	Credit Title	Documentation required
		• Statement from an appropriately qualified professional/organisation confirming that they are qualified in line with the BREEAM definition (BREEAM 2011 New Construction Technical Manual) to undertake the above reporting and championing of appropriate SUDS within the site design; • A report containing all information necessary to demonstrate compliance with the peak rate of run-off and volume of run-off requirements, including; – Areas of permeable and impermeable surfaces on the site pre- and post- development; – Details of the permeability characteristics of the site pre- and post-development (e.g. infiltration tests etc where appropriate); – Peak rates of run-off (l/s) calculations for the 1 year and 100 year events, pre- and post-development, including an allowance for climate change over the development lifetime; – Detailed documentary evidence showing the methods used to reduce the peak rate of run-off to pre-development rates; – The pre- development volume of run-off (m^3) for the 100 year 6 hour event; – The additional volume of run-off (m^3) for the 100 year 6 hour event caused by the development without mitigation measures; – The additional volume of run-off (m^3) with the proposed mitigation; – Information to demonstrate that the hierarchical approach to reducing the additional volume of run-off was followed; – Information on the calculation methods used, as well as summary results. • A Flood Risk Assessment • Drawings showing the pre-development drainage for the site (natural or constructed); • Drawings showing the proposed drainage solution, system failure flood flow routes, potential flood ponding levels and ground floor levels; and

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	**Credit Title**	**Documentation required**
		• Confirmation from the appropriately qualified professional/organisation that local drainage system failure would not cause an increase in the risk of flooding within dwellings either on or off site. Where tradable credits are sought, the feasibility report should detail design specifications, calculations and drawings supporting designed SUDS schemes and water treatment. Minimising Water Course Pollution: • Design drawings, specification or Building Contract to identify high and low risk areas of the site • Specification of SUDs, source control systems and oil/ petrol separators • Confirmation via Design Team letter confirming compliance with PPG 3 and SUDs manual.
Pol 04	Reduction of Night Time Lighting Pollution	The following information is to be provided at Design Stage: • Specification, or external lighting design data/ calculations confirming performance compliance with ILE Guidance • Information (drawings /specifications) highlighting the scope of the lighting strategy noting security lighting requirements • M&E / Lighting Consultant to provide examples demonstrating compliance of lighting strategy to criteria
Pol 5	Noise Attenuation	The design team are to confirm presence of noise sensitive areas or buildings within an 800m radius. Where these exist the following is to be provided at Design Stage: Drawings identifying existing and proposed noise sensitive locations within or surrounding the site, noting distance from the assessed development, and sources of noise. • An acousticians report should be provided and should note the following: • Acousticians qualifications and professional body memberships • Recommendations for measures to attenuate noise sources together with

Appendix 1: BREEAM NC 2014 Evidence Requirements		
BREEAM Issue	Credit Title	Documentation required
		• Design plan identifying attenuation measures and their specification. Where an acoustician is yet to be appointed, a formal letter or specification should be provided confirming commitment to appoint an acoustician to undertake BS 4142:1997 compliant Testing, and that any recommendations made by the acoustician will be implemented.

Appendix 2:
Glossary of Terms

Accredited Energy Assessor: A person registered with an accredited energy assessment scheme provider. The scheme provider will be licensed by Communities and Local Government to accredit competent persons to assess the CO_2 emission rates of domestic buildings for the purposes of demonstrating compliance with *Building Regulations*.

Actual Case CO_2 Emissions: CO_2 emissions from the dwelling (Kg CO_2/m_2/year) accounting for the input from specified/installed low and zero carbon technologies.

The standard case dwelling model must be used as the basis for the calculation of actual case emissions. However, where eligible low or zero carbon technologies are specified in the dwelling they can replace the standard systems assumptions from table Cat 1.2 for the purposes of the actual case calculation.

Actual case CO_2 emissions must be calculated in accordance with the methodology defined in table Cat 1.3.

(AD F) Approved Document F1: The Building Regulations for England and Wales Approved Document F1: Means of Ventilation (2010 Edition).

(AD L1A) Approved Document L1A: The Building Regulations for England and Wales Approved Document L1A: Conservation of Fuel and Power in New Dwellings (2010 Edition).

(ALO) Architectural Liaison Officer: This is the same as the Crime Prevention Design Advisor (see definition below) and is the title given to the same role in some police forces. Taken from www.securedbydesign.com

Angle of visible sky: The angle of visible sky u is the angle subtended, in the vertical plane normal to the window, by the visible sky from the centre of the window

Annual flood probability: The estimated probability of a flood of given magnitude occurring or being exceeded in any year. Expressed as a 1 in *x* year event. This is the equivalent to 1-in-x, 1:x or x% chance of a flood event occurring in any one year.

Annual flow rate probability: The estimated probability of a flow rate of given magnitude occurring or being exceeded in any year. Expressed as a 1 in x year event. This is the equivalent to 1-in-x, 1:x or x % chance of the flow rate being exceeded in any one year.

Appropriately qualified professional: A professional or team of professionals with the skills and experience to champion the use of SUDs within the overall design of the development at an early stage.

Approved Document E (AD E): The Building Regulations for England and Wales Approved Document E: Resistance to the Passage of Sound, 2003 edition incorporating 2004 amendments.

Average daylight factor: The average daylight factor is the average indoor illuminance (from daylight) on the working plane within a room, expressed as a percentage of the simultaneous outdoor illuminance on a horizontal plane under an unobstructed CIE 'standard overcast sky'.

Basic building elements: Basic building elements are defined as follows; *Frame,* Ground floor, Upper floors, Roof, External walls, Internal walls, Foundation/substructure, Staircase (includes the tread, risers and stringers).

BES 6001:2008 Framework Standard for Responsible Sourcing of Construction Products: BES 6001:2008 is a BRE Global standard that provides a framework for the assessment of responsible sourcing schemes and provides a route to certification of construction products.

Blowing agents: Any material used to produce a cellular structure in either a plastic or other foam insulation used in either manufacture or installation.

Boiler class: An indication of a boiler's NO_x emissions. Boilers are classified on a scale of 1 to 5, with 1 indicating high NO_x emissions through to relatively low NO_x emissions for a class 5.

Brownfield site: Land which is or was occupied by a permanent structure, including the curtilage of the developed land and any associated hard surfaces.

Building Regulations: Building Regulations apply in England and Wales and promote standards for most aspects of a building's construction, including structure, fire safety, accessibility, sound insulation, drainage, energy efficiency, ventilation and electrical safety.

Building Envelope: For the purpose of issue Mat 1, the building envelope is defined as the overall superstructure of the particular building. Each building envelope may contain single or multiple dwellings.

Catchment: The area contributing surface water flow to a drainage point or a point on a watercourse. It can be divided into sub-catchments

Central rainwater collection system: A system which will collect and store rainwater for use across the development. This could be a large storage tank or other form of surface water system.

Chain of custody (CoC): This is a process used to maintain and document the chronological history of the evidence/path for timber products from forests to consumers.

Compliant test body: Those organisations or individuals having UKAS accreditation or accredited by a European equivalent of UKAS, as well as organisations or individuals registered with the Association of Noise Consultants (ANC) Registration Scheme.

Composting: Composting is a natural process which converts organic waste into an earth-like mass by means of bacteria and micro-organisms. The composting process is also supported by larvae, wood lice, beetles, worms and other such creatures.

Considerate Constructors Scheme (CCS): The Considerate Constructors Scheme is a UK certification scheme that encourages the considerate management of construction sites.

Construction zone: The construction zone includes any land used for buildings, hard-standing, landscaping, site access or where construction work is carried out (or land is being disturbed in any other way), plus a 3m boundary in either direction around these areas. It also includes any areas used for

temporary site storage and buildings. If it is not known exactly where buildings, hard-standing, site access and temporary storage and buildings will be located, it must be assumed that the construction zone is the development site.

Contaminated land: A site can be defined as contaminated land where the level of site contamination prevents development unless decontamination is carried out.

Control systems (lighting): A method for controlling the external lighting to ensure that it will not operate unnecessarily, e.g. during daylight hours or when a space is unoccupied. Control systems that can be considered are passive infra red (PIR), 'dusk to dawn' daylight sensors and time switches.

(CPDA) Crime Prevention Design Advisor: "The Crime Prevention Design Advisor (CPDA) is a specialist crime prevention officer, trained at the Home Office Crime Reduction College, who deals with crime risk and designing out crime advice for the built environment. In addition to physical security measures the officer will consider defensible space, access, crime and movement generators all of which can contribute to a reduction in crime and disorder." Taken from www.securedbydesign.com

Dedicated energy efficient light fittings: Fittings that comprise the lamp, base, control gear and an appropriate housing, reflector, shade or diffuser. The fitting must be dedicated in that it must be capable of only accepting lamps having a luminous efficacy greater than 40 lumens per circuit watt. A light fitting may contain one or more lamps.

Design flood level: The maximum estimated water level during the design storm event. A site's design flood level can be determined through known historical data or modelled for the specific site.

(DER) Dwelling Emission Rate: The DER is the estimated CO_2 emissions per m_2 per year ($KgCO_2/m_2$/year) for the dwelling as designed. It accounts for energy used in heating, fixed cooling, hot water and lighting.

Direct Supply: The carbon benefit of energy generated by low or zero carbon technologies can only be allocated to dwellings that are directly supplied by the installation via dedicated supplies.

Discharge point: The point of discharge into watercourses and sewers (see definition of 'Watercourses and sewers')

Dry NO_x: The NO_x emissions (mg/kWh) resulting from the combustion of a fuel at zero per cent excess oxygen levels. If electricity is sourced from the national grid, the associate Dry NO_x emissions are approximately 1200 mg/kWh.

Ecological features: Ecological features are defined in Checklist Eco 1 – Land of Low Ecological Value, and include trees, hedges, ponds, streams, rivers, marshes, wetlands, meadows, species-rich grassland, heath land and heather.

Environmental performance indicators (EPIs): When operated as part of a measuring-to-manage programme, environmental performance indicators allow companies to track how well they are doing and to identify opportunities to: save money and increase profits; use resources more efficiently; minimise waste (raw materials, product, energy, water, packaging, etc); and prevent pollution. For more information see http://envirowise.wrap.org.uk

EMS: Environmental management system.

EMAS: Eco-Management and Audit Scheme

(EPC) Energy Performance Certificate: This is a certificate that confirms the energy rating of the dwelling from A to G, where A is the most efficient and G is the least efficient.

EU Energy Efficiency Labelling Scheme: The EU energy label rates products from A (the most efficient) to G (the least efficient). For refrigeration, the scale now extends to A++. It is a legal requirement for the label to be shown on all refrigeration and laundry appliances, dishwashers, electric ovens and light bulb packaging at point of sale.

(FEE) Fabric Energy Efficiency: Energy demand for space heating and cooling expressed in kilowatt-hours of energy demand per square metre per year (kWh/m_2/year).

Finishing elements: For the purpose of this issue, the assessed finishing elements are defined as: Stairs, Windows, External and internal doors, Skirting, Panelling (including any other trim), Furniture, Fascias and any other significant use.

Flood probability: The estimated probability of a flood of given magnitude occurring or being exceeded in any specified time period. For example, the 100-year flood has a 1-in-100 or 1% chance of occurring in any given year.

Flood Risk Assessment (FRA): A study to assess the risk of a site flooding and the impact that any changes or development on the site will have on flood risk on the site and elsewhere. A flood risk assessment must be prepared according to good practice guidance as outlined in PPS25 *Development and Flood Risk: Practice Guide* (available from www.communities.gov.uk).

Flood storage: The temporary storage of excess run-off or river flow in ponds, basins, reservoirs or on a flood plain during a flood.

Global Warming Potential (GWP): Global Warming Potential is defined as the potential for global warming that a chemical has relative to 1 unit of carbon dioxide, the primary greenhouse gas. In determining the GWP of the blowing agent, the Intergovernmental Panel on Climate Change (*IPCC*) methodology using a 100-year Integrated Time Horizon (ITH) must be applied.

Green Dragon Environmental Standard• (Safon Amgylcheddol Y Ddraig Werdd•): A stepped standard used to accredit compliance with the Green Dragon environmental management scheme. Depending on the content of the EMS being assessed, a level of 1, 2, 3, 4 or 5 may be achieved. At level 4 and above, the Green Dragon Environmental Standard• can be used as evidence of a compliant EMS for small companies being considered under the Mat 2 and Mat 3 issues.

Greenfield run-off rate: The rate of run-off that would occur from the site in its undeveloped state.

The Green Guide to Specification: The Green Guide to Specification is an easy to use comprehensive reference website and electronic tool, providing guidance for specifiers, designers and their clients on

the relative environmental impacts for a range of different building elemental specifications. The ratings within the Guide are based on Life Cycle Assessment, using the Environmental Profile Methodology.

Grey-water recycling: The appropriate collection, treatment and storage of used shower, bath and tap water for use instead of potable water in WCs and/or washing machines. Grey-water recycling systems normally collect used shower, bath and tap water and recycle it for toilet flushing.

Habitable space: A space typically occupied for more than 30 minutes during the day with safe access by a permanent stairway or other means of entrance which complies with the requirements of relevant national Building Regulations and where the space is 'finished' with floor, walls, lighting and electric sockets.

Net internal floor area: The area of all *habitable spaces*, including the area taken up by halls, stairwells, cupboards, internal partitions, habitable loft spaces and basements. This also includes common areas of blocks of flats and apartment buildings, including stairwells, circulation spaces and entrance lobbies.

Inclusive access and usability: The purpose of the Code is not to deliver purpose-designed wheelchair housing but rather inclusive general needs housing that caters for the widest possible segment of the population (including older people), and which can easily be adapted to meet the needs of wheelchair users.

Infiltration techniques: Techniques which allow the passage of water into the ground. Techniques used purely for infiltration purposes would typically involve soakaways or pervious paving. Other SuDS techniques, such as swales and filter strips, will also achieve a level of infiltration but, unlike soakaways, they also normally function as a conveyance mechanism for transporting run-off.

Key processes: These are the final major aspects of processing that are carried out. There may be a single process or multiple processes requiring assessment, depending on the end product.

Limiting discharge: The limiting discharge is based upon the calculated pre-development flow rate at a discharge point, but may be increased to 5 l/s.

Low and Zero Carbon Technologies: Technologies eligible to contribute to achieving the requirements of this issue must produce energy from renewable sources and meet all other ancillary requirements as defined by Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

Low ecological value: Land defined as having low ecological value using Checklist Eco 1 or defined by a suitably qualified ecologist as having low or insignificant ecological value.

(MCS) Microgeneration Certification Scheme: The Microgeneration Certification Scheme (MCS) is an independent scheme that certifies microgeneration products and installers in accordance with consistent standards. It is designed to evaluate microgeneration products and installers against robust criteria, and provides consumers with an independent indication of the reliability of products, assurance that the installation will be carried out to the appropriate standard and a route for complaints should there be any issues.

MTCC: Malaysian Timber Certification Council.

Net CO_2 Emissions: The annual dwelling CO_2 emissions ($KgCO_2/m_2$/year) from space heating and cooling, water heating, ventilation and lighting, and those associated with appliances and cooking.

No-sky line: The no-sky line divides those areas of the working plane which can receive direct light from the sky, from those which cannot. It is important as it indicates how good the distribution of daylight is in a room. Areas beyond the no-sky line will generally look gloomy.

Non-native invasive species: These are non-indigenous species (e.g. plants or animals) that adversely affect the habitats they invade economically, environmentally or ecologically. For the purposes of the Code, this currently includes only Japanese Knotweed and Giant Hogweed. Further information on their control and disposal and how this fits into the legislative framework relating to such species can be obtained from DEFRA.

Peak rate of run-off : Referred to as Qp [m^3/sec], this is the highest rate of flow from a defined catchment area assuming that rainfall is uniformly distributed over the drainage area, considering the entire drainage area as a single unit and estimation of flow at the most downstream point only.

PEFC: Programme for the Endorsement of Forest Certification Schemes.

Post-consumer waste stream: Waste material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose. This includes returns of material from the distribution chain.

Potable water: Drinking quality water that is taken from a connection to the mains water supply in the dwelling, which may be from the public water supply or a private supply such as from groundwater via a borehole.

Pre-consumer waste stream: Waste material generated during manufacturing processes. Excluded is reutilisation of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.

Probability of flooding – Low (Zone 1): Low annual probability of flooding is an area where the chance of both river and sea flooding each year is <0.1% (1 in 1000) or less.

Probability of flooding – Medium (Zone 2): An area where the chance of river flooding in any year is 1% (1 in 100) or less but greater than 0.1% (1 in 1000), and the chance of flooding from the sea is 0.5% – 0.1% (between 1 in 200 and 1 in 1000).

Probability of flooding – High (Zone 3a): An area where the chance of river flooding in any year is >1% (1 in 100) and the chance of flooding from the sea is >0.5% (1 in 200) or greater.

Probability of flooding – Functional flood plan (zone 3b): The land where water flows or is stored in times of flood.

Qbar: An estimation of the mean annual flood flow rate from a catchment (see Report IH124 *Flood estimations for small catchments*).

Rainfall intensity: Depth of rain falling in a period of time, e.g. mm/hour, sometimes given in l/s/m2.

Rainwater discharge: Rainwater discharge is the rainwater which flows from the development site to watercourses and sewers. It is also referred to as run-off.

Residual risk: The risk which remains after all risk avoidance, reduction and mitigation measures have been implemented.

Robust details: Robust details (RDs) are construction solutions that provide an alternative to pre-completion sound insulation testing as a method of complying with Requirement E1 of Approved Document E (2003 Edition) of the Building Regulations (England and Wales). Robust details must be approved by Robust Details Ltd (RDL) and all development sites must be registered with RDL and built in accordance with the RD specification.

Run-off rate: The rate of flow of water from a surface.

(SAP) Standard Assessment Procedure for Energy Rating of Dwellings: The Government's approved methodology for assessing the energy performance of new dwellings. The current version is SAP 2009 version 9.90, dated March 2010, rev October 2010. The procedure accounts for energy used in space heating and cooling, hot water provision and fixed lighting.

(SBD) Secured by Design: This is a police initiative to encourage the building industry to adopt crime prevention measures in the design of developments to assist in reducing the opportunity for, and fear of, crime, creating a safer and more secure environment. Secured by Design is owned by the Association of Chief Police Officers (ACPO), and has the support of the Home Office Crime Reduction & Community Safety Group and the Planning Section of the Department for Communities and Local Government.

Security lighting: Security lighting is provided to protect property. There are two types of security lighting commonly used in dwellings – high wattage intruder lights that are operated via PIR sensors which only switch on for a short time, and low wattage lighting that is controlled by time switches and daylight sensors.

SFI: Sustainable Forestry Initiative.

Site Inspection Report: A report prepared by the Code assessor during a post construction stage assessment and provided as evidence with the assessment.

Site Waste Management Plan Regulations 2008: Powers were included in the Clean Neighbourhoods and Environment Act 2005 for regulations requiring a SWMP for works involving construction or demolition waste. The regulations, which came into force in April 2008, mean that any construction project in England costing over £300,000 will require an SWMP. See www.environment-agency.gov.uk/business and www.defra.gov.uk.

Soakaway: Underground structure designed to permit infiltration into permeable/slightly permeable ground. They can be grouped and linked together to drain large areas including highways.

Space lighting: The normal lighting required to illuminate a space when in use. It can be used outside the entrance to the home, in outbuildings such as garages and cycle stores, and for external spaces such as paths, patios, decks, porches, steps and verandas.

Staggered dwellings: These are dwellings on several levels which are of unequal floor area. For example, a dwelling with a first floor area greater than the ground floor area which may overhang the ground floor.

Standard Case CO_2 Emissions: CO_2 emissions from the dwelling (Kg CO_2/m_2/year) assuming a standard systems specification, based on the Domestic Building Services Compliance Guide 2010 Edition.

Standard case CO_2 emissions create the baseline against which the contribution of low and zero carbon technologies is measured. They represent the common scenario where a gas boiler is installed and ensure a 'level playing field' to allow a fair comparison of the contribution of low and zero carbon technologies, regardless of the carbon intensity of the actual heating fuel specified.

Statutory safety lighting: Safety lighting is usually provided in multi-residential buildings such as blocks of flats to illuminate stairwells and exit routes when the main lighting system fails. Its design is specified by regulation (BS 5266) and is therefore outside the scope of the Code.

SuDS: As defined in the SuDS manual, sustainable drainage systems are an approach to surface water management that combines a sequence of management practices and control structures designed to drain surface water in a more sustainable fashion than some conventional techniques.

Suitably qualified ecologist: A suitably qualified ecologist is defined as an individual who:

- Holds a degree or equivalent qualification (e.g. N/SVQ Level 5) in ecology or a related subject
- Is a practising ecologist, with a minimum of three years' relevant experience (within the last five years). Such experience must clearly demonstrate a practical understanding of factors affecting ecology in relation to construction and the built environment, including acting in an advisory capacity to provide recommendations for ecological protection, enhancement and mitigation measures. Examples of relevant experience are ecological impact assessments, Phase 1 and 2 habitat surveys, and habitat restoration
- Is covered by a professional code of conduct and subject to peer review.

Supply Chain EMS: This covers all the major aspects of processing and extraction involved in the supply chain for the end product. Note: *Recycled materials* are not required to demonstrate a supply chain EMS. If EMS certification is provided for the key processes for recycled materials, this is assumed by default.

(TER) Target Emission Rate: The target emission rate is the maximum allowable CO_2 emissions per m_2 ($KgCO_2/m_2$/year) arising from energy used in heating, cooling, hot water and lighting which would demonstrate compliance with Criterion 1 of AD L1A.

The TER is calculated using the SAP methodology according to the requirements defined in AD L1A.

Treatment (water): Improving the quality of water by physical, chemical and/or biological means.

Verified ecological report: A verified ecological report is a report carried out by an ecologist who does not fully meet the requirements of a suitably qualified ecologist.

Volume of run-off: The volume of run-off that is generated by rainfall occurring on the site. This is typically measured in cubic metres.

Working plane: The working plane is a notional surface, typically at about desk or table height, at which daylight factor or the 'no-sky line' is calculated or plotted. For the calculations required under the Hea 1 issue, it is at 0.85 m above the floor.