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BREEAM RETAIL 2008
PRE-ASSESSMENT

SOLUM REGENERATION PARTNERSHIP

Proposed Mixed-Use Development
Twickenham Station
London

28/04/2011

Revision B

NB/JL/9090

CONTENTS

1.0 INTRODUCTION

This report summarises the results of, and assumptions made, within the production of a BREEAM Pre-Assessment for the proposed build of four speculative retail units within the mixed use development at Twickenham Station, London. The assessment only considers those retail units with a floor area in excess of 100m^2 as follows: 244m^2, 156m^2, 144m^2 and 133m^2. The smaller retail units less than 100m^2 within the development are excluded from the BREEAM assessment.

The report is based on plans and building layouts provided in the following drawings provided on 21/04/11 by Rolfe Judd;

4674 / T(20)E01 B; 4674 / T(20)E02 B; 4674 / T(20)E03 B; 4674 / T(20)E04 C; 4674 / T(20)E05 B; 4674 / T(20)E06 B

4674 / T(20)P -1 D; 4674 / T(20)P -1M B; 4674 / T(20)P00 B; 4674 / T(20)P0M B; 4674 / T(20)P01 B; 4674 / T(20)P02 B; 4674 / T(20)P03 B; 4674 / T(20)P04 B; 4674 / T(20)P05 B; 4674 / T(20)P06 B; 4674 / T(20)P07 B

4674 / T(20)S01 B; 4674 / T(20)S02 B; 4674 / T(20)S03 B; 4674 / T(20)S04 B

The report will explain the importance of, and methodology behind, the BREEAM assessment criteria.

The report will detail the project specific requirements to achieve the mandatory credits to attain the desired Excellent BREEAM Rating, before going on to detail the recommended requirements for tradable credits which, within the experience of the assessor, represent the most efficient ‘road-map’ to achieving the required BREEAM Excellent Rating.

A summary of the recommended targeted credits is to be found in the Appendix.

Throughout the report, reference will be made to the evidence required for the successful delivery of each credit, although more detail of these evidential requirements will be outside of the scope of this report and provided in an initial design stage assessment report.

Due to the nature of the pre-assessment being undertaken at an early stage, assumptions have been made and these will all be clearly noted within the body of this report.

2.0 BREEAM

Context

BREEAM is a holistic measure of the sustainability of both new and majorly refurbished non-domestic buildings. BREEAM is the world's most widely used environmental method and sets the standard for best practice in sustainable design.

The aim of BREEAM is to mitigate the impacts of buildings on the environment, to enable buildings to be recognised for their environmental benefits, to provide a credible environmental label for buildings, and to stimulate demand for sustainable buildings.

The objectives of BREEAM are to provide market recognition for low environmental impact buildings, to ensure best environmental practice is incorporated in buildings, to set criteria and standards surpassing those required by regulations, to challenge the market to provide innovative solutions to minimise the environmental impact of the built environment, to raise awareness of the benefits of low environmental impact buildings to owners, occupants and operators, and to allow organisations to demonstrate progress towards corporate environmental objectives.

How BREEAM Works

BREEAM is made up of nine categories, and several issues are covered within each category, with credits available for meeting the particular criteria of that issue.

Each category has a weighting factor for which the proportion of the maximum credits achieved in that category is multiplied by and then summed across all categories to achieve the final BREEAM Rating percentage.

Category	Weighting	Approximate weighted value of 1 credit
Management	12.0%	1.20
Health & Wellbeing	15.0%	1.15
Energy	19.0%	0.83
Transport	8.0%	0.80
Water	6.0%	1.00
Materials	12.5%	0.96
Waste	7.5%	1.07
Land Use & Ecology	10.0%	1.00
Pollution	10.0%	0.83

There are three types of credit; mandatory, tradable and innovation.

The mandatory credits differ depending on the target BREEAM rating and must be achieved in order to attain the required rating.

The building must score the rest of the required credits from the tradable or innovation credits. There are no restrictions within BREEAM on which tradable credits are achieved.

Innovation credits are also available for certain categories and for innovation in areas not currently covered by any BREEAM categories; 1% is added to the overall percentage points score for each innovation credit achieved.

The mandatory criteria will be discussed in chapter 3.0 before consideration of the tradable credits in chapter 4.0 and the innovation credits in chapter 5.0.

The BREEAM levels can be achieved through scoring percentage points as follows (assuming mandatory requirements are met);

Percentage Points	Code Rating
<30	*UNCLASSIFIED*
≥30	*PASS*
≥45	*GOOD*
≥55	*VERY GOOD*
≥70	*EXCELLENT*
≥85	*OUTSTANDING**

*there are additional criteria required to achieve this rating, including providing information to formulate a case study and a regular post-occupancy assessment to maintain the *Outstanding* rating.

It is recommended to aim to surpass the minimum percentage points target at the pre-assessment stage as there are frequently credits targeted at this stage which may not be achievable for the completed building.

BREEAM Site Assessment of Multiple Units

A site assessment can be performed where multiple units are assessed together.

For this approach the worst case unit must be used for the basis of the assessment and the individual required measures to achieve each credit must be implemented on each unit where applicable, this approach is assumed for the basis of this pre-assessment.

BREEAM Shell & Core Assessments

The proposed development assessed within this report consists of shell units which are intended to be fitted out by the future occupier in order to meet the building occupiers' needs.

The future tenants are not known therefore there are two options available in order to achieve certain BREEAM credits. These are:

1. Green Lease Agreement

2. Green Building Guide

In some cases a non-legally binding Green Building Guide can be used, however only half of the available credits for an issue can be achieved with this approach and certain mandatory elements for BREEAM *Excellent* such as HEA 4, HEA 12, ENE 2 and WAT 2 require a Green lease Agreement in order to achieve the required credits.

It is recommended to produce a draft Green Lease Agreement and Green Building Guide at the earliest possible opportunity during the design stage to ensure that any technical or legal difficulties can be considered at an early stage where alternative credits may still be available.

3.0 MANDATORY REQUIREMENTS

3.1 MANAGEMENT – COMMISSIONING

In order to achieve any BREEAM Rating it is mandatory that one credit is achieved on this issue. It is proposed that the Green Building Guide is used for evidence on this issue and as such, it will be necessary to ensure that the Green Building Guide contains specific guidance regarding an appropriate team member being appointed to monitor the commissioning of the building and building services to ensure, and collect evidence to prove, that commissioning is carried out in line with current best practice. In addition, seasonal commissioning responsibilities should also be covered in full.

3.2 MANAGEMENT – CONSIDERATE CONSTRUCTORS

In order to achieve BREEAM *Excellent* it is required that at least one credit is obtained for this issue.

3.3 MANAGEMENT – BUILDING USER GUIDE

In order to achieve BREEAM *Excellent* it is required that a Building User Guide is produced to inform building occupants about the operation and environmental performance of the building.

3.4 HEALTH – HIGH FREQUENCY LIGHTING

In order to achieve any BREEAM Rating it is mandatory for high frequency ballasts to be fitted on all fluorescent and compact fluorescent lamps.

3.5 HEALTH – MICROBIAL CONTAMINATION

In order to achieve any BREEAM Rating it is mandatory to provide evidence which demonstrates that the risk of waterborne and airborne legionella contamination has been minimised.

3.6 ENERGY – REDUCTION OF CO_2 EMISSIONS

In order to achieve BREEAM *Excellent* it is required that all assessed units achieve an EPC rating of 40/B or better.

3.7 ENERGY – SUB-METERING OF SUBSTANTIAL ENERGY USES

In order to achieve at least a *Very Good* BREEAM Rating it is mandatory to provide direct sub-metering of energy uses within each retail unit. Accessible energy sub-meters labelled with the energy consuming end-use are required for the following; space heating, domestic hot water, cooling, lighting, small power and any other major energy consuming items.

3.8 ENERGY – REDUCTION OF CO_2 EMISSIONS

In order to achieve BREEAM *Excellent* it is required that an LZC feasibility study is carried out by an energy specialist to establish the most appropriate local LZC energy source and based on such recommendations, an LZC system is specified and installed.

3.9 WATER – WATER CONSUMPTION

In order to achieve a BREEAM Rating of *Good* or higher then it is mandatory to ensure that all WCs have an effective flush volume (based on a 1:3 *full flush:reduced flush* ratio) of 4.5 litres or less. It must also be ensured that where dual flush WCs are specified they have appropriate symbols or guidance instructing the user on the appropriate use of the flushing device.

3.10 WATER – WATER METER

A further mandatory water requirement, in order to achieve a BREEAM Rating of *Good* or higher, is to demonstrate that a pulsed output water meter is installed on the mains water supply to each unit.

3.11 WASTE – STORAGE OF RECYCLABLE WASTE

In order to achieve BREEAM *Excellent* it is required that dedicated recyclable material storage space is provided for the retail units.

3.12 ECOLOGY – MITIGATING ECOLOGICAL IMPACT

In order to achieve BREEAM *Very Good* or higher it is mandatory to demonstrate that the ecological change to the site due to the development is minimal. The evidence for demonstrating this mandatory credit is through the BREEAM Assessor or a Suitably Qualified Ecologist assessing the change in ecological value due to the construction of the development.

4.0 TRADABLE REQUIREMENTS

4.1 MANAGEMENT

MAN 1 - COMMISSIONING

1 OF 2 CREDITS TARGETED

Both credits are targeted as a part of meeting the Management mandatory requirements for all BREEAM ratings; details of which are provided in Chapter 3.0.

The requirements should be included in the Green Building Guide; hence only half the value (1 out of 2) of the credits is awarded.

MAN 2 – CONSIDERATE CONSTRUCTORS

2 OF 2 CREDITS TARGETED

It has been assumed that the main construction contractors will make a commitment to go significantly beyond best practice within the Considerate Constructors Scheme (CCS) or any other nationally or locally recognised similar certification scheme. A CCS score of at least 32, with no less than 3, in each section must be achieved.

To meet the design stage evidence the main construction contractor should be bound by specification to achieve the required CCS score of at least 32 with no less than 3 in each section and confirmation of registration of the site with CCS prior to commencement of the construction phase must be provided.

MAN 3 – CONSTRUCTION SITE IMPACTS

4 OF 4 CREDITS TARGETED

It is assumed that evidence will be available to demonstrate that 80% of the site timber is responsibly sourced and that 100% of the site timber is legally sourced, and so the first credit can be awarded.

It is also assumed that at least six of the following seven measures are implemented in order to minimise the environmental impact of the construction site; measures c through g are thought to be possible without significant additional cost implications:

a. Monitor, report and set targets for CO_2 or energy arising from site activities.
b. Monitor, report and set targets for CO_2 or energy arising from transport to and from site.
c. Monitor, report and set targets for water consumption arising from site activities.
d. Implement best practice policies in respect of air (dust) pollution arising from the site.
e. Implement best practice policies in respect of water (ground and surface) pollution occurring on the site.
f. Main contractor has an environmental materials policy, used for sourcing of construction materials to be utilised on site.
g. Main contractor operates an Environmental Management System.

It is recommended that compliance with this issue is enforced within the main contractor's specification and by selecting a contractor with the relevant credentials.

MAN 4 – BUILDING USER GUIDE

1 OF 1 CREDIT TARGETED

It is assumed that a simple non-technical guide, meeting the BREEAM User Guide Contents specification, will be produced to inform building occupants about the operation and environmental performance of the building.

The guide must be developed as part of the shell contract and include all relevant sections in accordance with BREEAM guidelines and completed as far as possible given the services and fabric installed at shell stage, so that it can be handed over to the fit-out team who will then be able to complete the relevant sections of the fit-out strategy before handing over to the occupier.

Design stage evidence criteria can be satisfied by a specification clause confirming the requirement to develop a building user guide and that the scope of the guide's contents will meet the BREEAM criteria for this credit.

MAN 8 – SECURITY

1 OF 1 CREDIT TARGETED

It has been assumed that there has been a consultation with an Architectural Liaison Officer (ALO) or Crime Prevention Design Advisor (CPDA) from the Local Police Force regarding the design of the building and its parking facilities at the concept design stage (RIBA Stage C) and the recommendations made along with the principles and guidance of *Secured by Design* will be embodied into the final design.

The design stage criteria requires detailed documentary evidence confirming that this consultation has taken place and that recommendations are being implemented.

4.2 HEALTH AND WELLBEING

HEA 1 – DAYLIGHTING

1 OF 1 CREDIT TARGETED

It is assumed that, due to a high ratio of glazing to floor area in each of the retail units, a point daylight of greater than 2% can be achieved for more than 35% of sales and common spaces.

Daylight calculations will be required as design stage evidence for this credit.

HEA 4 – HIGH FREQUENCY LIGHTING

1 OF 1 CREDIT TARGETED

It is assumed that all lighting systems will be fitted with high frequency ballasts such that this mandatory credit can be achieved.

This requirement should be specified within the Green Lease Agreement.

HEA 5 – INTERNAL AND EXTERNAL LIGHTING LEVELS

0.5 OF 1 CREDIT TARGETED

It is assumed that all lighting will be designed and installed to meet CIBSE recommended illuminance levels. This credit requires that illuminance levels comply with CIBSE Code for Lighting 2006 in all

internal areas and with CIBSE Lighting Guide 6 *'The Outdoor Environment'* for all lighting in external areas within the construction zone.

This requirement should be included in the Green Building Guide for internal lighting and within the specification for external lighting; hence half the value of the credit is awarded.

HEA 8 – INDOOR AIR QUALITY

0 OF 1 CREDIT TARGETED

It is believed that the requirements to achieve this credit will be difficult to meet due to the sites proximity to sources of external pollution; notably nearby roads and railway lines. It is therefore recommended that this credit is given no further consideration.

HEA 9 – VOLATILE ORGANIC COMPOUNDS

0.5 OF 1 CREDIT TARGETED

It is assumed that evidence will be available to demonstrate that the emissions of Volatile Organic Compounds (VOCs) from all key internal finishes and fittings comply with best practice levels; hence, one credit can be awarded.

This requirement should be included in the Green Building Guide; hence half the value of the credit is awarded.

HEA 10 – THERMAL COMFORT

0.5 OF 1 CREDIT TARGETED

It is recommended that a computer simulated dynamic thermal analysis of each unit is carried out to demonstrate predicted levels of occupant thermal comfort. This should be done using software selected and applied in accordance with *CIBSE AM11 Building Energy and Environmental Modelling*.

This requirement should be included in the Green Building Guide; hence half the value of the credit is awarded.

HEA 12 – MICROBIAL CONTAMINATION

1 OF 1 CREDIT TARGETED

It is assumed that evidence will be available to show that the risks of waterborne and airborne legionella contamination will be minimised as compulsory to meet the mandatory requirement for all BREEAM ratings.

This requirement should be specified within the Green Lease Agreement.

4.3 ENERGY

ENE 1 – REDUCTION OF CO_2 EMISSIONS

6 OF 15 CREDITS TARGETED

It is assumed that the mandatory requirement of this issue to achieve an EPC rating of at least 40(B) will be achieved through energy efficient building design, gas-fired CHP and the use of the Green Lease Agreement, which can ensure energy efficient fit-out.

ENE 2 – SUB-METERING OF SUBSTANTIAL ENERGY USES

1 OF 1 CREDIT TARGETED

It is assumed that accessible energy sub-meters that are clearly labelled will be installed for the following; space heating, domestic hot water, cooling, lighting, small power and any other major energy consuming items in accordance with the mandatory requirements for a BREEAM *Very Good* rating.

In the case of lighting and small power, these may be sub-metered together where supplies are taken at floor or department level.

As the retail units are to be fitted out by future tenants, of which the works will be outside the main contract of the building development, it will be required that a legally binding Green Lease Agreement is drafted by the developers and signed by any future tenant such that they are obliged to meet the requirements of this BREEAM issue.

ENE 3 – SUB-METERING OF HIGH ENERGY LOAD AND TENANCY AREAS

1 OF 1 CREDIT TARGETED

It is assumed that accessible sub-meters covering the energy supply to all tenanted retail units will be provided and that all meters are labelled with the end-use. It will be required that all heat (for space heating and domestic hot water end-uses) provided by centralised plant is metered for each retail unit, as well as incoming electrical supplies.

Design stage evidence required includes marked-up drawings and site plan detailing building areas by department/function and/or tenancy and the location of meters. Also required is a specification document or technical drawing(s) confirming the metering arrangements for each tenancy area and the type of meter specified.

In addition, in the retail unit over 200m^2, sufficient sub-metering will be required to allow for monitoring of the relevant function areas/departments within the unit. This requirement should be included in the Green Lease Agreement.

ENE 4 – EXTERNAL LIGHTING

1 OF 1 CREDIT TARGETED

It is assumed that all external lighting is energy efficient with a luminous efficacy of at least 50 lamp lumens/circuit Watt, when Ra is greater than or equal to 60, or with luminous efficacy of at least 60 lamp lumens/circuit Watt, when Ra is less than 60.

It is also assumed that external lighting to the car park areas and associated roads has a luminous efficacy of at least 70 lamp lumens/circuit Watt, when Ra is greater than or equal to 60, or with luminous efficacy of at least 80 lamp lumens/circuit Watt, when Ra is less than 60.

There are also requirements for the energy efficiency of any illuminated signs, if provided.
Further to the efficacy of the external lighting provided, specific controls are also required to earn the credit. These involve use of either a time switch or daylight sensor to ensure that external lighting is only used outside of daylight hours.

Design stage evidence required includes marked-up site plan and building elevations showing the location and purpose of all external lighting fittings. Also required is a lighting specification or lighting

designer's calculations confirming the lamp lumens/circuit Watt for each type of fitting as well as the colour rendering index Ra and external lighting control strategy.

This requirement should be mentioned in the specification.

ENE 5 – LOW ZERO CARBON TECHNOLOGIES

2 OF 3 CREDITS TARGETED

The energy strategy for the development includes the use of a centralised gas-fired CHP plant and a roof-mounted photovoltaic array to reduce the Building Emission Rate (BER) of the retail units by an average of greater than 10% compared to the *LEAN* emissions baseline; hence it is assumed that two credits can be achieved for this issue.

Design stage evidence required includes a copy of the feasibility report by an energy specialist completed during the design stages, drawings and further detailed documentary evidence confirming the installation of the LZC technologies and calculations, normally produced in *approved energy modelling software*, demonstrating the achieved reduction in carbon dioxide emissions.

This requirement should be specified within the Green Lease Agreement to ensure that the connection provided to the site-wide heat network must be utilized to provide both space heating and hot water efficiently.

4.4 TRANSPORT

TRA 1 – PROVISION OF PUBLIC TRANSPORT

5 OF 5 CREDITS TARGETED

Due to its close proximity to Twickenham Central railway station and the bus services that link with it, it is anticipated that the retail development will achieve an Accessibility Index of 18 or greater; therefore achieving all five credits of this issue.

It is the responsibility of the BREEAM assessor to verify this information and make the final calculation.

TRA 2 – PROXIMITY TO AMENITIES

1 OF 1 CREDIT TARGETED

This credit can be achieved as all of the following amenities can be found within 500m of the proposed retail outlets:

1. Grocery shop and/or food outlet
2. Post box
3. Cash machine

It is the responsibility of the BREEAM assessor to verify and provide sufficient evidence of these facilites. Due to the town centre location it is assumed that these requirements can be met for the proposed development.

TRA 3 – CYCLIST FACILITIES

1 OF 2 CREDITS TARGETED

The drawings provided demonstrate that one credit can be awarded as covered, secured and well lit

cycle storage facilities will be provided within the grounds of the development and will be sufficient for 10% of each unit's occupants based upon an assumed occupancy of 1 person per 10m^2 net lettable area.

Further details of the proposed cycle storage facilities will be required for design stage evidence including information on the type, dimensions and layout of the cycle racks and confirmation that lighting for the facility is in accordance with BS5489 Part 1.

TRA 4 – PEDESTRIAN AND CYCLE SAFETY

2 OF 2 CREDITS TARGETED

It is assumed that two credits can be achieved for safe pedestrian and cyclist access.

The BREEAM criteria should be consulted to ensure that access is designed to meet the full requirements.

The design stage evidence can generally be satisifed through site plan and speciifciation documents, however, the requirements of this credit are detailed and the BREEAM handbook should be consulted to ensure that the site plan and specification include the required features to ensure pedestrian and cyclist safety.

TRA 5 – TRAVEL PLAN

1 OF 1 CREDIT TARGETED

It is anticipated that a Travel Plan is to be produced at the feasibility/design stage and will consider a range of travel options for users of each unit, and that a reduction of user reliance on forms of travel that have the highest environmental impact will be actively encouraged.

It is assumed that the Travel Plan will broadly address the following issues:

a. Existing travel patterns and opinions of the existing site users towards walking and cycling in order to identify constraints and opportunities.
b. Travel patterns of future building users.
c. Current local environment for walkers and cyclists, including visitors accompanied by young children.
d. Disabled access
e. Public transport links
f. Current cyclist facilities.

The travel plan should include a package of measures for the proposed development based on its findings in order to meet the travel plan objectives of reducing car-based transport.

The following are some site specific examples which may be appropriate:

a. Priority parking for car sharers
b. Dedicated and convenient cycle storage and changing facilities
c. Lighting, landscaping and shelter to make pedestrian and public transport areas pleasant

The travel plan is required for design stage evidence along with a marked up site plan demonstrating that the recommendations of the travel plan are implemnted within the design of the site.

4.5 WATER

WAT 1 – WATER CONSUMPTION

1.5 OF 3 CREDITS TARGETED

In order to achieve a BREEAM Rating of *Good* or higher then it is mandatory to ensure that All WCs have an effective flush volume (based on a 1:3 *full flush:reduced flush* ratio) of 4.5 litres or less. In order to achieve further credits it is assumed that this mandatory requirement is exceeded and all WCs have an effective flush volume of 3 litres or less.

It must also be ensured that where dual flush WCs are specified they have appropriate symbols or guidance instructing the user on the appropriate use of the flushing device.

In addition to the WC specification, it is assumed that the following measures will be specified:

- All taps except kitchen, cleaners sink and external taps have a maximum flow rate of less than 6 litres/min for a water pressure of 0.3 MPa and are at least one of the following; timed automatic shut off; electronic sensor taps; low-flow screw-down/lever taps; spray taps.

- All showers, where specified, have a measured flow rate not exceeding 9 litres/min for a water pressure of 0.3 MPa assuming a delivered water temperature of 37°C.

- All urinals are either waterless, ultra low flush or are fitted with individual presence detectors that operate the flushing control after each use.

This requirement should be included in the Green Building Guide; hence half the value of the credits is awarded.

WAT 2 – WATER METER

1 OF 1 CREDIT TARGETED

As it is a mandatory requirement in order to achieve a BREEAM Rating of *Good* or higher, it is assumed that a pulsed output water meter is installed on the mains supply to each retail unit and to shared common and service areas (covering any shared toilet blocks, storage, delivery and waste disposal areas).

This requirement should be specified; the specification and drawings marking the meter location are required for design stage evidence.

WAT 3 – MAJOR LEAK DETECTION

1 OF 1 CREDIT TARGETED

It is assumed that a leak detection system capable of detecting major leaks on the water supply will be installed and will be capable of the following:

a. Audible when activated
b. Activated when the flow of water passes through the water meter/data logger 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.

The scope and performance of the leak detection system should be stated within the specification in order to satisfy the design stage evidence.

WAT 4 – SANITARY SUPPLY SHUT OFF

0.5 OF 1 CREDIT TARGETED

It is anticipated that shut-off solenoid valves, in communication with infra-red movement detectors or any other proximity sensors, will be installed to control water supply to toilet areas; hence a credit can be awarded.

This requirement should be included in the Green Building Guide; hence half the value of the credit is awarded.

WAT 5 – WATER RECYCLING

2 OF 2 CREDITS TARGETED

One credit can be achieved for this issue if a grey-water recycling system is required within a Green Lease Agreement. The grey-water system should be sized to meet at least 10% of the urinal and WC flushing demand and should collect from at least 80% of hand basins and showers.

4.6 MATERIALS

MAT 1 – MATERIALS SPECIFICATION (MAJOR BUILDING ELEMENTS)

4 OF 4 CREDITS TARGETED

The BRE MAT1 calculator is used to calculate the credits for this issue depending on the Green Guide 2009 rating of the external walls, roof, floors and windows.

It is assumed that a Green Guide rating as follows is achieved for the three key building elements;

Roof	A+
External Walls	A
Windows	A

For further information of which constructions achieve the required ratings see the BRE Green Guide website http://www.bre.co.uk/greenguide.

Drawings and/or specification documents detailing the proposed constructions and areas for the key building elements are required for the design stage evidence.

MAT 2 – HARD LANDSCAPING AND BOUNDARY PROTECTION

1 OF 1 CREDIT TARGETED

It is anticipated that external hard landscaping and boundary protection materials will be specified to have a low environmental impact; hence this credit can be awarded.

To meet the criteria at least 80% of all external hard landscaping and boundary protection materials must achieve an A or A+ rating in the *Green Guide to Specification*.

Any existing exterior hard landscaping, boundary protection or natural features can be awarded with an A+ rating.

Drawings and/or specification documents detailing the proposed constructions and areas for the applicable hard landscaping and boundary elements are required for the design stage evidence.

MAT 3 – RE-USE OF BUILDING FAÇADE

0 OF 1 CREDIT TARGETED

It is not anticipated that any of the façade of the proposed building will be re-used from an existing building; hence no credits can be awarded.

MAT 4 – RE-USE OF BUILDING STRUCTURE

0 OF 1 CREDIT TARGETED

It is not anticipated that any of the structure of the proposed building will be re-used from an existing building; hence no credits can be awarded.

MAT 5 – RESPONSIBLE SOURCING OF MATERIALS

3 OF 3 CREDITS TARGETED

It is assumed that 80% of the materials required for the construction of each of the building elements (Structural frame, ground floor, roof, external and internal walls, foundation/substructure) would be responsibly sourced.

In order to get credits for this issue, all materials should be sourced from suppliers/manufacturers capable of providing certification for BES6001, EMS (EMAS/ISO 14001) or any other equivalent.
All timber should be sourced from suppliers capable for providing FSC Certificate with CoC number.

This requirement should be specified and the evidence in the form of certificates or purchase orders with certificate numbers and quantity of materials should be provided.

MAT 6 – INSULATION

1 OF 2 CREDITS TARGETED

It is assumed that evidence will be provided demonstrating that any thermal insulation products specified for the proposed retail units in the following building elements; external walls; ground floor; roof; building services, have a low embodied impact relative to their thermal properties, determined by the *Green Guide to Specification* ratings. This will be demonstrated with an *Insulation Index* for the building insulation assumed to be at least 2.

In addition, at least 80% of the thermal insulation used in the building elements identified must be responsibly sourced.

The above requirements should be included in the Green Building Guide where they do not form part of the shell and core build. Where insulation materials are specified as part of the shell and core build then meeting this requirement should be ensured through the specification and drawings.

As part of the evidence is from the Green Building Guide; hence only half of the credits can be awarded.

MAT 7 – DESIGNING FOR ROBUSTNESS

1 OF 1 CREDIT TARGETED

It is assumed that protection will be given, in the form of bollards and base plinth detailing etc, to vulnerable internal and external areas exposed to high pedestrian traffic, vehicular and trolley movements; hence this credit can be awarded.

In order to satisfy the design stage evidence requirements drawings need to be provided highlighting vulnerable areas of the building and specifying appropriate durability measures.

4.7 WASTE

WST 1 – CONSTRUCTION SITE WASTE MANAGEMENT

3 OF 4 CREDITS TARGETED

It is assumed that the amount of construction waste generated per 100m^2 (gross internal floor area) will be in the range 9.2 - 12.9m^3 (actual volume) and of weight 4.7 - 6.5 tonnes.

These targets do not include demolition or excavation waste.

In addition, it is required that a Site Waste Management Plan will be produced to contain the following information:

a. The target benchmark for resource efficiency, i.e. m^3 of waste per 100m^2 or tonnes of waste per 100m^2 (as specified above)
b. Procedures and commitments for minimising non-hazardous waste in line with the benchmark
c. Procedures for minimising hazardous waste
d. Procedures for monitoring, measuring and reporting hazardous and non-hazardous site waste
e. Procedures for sorting, reusing and recycling construction waste into defined waste groups, either on site or through a licensed external contractor
f. The name or job title of the individual responsible for implementing the above.

The third credit of this issue can be achieved if at least 75% by weight or 65% by volume of non-hazardous construction waste generated by the project has been diverted from landfill and either:

a. Reused on site (in-situ or for new applications)
b. Reused on other sites
c. Salvaged/reclaimed for reuse
d. Returned to the supplier via a ‘take-back’ scheme
e. Recovered from site by an approved waste management contractor and recycled

Additionally, waste materials will be sorted into separate key waste groups (according to the waste streams generated by the scope of the works) either onsite or offsite through a licensed contractor for recovery.

Also, an innovation credit is considered to be achieved for this issue, details mentioned in Section 5.

Additional clauses may be required within the Main Contractors Contract in order to ensure that this issue is complied with.

WST 2 – RECYCLED AGGREGATES

1 OF 1 CREDIT TARGETED

The proportion of recycled and secondary grade aggregate specified of the total high-grade aggregate uses of the building is unknown, but it is assumed that it will be in excess of 25% (by weight or volume); hence the credit can be awarded.

It should be noted that use of crushed masonry as a fill material for general landscaping is not considered high grade and would not count as part of the 25% requirement of this issue.

Additional clauses may be required within the Main Contractors Specification to ensure that the requirements of this issue are met.

A summary of the aggregate use proposed along with confirmation of the source of recycled or secondary aggregates is required for design stage evidence.

WST 3 – RECYCLABLE WASTE STORAGE

1 OF 1 CREDIT TARGETED

It is anticipated that a dedicated storage space catering for a minimum of six recyclable material types, generated by each unit during occupation, will be provided. Each unit's facility will be compliant with the following criteria:

a. Clearly labelled for recycling
b. Placed within accessible reach of each unit
c. Sized according to the area of each retail unit and the predicted volume of waste that will arise from that area.
d. In a location with good vehicular access to facilitate collections.

The design stage evidence requires a marked up site plan showing the dedicated recyclable storage area and a description of its labelling.

WST 5 – COMPOSTING

1 OF 1 CREDIT TARGETED

As space is limited on this site, then this credit can be achieved if there is a dedicated segregated space for storing compostable food waste prior to collection and delivery to an alternative composting facility and at least one water outlet is provided for cleaning in and around the facility.

A marked up site plan and/or specification showing the location size and space of the composting vessel and a nearby water outlet for cleaning is required for the design stage evidence.

4.8 LAND USE AND ECOLOGY

LE 1 – RE-USE OF LAND

1 OF 1 CREDIT TARGETED

As the development is to be built upon the site of an existing railway station and its associated car park and surrounding grounds it can be safely assumed that the majority of the development's footprint (at least 75%) is on an area of land which has previously been developed; hence the available credit can be awarded.

Reports, site plans and photographs are required to show the existing footprint of developed land pre-development in order to determine that this credit can be awarded at the design stage.

LE 2 – CONTAMINATED LAND

0 OF 1 CREDIT TARGETED

Chapter 11 of the Environmental Statement investigates the potential impacts of the proposed development on soil and ground conditions. It states that the overall risk rating for the site regarding contamination is currently low to medium; hence this credit it unlikely to be achieved.

LE 3 – ECOLOGICAL VALUE OF SITE AND PROTECTION OF ECOLOGICAL FEATURES

0 OF 1 CREDIT TARGETED

Chapter 13 of the Environmental Statement investigates the potential impacts of the proposed development on the site and its surrounding's ecological features. It finds that there will be a relatively small scale of impact (in terms of habitat affected) during development and this is unlikely to result in an *overall* adverse effect on the integrity of the site or the nearby River Crane. However, the loss of riverside trees (though outside the site boundary) to facilitate a footpath installation has the potential to destroy/disturb a number of species habitats; hence it is believed that this credit cannot be awarded.

LEA 4 – MITIGATING ECOLOGICAL IMPACT

2 OF 2 CREDITS TARGETED

In order to achieve a *Very Good* or higher BREEAM Rating it is a mandatory requirement to demonstrate that the ecological change to the site due to the development is minimal (i.e. where the change in ecological value is less than zero and equal to or greater than minus nine plant species) and this is supported by Chapter 13 of the Environmental Statement.

It is, however, assumed that the ecological value of the site will be improved by the proposed development if the ecologist's recommendations are followed.

The design stage evidence requires detailed documentary evidence of the site prior to development; this should be included within the survey report performed by the ecologist. The ecologist's report should also include a confirmation of the landscape and vegetation plot types and areas before and after development.

LE 5 – ENHANCING SITE ECOLOGY

2 OF 3 CREDITS TARGETED

Chapter 13 of the Environmental Statement provides appropriate recommendations for the protection and enhancement of the site's ecology, hence two credits can be achieved.

Drawings and specification or a formal letter is required confirming that the ecologist's recommendations will be implemented.

LE 6 – LONG TERM IMPACT ON BIODIVERSITY

2 OF 2 CREDITS TARGETED

It is anticipated that a Suitably Qualified Ecologist will be appointed prior to the commencement of site activities to produce a 5 year landscape and habitat management plan for the building occupants

and to confirm that all relevant UK and EU legislation relating to protection and enhancement of ecology have been complied with.

In additional to the above requirements, at least four of the following measures must be implemented. However, if the ecologist's findings conclude that some of these measures are not appropriate for the site then two credits can be awarded by meeting all applicable items.

1. Contractor nominates a 'Biodiversity Champion' with authority to influence the site activities in order to minimise environmental impact in line with the Ecologist recommendations.

2. Contractor trains workforce on how to protect site ecology based upon the Ecologists recommendations.

3. The Contractor records actions, and their effectiveness, taken to protect biodiversity at key stages of construction.

4. A new ecologically valuable habitat is created appropriate to the local area.

5. Where flora and/or fauna habitats exist on site the Contractor programmes site works to minimise disturbance to wildlife.

As there are several items required to meet this credit where responsibilities are put onto the Contractor then there should be relevant clauses in the Main Contract Specification to ensure that these items can be easily implemented.

4.9 POLLUTION

POL 1 – REFRIGERANT GWP – BUILDING SERVICES

0.5 OF 1 CREDIT TARGETED

It is assumed that a Green Building Guide will be drafted and will state that where specified; comfort cooling systems will use refrigerants with a GWP of no greater than 5.

Only half of the credit can be awarded due to the use of a Green Building Guide.

POL 2 – PREVENTING REFRIGERANT LEAKS

1 OF 2 CREDITS TARGETED

It is assumed that a Green Building Guide will be drafted and will state that where specified;

1. Systems using refrigerants are contained in a moderately air tight enclosure (or a mechanically ventilated plant room), and a refrigerant leak detection system is installed covering high-risk parts of the plant.

OR

2. An automatic permanent refrigerant leak detection system is specified, which is NOT based on the principle of detecting or measuring the concentration of refrigerant in air.

In addition to this, the Green Building Guide should specify the detailed requirements of the systems required to achieve this credit. This credit can, however, be awarded by default if CO_2 or ammonia is

used as a refrigerant or if the refrigerant charge is less than 5 kg.

As part of the evidence is from the Green Building Guide; hence only half of the credits can be awarded.

POL 4 – NO_X EMISSIONS FROM HEATING SOURCE

3 OF 3 CREDITS TARGETED

As space heating is to be provided by gas-fired systems (including CHP) it is anticipated that low NOx emissions (≤40mg/kWh) can be achieved. As the development is to be serviced by a central CHP plant, it is recognised that the replacement of grid-imported electricity with locally generated power acts to further reduce NOx emissions associated with the site; including both from heat and power demand.

The specification confirming the heating systems along with manufacturers information confirming the dry NOx emissions rate in mg/kWh is required for design stage evidence.

POL 5 – FLOOD RISK

3 OF 3 CREDITS TARGETED

From the Environment Agency Flood Map, shown above, it can be seen that the site is located in a low-risk zone where the annual probability of fluvial flooding is less than 1 in 1000 in any given year.

It is assumed that a site specific Flood Risk Assessment (FRA) can confirm to the satisfaction of the local authority and statutory body that the development is appropriately flood resilient and resistant from all sources of flooding and that the ground level of the building, and access to it 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.

Further to this, it is assumed that attenuation 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 predevelopment site and that such measures make an allowance for climate change.

A Flood Risk Assessment (FRA) report by an appropriately qualified hydrological consultant or engineer will be required clarifying that the site is in a low flood risk area from all sources of flooding in order for the design stage credits to be awarded.

POL 6 – MINIMISING WATERCOURSE POLLUTION

1 OF 1 CREDIT TARGETED

In order to achieve this credit the following measures should be taken to avoid watercourse pollution and it is assumed that this will be implemented.

1. Sustainable Drainage Systems (SUDs) or source control systems such as permeable surfaces should be specified where run-off drains are in areas of relatively low risk of watercourse pollution.
2. Oil/petrol separators' should be specified for the surface water drainage systems covering car parks, areas where goods vehicles are parked or manoeuvred, and roads.
3. All water pollution prevention systems are designed in accordance with the recommendations of *Pollution Prevention Guideline 3* and the *SUDS manual* where appropriate.
4. A comprehensive and up-to-date drainage plan of the site will be made available to the building's occupiers.

Site plans and specification are required to confirm the proposed drainage design. A formal letter is also required as part of the design stage evidence confirming that all of the relevant requirements of the credit will be met.

POL 7 – REDUCTION OF NIGHT TIME LIGHT POLLUTION

1 OF 1 CREDIT TARGETED

It is anticipated that evidence will be provided to demonstrate that the external lighting design will be in compliance with the guidance in the *Institution of Lighting Engineers (ILE) Guidance notes for the reduction of obtrusive light, 2005*; hence this credit can be awarded.

The design stage evidence requires a marked up site plan showing the areas of the site which are externally lit and any neighbouring properties which may be affected by night time light pollution.

Either a specification clause or external lighting design is required to ensure that the external lighting design is in compliance with the credit criteria.

POL 8 – NOISE ATTENUATION

0.5 OF 1 CREDIT TARGETED

An initial desktop survey has found that there are noise sensitive (residential) areas within 800 meters of the proposed development. In order to achieve this credit a noise impact assessment must be carried out by a Suitably Qualified Acoustic Consultant in accordance with BS4142:1997, both at the design stage and the post construction stage.

The study must find that the noise levels due to the development are less than the background noise level. If this is initially not the case, then attenuation measures are required to meet the criteria, though the site's proximity to a busy roads and a railway station suggests that background noise levels are likely to be high already.

This requirement should be included within the Green Building Guide for any occupier supplied building services systems, but will also be assessed in terms of the centralised energy centre supplying the retail units.

An acoustician should be commissioned to undertake the relevant analysis on the energy centre which is required for this credit to be awarded. The acoustician should provide a report sufficient to meet the design stage evidence requirements of this credit.

As part of the evidence is from the Green Building Guide; hence only half of the credits can be awarded.

5.0 INNOVATION

Further credits are available within the Management, Health and Wellbeing, Energy, Water, Materials and Waste categories for exceeding the requirements of certain criteria as stated below.

Innovation credits are also available for innovative solutions to solve issues of sustainability within buildings. Consultation with BRE is required in order to make a submission to request any innovation credits other than those detailed below.

5.1 MANAGEMENT

MAN 2 – CONSIDERATE CONSTRUCTORS

0 OF 1 CREDIT TARGETED

It is assumed that a CCS with a score of a least 36 will not be achieved; hence an innovation credit cannot be awarded.

5.2 HEALTH AND WELLBEING

HEA 1 – DAYLIGHTING

0 OF 1 CREDIT TARGETED

It is assumed that further enhanced levels of daylighting are not achieved throughout the occupied floor areas of each building.

5.3 ENERGY

ENE 1 – REDUCTION OF CO2 EMISSIONS

0 OF 2 CREDITS TARGETED

It is believed to be highly unlikely that each unit will achieve a CO_2 index of less than 0 on the benchmark scale. It is therefore not a true zero carbon development; hence no credits can be awarded.

ENE 5 – LOW ZERO CARBON TECHNOLOGIES

0 OF 1 CREDIT TARGETED

It is anticipated that the scale of low or zero carbon technologies that will be installed will not be sufficient to provide a carbon dioxide emissions reduction of at least 20%; hence an innovation credit cannot be awarded.

5.4 WATER

WAT 2 – WATER METER

0 OF 1 CREDIT TARGETED

There are not anticipated to be any high water usage appliances where sub-metering would be appropriate.

5.5 MATERIALS

MAT 1 – MATERIALS SPECIFICATION (MAJOR BUILDING ELEMENTS)

0 OF 1 CREDIT TARGETED

It is assumed that insufficient points will be achieved for the materials specification; hence an innovation credit cannot be awarded.

MAT 5 – RESPONSIBLE SOURCING OF MATERIALS

0 OF 1 CREDIT TARGETED

It is assumed that less than 95% of the assessed materials will be responsibly sourced; hence this credit cannot be awarded.

5.6 WASTE

WST 1 – CONSTRUCTION SITE WASTE MANAGEMENT

1 OF 1 CREDIT TARGETED

It is anticipated that all key waste groups would be identified for diversion from landfill at pre-construction stage SWMP and at least 90% by weight (80% by volume) of non-hazardous construction waste generated by the build would be diverted from landfill and either:

a. Reused on site (in-situ or for new applications)
b. Reused on other sites
c. Salvaged/reclaimed for reuse
d. Returned to the supplier via a ‘take-back’ scheme
e. Recovered from site by an approved waste management contractor and recycled.

6.0 RESULTS

Assuming that the recommendations within this report are implemented and supported with the required evidence; it is anticipated that a BREEAM *Excellent* rating can be achieved with an overall BREEAM score of 74.55%.

Stage of Assessment	BREEAM Score	BREEAM Rating
Pre Assessment	**74.55%**	**EXCELLENT**

Minimum BREEAM Standards					
Rating Level	Pass	Good	Very Good	Excellent	Outstanding
Minimum Standards Achieved	YES	YES	YES	YES	NO

Although the *Excellent* target has been reached in this pre-assessment, it is important to ensure that sufficient credits are targeted such that a reasonable buffer is afforded. This will allow flexibility in the design and build process should circumstances lead to one or several credits being missed unavoidably.

APPENDIX: Summary of Target Credits

CREDIT	Credit Ref.	Assessment Criteria	Credits Available	Credits Targeted	Notes
Management	MAN1	Commissioning	2	1	Green Building Guide
	MAN2	Considerate Constructors	2	2	
	MAN3	Construction Site Impacts	4	4	
	MAN4	Building User Guide	1	1	
	MAN8	Security	1	1	
Management Total Available / Targeted			**10**	**9**	
Health and Wellbeing	HEA1	Daylighting	1	1	
	HEA4	High Frequency Lighting	1	1	Green Lease Agreement
	HEA5	Internal& External Lighting	1	0.5	Green Building Guide
	HEA8	Indoor Air Quality	1	0	
	HEA9	Volatile Organic Compounds	1	0.5	Green Building Guide
	HEA10	Thermal Comfort	1	0.5	Green Building Guide
	HEA12	Microbial Contamination	1	1	Green Lease Agreement
Health and Wellbeing Total Available / Targeted			**7**	**4.5**	
Energy and Carbon dioxide Emissions	ENE1	Reduction of CO_2 Emissions	15	6	Green Lease Agreement
	ENE2	Sub-metering of substantial energy uses	1	1	Green Lease Agreement
	ENE3	Sub-metering of high energy load areas	1	1	Green Lease Agreement
	ENE4	External Lighting	1	1	
	ENE5	Low zero carbon technologies	3	2	Green Lease Agreement
Energy and Carbon Dioxide Emissions Total Available / Targeted			**21**	**11**	

CREDIT	Credit Ref.	Assessment Criteria	Credits Available	Credits Targeted	Notes
Transport	TRA1	Provision of Public Transport	5	5	
	TRA2	Proximity to amenities	1	1	
	TRA3	Cyclist Facilities	2	1	
	TRA4	Pedestrian and cycle safety	2	2	
	TRA5	Travel Plan	1	1	
Transport Total Available / Targeted			**11**	**10**	
Water	WAT1	Water Consumption	3	1.5	Green Building Guide
	WAT2	Water Meter	1	1	Actual Specification
	WAT3	Major Leak Detection	1	1	
	WAT4	Sanitary supply shut off	1	0.5	Green Building Guide
	WAT5	Water recycling	2	2	Green Lease Agreement
Water Total Available / Targeted			**8**	**6**	
Materials	MAT1	Materials Specification	4	4	
	MAT2	Hard Landscaping & Boundary Protection	1	1	
	MAT3	Re-use of Building Facade	1	0	
	MAT4	Re-use of Building Structure	1	0	
	MAT5	Responsible Sourcing of Materials	3	3	
	MAT6	Insulation	2	1	Green Building Guide
	MAT7	Designing for Robustness	1	1	
Materials Total Available / Targeted			**13**	**10**	

CREDIT	Credit Ref.	Assessment Criteria	Credits Available	Credits Targeted	Notes
Waste	WST1	Construction Site Waste Management	4	3	Additional Innovation credit
	WST2	Recycled aggregates	1	1	
	WST3	Recyclable Waste Storage	1	1	
	WST5	Composting	1	1	
Waste Total Available / Targeted			**7**	**6**	**+1**
Land Use and Ecology	LE1	Re-use of Land	1	1	
	LE2	Contaminated Land	1	0	
	LE3	Ecological Value of Site AND Protection of Ecological Features	1	0	
	LE4	Mitigating Ecological Impact	2	2	
	LE5	Enhancing Site Ecology	3	2	
	LE6	Long Term Impact on Biodiversity	2	2	
Land Use and Ecology Total Available / Targeted			**10**	**7**	
Pollution	POL1	Refrigerant GWP	1	0.5	Green Building Guide
	POL2	Preventing Refrigerant Leaks	2	1	Green Building Guide
	POL4	NOx emissions from heating source	3	3	Actual Specification
	POL5	Flood Risk	3	3	
	POL6	Minimising Watercourse Pollution	1	1	
	POL7	Reduction of Night Time Pollution	1	1	Actual Specification
	POL8	Noise Attenuation	1	0.5	Green Building Guide
Pollution Total Available / Targeted			**12**	**10**	