Greggs Bakery / Twickenham

BREEAM Pre-assessment Report

Prepared by Sol Environment

05 August 2022

BREEAM Pre-Assessment

Industrial Units

Former Greggs Bakery, Twickenham

Prepared for:
London Square

Date:
March 2022

Project Issue Number:
SOL_22_S021_LSQ

Sol Environment Ltd **Bristol | Malvern | Edinburgh**
t: +44 (0)1684 572727 **e:** enquiries@sol-environment.co.uk

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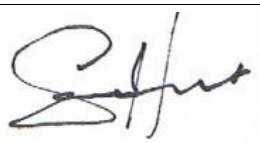
Reviewers Signature:			
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REPORT CONTENTS

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.

London Square is proposing a new mixed-use development on brownfield land at the former Greggs Bakery site in Twickenham, London Borough of Richmond upon Thames. This report is in relation to the proposed new shell & core industrial units which have 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 London Borough of Richmond upon Thames Local Plan (adopted July 2018) with particular reference Policy LP 22: Sustainable Design and Construction, which stipulates:

> *"New non-residential buildings over 100sqm will be required to meet BREEAM 'Excellent' standard, including a minimum of 2 credits on water consumption under Wat 01."*

The Proposed Development

The proposed industrial development shall incorporate the demolition of existing buildings on the former site of Greggs Bakery on Edwin Road in Twickenham, to provide a new residential development and an 883m^2 shell & core Industrial unit, use class E(g)(iii), and a 117m^2 affordable workspace, use class E, with associated car parking and landscaping. Due to the early stages of the development and the shell & core scope, it has been assumed the affordable workspace will also fall under the industrial use class for the purposes of this BREEAM assessment.

This BREEAM Pre-assessment was informed by correspondence with the design team in addition to site feasibility drawings prepared by Assael Architecture.

The design team are committed to achieving a minimum ***BREEAM 'Excellent'*** rating for the proposed development. Due to the current stage of the development, where detailed proposals are yet to be developed, the design team worked on the principal that the credits awarded within this assessment would be only *likely* to be achieved by the final design.

Figure ES1 Proposed Site Layout prepared by Assael Architecture (Industrial Buildings at southern end of the site)

Findings

Overall, the development is likely to gain a ***BREEAM 'Excellent'*** rating using the BREEAM 2018 New Construction (Shell & Core) tool. The total score of **75.23%** for the proposed scheme as a whole is within the *'Excellent'* bracket of 70% - 85%.

Graphical summary of findings

The figures below show a summary of the percentage of available credits which are likely to be achieved in each section (land use & ecology, management, etc.), given current design intent, for the proposed development.

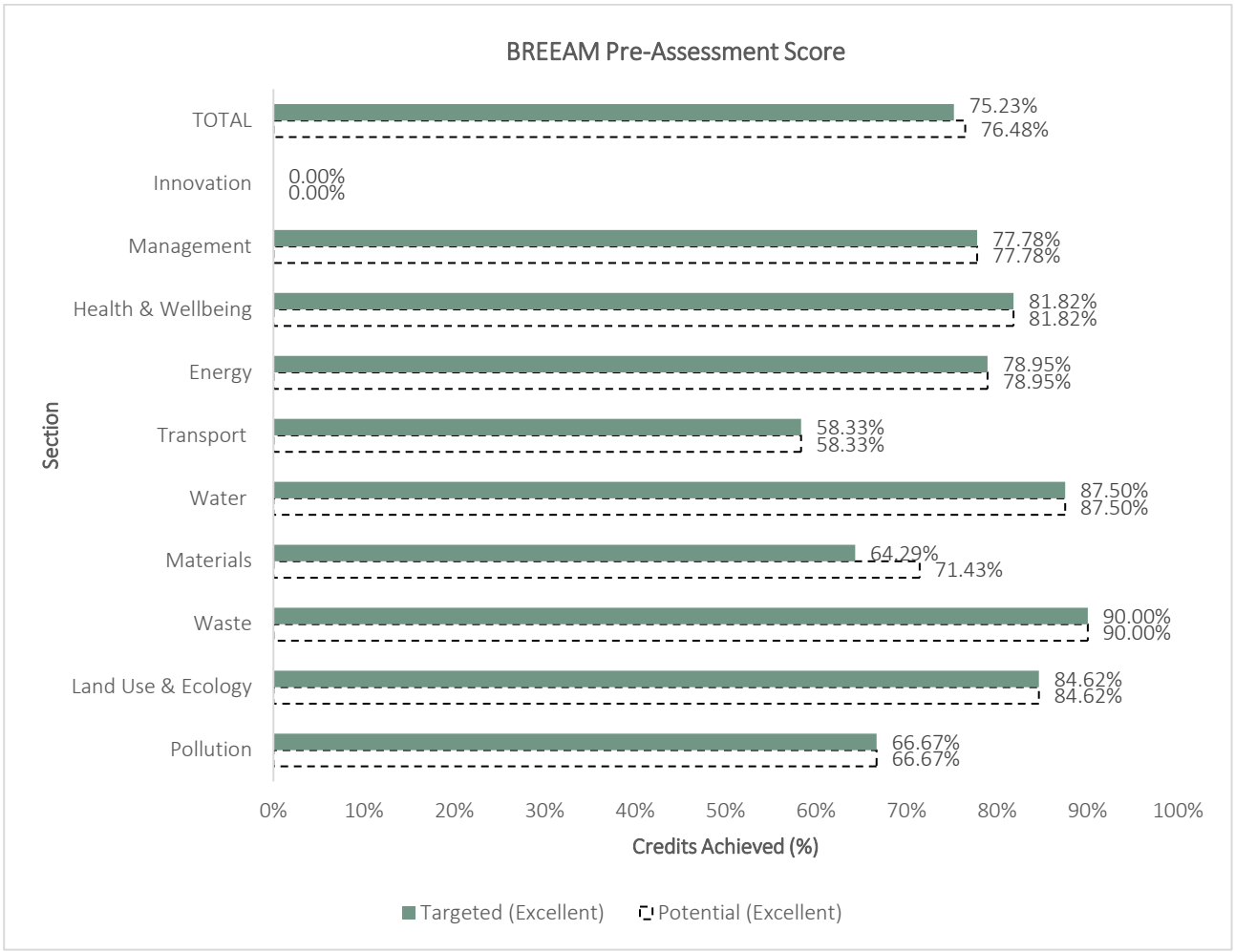


Figure ES2: Predicted percentage of the total score targeted and a breakdown of the percentage of credits closed out in each Section for the development. The potentially improved score, taking in consideration opportunities nominated in Section 5, is shown dashed.

Summary

Figure ES2 shows that the proposals perform well in the following environmental categories:

- **Management:** A focus on embedding sustainability throughout the key stages of design, procurement, and initial occupation, from the initial project brief stage to the appropriate provision of aftercare.
- **Health & Well Being:** Thermal comfort modelling will be carried out, the occupied spaces will meet the daylighting & view out requirements and the acoustic performance of the building will meet the relevant standards.
- **Energy:** Efficient building and material selection, the specification of low carbon mechanical systems and lighting and metering throughout the building
- **Water:** The selection of highly efficient sanitaryware to minimise water consumption, as well as sufficient metering and monitoring equipment
- **Waste:** Waste minimisation through optimised design methods, which consider current and future needs, and respond to functional requirements and climate change adaptation.
- **Land Use & Ecology:** Conscientious construction methods that will provide minimal disturbance to any sensitive ecological features and a landscaping scheme that will result in minimal loss of habitat

Irrespective of current predicted performance, there remains some further limited opportunity to increase the BREEAM score. These improvements mainly lie in the areas of Materials. These opportunities are identified in Section 5 of this report.

As this pre-assessment has been undertaken in the early stages of design, much of the evidence base required to demonstrate achievement of credits is yet to be finalised. It is possible that due to changes in the design or a lack of necessary evidence at the later design stages, there may be credits which cannot be awarded at the time the certification assessments are carried out. The project team should ensure that the requirement to demonstrate achievement of sufficient credits is fully taken into account during design development and construction.

- Section 6 of this report provides details outlining the Design and Post Construction Stages of BREEAM certification
- Appendix 1 provides details of the evidence needed from the design team to support the certification process
- Appendix 2 provides a glossary of all the technical terms used within the body of this report

1. INTRODUCTION: BREEAM

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 New Construction 2018 Scheme is designed to evolve with increasingly progressive Building Regulations, and the development of technology and innovations, with the most recent version of BREEAM released in July 2019 (V3.0).

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

- 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 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

The number of available credits in each category for any particular assessment 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' (see Table 1.1). The Weighting Factors reflect the relative importance of each of the categories.

Table 1.1: BREEAM 2018 Issue Weighting Factors

Environmental Impact Categories	No of Credits in Category	Environmental Weighting Factor		
		Fully Fitted	Shell Only	Shell & Core
Category 1 – Management	21	11%	12%	11%
Category 2 – Health & Wellbeing	22	14%	7%	8%
Category 3 – Energy	31	16%	9.5%	14%
Category 4 – Transport	12	10%	14.5%	11.5%
Category 5 – Water	9	7%	2%	7%
Category 6 – Materials	14	15%	22%	17.5%
Category 7 – Waste	9	6%	8%	7%
Category 8 – Land Use & Ecology	10	13%	19%	15%
Category 9 – Pollution	13	8%	6%	9%
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

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.

1.3 Minimum Standards

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 (Responsible construction management)** There is a requirement for a development to achieve a single credit under this issue. This can be gained where the principal contractor must implement at least six responsible construction management items as shown in Table 4.1 of the BREEAM 2018 Manual.
- **Man 04: Commissioning and Handover – One credit (Commissioning test schedule and responsibilities)** The team must demonstrate that all relevant building services have been commissioned in line with the relevant BREEAM accepted standards, as well as ensuring an appropriate project team member is appointed to oversee all commissioning activities and commissioning has been accounted for in the principal contractor's budget and programme.
- **Man 04: Commissioning and Handover – Criterion 11 (Building user guide)** The team must demonstrate two Building User Guides (BUG) have been developed prior to handover – one for the building occupiers and the other for the facilities managers.
- **Man 05: Aftercare – One Credit (Commissioning implementation)** The team must demonstrate a commitment to carry out Post-occupancy commissioning activities appropriate to the buildings systems must be completed over a minimum 12-month period, once the building becomes substantially occupied.
- **Ene 01: Reduction of Energy use and Carbon Emissions – 4 Credits** The BRUKL document must demonstrate that the building has achieved an EPRnc of at least 0.4 or above.
- **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 5th Edition.
- **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. Note, there may be additional requirements listed in Table 3.1 based on the assessment type.

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. The assessment stages are as follows:

1. Initial Design Stage certification – at this stage an Interim Certificate is issued, based on a provisional rating.
2. Post-Construction check – a further assessment is required to verify the rating in the final, built state before the final BREEAM Certificate can be issued.

A licensed assessor, who registers the assessment with the BRE, must carry out the Design Stage Assessment and Post-Construction Review.

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, London Square ('Client' hereafter), to undertake a BREEAM pre-assessment for the proposed new shell & core Industrial units (883m^2 & 117m^2) on the site of a former Greggs bakery, Twickenham.

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.

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 information available to enable a full Design Stage assessment to be carried out.

The purpose of the pre-assessment is to identify how the development will score when the current designs are formally assessed under BREEAM and identify opportunities to ensure that the project achieves the aspired **'Excellent'** rating.

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 proposed development ***is likely to achieve BREEAM 'Excellent'***, with a provisional score of **75.23%** meeting the design team target.

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 (approximately ranked in terms of cost / difficulty and the potential score by which the total will increase) which, 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*).

Appendix 1 provides a summary of the BREEAM credits that are likely to be achieved, given current design intent as outlined by the design team.

4. PERFORMANCE SUMMARY

The pre-assessment process identified the credits and consequent rating likely to be achieved by the proposed new shell & core Industrial unit on Edwin Road, Twickenham.

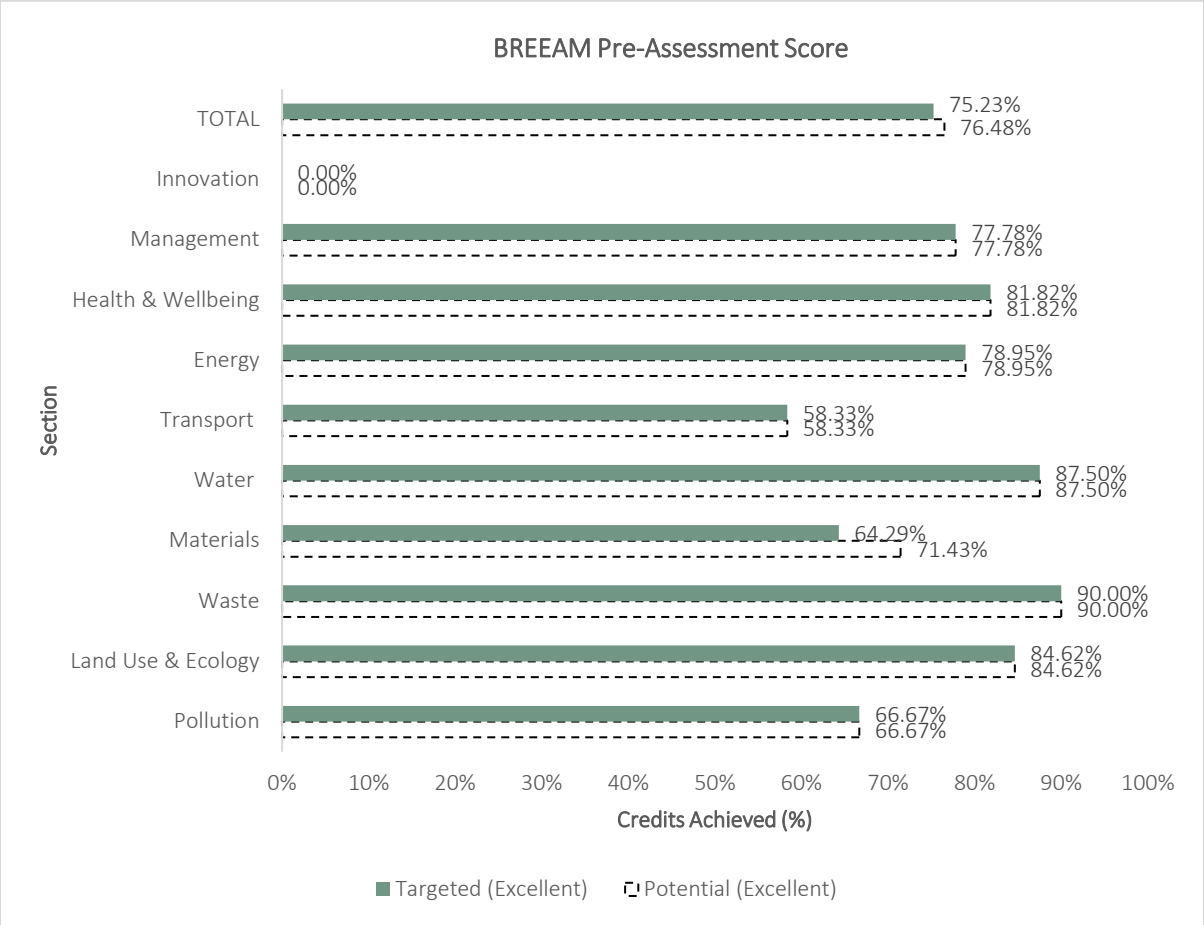


Figure 4.1: Predicted percentage of the total score targeted and a breakdown of the percentage of credits closed out in each section for the development. the potentially improved score, taking in consideration opportunities nominated in section 5, is shown dashed.

The proposed 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 **75.23%**.

5. OPPORTUNITIES FOR IMPROVEMENT

Table 5.1 identifies credits, selectively chosen by the BREEAM Assessor that can be considered to improve the overall BREEAM score if required at a later stage in the design. The table also shows the BREEAM score increase associated with each credit (this can be added to the current predicted score in order to determine a revised total).

Table 5.1: Opportunities for Improvement

Credit	Credit Description	Comment	%age of assessment
MAT03	Measuring Responsible Sourcing	Additional credit can be achieved if sourcing of building products are sourced to ensure over 20% of responsible sourcing points are achieved.	1.25

Points to note:

As this pre-assessment has been undertaken in the early stages of design, much of the required evidence has not been finalised. Where there are any changes made to the design or there is a lack of necessary evidence at the later design stages, there is a risk that credits may be lost and the overall BREEAM performance affected irreversibly in some cases. Therefore, it is strongly recommended as the design develops, the BREEAM assessor is kept informed of changes at the earliest possible stage so that they are able to check any impact on the BREEAM score and ultimately ensure that credit opportunities are not lost and the desired BREEAM performance level can be managed.

6. NEXT STEPS

6.1 Design Stage Assessment

The first stage of the BREEAM assessment is carried out on the detailed design, preferably before works begin on site. Before the design stage assessment can be formally submitted, sufficient evidence is required to 'close out' each credit; (see Appendix 2 for a list of the required evidence).

When the Assessor is satisfied, they have received all the evidence required and has collated this into a formal report, this will be submitted by the BREEAM Assessor to the BRE. The BRE will then audit the assessment typically within 6-8 weeks and often return a Quality Assurance [QA] Feedback form with comments which the assessor (in cooperation with the design team where necessary) will need to address. Once these issues have been addressed and a formal response is collated and submitted by the BREEAM Assessor, the BRE then take approximately 3 weeks to process this – which then results in either further QA feedback or the BREEAM Assessor shall receive an 'Interim' BREEAM certificate.

6.2 Post Construction Stage Assessment

The second stage of the assessment can be carried out after practical completion; this stage of the assessment is called the 'Post Construction Review' or 'PCR'. As the name suggests, this is the stage at which the information provided at design stage will be re-reviewed to establish the 'as built' performance and rating. As before, the BREEAM Assessor will require a full set of evidence from the project team and collate this information into a final report. Where changes have occurred from the design stage assessment, the BREEAM assessor will recalculate the final score. When the Assessor is satisfied with the performance, they will submit a report to BRE to receive a 'Final' BREEAM Certification for the development. The BRE audit process at the final stage is often like that explained at design stage. Once the assessment has passed the QA process, the BREEAM Assessor shall receive a Final BREEAM certificate.

Note, where a design stage assessment is not carried out, a full Post Construction Stage Assessment or 'PCA' can be completed. The PCA will comprise of one report from the BREEAM Assessor which contains both design related and final 'as built' evidence. This will be submitted in the same way as described above, and once subject to the BRE audit process described, will eventually receive a Final BREEAM certificate.

6.3 Ongoing Consultation – Post Occupancy Stage [POS]

Although not currently proposed for this project, BREEAM do provide the option for an optional, third stage called the Post occupancy stage. This stage confirms the process of monitoring, reviewing and reporting on the performance of the building once occupied and is carried out a minimum of 12 months after occupation. This aims to understand the actual performance of the building and optimise this in line with design expectations. Note this option is only open to fully fitted or Shell & Core assessments and must have achieved the minimum credit requirements in the final PCR/PCA assessment.

Appendix 1:
BREEAM Report

BREEAM Pre Assessment Tracker

BREEAM Scheme	BREEAM UK New Construction 2018 (Commercial-Industrial)
Development name	Greggs Bakery, Twickenham
Scope	Shell & Core - 883m2 Industrial Unit & 117m2 flexible use class E unit.
Assessor Name	C Macknight
BREEAM AP	S Hunt
Revision Date	13/07/2022
Revision	2

BREEAM Condition

BREEAM Very Good

Key

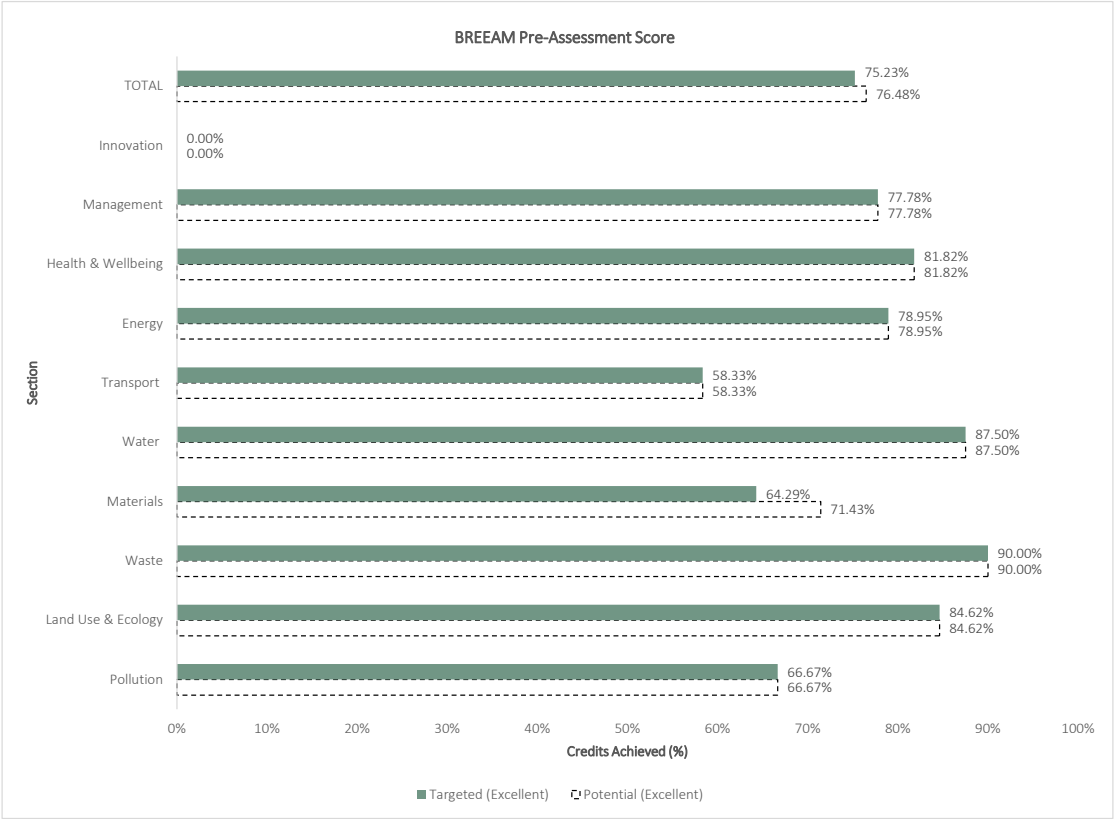
	Potential
	Not Targeted
	Not applicable
	BREEAM Very Good - Mandatory credits
	BREEAM Excellent - Mandatory credits
	Early Actions
	Evidence Outstanding
	More Evidence Required
	Credit Closed Out
	Credit Not Targeted
3	Credit at Risk

BREEAM Scores	%	Rating
Targeted (Excellent)	75.23%	Excellent
Potential (Excellent)	76.48%	Excellent

BREEAM Ratings

<30 %	BREEAM Unclassified
>30 %	BREEAM Pass
>45%	BREEAM Good
>55%	BREEAM Very Good
>70%	BREEAM Excellent
>85%	BREEAM Outstanding

Overall BREEAM Summary



Management - 1 credit worth 0.61%			Available	BREEAM Target	Potential	PA Comment	Responsibility
Man 01	Project Brief & Design	Project delivery planning	1	1	1	One credit could be achieved where the design team consult with one another throughout the project inception to concept design stage and identify roles and responsibilities & contributions.	Project Manager
		Stakeholder consultation (interested parties)	1	1	1	One credit could be achieved where public consultation will take place with all relevant stakeholders which specifically covers sustainability issues.	Planner
		BREEAM AP Concept design	1	1	1	One credit could be achieved where a BREEAM AP is appointed from project inception to concept design stage to monitor project performance i.e. Samuel Hunt of Sol Environment.	BREEAM AP
		BREEAM AP Developed design	1	1	1	One credit could be achieved where a BREEAM AP to be appointed from concept design stage to the end of the technical design stage to monitor project performance. As BREEAM is a contractual requirement it is assumed a BREEAM AP shall be appointed to act as BREEAM AP from RIBA Stages 2 - 4, therefore it is assumed this credit shall be achieved.	BREEAM AP
Man 02	Life Cycle Costing & Service Life Planning	Elemental Life Cycle Cost	2	0	0	Two credits could be achieved where an appropriate consultant is appointed to complete a Life Cycle Cost exercise (involving the design team) and produce a report outlining life cycle costs of different building element options. The project team shall consider the outcomes of the report and confirm how this information has impacted the design.	LCC Assessor
		Component Life Cycle Cost	1	0	0	One credit could be achieved where a cost consultant is appointed to complete a Life cycle cost exercise involving the design team and produce a report outlining life cycle costs of different building component options. The project team shall consider the outcomes of the report and confirm how this information has impacted the design.	LCC Assessor
		Capital cost	1	1	1	One credit could be achieved where the project cost consultant confirms the capital cost of the project.	Contractor
Man 03	Responsible Construction Practices	Legally Harvested and Traded Timber	Y	Y	Y	MANDATORY: All timber used on the project shall be legally harvested and traded i.e. CoC certificated. As this is a mandatory requirement, and the project contractually needs to achieve at least a BREEAM Very Good, it is assumed this credit shall be achieved.	Contractor
		Environmental Management	1	1	1	One credit could be achieved where the Main Contractor shall hold an ISO 14001 certification and implements best practice pollution prevention policies on site.	Contractor
		BREEAM AP Site	1	1	1	One credit could be achieved where a BREEAM AP is appointed from RIBA Stages 5 - 6 to monitor project performance. As BREEAM is a contractual requirement, it is assumed a BREEAM AP shall be appointed to for RIBA stages 5 - 6, therefore, it is assumed this credit shall be achieved.	Contractor
		Responsible Construction Management	2	2	2	Up to two credits could be achieved where the Main Contractor implements a given number of measures from a prescribed list of site management procedures during construction.	Contractor

		Monitoring of Construction Site Impacts	2	2	2	One credit could be achieved where the Main Contractor records & manages water and energy consumption during construction OR Two credits could be achieved where the Main Contractor records & manages water, energy AND transport movements on site (i.e. transportation of major building materials & construction waste).	Contractor
Man 04	Commissioning & Handover	Commissioning - testing and responsibilities	1	1	1	One credit could be achieved where the Main Contractor prepares a schedule of commissioning and testing, and an appropriate project team member is appointed to monitor and maintain the programme of pre-commissioning, commissioning, and testing.	M&E
		Commissioning - design and preparation	1	1	1	One credit could be achieved where a commisioning manager is appointed to oversee the design of all building services and system specifications included in the commissioning schedule.	M&E
		Testing and inspecting building fabric	1	0	0	One credit could be achieved where a thermographic survey is completed and any non-conformities must be rectified and re-tested to confirm compliance.	Contractor
		Handover	1	1	1	One credit could be achieved where the Main Contractor completes a Building User Guide for distribution to the building occupier and prepares a training schedule for implementation at handover.	Contractor
Man 05	Aftercare	Aftercare support	0	0	0	One credit could be achieved where the design team ensures aftercare support will be in place and available for a minimum of 12 months, once the building is occupied. Shell & Core scope - N/A	Contractor
		Commissioning - Implementation	0	0	0	Mandatory: BREEAM Excellent One credit could be achieved where the Main Contractor ensures seasonal commissioning activities will be completed over a minimum 12-month period, once the building is occupied. Shell & Core scope - N/A	Contractor
		Post Occupancy Evaluation	0	0	0	One credit could be achieved where the client provides a commitment to carry out a post occupancy evaluation after intial building occupation. Shell & Core scope - N/A	Tenant
Section Totals			**18**	**14**	**14**		

Health & Wellbeing - 1 credit worth 0.73%			Available	BREEAM Target	Potential	Comment	Responsibility
Hea 01	Visual Comfort	Control of glare	0	0	0	One credit could be achieved where areas at risk of glare are identified using a glare control assessment, with a glare control strategy used to design out the potential for glare. Shell & Core scope - N/A	Architect
		Daylighting	2	2	2	Two credit could be achieved where daylighting modelling & analysis demonstrates adequate daylighting levels are achieved in all occupied spaces. - one credit available if >35% of Sales area achieves a Point daylight factors of 2% or more; - one credit available if >80% of other occupied areas achieves an Average daylight factor of 2% and the Daylighting uniformity criteria	M&E
		View out	1	1	1	One credit could be achieved where view out requirements are met in all occupied spaces.	Archtiect
		Internal and external lighting levels, zoning and control	1	1	1	One credit could be achieved where external lighting is designed in accordance with BS 5489-1:2013 and BS EN 12464-2:2014.	M&E
Hea 02	Indoor Air Quality	Indoor Air Quality Plan (IAQP)	Y	N	N	One credit could be achieved where an indoor air quality plan has been procuded and implemented in accordance with GN06.	M&E
		Ventilation	1	0	0	One credit could be achieved where the building has been designed to mimise the indoor concentration and recirculation of pollutants in the building.	M&E
		Emissions from Construction Products	0	0	0	Two credits could be achieved where all 5 produce types listed in BREEAM NC 2018 table 5.11 meet emission limits (only one credit could be achieved where 3 out of 5 product types meet emission limits). Shell & Core scope - N/A	Architectural
		Post Construction Indoor Air Quality Measurement	0	0	0	One credit could be achieved where post-construction indoor air quality testing is completed to determine levels of formaldehyde and total volatile organic compound (TVOC). Shell & Core scope - N/A	Contractor
Hea 04	Thermal Comfort	Thermal Modelling	1	1	1	One credit could be achieved where thermal modelling is carried out using software in accordance with CIBSE AM11 Building Energy and Performance Modelling.	M&E
		Design for future thermal comfort	1	1	1	One credit could be achieved where the thermal comfort report demonstrates that the design is in accordance with CIBSE Guide A Table 1.5, or Table A.1 of Annex A of ISO 7730:2005. Where the design does not meet the above requirements, the credit can be achieved where the project team demonstrates how the building has been adapted, or designed to be easily adapted in the future using passive design solutions to subsequently meet the requirements.	M&E
		Thermal zoning & controls	0	0	0	One credit can be achieved where the thermal modelling analysis informs the temperature control strategy for the building and its users. Shell & Core scope - N/A	M&E
Hea 05	Acoustic Performance	Sound insulation	0	0	0	One credit could be achieved where the design team commit to achieving the sound insulation performance standards detailed in the relevant section (by building type) in Tables 5.14 - 5.18 of BREEAM UK NC 2018. This is demonstrated pre-completion. Shell & Core scope - N/A	Acoustician

		Indoor ambient noise level	1	1	1	One credit could be achieved where the design team commit to achieving the indoor ambient noise levels that comply with the design ranges detailed in the relevant section (by building type) in Tables 5.14 - 5.18 of BREEAM UK NC 2018. This is demonstrated at PC via on site testing.	Acoustician
		Room acoustics	0	0	0	One credit could be achieved where the design team commit to achieving the Room acoustics performance standards detailed in the relevant section (by building type) in Tables 5.14 - 5.18 of BREEAM UK NC 2018. This is demonstrated pre-completion. Shell & Core scope - N/A	Acoustician
Hea 06	Security	Security	1	1	1	One credit could be achieved where a Security Specialist is consulted on the project proposal prior to the planning application and all their recommendations are implemented.	Architect
Hea 07	Safe and healthy surroundings	Safe Access	1	0	0	One credit could be achieved where dedicated pedestrian and cycle routes/paths are provided from site entrance to building entrance, vehicle delivery and general parking areas are separated and do not cross pedestrian/cycle routes/paths and dedicated areas for goods vehicles and parking areas are designed for simple manoeuvring.	Architect
		Outside Space	1	1	1	One credit could be achieved where an outside space is provided for building users with seating in a landscaped, non-smoking area with seating and a view of the sky, away from sources of pollution and noise.	Architect
Section Totals			**11**	**9**	**9**		

Energy - 1 credit worth 0.74%			Available	BREEAM Target	Potential	Comment	Responsibility
Ene 01	Reduction of energy use and carbon emissions	Energy Performance	9	6	6	Minimum for Excellent = 4 credits. Minimum for Outsanding = 6 credits Up to nine credits could be achieved where an energy performance ratio for new construction (EPRNC) is calculated and compared with the benchmarks in Table 6.1 of BREEAM UK NC 2018.	Energy assessor
		Operational Energy Performance	4	4	4	Up to four credits could be achieved by completing the below operational energy consumption requirements: 1 - Complete an operational energy design workshop with relevant design team members. 1 - Complete additional energy modelling (during design & PC) to generate operational energy consumption figures 1 - Report predicted energy consumption targets by end use 1 - Carry out a risk assessment to highlight deisgn, technical, and process risks that should be monitored and managed throughout constrcution and commissioning.	M&E
Ene 02	Energy Monitoring	Sub-metering of end-use categories	1	1	1	One credit could be achieved where energy metering systems are installed in line with the requirements of Ene 02 so that the energy consuming end uses can be identified.	M&E
		Sub-metering of high energy load and tenancy areas	1	1	1	One credit could be achieved where a significant majority of the energy supply is monitored with a monitoring and management system or separate accessible energy sub-meters depending on use of building areas (tenanted or relevant function areas).	M&E
Ene 03	External Lighting	External Lighting	1	1	1	One credit could be achieved where the external lighting achieves an efficacy of at least 70lumens/circutwatt & timeclock and photocell controls are provided.	M&E
Ene 04	Low Carbon Design	Passive Design Analysis	1	1	1	One credit could be achieved where a passive design analysis is completed which demonstrates a meaningful reduction in CO2 emissions has been achieved based on passive design measures alone i.e. building layout, building fabric etc.	M&E
		Free Cooling	1	0	0	One credit could be achieved where a passive design analysis is completed and the building is naturally ventilated with no artificial cooling.	M&E
		Low and zero carbon technologies	1	1	1	One credit could be achieved where a Low and zero carbon technologies feasibility study is completed which demonstrates a low and zero carbon technology has been specified which shall deliver a meaningful reduction in CO2 emissions.	M&E
Ene 05	Energy efficient cold storage	Refrigeration Energy Consumption	0	0	0	One credit could be achieved where the refrigeration system is designed, installed and commissioned in accordance with the Code of Conduct for carbon reduction in the refrigeration retail sector and BS EN 378-2:2016, and when robust and tested refrigeration systems or components included on the Energy Technology Product List (ETPL) are used. N/A to this development	Refrig
		Indirect greenhouse gas emissions	0	0	0	One credit could be achieved where the above credit is achieved, and a saving in indirect greenhouse gas emissions is demonstrated from the installed refrigeration system over the course of its operational life. N/A to this development	Refrig

Ene 06	Energy efficient transportation systems	Energy consumption	0	0	0	One credit could be achieved where the transportation demand and usage patterns of the building are analysed to determine the optimum number and size of lifts, escalators, or moving walks, and predicted energy consumption is calculated in accordance with BS EN ISO 25745 Part 2 or Part 3 N/A to this development	Lift Consultant
		Energy efficient features	0	0	0	Up to two credits can be achieved if lifts and escalators or moving walks are specified. For each credit to be achieved, energy efficient features must be specified in accordance with the BREEAM criteria. N/A to this development	Lift Consultant
Ene 07	Energy efficient laboratories	Energy Efficiency Laboratories	0	0	0	N/A to this development	
Ene 08	Energy efficient equipment	Energy efficient equipment	0	0	0	Two credits can be achieved by calculating the building's unregulated energy consuming loads, and demonstrating a meaningful reduction in the total annual unregulated energy consumption of the building. Shell & Core scope - N/A	Client
Section Totals			19	15	15		

Transport - 1 credit is worth 0.96%			Available	BREEAM Target	Potential	Comment	Responsibility
Tra 01	Transport assessment and Travel Plan	Transport assessment and Travel Plan	2	2	2	Two credits could be achieved where a site specific Transport Assessment and Travel Plan is completed prior to RIBA Stage 2. The transport assessment and travel plan for the wider site can be used for this development.	Transport Consultant
Tra 02	Sustainable Transport Measures	Sustainable Transport Measures	10	5	5	Up to 10 credits could be achieved where sustainable transport measures have been considered; these include: - Existing AI >8 : 8.97 - *1 point* - Increase in AI - Improvements to pedestrian/cycle ways - EV Charging (10% of total) - *1 potential point* - Car Share (5% of total) - Cycle storage (covered and lit) - *1 point* - Cycle facilities (lockers and changing space) - *1 point assumed* - Proximity to sufficient amenities - Food outlet, ATM, Pharmacy - *1 point* - New amenity 5 points = 5 credits	Transport Consultant
Section Totals			12	7	7		

Water - 1 credit is worth 0.88%			Available	BREEAM Target	Potential	Comment	Responsibility
Wat 01	Water Consumption	Water Consumption	5	4	4	Up to five credits could be achieved by completing a comparison of water consumption for the assessed building against baseline performance. A 50% improvement ove the baseline is targeted	Architect / M&E
Wat 02	Water Monitoring	Water Monitoring	1	1	1	One credit could be achieved where a pulsed output water meter is supplied to each building/unit and to any area or water use which is <10% of the buildings/unit water demand.	M&E
Wat 03	Water Leak Detection	Leak Detection System	1	1	1	One credit could be achieved where a leak detection system is installed on the utilities water supply within the building[s] to detect and major leaks between the utilities supply and buildings, and within the buildings themselves.	M&E
		Flow Control Devices	1	1	1	One credit could be achieved where flow control devices are installed that regulate the water supply within the building to each WC area or sanitary facility to minimise undetected wastage and leaks.	M&E
Wat 04	Water efficient Equipment	Water efficient Equipment	0	0	0	One credit could be achieved where systems or processes to reduce the water demand of the building through good design or specification shall be implemented and demonstrate a reduction in the total water demand of the building. Plantings to be appropriately specified to rely solely on precipitation and, once established, not require irrigation through the year; OR if irrigation is requried an efficient drip fed system with moisture sensors and zoning is requried.	Landscape Archtiect
Section Totals			8	7	7		

Materials - 1 credit is worth 1.25%			Available	BREEAM Target	Potential	Comment	Responsibility
Mat 01	Environmental impacts from construction products (Life cycle assessments)	Superstructure	6	5	5	Up to 6 credits could be achieved where an appropriate consultant completes an IMPACT compliant LCA on the proposed design, including an appraisal of design options, and reports the results to the BRE. If an LCA Assessment is only conducted after planning has been submitted only 1 credit is achievable. Approximately 4 credits can be achieved if a LCA assessment is conducted before planning application is submitted.	LCA Assessor
		Sub structure and hard landscaping options	1	1	1	One credit could be achieved where an appropriate consultant completes an IMPACT compliant LCA on the proposed hard landscaping and substructure proposals, including an appraisal of design options, and submits the results to the BRE. This credit can only be achieved if a LCA assessment is conducted before planning applcaition is submitted.	LCA Assessor
Mat 02	Environmental impacts from construction products (Environmental product declarations)	Environmental impacts from construction products (Environmental product declarations)	1	0	0	One credit could be achieved where a sufficient proportion of materials sourced for the project have an Environmental Product Declaration.	Contractor
Mat 03	Responsible sourcing of construction products	Legal and sustainable timber	Y	Y	Y	MANDATORY: All timber used on the project shall be legally harvested and traded i.e. CoC certificated. As this is a mandatory requirement, and the project contractually needs to achieve at least a BREEAM Very Good, it is assumed this credit shall be achieved.	Contractor
		Enabling sustainable procurement	1	1	1	One credit could be achieved where the client operates a Sustainable Procurement Plan [SPP] (covering procurement of materials for construction). To achieve this credit a SPP must be completed before planning is submitted.	Client
		Measuring responsible sourcing	3	1	2	Up to 3 credits could be achieved where building products are sourced to ensure over 10%, 20% or 30% of responsible sourcing points are achieved. Potential credit	Contractor
Mat 05	Designing for durability & adaptation	Designing for durability & adaptation	1	1	1	One credit could be achieved where the design team ensure protection measures are specified to protect the building from damage. Also, a façade access strategy must be produced.	Architect
Mat 06	Material Efficiency	Material Efficiency	1	0	0	One credit could be achieved where the design team hold a material efficiency review at each stage of the project to maximise material efficiency of the project, including setting targets and reporting on opportunities and methods used to optimise material use.	Architect
Section Totals			14	9	10		

Waste - 1 credit is worth 0.70%			Available	BREEAM Target	Potential	Comment	Responsibility
Wst 01	Construction Waste Management	Pre Demolition Audit	1	1	1	Where demolition of any buildings or hard surfaces is required, a Pre Demolition Audit will be required to be conducted before the submission of the planning application.	Demo Contractor
		Construction Resource Efficiency	3	3	3	Up to three credits could be achieved based on the benchmark of construction waste met. A Site Waste Management plan is also required.	Contractor
		Diversion of resources from landfill	1	1	1	One credit could be achieved where at least 80% of construction waste is diverted from landfill.	Contractor
Wst 02	Use of sustainable aggregate	Use of recycled aggregate	1	0	0	One credit could be achieved where a sufficient proportion of aggregate comes from recycled sources.	Contractor
Wst 03	Operational Waste	Operational Waste	1	1	1	One credit could be achieved where a sufficiently sized, dedicated, labelled space is provided for recyclable waste from operations.	Archtiect
Wst 04	Speculative Finishes	Speculative Finishes (Office only)	0	0	0	One credit could be achieved where floor and ceiling finishes are limited to a show area only (for tenanted areas), or only installed when selected by the known occupant of a development. N/A to this development	
Wst 05	Adaption to climate change	Adaption to climate change	1	1	1	One credit could be achieved where the design team complete a climate change adaption appraisal.	Archtiect
Wst 06	Functional Adaptability	Functional Adaptability	2	2	2	Two credits could be achieved where the design team complete a functional adaptability study.	Archtiect
Section Totals			10	9	9		

Land Use & Ecology - 1 credit is worth 1.15%			Available	BREEAM Target	Potential	Comment	Responsibility
LE 01	Site Selection	Reuse of Land	1	1	1	One credit could be achieved where plans indicate at least 75% of the proposed building footprint is on previously developed land.	Archtiect
		Contaminated land	1	0	0	One credit could be achieved where remediation of contamination in the ground is completed for the purposes of the development.	
LE 02	Ecological risks and opportunities	Survey and Evaluation	1	1	1	One credit could be achieved where an ecologist completes a survey of the site prior to the end of RIBA Stage 2. An ecological survey has been completed for the site by the Ecologist, therefore it is assumed credit shall be achieved.	Ecologist
		Determining Ecological Outcomes	1	1	1	One credit could be achieved where the design team identify the optimal ecological outcome for the site.	Ecologist
LE 03	Managing impact on ecology	Ecological Risks and Opportunities	Y	Y	Y	LE 02 must be achieved.	Ecologist
		Planning and Measures On-site	1	1	1	One credit could be achieved where measures are implemented on site to manage negative ecological impacts on site. An ecological survey has been completed for the site by the Ecologist. It is understood that any protection measures recommended by the ecologist shall be implemented.	Ecologist
		Managing Negative Impacts	2	2	2	Up to 2 credits could be achieved based on the outcomes of the Pre VS Post ecological value calculations. It is understood a neutral impact on ecological value will be targeted	Ecologist
LE 04	Ecological change and enhancement	Managing Negative Impacts	Y	Y	Y	LE 03 must be achieved (1 credit in Managing negative impacts). It is assumed this shall be achieved.	Contractor
		Ecological Enhancement	1	1	1	One credit could be achieved where measures are implemented on site to enhance ecological value.	Ecologist

		Change and Enhancement of Ecology	3	2	2	Up to 3 credits could be achieved based on the outcomes of the Pre VS Post ecological value calculations. Scheme overall will show a positive change in the ecological value of the site through enhancement measures.	Ecologist
LE 05	Long term ecological management	Statutory obligations, planning and site implementation	Y	Y	Y	LE 04 must be achieved.	Contractor
		Management and maintenance throughout the project	1	1	1	One credit could be achieved where an ecologist is appointed throughout the design and construction process to monitor the implementation of ecological measures in line with the initial ecological outcome.	Ecologist
		Landscape and ecology management plan	1	1	1	One credit could be achieved where an ecologist completes a five year landscape and habitat management plan for the site. An additional site specific ecological enhancement strategy will be required.	Ecologist
Section Totals			**13**	**11**	**11**		

Pollution - 1 credit is worth 0.75%			Available	BREEAM Target	Potential	Comment	Responsibility
Pol 01	Impact of refrigerants	Impact of refrigerants	2	0	0	Two credits could be achieved where systems using refrigerants have a DELC of ≤ 100kgCO2-eq/kW cooling and heating capacity.	M&E
		Leak detection	1	0	0	One credit could be achieved where all systems are hermetically sealed, or a refrigerant leak detection system is installed.	M&E
Pol 02	Local Air Quality	Local Air Quality	2	2	2	Up to two credits could be achieved where all heating and hot water is supplied by non-combustion systems (i.e only powered by electricity), or where emissions from all combustion plant does not exceed the levels set in Tables 12.4 & 12.5 of BREEAM UK NC 2018. It is assumed that all heating will be supplied by non-combustion systems	M&E
Pol 03	Flood and surface water management	Flood resilience	2	2	2	Up to 2 credits could be achieved based on the flood risk to site. FRA is required. Based on an initial assessment, the site is found to be in Flood Zone 1	Drainage
		Surface water run off - rate	1	1	1	One credit could be achieved based on the reduction of the surface water run off rate or the impermeable area of site remains the same or decreases as a result of the development. Flood risk assessment and surface water drainage calacultions have been cometpled as part of the planning application. it is assumed that this credit is acheivable.	Drainage
		Surface water run off - volume	1	1	1	One credit could be achieved based on the reduction of the surface water run off volume or the impermeable area of site remains the same or decreases as a result of the development. The impermeable area of the site will be decreased through the development and therefore this credit shall be achieved by default	Drainage
		Minimising watercourse pollution	1	0	0	One credit could be achieved where the first 5mm of rainfall can be attenuated on site, pollution prevention treatment is provided etc. Waterman confirmed credit is not achievable.	Drainage
Pol 04	Reduction of night time pollution	Reduction of night time pollution	1	1	1	One credit could be achieved where external lighting is designed to minimise light pollution in accordance with the ILP guidance notes.	M&E
Pol 05	Reduction of noise pollution	Reduction of noise pollution	1	1	1	One credit could be achieved where there are no noise-sensitive areas within 800m of the building or assessed site, or where there are noise-sensitive areas within this radius, a noise impact assessment is completed by a suitably qualified acoustic consultant.	M&E
Section Totals			12	8	8		

Innovation - 1 credit is worth 1.00%		Available	BREEAM Target	Potential	Comment	Responsibility
Inn 01 - Man 03	Responsible Construction Management	1	0	0	One credit could be achieved where the Main Contractor implements all measures from a prescribed list of site management procedures during construction. This is the equivalent of achieving a CCS score of 40+.	
Inn 01 - Hea 01	Daylighting	1	0	0	One credit could be achieved where exemplary daylighting levels are achieved. As the design is still in the early stages, it is not yet known if these requirements could be achieved alongside the functional requirements therefore this credit has not been targeted but will be reviewed at a later stage.	
Inn 01 - Ene 01	Energy Performance	0	0	0	Up to 2 credits could be achieved where the building achieves zero net regulated CO2eq emissions. Up to 3 credits could be achieved where the building is deemed carbon negative i.e. where more than 100% of carbon emissions from unregulated energy use are offset by energy generated from on-site LZC sources. Two credits could be achieved where the client commits funds to pay an assessor to be appointed for the post occupancy stage (i.e. to do an energy model at PC) to report on actual building energy consumption and submit this to the BRE.	
Inn 01 - Wat 01	Water Consumption	0	0	0	One credit could be achieved where exemplary performance is achieved in the BREEAM Wat 1 calculator. As the design is still in the early stages, it is not yet known if these requirements could be achieved alongside the functional requirements therefore this credit has not been targeted but will be reviewed at a later stage.	
Inn 01 - Mat 01	Environmental impacts from construction products (Life cycle assessments)	3	0	0	One credit could be achieved where an LCA appraisal is completed on the core building services options. One credit could be achieved where an the LCA is aligned with the LCC (Man 02) One credit could be achieved where the building LCA (superstructure) undergoes third party verification.	
Inn 01 - Mat 03	Measuring responsible sourcing	1	0	0	One credit could be achieved where building products are sourced to ensure over 50% of responsible sourcing points are achieved. As the design is still in the early stages, the impact of achieving these credits is not yet known however this credits can be reviewed at a later stage.	
Inn 01 - Wst 01	Construction Resource Efficiency & Diversion from landfill	1	0	0	One credit can achieved where exemplary level construction waste benchmarks are achieved. As the design is still in the early stages, the impact of achieving these credits is not yet known however this credit can be reviewed at a later stage.	
Inn 01 - Wst 02	Recycled aggregates	1	0	0	One credit could be achieved where a sufficient percentage of aggregate is from recycled sources.	

Inn 01 - Wst 05	Adaption to climate change	1	0	0	One credit could be achieved where HEA 04 (criterion 6), ENE 01 (6 credits), ENE 04 (passive design), WAT 01 (3 credits), MAT 05 ,WST 05 & POL 03 (watercourse pollution) is achieved.	
Inn 01 - LE 02	Wider site sustainability	1	0	0	One credit could be achieved where the ecologist confirms the wider sustainability related activities and ecosystem benefits brought about by the development (and HEA 07, POL 03 & POL 05 are achieved).	
Inn 01 - LE 04	Change and Enhancement of Ecology	1	0	0	One credit could be achieved where the ecologist's calculations demonstrate a significant increase in ecological value as a result of the development i.e. score of 105%+.	
Innovation		**10**	**0**	**0**		

Appendix 2:
BREEAM Evidence Types

Appendix 2: BREEAM Evidence Types		
Ref	**Document/Evidence Type**	**Comment**
E1	As constructed information	Information produced at the end of a project to represent what has been constructed. This will comprise a mixture of 'as built' information/drawings and surveys from specialist subcontractors and the 'final construction issue' from design team members.
E2	Building information model (BIM)	The BIM (or BIM files) used for the project containing relevant information/evidence of compliance.
E3	BRE Global correspondence reference number	For example, the reference number for a BRE Global response to an assessor's technical query
E4	BREEAM Assessor's site inspection report	A formal report based on the BREEAM Assessor's own survey of the site/building to confirm compliance with BREEAM criteria. An assessor's site inspection report will be distinct from their formal BREEAM assessment report, serving as a form of evidence of compliance in its own right, and it may include photographs taken by the assessor as part of the survey.
E5	Building contract(s)	The building contract (or excerpts/clauses from it) between the client and the contractor for the construction of the project. In some instances, the building contract may contain design duties for specialist subcontractors and/or design team members.
E6	Certificates of compliance (third party)	Examples include ISO 14001, BES 6001, FSC (Forest Stewardship Council), EPC (environmental profile certificate), EPD (environmental product declaration), Considerate Constructors etc.
E7	Communication records	Formal communication records between/from relevant project stakeholders and/or other third parties confirming an appointment, action or outcome. This may be in the form of a letter, meeting minutes, email correspondence, publication or another form of media (see also additional guidance on following pages).
E8	Communication strategy	The strategy that sets out when the project team will meet, how they will communicate effectively and the protocols for issuing information between the various parties, both informally and at information exchanges

Appendix 2: BREEAM Evidence Types		
Ref	**Document/Evidence Type**	**Comment**
E9	Computer aided modelling results/outputs	Examples include thermal modelling, flooding, life cycle assessment, life cycle costing, ventilation modelling etc.
E10	Construction specification	The specification for the project/building.
E11	Construction stage data/information	For example, purchase orders, metering data, log books, commissioning records/reports etc.
E12	Contractual tree	A diagram that clarifies the contractual relationship between the client and the parties undertaking the roles required on a project.
E13	Cost information	Project costs, including the cost estimate and life cycle costs.
E14	Design drawings	Developed Design and Technical Design, including the coordinated architectural, structural and building services design. Site plans, drainage designs.
E15	Design programme	A programme setting out the strategic dates in relation to the design process. It is aligned with the Project Programme but is strategic in its nature, due to the iterative nature of the design process, particularly in the early stages.
E16	Design responsibility matrix	A matrix that sets out who is responsible for designing each aspect of the project and when. This document sets out the extent of any performance specified design.
E17	Feasibility study	Studies undertaken to test the feasibility of the Initial Project Brief for the site or in a specific context and to consider how site-wide issues will be addressed.
E18	Final project brief	The Initial Project Brief amended so that it is aligned with the Concept Design and any briefing decisions made during this stage.
E19	Other third party information	For example, maps, public transport timetables, product data/details, manufacturers' literature, government/EU standards or codes, EU labelling.
E20	Professional services contract	An agreement to provide professional or consulting services such as, designing, feasibility studies, or legal or technical advice.

Appendix 2: BREEAM Evidence Types		
Ref	**Document/Evidence Type**	**Comment**
E21	Professional specialist reports	Professional reports resulting from specialist surveys/studies/test results, e.g. contaminated land, ecology, flood risk assessment, surface water run-off report, site investigation, acoustics, indoor air quality plan, low and zero carbon technologies study, transportation analysis, commissioning reports, passive design analysis report, free cooling analysis report, life cycle assessment, landscape and habitat management plan etc.
E22	Project Execution or Quality Plan	The Project Execution Plan is produced in collaboration between the project lead and lead designer, with contributions from other designers and members of the project team. The Project Execution Plan sets out the processes and protocols to be used to develop the design.
E23	Project programme	The overall period for the briefing, design, construction and post completion activities of a project.
E24	Project roles table	A table that sets out the roles required on a project as well as defining the stages during which those roles are required and the parties responsible for carrying out the roles.
E25	Project strategy	The strategies developed in parallel with the Concept Design to support the design and, in certain instances, to respond to the Final Project Brief as it is concluded. Examples include strategies for sustainability, acoustics, handover, maintenance and operational, fire engineering, building control, technology, health and safety, construction, travel plan, sustainable procurement plan.
E26	Risk assessment	The risk assessment considers the various design risks and other risks on a project and how each risk will be managed and the party responsible for managing each risk.
E27	Schedule of services	A list of specific services and tasks to be undertaken by a party involved in the project which is incorporated into their professional services contract.
E28	Strategic or initial project brief	The brief prepared following discussions with the client to ascertain the project objectives, the client's business case and, in certain instances, in response to site feasibility studies.

Appendix 4:
Glossary of Terms

Accredited Energy Assessor [Ene 01]: A person registered with an accredited energy assessment scheme provider. The scheme provider will be licensed by the relevant government department to accredit competent persons in the energy assessment of non-domestic or domestic buildings for the purposes of demonstrating compliance with the building regulations.

Approved building energy calculation software
Software approved for the purpose of demonstrating compliance with the energy efficiency and carbon emission requirements of the building regulations. The definition includes the SBEM and its interface iSBEM, as well as third party software approved by the relevant government department.

Appropriately qualified professional [Ene 05]: A building services engineer

Appropriate consultant [Pol 03]: A consultant with qualifications and experience relevant to designing SuDS and flood prevention measures and completing peak rate of run-off calculations. Where complex flooding calculations and prevention measures are required, this must be a specialist hydrological engineer.

BREEAM AP [Advisory Professional]: Accredited BREEAM 'Advisory Professional'

BREEAM Simplified Building LCA Tool: The BREEAM Simplified Building LCA tool is an elemental construction level LCA tool that is free to use by BREEAM Assessors and design team members working on a registered BREEAM assessment.

Capital cost: The capital cost for the building includes the expenses related to the initial construction of the building:

- Construction, including preparatory works, materials, equipment and labour
- Site management
- Construction financing
- Insurance and taxes during construction
- Inspection and testing

Costs related to land procurement, clearance, design, statutory approvals and post occupancy aftercare are not included.

Competent Person [Man 02]: An individual who has acquired substantial expertise or a recognised qualification for undertaking life cycle costing studies and is not professionally connected to a single manufacturer.

Complex systems [Man 04]: These include, but are not limited to, air-conditioning, comfort cooling, mechanical ventilation, displacement ventilation, complex passive ventilation, BMS, renewable energy sources, microbiological safety cabinets and fume cupboards, cold storage enclosures and refrigeration plant.

Compliant test body [Hea 05]: A compliant test body is defined as:

1. Organisations having United Kingdom Accreditation Scheme (UKAS) accreditation to the appropriate Scope OR
2. Organizations or individuals registered with the ANC Registration Scheme OR

3. Companies or individuals that have been declared competent by an organization who can provide evidence that they follow the relevant principles of BS EN ISO/IEC 17024

Construction zone: The construction zone is defined as the site which is being developed for the BREEAM-assessed building and its external site areas, i.e. the scope of the new works

Contaminated land: Land affected by contamination Land that could not be legally or safely developed or built on to the proposed end use without the remediation of the contamination. Contamination is defined as any substance or agent in, or on the ground within the development footprint, which presents an unacceptable risk to human health, property or the environment. For the purposes of BREEAM, substances or agents that could present unacceptable contamination risks are defined as those that act as a barrier to the development of land, which could include certain plant species such as, but not limited to, Japanese knotweed and giant hogweed. Where asbestos is found to be present in the ground this is classed as contamination for the purposes of this issue. If asbestos is present in existing building fabric, the site cannot be classified as contaminated land.

Design flood event: An historic or notional flood event of a given annual flood probability, against which the suitability of a proposed development is assessed and mitigation measures, if any, are designed.

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.

Direct effect life cycle (DELC) carbon dioxide equivalent: A measure of the effect on global warming arising from emissions of refrigerant from the equipment to the atmosphere over its lifetime (units: $kgCO_2$-eq). The calculation involves estimating the total refrigerant release over the period of operation and subsequent conversion to an equivalent mass of carbon dioxide. Should the system use several different refrigerants (e.g. a primary refrigerant and a secondary coolant) or a cascade system, individual calculations are made for all refrigerants which contribute to the direct effect.

ECA Energy Technology Product List (ETPL) The ETPL is part of the UK Government's Enhanced Capital Allowance Scheme, a key part of its programme to manage climate change.

Ecological baseline: The ecological baseline is the ecological value of the site before construction

Energy monitoring and management system: Examples include automatic meter reading systems and building energy management systems (BEMS). Automatic monitoring and targeting) is an example of a management tool that includes automatic meter reading and data management.

Energy specialist: An individual who has acquired substantial expertise or a recognised qualification for undertaking assessments, designs and installations of low or zero carbon solutions in the commercial buildings sector and is not professionally connected to a single low or zero carbon technology or manufacturer.

EMS: Environmental management system.

EU Energy Efficiency Labelling Scheme: The EU energy label rates products from A (the most efficient) to G (the least efficient).

Environmental Product Declaration (EPD): An EPD compliant with BREEAM is an independently verified environmental label (i.e. ISO Type III label) according to the requirements of ISO 14025.

Formally agreed: The term 'formally agreed' relates to performance targets. Examples of formal agreements include a contract or letters of appointment with the architect and with other relevant project team members.

Free cooling: The ability of the building to provide cooling to the internal occupied areas without the need to rely on energy consuming mechanical cooling

IMPACT: IMPACT is a specification and database for software developers to incorporate into their tools to enable consistent LCA.

Independent party [Man 01 & Man 04]: A third party or a person or body internal to a party involved (parties involved are typically a supplier (1st party) or purchaser (2nd party)), who shall not be involved in the issue in question and shall not have conflicts of interests resulting from their position. To comply with the criterion relating to the use of an independent party, the client or design team needs to demonstrate either:

1. They have used a party independent of the design process to conduct the necessary consultation exercise; OR
2. If the consultation is to be carried out by an organisation involved with the design of the building, e.g. the project architect, then they must present the assessor with evidence that robustly demonstrates the independence of the consultation process. BREEAM has not attempted to define what form this evidence must take; the onus is on the design team or relevant individual to clearly demonstrate to the BREEAM Assessor a credible level of independence.

Indirect operational greenhouse gas emissions: These are the indirect greenhouse gas emissions that result from the production of energy used to power the refrigeration system's cooling plant**.**

Interested parties [Man 01]: This includes but is not limited to:

1. Actual or intended building users (if known) including facilities management staff or those responsible for the day-to-day operation of the building and grounds.
2. Representative consultation group from the existing community (if the building is a new development in an existing community) or for a community still under construction.
3. Existing partnerships and networks that have knowledge of, and experience of working on, existing buildings of the same type.
4. Potential users of any shared facilities, e.g. operators of clubs and community groups.
5. AND the following where relevant:
6. In educational building types, representatives of local education authorities, board of governors etc.
7. Local or national historic or heritage groups (over and above any requirements relating to statutory consultees).
8. Specialist service and maintenance contractors or representatives where the building function has particular technical requirements in complex environments, e.g. buildings containing laboratories.

9. For stations, passenger focus groups, train and station operations groups

Flood Risk Assessment (FRA): A study to assess the risk of a site flooding, and to assess the impact that any changes or development on the site will have on flood risk to the site and elsewhere. A FRA should be prepared according to relevant planning policy and technical guidance documents. The FRA must account for future climate change and detail any necessary adaptation measures if required. Where more than five years have passed since the FRA was carried out, evidence is required to demonstrate that the basis of the FRA has not changed in that time.

FSC: Forest Stewardship scheme

Green lease agreement: A formal contractually binding agreement between a building developer or owner and their tenants.

Indirect operational greenhouse gas emissions: These are the indirect greenhouse gas emissions that result from the production of energy used to power the refrigeration system's cooling plant. This includes the emissions from the production of grid electricity or an on-site source of energy generation, e.g. gas CHP. In the case of refrigeration systems, the term 'direct greenhouse gas emissions' is also used; this refers to the emissions that occur as a direct result of leakage of refrigerant from the system. The impacts of direct greenhouse gas emissions from refrigeration systems are dealt with in the BREEAM issue Pol 01 Impact of refrigerants on page 300. Therefore, only indirect emissions resulting from the energy consumption of the system are covered in this issue.

Legally harvested and traded timber: Timber that meets the requirements as outlined in the Central Point of Timber (CPET) 5th Edition of the UK Government Timber Procurement Policy (TPP).

Options appraisal summary document: The options appraisal summary document is produced by the design team after LCA options appraisal has been completed to record: the options appraised by the design team and client; how the options appraisal process was utilised to make better informed decisions; and the reasons for selecting or rejecting each option at Concept Design and Technical Design. It shall provide information on the environmental impacts of each design option along with the effect, if any, on other relevant factors such as (but not necessarily limited to) capital cost and delivery times.

Occupied space: A room or space within the assessed building that is likely to be occupied for 30 minutes or more by a building user.

Peak run-off (rate) : 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.

Previously occupied land: For the purposes of this issue BREEAM defines previously occupied land as that which is or was occupied by a permanent structure, including any associated fixed surface infrastructure.

Project delivery stakeholders: This includes the client, the building occupier (where known), the design team and the principal contractor. Contractors' involvement ensures their input in terms of

formulating sustainable design solutions, commenting or inputting on the practicality and buildability of (one or more) design solutions and their impact on programming, cost etc.

Projected climate change environment: Naturally ventilated buildings - Time period: 2050s: Emissions scenario: Medium (A1B) 50th percentile DSY 2 and DSY 3. Mechanically ventilated or mixed mode buildings -Time period: 2020s : Emissions scenario: High (A1F1) 50th percentile DSY 2 and DSY 3

Recognised local LZC technologies: Technologies eligible to contribute to achieving the criteria must produce energy from renewable sources and meet all other ancillary requirements as defined by Directive 2009/28/EC (119). The following requirements must also be met:

1. There must be a direct supply of energy produced to the building under assessment.
2. Technologies under 50 kWe or 45 kWth must be certified by a Microgeneration Certification Scheme (MCS), or equivalent, and installed by MCS (or equivalent) certified installers.
3. Combined heat and power (CHP) schemes above 50 kWe must be certified under the CHPQA standard. CHP schemes fuelled by mains gas are eligible to contribute to performance against this issue.
4. Heat pumps can only be considered as a renewable technology when used in heating mode. Refer to Annex VI of Directive 2009/28/EC for more detail on accounting for energy from heat pumps.
5. Where MCS or CHPQA certification is not available, the design team must investigate the availability of alternative accreditation schemes in line with the Directives listed above, or an equivalent country or regional directive or standard. Where an accreditation scheme exists, it should be used for the purpose of verifying compliance of the specified LZC technology. If no accreditation scheme exists in the country, the design team must demonstrate they have investigated the competence of the installer selected and are confident that they have the skill and competence to install the LZC technology appropriately.

Regulated energy: Building energy consumption resulting from the specification of controlled, fixed building services and fittings, including space heating and cooling, hot water, ventilation and lighting.

Route 1 [Ecology]: For sites where ecological opportunities and risks are limited in nature This route is only appropriate where the level of ecological risk associated with the site is of a level that can practically be understood and addressed by a project team member using general observation, non-specialist knowledge and publicly available resources and information. This would be assessed by completing the Ecological Risk Evaluation Checklist.

Route 2 [Ecology]: For sites where complex ecological systems are likely to be present This is the more comprehensive route of assessment and therefore can achieve a higher level of reward than Route 1. It must be conducted by a Suitably Qualified Ecologist (See Definitions). This route will be mandatory for more sensitive sites and optional for those eligible for assessment under Route 1 . This would be assessed by completing the Ecological Risk Evaluation Checklist.

Security Needs Assessment (SNA): The project and site-specific assessment of security needs, including:

1. A visual audit of the site and surroundings, identifying environmental cues and features pertinent to the security of the proposed development.

2. Formal consultation with relevant stakeholders, including the local ALO, CPDA and CTSA (as applicable), in order to obtain a summary of crime and disorder issues in the immediate vicinity of the proposed development.
3. Identify risks specific to the proposed, likely or potential use of the buildings.
4. Identify risks specific to the proposed, likely or potential user groups of the buildings.
5. Identify any detrimental effects the development may have on the existing community.

Sources of external pollution: This includes but is not limited to the following:

1. Highways and the main access roads on the assessed site
2. Car parks, delivery and vehicle waiting bays
3. Other building exhausts, including from building services plant industrial or agricultural processes

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 acoustician (SQA): An individual achieving all the following items can be considered to be 'suitably qualified' for the purposes of a BREEAM assessment:

1. Has a minimum of three years relevant experience (within the last five years). Such experience must clearly demonstrate a practical understanding of factors affecting acoustics in relation to construction and the built environment; including, acting in an advisory capacity to provide recommendations for suitable acoustic performance levels and mitigation measures.
2. An individual who holds a recognised acoustic qualification and membership of an appropriate professional body. The primary professional body for acoustics in the UK is the Institute of Acoustics.

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

1. Holds a degree or equivalent qualification (e.g. N/SVQ Level 5) in ecology or a related subject
2. 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
3. Is covered by a professional code of conduct and subject to peer review.

Suitably qualified energy modeller [Ene 01]: An individual who:

4. Holds a degree or equivalent qualification in building services or a sustainability related subject
5. Has a practical experience of conducting energy modelling and has appropriate knowledge of the tool being used, e.g. has attended training by independent providers.
6. Is a member of a professional body such as CIBSE

Suitably qualified professionals [Man 04]: thermographic survey and airtightness testing
Thermography surveys and airtightness testing are to be undertaken by suitably qualified professionals in accordance with the appropriate standards, as follows:

1. Airtightness testing: by professionals with membership of Air Tightness Testing and Measurement Association (ATTMA) OR
2. Thermographic survey: by professionals holding a valid Category 2, e.g. PCN (Personnel Certification in Non-Destructive Testing)

Suitably qualified third party [Mat 01]: An individual who:

1. Is a third party
2. Has received training on using the building LCA tool that is recognised by the tool supplier, and has passed the associated tests or exams (if any)
3. Has completed building LCA for at least three projects for paying customers in the last two years.
4. Is able to interpret construction documentation (drawings, specifications, schedules etc.), which may be evidenced by a suitable construction related qualification or relevant experience.

Suitably qualified security specialist (SQSS): An individual achieving 1–3 or 4 of the following can be considered to be suitably qualified for the purposes of compliance with BREEAM:

1. Minimum of three years' experience in a relevant security profession (in the last five years). This experience must clearly demonstrate a practical understanding of factors affecting security in relation to construction and the built environment, relevant to the type and scale of the project being undertaken.
2. Holds a qualification relevant to security.
3. Maintains a full membership to a relevant professional body, institute or certification scheme that has a professional code of conduct, to which members adhere.
4. A specialist registered with a BREEAM recognised third party licensing or registration scheme for security specialists.

An SQSS may be any practising security professional (e.g. a private security consultant or advisor, an ALO, CPDA, CTSA, or an individual associated with the client team), however they must demonstrate that they hold the experience, qualifications and memberships required by the SQSS criteria.

Specialist commissioning managers: The specialist commissioning manager is a specialist contractor rather than a general sub- contractor, able to independently verify the work carried out by the project team members installing the systems. The specialist commissioning manager can be appointed by the client or the contractor to perform the tasks described under the relevant criteria for buildings with complex building services and systems and defined in their contract. The specialist commissioning manager shall be a professional who, in the opinion of the assessor, has experience or qualifications that enable them to undertake the responsibilities described in this issue. As an example, membership to the Commissioning Specialists Association (CSA) is a relevant qualification.

Sources of external pollution: This includes but is not limited to the following:

1. Highways and the main access roads on the assessed site
2. Car parks, delivery and vehicle waiting bays

3. Other building exhausts, including from building services plant industrial or agricultural processes.

Unregulated energy: Building energy consumption resulting from a system or process that is not 'controlled', i.e. energy consumption from systems in the building on which building regulations do not impose a requirement.

Utility monitoring and management system: Examples include automatic meter reading systems and building energy management systems. Automatic monitoring and targeting is an example of a management tool that includes automatic meter reading and data management.

Zone of influence: Areas of land or water bodies impacted by the site undergoing assessment.