GREENWOOD PLACE AND HIGHGATE ROAD SITE

COMMUNITY RESOURCE CENTRE, CENTRE FOR INDEPENDENT LIVING AND NEW RESIDENTIAL UNITS

SUSTAINABILITY STATEMENT
AUGUST 2013
JOB REF. 1213 GREENWOOD PLACE

Camden Tibbalds Multidisciplinary Team PCKO

tga CONSULTING ENGINEERS

a sustainable future... engineered.

GREENWOOD PLACE & HIGHGATE ROAD SITE:

COMMUNITY RESOURCE CENTRE, CENTRE FOR INDEPENDENT LIVING

AND RESIDENTIAL UNIT

SUSTAINABILITY STATEMENT

REVISION B

Final version by Stewart Park, reviewed by Alex Maguire, issued 9 September 2013

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1.0 INTRODUCTION

1.1 PREAMBLE

A team of construction professional are developing proposals for the demolition of a number of single storey buildings in Greenwood Place and the construction of a new Community Centre building. The team are also preparing proposals for the demolition of the Highgate Centre building, situated on Highgate Road and the construction of a new residential building.

TGA consulting Engineers LLP has been engaged, as part of the Tibbalds multi-disciplinary team, to provide professional design services associated with the redevelopment of Greenwood Estate. TGA's role includes development of the energy and building engineering services strategies for the development.

Development proposals are currently at RIBA stage D

1.2 CAMDEN COUNCIL PLANNING POLICIES

All new building developments in the London Borough of Camden are required to meet minimum standards relating to sustainability, energy efficiency and carbon reduction. This is in line with London wide and national aspirations set by the London Mayor and the UK Government.

In the London Borough of Camden area, sustainability, energy efficiency and carbon reduction all feature in the planning process. Planning guidance on these matters is set out in the Local Development Framework and, in particular, in the following inter-related policy documents:

- CPG3 - Sustainability
- CS13 - Tackling Climate Change Through Promoting Higher Environmental Standards
- DP22 - Promoting Sustainable Design and Construction
- DP23 - Water
- CS16 - Improving Camden's Health and Wellbeing
- DP32 - Air Quality & Camden's Clear Zone

The formulation of a viable design strategy for this project, as defined in this Sustainability Statement, takes into account guidance contained in the above listed documentation.

1.3 SUSTAINABILITY ASSESSMENT TOOLS

New buildings which feature in this project have been assessed using BRE environmental and sustainability standards, BREEAM and Code for Sustainable Homes assessments tools.

1.4 THIS REPORT

The purpose of this report is to identify design strategies and features relating to sustainable design, construction and operation which have been embodied into the development proposals and will be carried forward into the detail design and construction phases of the project and beyond.

In the first instance, the information contained in this report is will enable the local authority Planning Team to consider and understand the measures and features, relating to sustainability, that have been incorporated into the development proposals thus far.

The emphasis in this report is on sustainable design, construction and operation. The specific issue of energy, which come under the general heading of ‘sustainability’ has been covered in a separate document. Refer to a separate document entitled ‘Energy Statement’.

2.0 DEVELOPMENT PROPOSALS

2.1 PROJECT DESCRIPTION

The Greenwood Estate development, located in the Kentish Town area of London, is to be redeveloped and will include two new buildings as follows:

- Greenwood Place Community Centre
- A Residential Building in Highgate Road, Providing 42Nr Individual Dwellings

Greenwood Place Community Centre comprises a 3228m^2, 3-storey day centre building with a roof garden area. This building is to be designed to achieve a BRE BREEAM 'Excellent' rating with the building achieving at least 60% of the un-weighted energy credits.

The residential building is set over 5-storeys and includes 42Nr individual dwellings providing 3559m^2 of residential accommodation. A small roof garden area is being included in this building, also. This building is to be designed to meet Code for Sustainable Homes (CfSH) level 4 rating with the building achieving at least 50% of the un-weighted energy credits.

The Greenwood site is to be developed in two phases with the Community Centre Building being constructed first followed by construction of the Residential Building. To achieve this, redundant building stock on the site will be decommissioned and removed.

The following section of the report describes the key strategies that have been adopted under the general heading of sustainability.

2.2 SUSTAINABILITY FEATURES

Sustainability issues relating to design, construction and operation of the new buildings, has been carefully considered during the early design stages.

The built form, structure and building services proposals reflect and incorporate many of the required features and facilities that will ultimately be included in the completed buildings. The next stage in the design process will involve incorporating those features which, of necessity, are not confirmed until the later design stages.

Issues that have been considered in detail include

- Built form, structure and building services installations
- Energy conservation, energy efficiency and energy supply
- Materials
- Water conservation
- Pollution, air quality and noise
- Wastes
- Land use and Ecology
- Flooding
- Construction site impacts

All of the above items are addressed in the BREEAM and Code for Sustainable Homes assessment tools.

Separate documentation has been produced to address the specific subject matter of air quality, noise, flooding and Ecology.

3.0 BREEAM/CODE PRE ASSESSMENT OUTCOMES

3.1 GREENWOOD PLACE COMMUNITY CENTRE

A preliminary assessment under the BRE environmental and sustainability standard BREEAM, New Construction 2011, has been produced for this building. A copy of the pre-assessment report, produced by Avoca, is included in appendix A.

The Community Centre building achieves **BREEAM 'Excellent'** rating with a score of 75.15%. A minimum required score of 70% must be achieved,

Specific design features that have been incorporated into the stage D design include

- High thermal mass
- Natural ventilation strategies in summertime to maintain comfortable internal temperature conditions
- Good day lighting in interior spaces
- Night time ventilation/cooling strategy
- Effective use of winter sunshine on southern elevations
- Effective shading strategies to reduce unwanted solar heat admission via curtain walling and glazed roof areas
- Community heating by combined heat and power unit and high efficiency condensing gas fired boilers
- Building integrated photo voltaic installation (BIPV)

Cooling will be provided in high use IT rooms and IT equipment rooms, only

The building envelope is to comprise highly insulated elements with improved u-values over minimum statutory standards.

The building will be highly air-tight, preventing uncontrolled and wasteful air infiltration.

A green roof feature has been incorporated onto part of the roof area.

A small scale rainwater harvesting system is included. This system is for watering of the roof level green spaces, only.

3.2 HIGHGATE ROAD RESIDENTIAL BUILDING

A preliminary assessment under the BRE environmental and sustainability standard - Code for Sustainable Homes (CfSH), has been produced for this building. A copy of the pre-assessment report, produced by Avoca, is included in appendix B.

The Highgate Road Residential Building achieves **CfSH level 4** with a score of 69.06%. A minimum required score of 68% must be achieved.

Specific design features that have been incorporated into the stage D design include:

- Natural ventilation strategies in summertime to maintain comfortable internal temperature conditions (upper levels only)
- Good day lighting in interior spaces

- Effective use of winter sunshine on southern elevations
- Community heating by combined heat and power unit and high efficiency condensing gas fired boilers
- Solar photo voltaic panels and flat plate solar thermal panels on roof areas

Comfort cooling has been included in ground level dwellings due to issues of poor air quality in Highgate Road and a need to keep ground floor windows in this elevation, closed.

The building envelope is to comprise highly insulated elements with improved u-values over minimum statutory standards.

The building will be highly air-tight, preventing uncontrolled and wasteful air infiltration.

A green roof feature has been incorporated onto part of the roof area.

Rainwater will be collected in individual rain water butts for the purposes of watering green garden areas on the roof.

3.3 PASSIVHAUS

Consideration had been given, during the early design stages, to adopting the PassivHaus standard for the Highgate Road Residential building. This approach has been rejected for the reasons given below.

Orientation is critical for the success of a PassivHaus design, with the majority of windows having to face south. This would not have been possible due to the constraints of the site and its adjacent buildings. The building has been orientated to ensure balconies capture as much Eastern aspect as possible.

Windows to the north need to be limited in size in order to reduce winter heat loss. Whilst every effort has been made to account for this on the north east elevation, including the provision of triple glazing and sealed balconies, these measures would not meet with the stringent PassivHaus requirements. A reduction in window size facing Highgate Road is not considered compatible with meeting Camden policy in terms of providing high quality architecture. The current design is considered to help with ensuring the main street frontage is active and secure via passive surveillance.

It is important to minimise the perimeter of the building with regard to its area. Urban design principles required a strong articulation of the principle façade, setting up a strong vertical rhythm. PassivHaus principles severely penalise this approach to massing and would have resulted in a much more solid looking building which is considered to be an unacceptable solution in terms of design quality and urban design.

The ground floor flats all need to be mechanically cooled in summer due to air quality constraints, this rules out PassivHaus for the ground floor units categorically.

Cost is also an important factor and a PassivHaus solution would be considerably more expensive to construct.

The current stage D design exceeds Camden construction standards and these standards are considered to be best practice.

4.0 CONCLUDING REMARKS

As part of a planning submission for this development, a Sustainability Statement is required to be prepared and submitted. This document is intended to fulfil that requirement.

Development proposals are at RIBA stage D and the information included in the attached pre assessment reports, produced by Avoca, describes the design features that have been included into the project.

BREEAM and CfSH pre-assessments have been included in appendices A & B

As the design process moves forward into the next stage and beyond, the appointed design team will be required to develop the design proposals in a manner compatible with the expectations set out in the pre-assessment documentation included with this document.

In conclusion, TGA Consulting Engineers believe that the sustainable design, construction and operating standards described in this sustainability statement represents a pragmatic and feasible plan for the development.

APPENDIX A – GREENWOOD COMMUNITY CENTRE BREEAM PRE ASSESSMENT

Greenwood Estate
Proposed Greenwood Centre
Kentish Town, London

BREEAM Other Buildings
Pre-assessment Reports

REPORT CONTROL

Document: Greenwood Centre
BREEAM Other Buildings Pre-assessment Report

Project: Proposed New Greenwood Centre

Client: TGA Consulting Engineers

Project Number: 13-104

Document Checking:

Issue	Date	Status	Prepared By	Checked By	Issue Notes
01	15/08/13	Draft	L.Mason	J.Houghton	Issued to TGA
02	28/08/13	Full Issue	L.Mason	J.Houghton	Revised to incorporate project team comments – issued for planning

EXECUTIVE SUMMARY

Avoca Consulting Engineers has been commissioned by TGA Consulting Engineers to carry out a BREEAM New Construction 2011 pre-assessment of the new community centre proposed at the Greenwood Estate, Kentish Town, London. The aspiration of the project team is to achieve an **'EXCELLENT'** rating and in order to provide this the scheme must achieve BREEAM assessment score of **70%** including several mandatory criteria.

This report details the potential performance of the proposed development, as measured against the BRE Environmental Assessment Method for newly constructed non-domestic building types.

A pre-assessment meeting was held on the 4th April 2013 between PCKO Architects, TGA Consulting Engineers and Avoca Consulting Engineers in order to review the scheme drawings and gain commitments from the design team regarding compliance with each of the individual BREEAM issues.

In addition to the above discussions, TGA Consulting Engineers has produced a design stage SBEM report which has been used to substantiate credit claims within the Ene 01 and Ene 04 BREEAM issues. The SBEM report confirms that the building will use a mixture of Photovoltaic arrays and Combined Heat and Power together with increased U values and air tightness to achieve a 25% reduction in CO_2 emissions over Building Regulations 2010 Part L2a requirements.

With the commitments received to date the Greenwood Centre is capable of achieving a BREEAM score of **75.15%** which would translate into a rating of **'EXCELLENT'**.

It should be noted that the majority of the credit allocations detailed in this report are based on verbal commitments expressed by the design team with only limited documentary evidence provided to substantiate the pursuit of credits, as such it should be used for guidance purposes only.

Section 6 of this report contains the details of additional credits which are available should the design team wish to increase the score further.

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DISCLAIMER

This report is not a BREEAM certificate and does not guarantee that the BREEAM rating sought will be achieved until a Final Report has been issued and verified by the BRE. Its purpose is to provide written guidance on how best to approach the rating and state the information required to gain it.

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ALTERATIONS

The BRE hold the right to update or alter the scheme at any time, Avoca Consulting Engineers Ltd, as their agents will implement these changes, as required, to any assessment being undertaken.

1. Introduction

Avoca Consulting Engineers was commissioned by TGA Consulting Engineers to carry out a BREEAM New Construction 2011 pre-assessment of the proposed construction of a new day centre at Greenwood Place, Kentish Town, London. The development will involve the demolition of the existing building to be replaced by a new three storey community centre.

Following review of the drawings and the activities which will be carried out within the day centre it was decided to carry out the pre-assessment using the BREEAM New Construction 2011 Other Buildings scheme.

A BREEAM pre-assessment is the first stage in the BREEAM assessment process and it should be followed by both Design and Post Construction Stage assessments in order to confirm the rating achieved.

1.1 Project Team Details

Name / Position	**Company / Address**
Developer	London Borough of Camden Housing and Adult Social Care Department 2nd Floor Bidborough House 38-50 Bidborough Street London WC1H 9DB
Architect	PCKO Architects 45-51 Lowlands Road Harrow on the Hill HA1 3AW
M & E Consultant	TGA Consulting Engineers Ltd Building 3 Gateway 1000 Stevenage Herts SG1 2FP
CfSH Assessor	Avoca Ltd 1st Floor Swale House Mandale Business Park Belmont Industrial Estate Durham DH1 1TH

1.2 Summary

This report has been prepared using the BREEAM New Construction 2011 Other Buildings pre-assessment scoring tool following a meeting held with the design team on 4th April 2013 and discussions/emails following this.

Section 5 summarises the commitments made by the design team regarding compliance with each individual BREEAM issue and provides guidance to help the project team in achieving an **'EXCELLENT'** BREEAM rating.

It should be noted that this is not a formal BREEAM Other Buildings assessment and will not be issued to the BRE for certification purposes. A formal assessment should be undertaken when the design stage of the project is complete (RIBA Stage D / E).

On the basis of this report, the pre-assessment meeting with the design team and subsequent discussions it is anticipated that the overall rating for the proposed development would be a BREEAM '**EXCELLENT'** Rating. The percentage score achieved using the standard BRE pre-assessment scoring tool is **75.15%**.

1.3 Report Format

Section 1: Introduction to assessment
Section 2: Introduction to the BRE Environmental Assessment Method
Section 3: Building details
Section 4: Assessment summary
Section 5: Pre-assessment
Section 6: Recommendations

2 BRE Environmental Assessment Method - BREEAM

2.1 BREEAM Assessment Approach and Methodology

BREEAM (Building Research Establishment's Environmental Assessment Method) is the world's leading and most widely used environmental assessment method for buildings. It sets the standard for best practice in sustainable design and has become the de facto measure used to describe a building's environmental performance.

The aims and objectives of BREEAM are:

Aims of BREEAM

- To mitigate the impacts of buildings on the environment
- To enable buildings to be recognised according to their environmental benefits
- To provide a credible, environmental label for buildings
- To stimulate demand for sustainable buildings

Objectives of BREEAM

- To provide market recognition to low environmental impact buildings.
- To ensure best environmental practice is incorporated in buildings.
- To set criteria and standards surpassing those required by regulations and challenges the market to provide innovative solutions that minimise the environmental impact of buildings.
- To raise the awareness of owners, occupants, designers and operators of the benefits of buildings with a reduced impact on the environment.
- To allow organisations to demonstrate progress towards corporate environmental objectives.

Building projects are assessed at the design and post construction stages using a system of environmental issues grouped within the following categories:

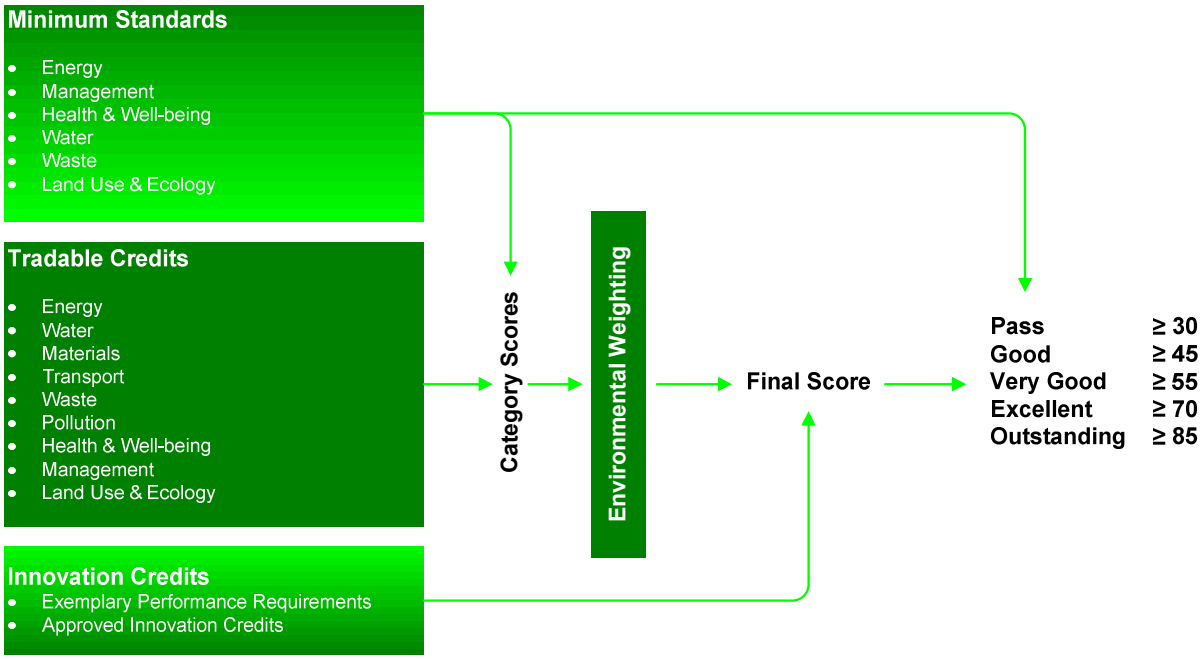
- Management
- Health and Wellbeing
- Energy
- Transport
- Water
- Materials
- Waste
- Land Use & Ecology
- Pollution
- Innovation

The assessment of the building results in a final report and BRE Global BREEAM certificate detailing the performance of the assessed building against the environmental issues covered by standard. The buildings performance is expressed as a BREEAM rating of PASS, GOOD, VERY GOOD, EXCELLENT or OUTSTANDING. BREEAM is developed, operated and maintained by BRE Global Ltd and the operation and direction of the method if overseen by an independent sustainability board, representing a wide

cross-section of construction industry stakeholders. Further information about BREEAM, including copies of the BREEAM standards, can be found at www.breeam.org

2.2 BREEAM Scoring & Rating

The diagram and text below describes how BREEAM scores and rates an assessed building:



The BREEAM categories contain a number of environmental issues, which reflect the options available when designing, procuring and constructing a building.

2.2.1 BREEAM issues and credits

Tradable credits
Each environmental issue has a set number of 'credits' available and these credits are awarded where the building demonstrates that it complies with the requirements of that issue.

Minimum standards
A number of issues within a category have set minimum standards, i.e. a minimum number of credits that must be achieved in order for a particular BREEAM rating level to be met.

In the case of Greenwood Centre an 'Excellent' rating is required and the following minimum standards must be achieved:

- Man 01 – 1 credit
- Man 02 – 1 credit
- Man 04 – 1 credit (Building User Information)
- Hea 01 – Provision of high frequency fluorescent lighting
- Hea 04 – Minimising Legionella risk in installed water systems
- Ene 01 – 6 credits and a 25% reduction in CO2 emissions
- Ene 02 – 1 credit
- Ene 04 – 1 credit

- Wat 01 – 1 credit
- Wat 02 – Provision of a pulsed water meter
- Mat 03 – All timber procured in accordance with the UK Government Timber Procurement Policy
- Wst 03 – 1 credit
- LE 03 – 1 credit

Innovation credits
Innovation credits provide additional recognition for a building that innovates in the field of sustainable performance, above and beyond the level that is currently recognised and rewarded by standard BREEAM issues. Innovation credits are awarded for either complying with pre-defined BREEAM issue exemplary level requirements, through the appointment of a BREEAM Accredited Professional or Suitably Qualified Assessor or via application to BRE Global to have a particular building feature, system or process approved as 'innovative'.

Environmental weightings, final score and BREEAM Rating
Once each BREEAM issues has been assessed the category percentage scores are determined (based on the number of credits achieved over those available within a category), and an environmental weighting applied (as shown below).

The weighted category scores are then totalled to give an overall score, and any additional score for innovation is added to give the final BREEAM score which is used to determine the BREEAM rating.

The environmental weightings are as follows:

Issue Category	Issue Weighting
Management	12%
Health and Wellbeing	15%
Energy	19%
Transport	8%
Water	6%
Materials	12.5%
Waste	7.5%
Land Use and Ecology	10%
Pollution	10%

There is also an additional (up to 10%) score for Innovation, available to projects that demonstrate they have gone above and beyond the best practice levels of BREEAM.

The weighting factors have been derived from consensus based research with various groups such as government, material suppliers and lobbyists. This research was carried out by BRE to establish the relative importance of each environmental issue.

3 Building Details

General	**Building**	Community Centre
	Site	Existing, redeveloped
	Floor Area	3228m²
Building Fabric	**Walls**	Brick with lightweight metal infill to concrete frame internally.
	Roof	Inverted warm flat roof with roof gardens.
	Floors	Concrete frame, screed.
	Windows	Timber aluminium composite.
Building Services	**Heating**	Combined Heat and Power and supplementary gas fired boilers.
	Ventilation	Natural ventilation and supplementary mechanical ventilation with heat recovery.
	Cooling	IT equipment rooms and high IT use spaces only.
	Hot Water	Community heating system.
Other	**Specify**	Building integrated photovoltaics.

4 Summary of Building's Assessment Performance

The Greenwood Centre development is capable of achieving a score of **75.15%** measured against the BREEAM Other Buildings (New Construction 2011). This translates into an interim BREEAM pre-assessment rating of '**EXCELLENT**'.

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

Building Performance by Section					
	Environmental weighting	**Credits available**	**Credits achieved**	**% Achieved**	**Weighted score**
Management	12%	22	17	77.27%	9.27%
Health & Wellbeing	15%	14	7	50.00%	7.50%
Energy	19%	27	24	88.88%	16.89%
Transport	8%	11	10	90.90%	7.27%
Water	6%	9	6	66.66%	4.00%
Materials	12.5%	13	12	92.31%	11.55%
Waste	7.5%	6	3	50.00%	3.75%
Land Use & Ecology	10%	10	7	70.00%	7.00%
Pollution	10%	13	9	69.23%	6.92%
Innovation	10%	10	1	10.00%	1.00%
				Total BREEAM Score	**75.15%**

5 Detailed Assessment of Building Performance

The following section summarises each of the issue requirements for this BREEAM pre-assessment by environmental section, and the information that has been provided as evidence of the buildings performance against those requirements. On the basis of the documentary evidence provided and verbal commitments from the design team, the relevant number of BREEAM credits have either been allocated or withheld.

Each issue assessed includes the BREEAM Assessor's validation statement. This statement summarises their assessment of the buildings performance against the BREEAM issue requirements, validating the number of BREEAM credits allocated.

Man 01 Sustainable Procurement		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	7 of 8	Min. credits to achieve rating level	1	1	1	1	2

Aim

To ensure delivery of a functional and sustainable asset designed and built in accordance with performance expectations.

Credits	Criteria
1-8	**PROJECT BRIEF AND DESIGN** **1 Credit** From RIBA stage B or equivalent, the client, building occupier, design team and contractor are involved in contributing to the decision making process for the project. As a minimum this includes meeting to identify and define their roles and responsibilities and contributions during the whole of the project. As well as this, there is a schedule of training identified for relevant building occupiers/premises manager which includes the following as a minimum: Building User Guide, Design Strategy, Installed Systems and Key Features, Documentation i.e. O&M's and Building Log and Training responsibilities. **1 Credit** A BREEAM Accredited Professional is appointed, no later than RIBA Stage C or equivalent, to define BREEAM performance targets, and guide the project to interim design stage certification. **1 Credit** The above BREEAM AP criterion is achieved and the AP is engaged to monitor and report progress against the pre-determined BREEAM targets, by attending key project/design team meetings during the feasibility and design stages. The AP prepares regular written reports for the client and design team detailing progress against the BREEAM performance targets. **1 Credit** The above BREEAM AP criterion is achieved and the AP is engaged to monitor and report progress against the pre-determined BREEAM targets, by attending key project/design team meetings during the tendering and construction stages. The AP prepares regular written reports for the client and design team detailing progress against the BREEAM performance targets. The scheme demonstrates compliance with design stage BREEAM targets via the BREEAM Assessors final post-construction stage certification report. **CONSTRUCTION AND HANDOVER** **1 Credit** The main contractor accounts for a thermographic survey within the project budget and programme of works. Once construction is complete a thermographic survey of the building fabric is undertaken in accordance with all requirements. Any defects identified via the post-construction inspection are rectified.

	1 Credit An appropriate project team member is appointed to monitor and programme pre-completion commissioning, commissioning and where necessary, re-commissioning on behalf of the client. All building services are included in the commissioning schedule and are carried out in-line with all current legislation. The main contractor accounts for the commissioning period within the main contract programme of works. A specialist commission manager is appointed during the design stage for complex systems. **Where a BMS is installed this should be commissioned in line with the BREEAM Technical Guide procedures.** **AFTERCARE** **1 Credit** Pre-determined seasonal commissioning responsibilities will be completed over a minimum 12 month period, once the building becomes occupied, for both complex systems and simple systems, where applicable. **1 Credit** The above seasonal commissioning criterion has been achieved, and there is a mechanism to collect energy and water consumption data for at least 12 months after occupation, which will be compared with what was expected and any discrepancies analysed with a view to adjusting systems if they are not operating as expected. There is a contract or commitment to provide aftercare support to all the building occupiers which includes a meeting with the building occupants to introduce the aftercare team, initial aftercare for at least 4 weeks after handover, on site FM training to include a walkabout of the building and longer term aftercare facilities. E.g. a helpline, nominated individual or other appropriate system to support building users. **INNOVATION CREDIT REQUIREMENTS** There is a commitment or contract for the facilities manager or equivalent to undertake the following at quarterly intervals for the first 3 years after occupation: a. Collect the occupant satisfaction, energy consumption and water consumption data. b. Utilise the data to check the building is performing as expected and make any necessary adjustments. c. Set targets for reducing energy and water consumption and monitor progress towards these. d. Feedback any ‘lessons learned’ to the design team and developer for use in future projects. e. Provision of the actual annual building energy, water consumption and occupant satisfaction data to the BRE.

Design Stage Evidence Required

PROJECT BRIEF AND DESIGN

First Credit

1. Documentation indicating when the collaboration began and the roles and responsibilities of the project team for the required phases e.g. meeting minutes, construction programme, responsibilities schedule, building specification or contract documents.
2. The training schedule.

Second, Third and Fourth Credits

1. The AP appointment letter.
2. Relevant section/clause of the building specification or contract.
3. Project programme indicating the dates by which the key work stages (Preparation and Design) are to be completed.
4. Meeting notes/minutes, recorded correspondence or schedules that can demonstrate BREEAM issues are a regular agenda item and AP attendance.
5. The AP progress report (for each work stage).
6. Design stage BREEAM assessment report.

CONSTRUCTION AND HANDOVER

First Credit

1. Project budget.
2. Programme of works.
3. Relevant section/clause of the building specification or contract and/or letter of appointment.

Second Credit

1. Appointment letter or commissioning responsibilities schedule.
2. Relevant section/clause of the building specification or contract.
3. Main contractors programme.
4. Commissioning schedule.

AFTERCARE

First Credit

1. Appointment letter and/or commissioning responsibilities schedule.

Second Credit

1. As above for First Credit.
2. Evidence of either existing procedures or a commitment/contract to put in place a mechanism to:
    a. Collect, compare and analyse relevant data.
    b. Undertake suitable adjustments if necessary.
3. Evidence of a commitment/contract to provide compliant aftercare support and training.

INNOVATION CREDIT

Evidence as above (for data collection and aftercare support credit), but from end user.

Validation Statement

PROJECT BRIEF AND DESIGN
The design team confirmed that collaboration has already begun between project team members and that roles and responsibilities were to be discussed and agreed with a training schedule to be compiled in compliance with the requirements of this issue.

TGA confirmed that the credits relating to the appointment of a BREEAM AP would be allocated as follows:

- RIBA Stage C – TGA confirmed that their in-house AP would be appointed for this stage of the project.
- RIBA Stages D & E – This credit is not to be allocated at present, TGA are to contact the client and give them the option of extending the appointment of their in-house AP in order to cover the requirements of this credit.
- RIBA Stages F-L – The team confirmed that an obligation would be placed upon the Principal Contractor to appoint a BREEAM AP to prepare written reports detailing progress throughout the construction phase leading to certification at Post Construction.

CONSTRUCTION AND HANDOVER
The design team have confirmed that an obligation would be placed upon the Principal Contractor to procure a Thermographic Survey and appoint a Commissioning Monitor for general systems and a Specialist Monitor for any complex systems.

AFTERCARE
TGA confirmed that seasonal commissioning responsibilities will be included within the performance specification for the project; these duties will include monitoring of energy and water data.

INNOVATION CREDIT
The client has confirmed via email dated 25/04/13 that data collection for the first three years after occupation will be carried out by the FM provider.

Based on the above 7 standard credits and the innovation credit have been allocated.

Man 02 Responsible Construction Practices		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	2 of 2	Min. credits to achieve rating level	0	0	0	1	2

Aim

To recognize and encourage construction sites which are managed in an environmentally and socially considerate, responsible and accountable manner.

Credits	Criteria
1-2	Where the principal contractor uses a 'compliant' organizational, local or national considerate construction scheme. Where the principal contractors performance against the compliant scheme has been confirmed by independent assessment and verification, the BREEAM credits can be awarded as follows: a. One credit where the contractor achieves 'compliance' with the criteria of a compliant scheme. b. Two credits where the contractor significantly exceeds 'compliance' with the criteria of the scheme. **INNOVATION CREDIT REQUIREMENTS** Where the principal contractor's performance against the compliant scheme has been confirmed by independent assessment and verification and the contractor achieves compliance with the criteria of the complaint scheme to an exemplary level of practice.

Design Stage Evidence Required

Relevant section/clause of the building specification of contract.

OR

A formal letter of commitment from the client/developer.

Validation Statement

The design team have provided a commitment that an obligation will be placed on the Principal Contractor to register the site with the Considerate Constructors Scheme and achieve a minimum score of 35-39. The exemplary level credit (40+ points) is not to be targeted.

2 credits have been allocated.

Man 03 Construction Site Impacts		Minimum BREEAM Standards					
		Level	P	G	VG	E	0
No. of credits awarded:	4 of 5	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognise and encourage construction sites managed in an environmentally sound manner in terms of resource use, energy consumption and pollution.

Credits	Criteria
1-5	Responsibility has been assigned to an individual(s) for monitoring, recording and reporting energy, water and transport consumption data resulting from all construction processes. To ensure the robust collection of information, this individual(s) has the appropriate authority, responsibility and access to the data required. **ENERGY CONSUMPTION** **1 Credit** Monitor and record data on energy consumption (kWh) from the use of construction plant, equipment (mobile and fixed) and site accommodation necessary for completion of all construction processes. Using the collated data report the energy consumption (total kWh and kWh/£100k of project value) and carbon dioxide emissions (total kg CO_2eq and kg CO_2eq/£100k of project value) from the construction process via the BREEAM scoring and reporting tool. **WATER CONSUMPTION** **1 Credit** Monitor and record data on water consumption (m^3) from the use of construction plant, equipment (mobile and fixed) and site accommodation necessary for completion of all construction processes. Using the collated data report the total net water consumption (m^3), i.e. consumption minus any recycled water use, from the construction process via the BREEAM scoring and reporting tool. **TRANSPORT OF CONSTRUCTION MATERIALS AND WASTE** **1 Credit** Monitor and record data on transport resulting from delivery of the majority of construction materials to site and construction waste from site. As a minimum this must cover: 1. Transport of materials from the factory gate to the building site, including any transport, intermediate storage and distribution. Scope of this monitoring must cover the following as a minimum: i. Materials used in major building elements (i.e. those defined in BREEAM issue Mat 01), including insulation materials.

ii. Ground works and landscaping materials.

2. Transport of construction waste from the construction gate to waste disposal processing/recovery centre gate. Scope of this monitoring must cover the construction waste groups outlined in the project's site waste management plan (SWMP).

Using the collated data, report separately for materials and waste, the total fuel consumption (litres) and total carbon dioxide emissions (kg CO_2eq), plus total distance travelled (km) via the BREEAM scoring and reporting tool.

TIMBER PROCUREMENT

1 Credit
Confirmation that all site timber used on the project is sourced in accordance with the UK Government's Timber Procurement Policy.

CONSTRUCTION SITE MANAGEMENT

1 Credit
The principal contractor for the project operates an Environmental Management System covering their main operations. The EMS must be either:

1. Third party certified, to ISO14001/EMAS or equivalent standard.

2. The structure of the EMS is in compliance with BS8555 2003 and has reached phase four of the implementation stage, 'implementation and operation of the environmental management system', and completed phase audits one to four, as defined in BS8555.

Implement best practice pollution prevention policies and procedures on site, demonstrated through compliance with the items in the Environmental Checklist section 2.2.5 Preventing Pollution in the England and Wales Environment Agency's 'Building a Better Environment, a guide for developers'.

Design Stage Evidence Required

Relevant section/clause of the building specification or contract.

OR

A signed and dated letter of commitment to meet the relevant criteria.

Validation Statement
The design team confirmed that an obligation would be placed upon the Principal Contractor to carry out the following activities: 1. Monitor and record energy usage related to site activities. 2. Monitor and record water usage related to site activities. 3. Source all site timber in accordance with the UK Governments Timber Procurement Policy. 4. Operate a compliant Environmental Management System. 5. Implement best practice pollution prevention policies on site. The credit relating to monitoring of transport of materials and waste to/from site is not targeted. 4 credits have been allocated.

Man 04 Stakeholder Participation		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	4 of 4	Min. credits to achieve rating level	0	0	0	1	1

Aim

To design, plan and deliver accessible functional and inclusive buildings in consultation with current and future building users and other stakeholders.

Credits	Criteria
1-4	**CONSULTATION** **1 Credit** During the preparation of the brief, all relevant parties and relevant bodies Are identified and consulted with by the design team. The findings of the consultation influence the design and therefore must have been held before key and final design decisions were made. A consultation plan has been prepared and includes a timescale and methods of consultation for all relevant parties/bodies and how the relevant parties will be kept informed about progress on the project. The minimum consultation content has been covered. During the design stage, consultation feedback has been given to and received by all relevant parties regarding suggestions made, including how the results of the consultation process have influenced, or resulted in modifications to, the proposed design and building operation/use. The project team ensures that through consultation and the resulting measures taken (as agreed with the relevant bodies) any areas or features of historic/heritage value are protected. **INCLUSIVE ACCESSIBLE DESIGN** **1 Credit** The building is designed to be fit for purpose, appropriate and accessible by all potential users. An access statement is developed in line with the CABE publication Design & Access Statements, How to write, read and use them, based on the principles of inclusive design. The access statement results in a strategy that must address, as a minimum, access to and throughout the development for all users, with particular emphasis on the following: 1. Disabled users; addressing and proposing design solutions that remove obstacles that define disability. 2. People of different age groups, genders, ethnicity and stamina/fitness levels. 3. Parents with children (where appropriate to building use/type). Provision of facilities is made for future building occupants and users including, where relevant, facilities that can be shared and are accessible to

members of the public/community without gaining uncontrolled access to other parts of the building.

BUILDING USER INFORMATION

1 Credit
Building User Guides are provided and are appropriate to all users of the building (general users including staff and if applicable residents, as well as the non-technical facilities management team/building manager).

The Guides cover all functions and uses of the building, ensuring building users are able to use the building effectively. Where relevant, the documents must describe the facilities to be shared and how access to them will be arranged for potential users.

Building and site related information is made readily available to all future building users, enabling them to access and use the building, site and local transport infrastructure/amenities effectively.

POST OCCUPANCY EVALUATION AND INFORMATION DISSEMINATION

1 Credit
The client makes a commitment to carry out a Post Occupancy Evaluation (POE) one year after building occupation, to gain building performance feedback. The POE should be carried out by an independent third party and should cover:

1. A review of the design and construction process (review of design, procurement, construction and handover processes).
2. Feedback from a wide range of building users including Facilities Management on the design and environmental conditions of the building covering:

    i. Internal environmental conditions (light, noise, temperature, air quality).
    ii. Control, operation and maintenance.
    iii. Facilities and amenities.
    iv. Access and layout.
    v. Other relevant issues.

Sustainability performance (energy/water consumption, performance of any sustainable features or technologies e.g. materials, renewable energy, rainwater harvesting etc).

The client makes a commitment to carry out the appropriate dissemination of information on the building's post occupancy performance in order to share any good practice and lessons learned.

Design Stage Evidence Required

CONSULTATION

1. A list of stakeholders consulted.
2. A consultation plan setting out the process and the scope of the consultation.
3. Agenda/minutes from consultation meetings.
4. Documentation demonstrating consultation feedback and subsequent actions.

INCLUSIVE AND ACCESSIBLE DESIGN

1. The access statement and/or access strategy.
2. Design drawings and/or relevant section/clauses of the building specification or contract.

BUILDING USER INFORMATION

1. Relevant section/clause of the building specification or contract.

   OR

2. A letter of commitment from the client/developer.

POE AND INFORMATION DISSEMINATION

1. Signed and dated commitment by the client/developer or future building occupier.

Validation Statement

The design team have provided a commitment to achieve the requirements specified in the above Consultation, Inclusive Accessible Design and Building User Information criteria.

The client has confirmed via an email dated 25/04/13 a commitment to carry out POE and disseminate appropriate information to building users.

4no. credits have been provisionally awarded.

Man 05 Life Cycle cost and Service Life Planning		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	0 of 3	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognise and encourage life cycle costing and service life planning in order to improve design, specification and through-life maintenance and operation.

Credits	Criteria
	1 Credit A Life Cycle Cost (LCC) analysis has been carried out based on the proposals developed during RIBA Work Stages C/D (concept design/design development) or equivalent. The Life Cycle Cost analysis is: 1. Conducted in accordance with the process outlined in PD156865:2008 (a supplement to BS ISO 15686-5:2008). 2. Based on the concept design/design development proposals. 3. Completed for the following stages and uses a study period of 60 years, shown in real and discounted cash flow terms: i. Construction. ii. Operation - includes as a minimum, utilities, cleaning and management costs. iii. Maintenance - includes as a minimum, planned maintenance, replacements and repairs costs.
1-3	A critical appraisal has been completed at the feasibility stage of building procurement, covering the service life estimations and maintenance implications for different design options. This appraisal must comply with Service life planning in accordance with ISO 15686 Buildings and constructed assets - Service life planning Part 1. **2 Credits** The first credit above is achieved. The analysis demonstrates that elements in at least two of the following building components have been analysed at a strategic and system level, as per figure 6, Different levels of analysis at different stages of the life cycle, ISO 15686-5), comparing alternative options: 1. Envelope: e.g. cladding, windows, and/or roofing. 2. Services: e.g. heat source cooling source, and/or controls. 3. Finishes: e.g. walls, floors and/or ceilings. 4. External spaces. The option(s) meet the performance criteria for the building (i.e. realistic options are used for the comparison) and the lowest discounted LCC over the period is preferred, assuming that their selection results in at least one of the following: a. Lower building energy consumption over the operational life span of

	the building (compared to other options/alternatives analysed). b. A reduction in maintenance requirement/frequency. c. Extended service lives of services infrastructure/systems and/or building fabric resulting in fewer replacement intervals. d. Dismantling and recycling or reuse of building components. The selected option is of critical value within the project. **3 Credits** Criteria 1 to 7 are achieved. The model outlined in the first LCC credit is updated during RIBA Work Stages D/E (design development/technical design) or equivalent. The results of the study have been implemented in the specification, design and final construction of the assessed building. A maintenance strategy has been developed, informed by the LCC analysis and includes: 1. The extent to which maintenance has been designed out and how systems have been included in the specification to facilitate safe, efficient and cost-effective operation and maintenance. 2. How the removal and replacement of major plant and equipment, within the design life of the building, has been facilitated by the building design and specification (layout/access etc.). 3. A management plan for the landscaping (for example, as defined in BREEAM issue LE 05 Long term impact on biodiversity) if appropriate.
Design Stage Evidence Required	
First Credit 1. Relevant sections of the feasibility stage life cycle cost analysis report/documentation. 2. Relevant section of the feasibility stage appraisal documentation. **Second Credit** 1. As for the first credit above. 2. Details of alternative options considered including benefits of selected options and evidence that the element is of critical value. **Third Credit** 1. As for the second credit above updated for the detailed design. 2. Design drawings or relevant section/clause of the building specification or contract demonstrating implementation of the preferred option(s) from the latest LCC analysis. 3. A copy of the maintenance strategy and/or a letter of commitment from the client/developer to provide one. 4. Evidence of how the maintenance strategy was/will be informed by the LCC analysis above.	
Validation Statement	
The design team have confirmed that they will not be seeking compliance with any of the credit requirements, outlined above.	

Hea 01 Visual Comfort		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 3	Min. credits to achieve rating level	0	0	0	0	0

Aim

To ensure daylighting, artificial lighting and occupant controls are considered at the design stage to ensure best practice visual performance and comfort for building occupants.

Credits	Criteria
Mandatory	**PRE-REQUISITE** All fluorescent and compact fluorescent lamps are fitted with high frequency ballasts.
1-3	**DAYLIGHTING – 1 CREDIT** Occupied spaces must achieve a daylight factor of 2% over 80% of the rooms assessed. **DAYLIGHTING – EXEMPLARY LEVEL CREDIT** The exemplary level credit can be awarded where occupied spaces achieve a daylight factor of 3% over 80% of the rooms assessed. **GLARE CONTROL AND VIEW OUT – 1 CREDIT** 1. Glare from sunlight is designed out of all relevant building areas either through building layout (low eaves) or building design (blinds fitted to windows, brise soleil etc). Relevant building areas should include the following areas: i. Areas where there will be workstations/benches or desks for building users. ii. Areas where close work will be undertaken or where visual aids will be used. iii. Areas where a view out would be deemed to be of benefit to the building occupants. 2. All positions within relevant areas are to be within 7m of a wall which has a window or permanent opening providing an adequate view out. The window/opening must be 20% of the surrounding wall area. Exclusions to both of the above include clinical areas with a controlled environment and nurse bases where they are located centrally to enable patient observation. **INTERNAL AND EXTERNAL LIGHTING – 1 CREDIT** **Internal Lighting** Illuminance (lux) levels in all internal relevant building areas of the building are specified in accordance with the CIBSE Code for Lighting 2009 and any other relevant industry standard. For areas where computer screens are regularly used, the lighting design complies with CIBSE Lighting Guide 7 sections 3.3, 4.6, 4.7, 4.8 and 4.9.

	This gives recommendations highlighting: 1. Limits to the luminance of the luminaires, to avoid screen reflections. (Manufacturers' data for the luminaires should be sought to confirm this). 2. For up-lighting, the recommendations refer to the luminance of the lit ceiling rather than the luminaire; a design team calculation is usually required to demonstrate this. 3. Recommendations for direct lighting, ceiling illuminance, and average wall illuminance. **External Lighting** Illuminance levels for lighting in all external areas within the construction zone are specified in accordance with BS54891:2003+A2:2008 Lighting of roads and public amenity areas.

Design Stage Evidence Required

PRE-REQUISITE
A copy of the luminaire schedule or lighting specification.

DAYLIGHTING
1. Design drawings.
2. Daylight Calculations.
3. Where relevant for Multi-residential buildings:

Evidence in-line with the design stage evidence requirements of the CSH issue Hea 1 **OR** a copy of the Design Stage CSH certificate and report form the CSH online reporting system confirming the number of credits achieved for CSH issue Hea 1.

GLARE CONTROL AND VIEW OUT
1. Design drawings.
2. Relevant section/clause of the building specification or contract.
3. Window schedule.

INTERNAL AND EXTERNAL LIGHTING
1. Design drawings and/or room data sheets/schedules.
2. Relevant section/clause of the building specification or contract **OR** a letter of formal confirmation of compliance from the relevant design team member.

Validation Statement
PRE-REQUISITE TGA confirmed that the majority of internal light fittings will be LED and where any fluorescent or compact fluorescent lighting is installed it will have a High Frequency control. **DAYLIGHTING** PCKO confirmed that these credits would not be included at this time pending the input of a daylight specialist. **GLARE CONTROL AND VIEW OUT** Having reviewed the design plans tabled at the pre-assessment it was felt that it would not be possible to achieve the credits relating view out and glare control as there are several inner rooms with no windows. **INTERNAL AND EXTERNAL LIGHTING** TGA confirmed that they would ensure that all internal and external lighting would comply with the relevant CIBSE and British Standards and would be appropriately zoned and controlled. Based on the above 1 credit has been allocated.

Hea 02 Indoor Air Quality		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	2 of 4	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognise and encourage a healthy internal environment through the specification and installation of appropriate ventilation, equipment and finishes.

Credits	Criteria
1-4	**MINIMISING SOURCES OF AIR POLLUTION** **First Credit** An indoor air quality plan has been produced which considers; • Removal of contaminant sources. • Dilution and control of contaminant sources. • Procedures for pre-occupancy flush out. • 3rd party testing and analysis. For air-conditioned and mixed-mode buildings: the building's air intakes and exhausts are over 10m apart to minimise recirculation and intakes are over 20m from sources of external pollution. For naturally-ventilated buildings: openable windows/ventilators are over 10m from sources of external pollution. The building has been designed to provide fresh air and minimise internal pollutants (and ingress of external polluted air into the building) in accordance with the criteria of the relevant standard for ventilation. Areas of the building subject to large and unpredictable or variable occupancy patterns have CO_2 or air quality sensors specified and: a. In mechanically ventilated spaces, the sensor(s) are linked to the mechanical ventilation system and provide demand-controlled ventilation to the space. b. In naturally ventilated spaces, the sensors either have the ability to alert the building owner/manager when CO_2 levels exceed the recommended set point, or are linked to controls with the ability to adjust the quantity of fresh air, i.e. automatic opening windows/roof vents. **Second Credit** An indoor air quality plan has been produced (as above). All decorative paints and varnishes have met the requirements listed in Table 5-3 of the BREEAM Technical Guide. At least five of the eight remaining product categories listed in Table 5-3, have met the testing requirements and emission levels for Volatile Organic Compound (VOC) emissions against the relevant standards identified within this table. Where five or less products are specified within the building, all must meet the requirements in order to achieve this credit

Third Credit
An indoor air quality plan has been produced (as above).

Formaldehyde concentration level is measured post construction (but pre-occupancy) and is found to be less than or equal to 100µg/m³ averaged over 30 minutes (WHO guidelines, source BRE Digest 464 part 2).

The total volatile organic compound (TVOC) concentration is measured post construction (but pre-occupancy) and found to be less than 300µg/m³ over 8 hours, in line with the Building Regulation requirements.

Where levels are found to exceed these limits, the project team confirms the measures that have, or will be undertaken in accordance with the IAQ plan, to reduce the TVOC and formaldehyde levels to within the above limits.

The testing and measurement of the above pollutants are in accordance with the following standards where relevant:

a. BS EN ISO 16000-4: 2004 Diffusive sampling of formaldehyde in air.
b. EN ISO 16000-6 VOCs in air by active sampling.
c. BS EN 16017-2: 2003 VOCs - Indoor, ambient and workplace air by passive sampling.
d. BS EN ISO 16000-3: 2001 formaldehyde and other carbonyls in air by pumped sampling.

The measured concentration levels of formaldehyde (µg/m³) and TVOC (µg/m³) are reported, via the BREEAM scoring and reporting tool, for the purpose of confirming criteria above.

POTENTIAL FOR NATURAL VENTILATION

1 Credit
Occupied spaces of the building are designed to be capable of providing fresh air entirely via a natural ventilation strategy, demonstrated via either of the following:

1. The openable window area in each occupied space is equivalent to 5% of the gross internal floor area of that room/floor plate. For room/floor plates between 7m-15m depth, the openable window area must be on opposite sides and evenly distributed across the area to promote adequate cross-ventilation. **OR**
2. The design demonstrates that the natural ventilation strategy provides adequate cross flow of air to maintain required thermal comfort conditions and ventilation rates. This is demonstrated using ventilation design tool types recommended by CIBSE AM10.

For a strategy which does not rely on openable windows, or which has occupied spaces with a plan depth greater than 15m, the design must demonstrate (in accordance with requirement 15b above) that the ventilation strategy can provide adequate cross flow of air to maintain the required thermal comfort conditions and ventilation rates.

	The natural ventilation strategy is capable of providing at least two levels of user-control on the supply of fresh air to the occupied space, as follows; • Higher level: higher rates of ventilation achievable to remove short-term odours and/or prevent summertime overheating. • Lower level: adequate levels of draught-free fresh air to meet the need for good indoor air quality throughout the year, sufficient for the occupancy load and the internal pollution loads of the space. Any opening mechanisms must be easily accessible and provide adequate user-control over air flow rates to avoid draughts. Relevant industry standards for ventilation can be used to define 'adequate levels of fresh air' sufficient for occupancy and internal air pollution loads relevant to the building type.

Design Stage Evidence Required

MINIMISING SOURCES OF AIR POLLUTION

First Credit
1. Copy of the indoor air quality plan.
2. Relevant section/clause of the building specification or contract.
3. Design drawings.

Second Credit
1. Copy of the indoor air quality plan.
2. Relevant section/clause of the building specification or contract.

Third Credit
1. Copy of the indoor air quality plan.
2. Commitment to carry out necessary testing post construction.

POTENTIAL FOR NATURAL VENTILATION
1. Relevant section/clause of the building specification or contract.
2. Formal letter from the design team with details of the ventilation strategy and calculations/results from appropriate software modelling tool(s).
3. Manufacturers'/suppliers' literature.

Validation Statement

MINIMISING SOURCES OF AIR POLLUTION
The design team confirmed at the pre-assessment meeting that an Indoor Air Quality Plan (IAQP) will be produced; however, the credit relating to minimising sources of air pollution is not possible due to the proximity of the car park and access road to naturally ventilated areas and mechanical air intakes.

PCKO confirmed that internal finishes will comply with the BREEAM VOC criteria, please note that the IAQP mentioned above must be produced in order to award this credit.

The client confirmed via an email dated 25/04/13 that the requirement for formaldehyde and TVOC testing would be placed in the contract conditions as a condition of the Principal Contractor achieving practical completion for the building.

POTENTIAL FOR NATURAL VENTILATION
It is felt unlikely that the credits associated with natural ventilation could be achieved as some of the rooms which would need to be assessed for this issue are located in central locations with no windows.

There are no laboratories or fume cupboards within this development so the criteria relating to these issues are not applicable.

On the basis of the above 2 credits can be allocated for this issue.

Hea 03 Thermal Comfort		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	2 of 2	Min. credits to achieve rating level	0	0	0	0	0

Aim

To ensure that appropriate thermal comfort levels are achieved though design and controls are selected to maintain a thermally comfortable environment for occupants within the building.

Credits	Criteria
1-2	**First Credit** Thermal modelling must be carried out using software selected in accordance with CIBSE AM11 Building Energy and Environmental Modelling. The modelling should demonstrate that the building design and services strategy can deliver thermal comfort levels in occupied spaces in accordance with the criteria set out in CIBSE Guide A Environmental Design; or other appropriate industry standard (where this sets a higher or more appropriate requirement/level for the building type). The software used to carry out the simulation at the detailed design stage provides full dynamic thermal analysis. For smaller and more basic building designs with less complex heating / cooling systems, an alternative less complex means of analysis may be appropriate (such methodologies must still be in accordance with CIBSE AM11). The building complies with any requirement, in terms of "time out of range" (TOR) metric, from the appropriate industry standard (as above) **OR** where there is no appropriate industry standard available or TOR recommendation made, the building services engineer confirms that the TOR is acceptable for the purpose and function of the building. The TOR metric (%) must be confirmed to the BREEAM assessor based on the modelling above, this should include maximum and minimum temperatures for both summer and winter settings. **Second Credit** The above credit must be awarded before achieving these criteria. The thermal modelling analysis (above) has informed the temperature control strategy for the building and its users. The strategy for proposed heating / cooling system(s) demonstrates that it has addressed the following: a. Zones within the building and how the building services could efficiently and appropriately heat or cool these areas e.g. consider the different requirements for the central core of a building compared with the external perimeter adjacent to the windows. b. The amount of occupant control required for these zones, based on discussions with the end user (or alternatively building type/use

	specific design guidance, case studies, feedback) and considers: i. User knowledge of building services. ii. Occupancy type, patterns and room functions (and therefore appropriate level of control required). iii. How the user is likely to operate/interact with the system(s) e.g. are they likely to open windows, access TRV's on radiators, change air conditioning settings etc. iv. The user expectations (e.g. this may differ in the summer and winter; users tend to accept warmer internal conditions in the summer) and degree of individual control (i.e. obtaining the balance between occupant preferences, for example, some occupants like fresh air and others dislike drafts). c. How the proposed systems will interact with each other (where there is more than one system) and how this may affect the building occupants thermal comfort. d. The need or otherwise for an accessible building user actuated manual override for any automatic systems.

Design Stage Evidence Required

First Credit

1. Relevant section/clause of the building specification or contract or correspondence (e.g. letter, email or meeting minutes) from the design team.
2. Thermal modelling results.
3. TOR data from the design team.

Second Credit

1. Thermal comfort strategy highlighting the points that have been considered and decisions taken accordingly.
2. Relevant section/clause of the building specification or contract.
3. Design drawings.

Validation Statement

TGA confirmed at the pre-assessment meeting that compliant thermal modelling will be carried out in order to confirm the first credit.

The second credit for incorporating the results of the thermal modelling into the design of the heating and cooling strategy is also to be included.

2 credits are allocated on this basis.

Hea 04 Water Quality		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 1	Min. credits to achieve rating level	0	0	0	0	0

Aim

To minimise the risk of water contamination in building services and ensure the provision of clean, fresh sources of water for building users.

Credits	Criteria
Mandatory	All water systems in the building are designed in compliance with the measures outlined in the Health and Safety Executive's "Legionnaires' disease - The control of legionella bacteria in water systems". Approved Code of Practice and Guidance, 2000 and, where relevant, other industry/sector best practice guidance.
1	The above mandatory requirement must be met before credits can be awarded. To award the credit a wholesome supply of accessible, clean and fresh drinking water must be supplied, as follows: Community Use Centres: i. Chilled, mains-fed point-of-use water supply or point-of-use water coolers. ii. Provision in safe convenient locations throughout the building. iii. One compliant water cooler per 200 building users (subject to a minimum of one cooler for any building less than 200 users). iv. All coolers must be attached to both the wall and floor and contain security covers to protect all water and electrical connections. An additional requirement is that where humidification is required, a failsafe humidification system must also be provided.

Design Stage Evidence Required

Relevant section/Clause of the building specification or contract.

Design drawings.

Validation Statement

TGA confirmed that all water systems will be designed to minimise the risk of legionella as detailed above.

In addition to this BREEAM compliant point-of-use water coolers or a chilled, mains-fed point-of-use water supply to cover the permanently staffed areas of the building will be installed.

1no. credit has been provisionally awarded.

Hea 05 Acoustic Performance		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	0 of 2	Min. credits to achieve rating level	0	0	0	0	0

Aim

To ensure the buildings acoustic performance including sound insulation meets the appropriate standards for its purpose.

Credits	Criteria
	PRE-REQUISITE A suitably qualified acoustician is appointed by the client at pre-bid/briefing stage of the project to provide early design advice on: a. External sources of noise impacting the chosen site. b. Site layout and zoning of the building for good acoustics. c. Acoustic requirements for users with special hearing and communication needs. d. Acoustic treatment of different zones and facades.
	ACOUSTIC PERFORMANCE STANDARDS The building meets the acoustic performance standards and testing requirements for the relevant building type and function areas as detailed below.
1	Indoor ambient noise levels comply with good practice criteria levels of BS 8233:1999, Table 5-4. For acoustically sensitive rooms e.g. cellular offices the sound insulation between these rooms and other occupied areas complies with section 7.6.3.1 of BS 8233 as follows, Dw + LAeq, T> 75. Any medical spaces (where present) should comply with the performance requirements of HTM 08-01.
1	Rooms used for performance/speech including public speaking must achieve reverberation times compliant with Table 8 of BS 8233:1999. If relevant to the assessed building any classrooms, seminar rooms and lecture theatres should achieve reverberation times compliant with Table 1.5 of BB93.
	TESTING REQUIREMENT To award either of the above credits a suitably qualified acoustician must carry out pre-completion testing to ensure that the relevant spaces (as built) achieve the required performance standards. Where testing identifies that spaces do not meet the standards, remedial works are carried out prior to handover and occupation.

Design Stage Evidence Required
Professional report/study and calculations from the acoustician. A letter of appointment or other confirmation demonstrating when the acoustician was appointed. Relevant section/clauses of the building specification or contract and/or formal letter from the project team regarding the commitments detailed above.
Validation Statement
The design team confirmed at the pre-assessment meeting that these credits are not being sought.

Hea 06 Safety and Security		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 2	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognise and encourage effective design measures that promote low risk, safe and secure access to and use of the building.

Credits	Criteria
1-2	**SAFE ACCESS – 1 CREDIT** External site areas should comply with the following criteria (where applicable) in order to award the credit: **Cycle Lanes** Dedicated cycle lanes are provided and have been designed and constructed in accordance with either: a. Local Transport Note 2/08 Cycle Infrastructure Design, Department of Transport, 2008. b. The National Cycle Network Guidelines and Practical Details – issue 2, Sustrans and the relevant parts of Appendix VI NCN Design and Construction Checklist. The cycle lanes provide direct access from the site entrance(s) to any cycle storage facilities provided, without the need to deviate from the cycle path and, if relevant, connects to offsite cycle paths where these run adjacent to the development's site boundary. **Footpaths** Footpaths on site provide direct access from the site entrance(s) to the building entrance(s) and connect to public footpaths off site (where existing) providing access to local transport nodes and other offsite amenities (where existing). **Drop-off Areas** Where provided, drop-off areas are designed off/adjoining to the access road and provide direct access to pedestrian footpaths, therefore avoiding the need for the pedestrian to cross vehicle access routes. **Pedestrian Road Crossings** Where a dedicated pedestrian crossing of a vehicle access route is provided, the road is raised to the pavement level, unless pavement is at road level. **Signage** For large developments with a high number of public users/visitors pedestrian pathways must be signposted to other local amenities off site, including public transport nodes (where existing).

	Lighting The lighting for access roads, pedestrian areas, footpaths and cycle lanes is compliant with the external lighting criteria defined in BREEAM issue Hea 01, i.e. in accordance with BS5489-1:2003+A2:2008 Lighting of roads and public amenity areas. **Delivery Areas** Delivery areas (where present) are not directly accessed through general parking areas and do not cross or share pedestrian and cyclist routes and other outside amenity areas accessible to building users and general public. There is a separate parking/waiting area for goods vehicles away from / adjacent to the manoeuvring area and staff/visitor car parking. Parking and turning areas are designed for simple manoeuvring according to the type of delivery vehicle likely to access the site, thus avoiding the need for repeated shunting. There is a dedicated space for the storage of refuse skips and pallets away from the delivery vehicle manoeuvring area and staff/visitor car parking (if appropriate given the building type/function). **SECURITY OF SITE AND BUILDING – 1 CREDIT** To award the credit the project team must account for security considerations in the new building design and site layout through consultation with a suitably qualified security consultant. Consultation with the suitably qualified security consultant must occur during or prior to the concept design stage (RIBA stage C) or equivalent. The final design must embody the recommendations/solutions of the suitably qualified security consultant and be built to conform to either: 1. The principles and guidance of Secured by Design (SbD) and/or Safer Parking (SP) Scheme. Or where SbD/SP is of less relevance to the building type/operation: 2. A site specific security risk and threat assessment and subsequent security strategy and recommendations for security measures (as developed/recommended by the suitably qualified security consultant).

Design Stage Evidence Required
SAFE ACCESS Design drawings (including a scaled site plan), **AND**/**OR** relevant sections of the specification highlighting all necessary complaint features and dimensions. **SECURITY OF SITE AND BUILDING** Correspondence from or copy of the report/feedback from the ALO/CPDA/Security Consultant confirming: 1. Scope of their advice/involvement. 2. The stage of design in which their advice was sought. 3. Summary of their recommendations. Design drawings **AND**/**OR** relevant sections of the specification or contract.
Validation Statement
SAFE ACCESS The building will be capable of being accessed direct from the public footpath with any vehicular crossings across the footpaths being raised to the same level; therefore compliance with this issue should be achievable. **SECURITY OF SITE AND BUILDING** PCKO confirmed at the pre-assessment that they had already liaised with the local Police ALO who had concerns regarding the recessed entrance to the building, it was agreed not to allocate this credit at present pending the outcome of further discussions with the ALO. 1 credit has been allocated on the basis of the above.

Ene 01 Reduction of CO_2 Emissions		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	**12 of 15**	Min. credits to achieve rating level	0	0	0	6	10

Aim

To recognise and encourage buildings designed to minimise operation energy demand, consumption and CO_2 emissions.

Credits	Criteria
1 - 15	An Energy Performance Ratio for New Constructions (EPR_{NC}) is calculated using BREEAM's Ene 01 calculator. The EPR_{NC} calculation takes account of the following parameters: a. Operational energy demand. b. Primary energy consumption. c. Total resulting CO_2 emissions. The calculation is determined using the following performance data from modelling the building's specified/designed regulated fixed building services, as sourced from the approved building energy calculation software: i. Building floor area (m^2) ii. Notional building energy demand (MJ/m^2) iii. Actual building energy demand (MJ/m^2) iv. Notional building primary energy consumption (kWh/m^2) v. Actual building primary energy consumption (kWh/m^2) vi. Target Emission Rate (kg CO_2/m^2) vii. Building Emission Rate (kg CO_2/m^2) The EPR_{NC} achieved is then compared with benchmarks below and award the corresponding number of BREEAM credits. **1-5 CREDITS** Requires an EPR_{NC} of between 0.06 and 0.30 and a CO_2 performance improvement progressively better than the Target Emission rate (TER) required for Building Regulations Approval. **6-9 CREDITS** Requires a minimum EPR_{NC} of 0.36 and at BREEAM Excellent Level 6 credits are required and a 25% reduction in CO_2 emissions arising from regulated building energy consumption. **10-14 CREDITS** Requires a minimum EPR_{NC} of 0.60 and at BREEAM Outstanding Level 10 credits are required and a 40% reduction in CO_2 emissions arising from regulated building energy consumption. **15 CREDITS** Requires a CO_2 parameter for the EPR_{NC} calculation of 0.90 and a 100% reduction in CO_2 emissions arising from regulated building energy consumption.

	INNOVATION CREDIT REQUIREMENTS – 5 CREDITS The building is 'carbon negative' in terms of its total modelled operational energy consumption. **UP TO FOUR CREDITS** The building achieves an EPR_{NC} = 0.9 and zero net CO_2 emissions. An equivalent percentage of the buildings modelled 'regulated' operational energy consumption, as stipulated below, is generated by carbon neutral on-site, near-site or 'accredited external' sources and used to meet energy demand from 'unregulated' building systems or processes. • 10% - 1 innovation credit • 20% - 2 innovation credits • 50% - 3 innovation credits • 80% - 4 innovation credits

Design Stage Evidence Required

A copy of the Building Regulations Output Document from the approved software, as follows:

1. England & Wales (Part L): Approved Document checks (BRUKL Output Document).
2. Scotland (Section 6): Specification checks.
3. N. Ireland (Part F): Approved Document checks (BRUKL Output Document).
4. Where relevant for multi-residential buildings, a copy of the calculations based on design stage SAP outputs.

The output document must be based on the 'As Designed' stage of analysis.

INNOVATION CREDITS
As above, plus:

1. A copy of a report, calculations/outputs from the manufacturer, supplier, engineer or software modelling confirming:

    a. The total carbon neutral energy generation (kWh/yr)
    b. The source of the carbon neutral energy.
    c. Calculated estimate of energy consumption from 'unregulated' systems/process (kWh/tr) (required only if confirming 'carbon negative status).
    d. Calculated estimates of exported energy surplus (required only if confirming 'carbon negative status).

Written confirmation from the developer/client/owner-occupier that any surplus carbon neutral energy generated by the development and exported to the Grid will not be used to claim Renewable Obligation Certificates (ROCs), via an accredited generator.

Validation Statement

For this BREEAM issue the mandatory requirements for achieving an Excellent rating are that a minimum of 6 credits must be achieved together with a 25% reduction in CO_2 emissions.

TGA have provided a BRUKL Output Document dated 14th August 2013 this confirms the following:

U Values

- Walls – 0.2
- Floor – 0.15
- Roof – 0.13
- Windows – 1.5

Airtightness

- 3m³/(h/m²) @ 50 Pa

Renewable Technologies

- Photovoltaic Systems – 8,602 kWh/annum
- Combined Heat and Power Generators – 58,558 kWh/annum

Carbon Emissions

- Target Emission Rate = 31.4 kgCO_2/m²
- Building Emission Rate = 23.5 kgCO_2/m² (a 25% reduction over the TER)

Avoca have uploaded the BRUKL input file to the BRE's Ene 01 Online Compliance Checker website in order to confirm the buildings Energy Performance Ratio; the following figures have been confirmed:

- EPR – Energy Demand = 0.2342
- EPR – Primary Energy = 0.3395
- EPR – CO2 Emissions = 0.1937

Combining the above three metrics confirms the following :

- Overall EPR_{NC} = 0.7674

The overall EPR_{NC} would allow the award of 12 credits and as a 25% reduction in CO_2 emissions has been achieved the mandatory Ene 01 requirements for an Excellent rating have been met.

Ene 02 Energy Monitoring		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	2 of 2	Min. credits to achieve rating level	0	0	1	1	1

Aim

To recognise and encourage the installation of energy sub-metering that facilitates the monitoring of operational energy consumption.

Credits	Criteria
1	The following major energy consuming systems (where present) are monitored using either a Building Energy Management System (BEMS) or separate accessible energy sub-meters with a pulsed output to enable future connection to a BEMS: i. Space Heating. ii. Domestic Hot Water. iii. Humidification. iv. Cooling. v. Fans (major). vi. Lighting. vii. Small Power (lighting and small power can be on the same sub-meter where supplies are taken at each floor/department). viii. Other major energy-consuming items where appropriate. The end energy consuming use is identifiable to the building user through labelling or data outputs.
1	An accessible BEMS or accessible sub-meters are provided to all tenanted, or in the case of single occupancy buildings, relevant function areas or departments within the building/unit.

Design Stage Evidence Required

Relevant section/clause of the building specification or contract.

Design drawings.

Validation Statement

The design team have confirmed that all major energy consuming systems are to be monitored using a building energy management systems (BEMS) and separate accessible energy sub-meters with a pulsed output in-line with the above requirements.

In addition to separately monitoring all building systems meters will be supplied to high load or tenancy areas.

2 credits have been allocated.

Ene 03 External Lighting		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 1	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognise and encourage the specification of energy-efficient light fittings for external areas of the development.

Credits	Criteria
1	All external light fittings for the building, access ways and pathways have a luminous efficacy of at least 50 lamp lumens/circuit Watt when the lamp has a colour rendering index (Ra) greater than or equal to 60 **OR** 60 lamp Lumens/circuit Watt when the lamp has a colour rendering index (Ra) less than 60. All external light fittings to car parking areas, associated roads and floodlighting has a luminous efficacy of at least 70 lamp lumens/circuit Watt when the lamp has a colour rendering index (Ra) greater than or equal to 60 **OR** 80 lamp Lumens/circuit Watts when the lamp has a colour rendering index (Ra) less than 60. All external light fittings for signs and uplighting have a luminous efficacy of at least 60 lamp lumens/circuit Watt when the lamp wattage is greater than or equal to 25W OR 50 lamp lumens/circuit Watt when the lamp wattage is less than 25W. External light fittings are controlled through a time switch, or daylight sensor, to prevent operation during daylight hours. Daylight sensor override on a manually switched lighting circuit is acceptable.

Design Stage Evidence Required

Relevant section/clause of the building specification or contract.

Design drawings.

Validation Statement

TGA have confirmed that all external lighting will be installed and controlled in-line with the above Ene 03 lighting requirements.

1 credit has been allocated.

Ene 04 Low and Zero Carbon Technologies		Minimum Code for Sustainable Homes Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	5 of 5	Min. credits to achieve rating level	0	0	0	1	1

Aim

To reduce carbon emissions and atmospheric pollution by encouraging local energy generation from renewable sources to supply a significant proportion of the energy demand.

Credits	Criteria
1	**FEASIBILITY STUDY/RENEWABLE SUPPLY CONTRACT** **1 Credit** A feasibility study has been carried out by an energy specialist to establish the most appropriate local (on-site or near-site) low or zero carbon (LZC) energy source for the building/development. This study covers as a minimum: a. Energy generated from LZC energy source per year b. Life cycle cost of the potential specification, accounting for payback c. Local planning criteria, including land use and noise d. Feasibility of exporting heat/electricity from the system e. Any available grants f. All technologies appropriate to the site and energy demand of the development. g. Reasons for excluding other technologies. h. Where appropriate to the building type, connecting the proposed building to an existing local community CHP system or source of waste heat or power OR specifying a building/site CHP system or source of waste heat or power with the potential to export excess heat or power via a local community energy scheme. A local LZC energy technology has been specified for the building/development in line with the recommendations of the above feasibility study. The feasibility study has been carried out at RIBA stage C (concept design) or equivalent procurement stage. **OR** The organisation that occupies the building has in place a contract with an energy supplier to provide electricity for the assessed building/development from a 100% renewable energy source. This supply must be delivered by an accredited external renewable source. The contract must be valid for a minimum of 3 years from the date the assessed building becomes occupied.

2-4	**LOW OR ZERO CARBON TECHNOLOGY SPECIFICATION AND INSTALLATION** **Up to four credits** The above Feasibility study/Renewable Supply Contract criteria have been met. A local LZC energy technology has been installed in line with the recommendations of the feasibility study and this method of supply results in a reduction in regulated CO_2 emissions as follows: **2 Credits** – 10% reduction in regulated CO_2 emissions **3 Credits** – 20% reduction in regulated CO_2 emissions **Innovation Credit** – 30% reduction in regulated CO_2 emissions **OR** Where the feasibility study includes a Life Cycle Assessment of the carbon impact of the chosen LZC system(s), accounting for its embodied carbon emissions and operational carbon savings and emissions, and this method of supply results in a reduction in life cycle CO_2 emissions as follows: **2 Credits** – Feasibility Study Only **3 Credits** – 10% reduction in life cycle CO_2 emissions **4 Credits** – 20% reduction in life cycle CO_2 emissions **Innovation Credit** – 30% reduction in life cycle CO_2 emissions The LCA study must be completed in accordance with ISO 14044:2006 Environmental Management Life Cycle Assessment – Requirements and Guidelines. The LCA must consider a 60 year period (a typical assumption for the life of a building) and any necessary replacements/maintenance requirements within this period. Figures used for calculations of the percentage carbon reduction provided by LZC technology are based on the output from approved energy modelling software.
1	**FREE COOLING** **1 Credit** Where, regardless of the percentage reduction in the building's CO_2 emissions from LZC sources and number of BREEAM credits achieved above, the building utilises ANY of the following free cooling strategies and the first credit within the BREEAM issue Hea 03 Thermal comfort has been achieved: a. Night-time cooling (requires fabric to have a high thermal mass). b. Ground coupled air cooling. c. Displacement ventilation. d. Ground water cooling. e. Surface water cooling.

	f. Evaporative cooling, direct or indirect. g. Desiccant dehumidification and evaporative cooling, using waste heat. h. Absorption cooling, using waste heat. i. The building does not require any form of cooling (i.e. naturally ventilated).

Design Stage Evidence Required

FEASIBILITY STUDY/RENEWABLE SUPPLY CONTRACT CREDIT
The feasibility study report.

Design drawings or relevant specification/clause of the building specification or contract.

Name and details of energy supplier.

Details of the source of supply.

A copy of the contract or other formal documentation confirming the length of contract to supply 100% renewable energy.

LOW OR ZERO CARBON TECHNOLOGY SPECIFICATION AND INSTALLATION
Evidence as outlined above confirming compliance with the first credit.

Report, calculations/outputs from the manufacturer, supplier, engineer or approved modelling software confirming carbon savings as a result of the installed LZC technology.

A copy of the LZC study report/findings demonstrating the percentage carbon saving over the lifetime of the LZC system.

FREE COOLING
Correspondence from the building services engineer summarising the 'purpose deigned' free cooling strategy.

The results from a dynamic simulation model demonstrating the feasibility of the free cooling strategy.

Evidence as requested for the first credit within the BREEAM Issue HEA 03 Thermal Comfort.

Validation Statement

TGA confirmed at the pre-assessment meeting that a compliant LZC feasibility study will be produced and a compliant LZC technology specified for the building, it was also confirmed that a reduction in CO_2 of 25% would be targeted.

Avoca advised that the report should include a Life Cycle Assessment of the carbon impact of the chosen LZC in order to claim full credits.

It was also stated that an element of Night Time cooling would be included within the design.

The exemplary level criteria for this issue are not to be targeted.

5 credits have been allocated.

Ene 06 Energy Efficient Transportation Systems		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	2 of 2	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognise and encourage the specification of energy-efficient transportation systems.

Credits	Criteria
1-2	**FIRST CREDIT** Where either lifts, escalators or moving walks (transportation types) are required: a. An analysis of the transportation demand and usage patterns for the building has been carried out by the design team to determine the optimum number and size of lifts (including counter-balancing ratio), escalators and/or moving walks. b. The energy consumption has been estimated for one of the following: i. At least two types of system (for each transportation type required) or ii. An arrangement of systems (e.g. for lifts, hydraulic, traction, MRL) or iii. A system strategy which is 'fit for purpose' (scheduling) c. The lift/escalator/moving walk system/strategy with the lowest energy consumption is specified. **SECOND CREDIT** The above credit requirements have been achieved. For lifts, of the following energy-efficient features the three that offer the greatest potential energy savings are specified: a. The lifts operate in a stand-by condition during off-peak periods. For example the power side of the lift controller and other operating equipment such as lift car lighting, user displays and ventilation fans switch off when the lift has been idle for a prescribed length of time. b. The lift car uses energy-efficient lighting and display lighting i.e. an average lamp efficacy, across all fittings in the car, of >55 lamp lumens/ circuit watt and lighting switches off after the lift has been idle for a prescribed length of time. c. The lift uses a drive controller capable of variable-speed, variable-voltage, variable frequency (VVVF) control of the drive motor. d. The lift has a regenerative drive unit so that any energy generated by a traction lift (due to running up loaded to less than the counterbalancing ratio or running down loaded to more than the counter balancing ratio) or by a hydraulic lift (due to running down) is returned back to the electricity utility supplier or used elsewhere in the building.

	For escalators and/or moving walks, each escalator and/or moving walk complies with **EITHER** of the following: a. It is fitted with a load sensing device that synchronises motor output to passenger demand through a variable speed drive. **OR** b. It is fitted with a passenger sensing device for automated operation (auto walk), so the escalator operates in stand-by mode when there is no passenger demand.

Design Stage Evidence Required

First Credit
Professional report/study of transportation analysis **AND**/**OR** calculations.

Second Credit
Relevant section/clause of the building specification or contract

AND EITHER

Manufacturer's product details.

OR

Formal letter of commitment from the system(s) manufacturer/supplier.

Validation Statement

The design team confirmed that they would produce a transport/energy analysis of the building and specify a lift with compliant energy efficiency features.

2 credits can be allocated.

Ene 08 Energy Efficient Equipment		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	2 of 2	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognize and encourage procurement of energy-efficient equipment to ensure optimum performance and energy savings in operation.

Credits	Criteria
2	**Two Credits** Identify from the list below the functions/equipment that are or will be present within the assessed building. Of those functions identify which will be responsible for the significant majority of unregulated energy consumption in the building. Two credits are then awarded for compliance with the corresponding criteria. A. Small power, plug in equipment. B. Swimming pool. C. Communal laundry. D. Data Centre. E. IT-intensive operating areas. F. Residential areas. G. Healthcare. H. Kitchen and catering facilities.

For a building of this type we expect that the majority of unregulated energy consumption will be as a result of small power and plug in equipment. Such as:

1. Office equipment.
2. Domestic scale white goods and other small powered equipment.
3. Supplementary electric heating.

To demonstrate compliance the above equipment should **EITHER** qualify for an Enhanced Capital Allowance Scheme claim (i.e. it is on the Energy Technology Product List) **OR** has been awarded an Energy Star rating **OR** has been procured in accordance with the Governments Buying Standards **OR** are identified as products with at least a 'green tick' standard on the Buying Solution website.

Design Stage Evidence Required

Relevant section/clauses of the building specification or contract.

Manufacturer's product details.

Documentation confirming compliance with the relevant scheme or standard outlined in the criteria e.g. details of compliance with the ECA scheme (where relevant).

Validation Statement

The client confirmed via emails dated 25/04/13 and 26/04/13 that tenancy agreements will commit the building occupants to comply with the requirements of these credits, as a result 2 credits are have been allocated.

Tra 01 Public Transport Accessibility		**Minimum BREEAM Standards**					
		Level	**P**	**G**	**VG**	**E**	**O**
No. of credits awarded:	**5 of 5**	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognize and encourage development in proximity of good public transport networks, thereby helping to reduce transport-related pollution and congestion.

Credits	**Criteria**
1-5	**ACCESSIBILITY INDEX** The public transport Accessibility Index (AI) for the assessed building is calculated and BREEAM credits awarded in accordance with the building type, AI benchmarks and BREEAM credits below: Other Building (Type 2) - AI = 2 (**1 Credit**) AI = 4 (**2 Credits**) AI = 8 (**3 Credits**) AI = 12 (**4 Credits**) AI = 18 (**5 Credits**) The Accessibility Index is determined by entering the following information in to the BREEAM Tra 01 calculator: a. The distance (m) from the main building entrance to each compliant public transport node. b. The public transport type(s) serving the compliant node e.g. bus or rail. c. The average number of services stopping per hour at each compliant node during the standard operating hours of the building for a typical day.
1	**DEDICATED BUS SERVICE** For buildings with a fixed shift pattern i.e. where building users will predominantly arrive/depart at set times and where the building is unable to gain any of the above credits one credit can be awarded where the building occupier will provide a dedicated bus service to and from the building at the beginning and end of each shift/day. The bus must provide transfer to the local population centre, public transport interchange or be a door-to-door service.

Design Stage Evidence Required

ACCESSIBILITY INDEX
Scale map highlighting the location of the building and all public transport nodes in proximity of the building.

Timetables for each service at each public transport node considered.

The calculated Accessibility Index for the building.

DEDICATED BUS SERVICE
A formal letter from the future building occupier confirming provision of and details for the dedicated bus service(s)

Validation Statement

The site is in a good location with access to several public transport nodes; although no site survey has been carried out it is expected that the building will benefit from excellent public transport links.

5 credits have been allocated.

Tra 02 Proximity to Amenities		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 1	Min. credits to achieve rating level	0	0	0	0	0

Aim

To encourage and reward a building that is located in close proximity to local amenities, thereby reducing the need for extended travel or multiple trips.

Credits	Criteria
1	The credit can be awarded where the assessed building is within 500m of two of the following amenities: • Grocery Shop or Food Outlet • Post Box • Cash Machine • Pharmacy • GP Surgery/Medical Centre

Design Stage Evidence Required

Marked-up site plan or map highlighting:

1. Location of assessed building
2. Location and type of amenities
3. The route to the amenities
4. Plan/map scale

OR

Where the amenities do not currently exist, but are due to be developed, a letter from the client/developer confirming:

1. The location and type of amenities to be provided.
2. The timescale for development of the amenities.

Validation Statement

The site is in close proximity to a main high street with several compliant amenities present.

1 credit has been allocated.

Tra 03 Cyclist Facilities		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 2	Min. credits to achieve rating level	0	0	0	0	0

Aim

To encourage building users to cycle by ensuring adequate provision of cyclist facilities.

Credits	Criteria
1-2	**OTHER BUILDING TYPE 2** **First Credit** Providing compliant cycle parking spaces as follows: 1. 1no. compliant cycle space per 10 staff members. **PLUS** 2. 1no. compliant cycle space per 10 visitors. **Second Credit (First credit must be achieved)** 2no. compliant cyclist facilities.

Design Stage Evidence Required

Design drawings and/or relevant section/clauses of the building specification or contract.

Validation Statement

First Credit
PCKO confirmed during the pre-assessment meeting that compliant cycle parking will be provided.

Second Credit
Following the pre-assessment meeting Avoca advised that the number of compliant cyclist changing facilities (lockers) required is only related to the number of staff cycle spaces; PCKO have subsequently advised that there is insufficient space to incorporate all necessary facilities and that this credit should not be pursued.

1 credits can be allocated on the basis of the above.

Tra 04 Maximum car Parking Capacity		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	2 of 2	Min. credits to achieve rating level	0	0	0	0	0

Aim

To encourage the use of alternative means of transport to the building other than the private car, thereby helping to reduce transport related emissions and traffic congestion associated with the buildings operation.

Credits	Criteria
2	Maximum parking should not exceed the figures given with the BREEAM 2011 New Construction Technical Guide for Other Building Transport Type 2. The following types of parking spaces can be excluded from the assessment of this issue: • Disabled • Mother & baby • Motorbike • Car share (a car share policy must be demonstrated to be in place).

Design Stage Evidence Required

Drawings or relevant section/clauses of the building specification or contract confirming the number and type of parking spaces provided for the building.

Relevant documentation or correspondence from the design team or client confirming the number of building users.

Where relevant, confirmation of the buildings' Accessibility Index (as per BREEAM issue Tra 1).

Validation Statement

The site layout tabled at the site meeting showed that the development will not have its own car park and should therefore comply with this issue by default.

2 credits allocated.

Tra 05 Travel Plan		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 1	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognize the consideration given to accommodating a range of travel options for building users, thereby encouraging the reduction of user reliance on forms of travel that have the highest environmental impact.

Credits	Criteria
1	A travel plan has been developed as part of the feasibility and design stages which considers all types of travel relevant to the building type and users. The travel plan is structured to meet the needs of the particular site and takes into consideration the findings of a site-specific transport survey and assessment that covers the following (as a minimum): 1. Where relevant, existing travel patterns and opinions of existing building or site users towards cycling and walking so that constraints and opportunities can be identified. 2. Travel patterns and transport impact of future building users. 3. Current local environment for walkers and cyclists (accounting for visitors who may be accompanied by young children). 4. Disabled access (accounting for varying levels of disability and visual impairment). 5. Public transport links serving the site. 6. Current facilities for cyclists. The travel plan includes a package of measures that have been used to steer the design of the development in order to meet the travel plan objectives and minimise car-based travel patterns. This is demonstrated via specific examples such as: a. Providing parking priority spaces for car sharers. b. Providing dedicated and convenient cycle storage and changing facilities. c. Lighting, landscaping and shelter to make pedestrian and public transport waiting areas pleasant. d. Negotiating improved bus services, i.e. altering bus routes or offering discounts. e. Restricting and/or charging for car parking. f. Criteria for lobby areas where information about public transport or car sharing can be made available. g. Pedestrian and cycle friendly (for all types of user regardless of the level of mobility or visual impairment) via the provision of cycle lanes, safe crossing points, direct routes, appropriate tactile surfaces, well lit and signposted to other amenities, public transport nodes and adjoining offsite pedestrian and cycle routes. h. Providing suitable taxi drop-off/waiting areas. i. Ensuring that rural buildings are located with appropriate transport access to ensure that they adequately serve the local community (where procured to do so e.g. community centre).

	Where appropriate to the building type, size and intended operation, the travel plan includes measures tailored to minimise the impacts of operational-related transport e.g. deliveries of supplies, equipment and support services to and from the site. Where the building's final occupier is known, they confirm that the travel plan will be implemented post construction and supported by the building's management during building operation.

Design Stage Evidence Required

A copy of the Travel Plan.

A copy of the site-specific transport survey/assessment.

Design drawings demonstrating examples of design measures implemented in support the travel plan's findings.

OR

Where a detailed site plan is not available, a formal letter from the client confirming that measures will be implemented into the final design in support the travel plan's findings.

A letter of confirmation from either the building's occupier, or in the case of a speculative development, the developer.

Validation Statement

The design team have confirmed that there will be a site-specific Travel Plan produced for the proposed development.

1 credit has therefore been allocated.

Wat 01 Water Consumption		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	2 of 5	Min. credits to achieve rating level	0	1	1	1	2

Aim

To reduce the consumption of potable water for sanitary use in new buildings from all sources through the use of water efficient components and water recycling systems.

Credits	Criteria
1-5	**UP TO 5 CREDITS** An assessment of the efficiency of the building's domestic water consuming components is undertaken using the BREEAM Wat 01 calculator. The water consumption (litres/person/day) for the assessed building is compared against a notional baseline performance and BREEAM credits awarded as follows: % improvement — No. of BREEAM Credits 12.5% — **1** 25% — **2** 40% — **3** 50% — **4** 55% — **5** 65% — **Innovation Credit** The efficiency of the following 'domestic scale' water consuming components must be included in the calculation (where specified): a. WC's b. Urinals c. Taps (wash hand basins and where specified kitchen taps and waste disposal unit) d. Showers e. Baths f. Dishwashers (domestic and commercial sized) g. Washing machine (domestic and commercial/industrial sized) The BREEAM Wat 01 calculator defines the building types and activity areas for which the above components must be assessed. Where a greywater and/or rainwater system is specified, its yield (l/person/day) can be used to off-set non potable water demand from components that would otherwise be supplied using potable water. Any greywater systems must be specified and installed in compliance with BS8525-1:2010 Greywater Systems - Part 1 Code of Practice. Any rainwater systems must be specified and installed in compliance with BS8515:2009 Rainwater Harvesting Systems - Code of practice.

	Report the total net water consumption in m^3/person/yr, via the BREEAM scoring and reporting tool (where total net water consumption can be modelled by the BREEAM Wat01 calculator for the assessed building type). This figure is reported by the assessor via the BREEAM scoring and reporting tool.

Design Stage Evidence Required

Completed copy of the BREEAM Wat 01 calculator.

Relevant section/clauses of the building specification/ design drawings confirming technical details of;

1. Sanitary components.
2. Rainwater and greywater collection system

OR where detailed documentary evidence is not available at this stage;

Completed BREEAM Wat 01 calculator.

A letter of instruction to a contractor/supplier or a formal letter from the developer giving a specific undertaking, providing sufficient information to allow the water calculations to be completed.

Validation Statement

The design team agreed to target compliance with Level 2 (a 25% improvement) in order to achieve credits.

No allowance for rainwater or greywater systems has been made.

BREEAM Wat 01 calculations will need to be undertaken, to confirm this credit allocation; once the sanitaryware specification has been produced.

2 credits have been allocated.

Wat 02 Water Monitoring		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 1	Min. credits to achieve rating level	0	0	0	0	0

Aim

To ensure that water consumption can be monitored and managed and therefore encourage reductions in water consumption.

Credits	Criteria
Mandatory	The specification of a water meter on the mains water supply to each building; this includes instances where water is supplied via a borehole or other private source.
1	Water-consuming plant or building areas, consuming 10% or more of the building's total water demand, are either fitted with sub meters or have water monitoring equipment integral to the plant or area. Each meter (main and sub) has a pulsed output to enable connection to a Building Management System (BMS) for the monitoring of water consumption. If the site on which the building is located has an existing BMS, managed by the same occupier/owner (as the new building), the pulsed water meter(s) for the new building must be connected to the existing BMS.

Design Stage Evidence Required

Relevant section/clauses of the building specification or contract.

Design drawings

Validation Statement

The design team have confirmed that the mandatory criteria will be met, and there will be sub-metering or water monitoring equipment installed on the water consuming plant, which consumes 10% or more of the buildings total water demand. As well as this, each meter (main and sub) will have a pulsed output to enable connection to a BMS for monitoring purposes.

1 credit has been allocated.

Wat 03 Leak Detection and Prevention		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	2 of 2	Min. credits to achieve rating level	0	0	0	0	0

Aim

To reduce the impact of water leaks that may otherwise go undetected.

Credits	Criteria
1-2	**First Credit** A leak detection system which is capable of detecting a major water leak on the mains water supply within the building and between the building and the utilities water meter. The leak detection system is: a. Audible when activated. b. Activated when the flow of water passing through the water meter/data logger is at a flow rate above a pre-set maximum for a pre-set period of time. c. Able to identify different flow and therefore leakage rates, e.g. continuous, high and/or low level, over set time periods. d. Programmable to suit the owner/occupiers' water consumption criteria. e. Where applicable, designed to avoid false alarms caused by normal operation of large. **Second Credit** One of the following types of flow control device is fitted to each WC area/facility to ensure water is supplied only when needed (and therefore prevent minor water leaks): a. A time controller i.e. an automatic time switch device to switch off the water supply after a predetermined interval. b. A programmed time controller i.e. an automatic time switch device to switch water on and/or off at predetermined times. c. A volume controller i.e. an automatic control device to turn off the water supply once the maximum pre-set volume is reached. d. A presence detector and controller i.e. an automatic device detecting occupancy or movement in an area to switch water on and turn it off when the presence is removed. e. A central control unit i.e. a dedicated computer-based control unit for an overall managed water control system, utilising some or all of the types of control elements listed above.

Design Stage Evidence Required

Relevant section/clauses of the building specification or contract.

Design drawings.

Manufacturer's product details.

Validation Statement
The design team confirmed that they would install a leak detection system based on a pulsed water meter at the incoming supply and a pulsed check meter inside the building; these will be linked to a BMS system. It was also confirmed that solenoid valves would be installed on the cold water supply to toilet and shower areas. These will be linked to the lighting PIR's in each room to enable automatic operation. 2 credits have been allocated.

Wat 04 Water Efficient Equipment		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 1	Min. credits to achieve rating level	0	0	0	0	0

Aim

To reduce unregulated water consumption by encouraging specification of water efficient equipment.

Credits	Criteria
1	Where an irrigation method specified for internal or external planting and/or landscaping, it complies with **ANY ONE** of the following: a. Drip feed subsurface irrigation that incorporates soil moisture sensors. The irrigation control should be zoned to permit variable irrigation to different planting assemblages. b. Reclaimed water from a rainwater or greywater system. The storage system must be appropriately sized i.e. storage capacity is relative to the size of the soft landscaped area. c. External landscaping and planting that relies solely on precipitation, during all seasons of the year. d. All planting specified is restricted to species that thrive in hot and dry conditions. e. Where no dedicated, mains-supplied irrigation systems (including pop-up sprinklers and hoses) are specified and planting will rely solely on manual watering by building occupier or landlord. Where a sub-surface drip feed irrigation system is installed for external areas, a rain-stat must also be installed to prevent automatic irrigation of the planting and the landscape during periods of rainfall. Where a vehicle wash system is specified, it uses a full or partial reclaim unit which contains one or more of the following: a hydro-cyclone, a sand or activated carbon filter, a sump tank(s), three chamber interceptors, and a cartridge filter or bag filter. This is in line with the ECA water technology list.

Design Stage Evidence Required

Documentation detailing the planting and irrigation strategy.

Relevant section/clauses of the building specification or contract **AND**/**OR** design drawings (where necessary).

Manufacturer's product details.

Validation Statement
The design team have confirmed that no dedicated, mains supplied irrigation system will be installed at the scheme and the planting will rely on either precipitation or manual watering by the building occupiers via a bib tap. There are to be no vehicle wash systems installed and no sub-surface drip fed irrigation systems installed at the scheme. 1 credit has been allocated.

Mat 01 life Cycle Impacts		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	6 of 6	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognize and encourage the use of construction materials with a low environmental impact (including embodied carbon) over the full life cycle of the building.

Credits	Criteria
1-6	BREEAM awards credits on the basis of the building's quantified environmental life cycle impact through assessment of the main building elements, as listed below: **Other Buildings** • External Walls • Windows • Roof • Upper Floor Slab • Internal Walls • Floor Finishes/Covering Credits are awarded on the basis of the total number of points achieved, as set out below, and calculated using the BREEAM Mat 01 calculator. This point's score is based on the Green Guide rating(s) achieved for the specifications that make-up the main building elements (as above). Note: Where an independently verified third-party Environmental Product Declaration (EPD), covering part of or the whole life cycle, is available for a material/product that forms part of an assessed building element, this can be used to increase the contribution of that element to the building's Mat 01 performance. **Other Buildings** Total Mat 01 points achieved — Available BREEAM Credits 2 — **1** 4 — **1** 5 — **2** 8 — **3** 10 — **4** 12 — **5** 14 — **6** Where the total points achieved exceeds the level required for maximum credits see the exemplary level criteria as the building may be eligible for an additional **innovation credit.**

	Life cycle Green House Gas emissions (kg CO_2 eq.) for each element are also required to be reported based on a 60-year building life. Where specific data is not available for a product or element, generic data should be used. Generic data can be obtained from the online Green Guide for each element and must be entered in to the BREEAM Mat 01 calculator **INNOVATION CREDIT REQUIREMENTS** The following outlines the exemplary level criteria to achieve an innovation credit for this BREEAM issue. Where assessing four or more applicable building elements, the building achieves at least two points additional to the total points required to achieve maximum credits under the standard BREEAM criteria (as outlined in the table above). **OR** Where assessing fewer than four applicable building elements, the building achieves at least one point additional to the total points required to achieve maximum credits under the standard BREEAM criteria.

Design Stage Evidence Required

Specification providing a detailed description of each applicable element and its constituent materials specification.

Design drawings or specification detailing the location and area (m²) of each applicable element.

A copy of the output from the BREEAM Mat 01 calculator, including Green Guide rating and element number for each specification assessed.

And if relevant:

1. Copies of Environmental Product Declarations.
2. A link/reference to the EPD's Product Category Rules.
3. Online Green Guide calculator output.
4. Environmental Profile certificate(s) (or certificate number).

Validation Statement

The design team have confirmed that six credits will be targeted under this criterion. At the time of writing, there has been no specification document issued to check compliance with the above statement.

A specification document/design stage drawings will need to be submitted to check that all of the above 'main building elements' are in compliance with the required Mat 01 calculator score.

The innovation credit is not to be targeted.

6 credits have been allocated in accordance with the above.

Mat 02 Hard Landscaping and Boundary Protection		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 1	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognise and encourage the specification of materials for boundary protection and external hard surfaces that have a low environmental impact, taking account of the full life cycle of materials used.

Credits	Criteria
1	Where at least 80% of all external hard landscaping and boundary protection (by area) Achieves an A or A+ rating, as defined in the Green Guide to Specification.

Design Stage Evidence Required

1. Relevant section/clauses of the building specification or contract and/or design drawings.
2. Calculations confirming:
    a. A detailed description of each applicable element and its constituent materials.
    b. Location and area (m²) of each applicable element.

3. The Green Guide rating and element number for the assessed specifications.

Validation Statement

The design team have confirmed that they intend to target compliance with this item.

At the time of writing, no external hard landscaping or boundary protection specification had been submitted to enable a full assessment against the Mat 02 criterion.

1 credit has been allocated in accordance with the above.

Mat 03 Responsible Sourcing of Materials		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	2 of 3	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognise and encourage the specification of responsibly sourced materials for key building elements.

Credits	Criteria
Mandatory	Confirmation that all timber used on the project is sourced in accordance with the UK Government's Timber Procurement Policy.
1-3	Each of the applicable specified materials comprising the main building elements are assigned a responsible sourcing tier level and points awarded as follows: Tier Level — Points 1 — 4.0 2 — 3.5 3 — 3.0 4 — 2.5 5 — 2.0 6 — 1.5 7 — 1.0 8 — 0 The tier rank is determined based on the rigour of responsible sourcing demonstrated by the supplier(s)/manufacturer(s) of that material/element (through responsible sourcing certification schemes). The number of BREEAM credits achieved is determined as follows: BREEAM Credits — % of available points achieved **3** — 54% **2** — 36% **1** — 18% The BREEAM Mat 03 calculator must be used to determine the points and credits achieved for this issue. To achieve points for any given building element, at least 80% of the materials that makeup that element must be responsibly sourced i.e. classified in tier 1-7. The number of building elements present and therefore applicable determines the maximum number of point's available e.g. if nine elements are present and assessed the maximum number of available points will be 36. Potential variance in tier levels achieved for materials within any one element will require a pro-rata calculation of the points total for any given

	element. **INNOVATION CREDIT REQUIREMENTS** The following outlines the exemplary level criteria to achieve an innovation credit for this BREEAM issue: Where 70% of the available responsible sourcing points have been achieved.

Design Stage Evidence Required

Design plan and/or specification confirming:

1. The building elements.
2. Details of the materials specification for each element.

A copy of the output from the BREEAM Mat 03 calculator.

AND EITHER

A letter of intent from the design team or other detailed documentary evidence confirming the product shall be sourced from suppliers capable of providing certification to the level required for the particular tier claimed **OR**

A copy of the relevant responsible sourcing scheme certificate(s) for the relevant specifications/products.

RECYCLED MATERIALS
Documentation stating specific recycled materials.

A letter of intent to use suppliers who can provide an EMS certificate (or equivalent) for the recycling process.

TIMBER PROCUREMENT
Written confirmation from the supplier/s that all timber is sourced in compliance with the UK Government Timber Procurement Policy for legal and sustainable sourcing **OR**

Copies of the actual chain of custody evidence in accordance with CPET requirements **OR**

A specification or letter of intent from the design team confirming that all timber will be procured in accordance with the policy.

Written confirmation from supplier(s) that the Green Dragon Environmental Standard has been completed up to and including Level 4. Confirmation is taken from a Green Dragon Standard certificate stating the company's achievement of Level 4.

As company's achieving Level 4 will normally be required to undertake annual audits, this certification should be dated within 1 year at the point of the last purchase made from the company.

For smaller companies with low environmental impacts, a renewal date of within 2 years is acceptable.

SMALL COMPANY EMS
Written confirmation from the supplier/s confirming that:

1. The company EMS is structured in compliance with BS 8555 2003 (or equivalent).
2. The EMS has completed phase audits one to four as outlined in BS 8555. This can be found in company documentation demonstrating the process and typical outputs from phase four audits such as an EMS manual/ paperwork and guidance to staff.
3. Where independent certification exists to demonstrate these phases, it can be used as evidence.

Validation Statement

The design team have confirmed that the mandatory timber procurement requirement, noted above, will be achieved.

At the time of writing, there has been no specification provided to assess the materials present in the main building elements however it was confirmed that a clause would be inserted into the contract committing the Principle Contractor to achieving 2 credits for responsibly sourcing the main building elements.

Mat 04 Insulation		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	2 of 2	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognize and encourage the use of thermal insulation which has a low embodied environmental impact relative to its thermal properties and has been responsibly sourced.

Credits	Criteria
1-2	**PRE-REQUISITE** Any new insulation specified for use within the following building elements must be assessed: a. External walls b. Ground floor c. Roof d. Building services **FIRST CREDIT – EMBODIED IMPACT** The Green Guide rating for the thermal insulation materials must be determined. The Insulation Index for the building insulation is the same as or greater than 2. The Insulation Index is calculated using the BREEAM Mat 04 calculator which uses the following calculation methodology: For each type of thermal insulation used in the relevant building elements, the volume weighted thermal resistance provided by each type of insulation is calculated as follows: a. (Area of insulation (m^2) x thickness(m)) / Thermal Conductivity (W/ m.K) **OR** b. Total volume of insulation used (m^3) / Thermal conductivity (W/m.K) The volume weighted thermal resistance for each insulation material is then multiplied by the relevant Green Guide point(s) from the following information to give the Green Guide Rating corrected value: Green Guide Rating — Points/Element A+ — 3 A — 2 B — 1 C — 0.5 D — 0.25 E — 0 To calculate the Insulation Index, the sum of the Green Guide rating corrected values for all insulating elements is divided by the sum of the volume weighted thermal resistance values. Note: Where an independently verified third-party Environmental Product Declaration (EPD), covering part of or the whole life cycle, is available for an

	insulating material/product, this can be used to increase the contribution of that material/product to the building's Mat 04 performance. **SECOND CREDIT – RESPONSIBLE SOURCING** At least 80% by volume of the thermal insulation used in the building elements identified in Item 1 must be responsibly sourced i.e. each insulation product must be certified in accordance with either tier levels 1, 2, 3, 4, 5 or 6 as described in BREEAM issue Mat 03 .

Design Stage Evidence Required

First Credit
Design drawings **AND**/**OR** relevant section/clauses of the building specification or contract confirming:

1. The location of insulating materials.
2. The area (m²) and thickness (m) or volume (m³) of insulation specified.

Manufacturer's technical details confirming the thickness and thermal conductivity of the insulating materials specified.

A copy of the output from the BREEAM Mat 04 calculator.

The Green Guide rating and element number for the assessed insulation specifications.

And if relevant:

1. Copies of Environmental Product Declarations.
2. A link/reference to the EPD's Product Category Rules.
3. Online Green Guide calculator output.
4. Environmental Profile certificate(s) (or certificate number).

Second Credit
Evidence as outlined in BREEAM issue Mat 03 confirming compliance for the insulating materials.

Validation Statement

The design team have confirmed that the buildings insulation index will be the same as, or greater than 2, in-line with the Embodied Impact criteria above.

The design team have also confirmed that the insulation will be specified from insulation manufacturers (i.e. Kingspan) capable of supplying Environmental Management System certification for both the insulation manufacture and the Key Production Process and Supply Chain Process in order to award the second credit.

2 credits have been allocated.

Mat 05 Designing for Robustness		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 1	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognize and encourage adequate protection of exposed elements of the building and landscape, therefore minimising the frequency of replacement and maximizing materials optimisation.

Credits	Criteria
1	Areas of the building have been identified (both internal and external) where vehicular, trolley and pedestrian movement occur. The design incorporates suitable durability and protection measures or design features/solutions to prevent damage to the vulnerable parts of the building. This must include, but is not necessarily limited to: a. Protection from the effects of high pedestrian traffic in main entrances, public areas and thoroughfares (corridors, lifts, stairs, doors etc.). b. Protection against any internal vehicular/trolley movement within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas. c. Protection against, or prevention from, any potential vehicular collision where vehicular parking and manoeuvring occurs within 1m of the external building façade for all car parking areas and within 2m for all delivery areas.

Design Stage Evidence Required

Design drawings illustrating vulnerable areas/parts of the building.

Design drawings and/or relevant section/clauses of the building specification or contract confirming the durability measures specified.

Validation Statement

The design team have confirmed that the building will be designed for robustness, in-line with the above requirements of Mat 05. No final details issued as yet.

1 credit has been allocated.

Wst 01 Construction Waste Management		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	2 of 4	Min. credits to achieve rating level	0	0	0	0	1

Aim

To promote resource efficiency via the effective management and reduction of construction waste.

Credits	Criteria
1-4	**CONSTRUCTION RESOURCE EFFICIENCY (UP TO 3 CREDITS)** Non-hazardous construction waste (excluding demolition and excavation waste) generated by the building's design and construction meets or exceeds the following resource efficiency benchmarks: BREEAM Credits — Amount of waste generated per 100m² (GIFA): m^3 / Tonnes **One Credit** 13.3 / 11.1 **Two Credits** 7.5 / 6.5 **Three Credits** 3.4 / 3.2 **Innovation Credit** 1.6 / 1.9 Note: Volume (m^3) is actual volume of waste (not bulk volume). There is a compliant Site Waste Management Plan (SWMP). Where existing buildings on the site will be demolished a pre-demolition audit of any existing buildings, structures or hard surfaces is completed to determine if, in the case of demolition, refurbishment/reuse is feasible and, if not, to maximise the recovery of material from demolition for subsequent high-grade/value applications. The audit must be referenced in the SWMP and cover: a. Identification of the key refurbishment/demolition materials. b. Potential applications and any related issues for the reuse and recycling of the key refurbishment and demolition materials. **DIVERSION OF RESOURCES FROM LANDFILL (1 CREDIT)** The following percentages of non-hazardous construction and demolition waste (where applicable) generated by the project have been diverted from landfill: **BREEAM Credits** / **Type of Waste** / **Volume** / **Tonnage** **One Credit** — Non Demolition: 70% / 80% Demolition: 80% / 90% **Innovation Credit** — Non Demolition: 85% / 90% Demolition: 85% / 95% There is a compliant Site Waste Management Plan (SWMP). 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.

	INNOVATION CREDIT REQUIREMENTS The following outlines the exemplary level criteria to achieve an innovation credit for this BREEAM issue: Non-hazardous construction waste generated by the building's design and construction is no greater than the exemplary level resource efficiency benchmark (outlined in the above table). The percentage of non-hazardous construction and demolition waste (if relevant) diverted from landfill meets or exceeds the exemplary level percentage benchmark (outlined in the above table). All key waste groups are identified for diversion from landfill in the pre-construction stage SWMP.

Design Stage Evidence Required

A copy of the compliant Site Waste Management Plan and where relevant, a copy of the pre-demolition audit **AND**/**OR**

Relevant section/clauses of the building specification or contract **AND**/**OR**

A letter from the client or their representative.

Where relevant for multi-residential buildings:

Evidence in line with the Design Stage evidence requirements of the CSH Issue Was 2 **OR**

A copy of the Design Stage CSH certificate and report from the CSH online reporting system confirming the number of credits achieved for CSH Issue Was 2.

Validation Statement

The contractor has not been appointed at this time but it was agreed to target one credit for producing a compliant SWMP containing all features listed above and targeting no more than 13.3m^3 (11.1 tonnes) of non-hazardous construction waste per 100m^2 of gross internal floor area.

The contractor would also need to carry out a pre-demolition audit of the existing buildings to maximise the recovery of material from demolition. This audit should be referenced within the SWMP.

The design team have confirmed that there will be an obligation placed on the Principal Contractor that a minimum of 70% by volume (80% by weight) of non-demolition waste generated by the project, and at least 80% by volume (90% by weight) of demolition waste will be diverted from landfill. Key waste groups identified on the scheme will be sorted either on-site or off-site by a licensed waste recovery contractor.

2 credits have been allocated on the basis of the above.

Wst 02 Recycled Aggregates		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	0 of 1	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognise and encourage the use of recycled and secondary aggregates, thereby reducing the demand of virgin material and optimizing material efficiency in construction.

Credits	Criteria
1	The total amount of recycled and/or secondary aggregate specified is greater than 25% (by weight or volume) of the total high-grade aggregate specified for the development. To contribute to the total amount, the percentage of high-grade aggregate specified per application (where present) that is recycled and/or secondary aggregate, must meet the following minimum levels (by weight or volume):

Application	Min % **One Credit**	Min % **Innovation Credit**
Structural frame	25%	50%
Floor slabs, inc. ground floor slabs	25%	50%
Bitumen or hydraulic bound base, binder, and surface courses for paved areas and roads	50%	75%
Concrete road surfaces	25%	50%
Pipe bedding	50%	100%
Building foundations	25%	50%
Granular fill and capping	75%	100%
Gravel landscaping	100%	100%

The aggregates are **EITHER**:

a. Obtained on site **OR**
b. Obtained from waste processing site(s) within a 30km radius of the site; the source will be principally from construction, demolition and excavation waste (CD&E) – this includes road planning's **OR**
c. Secondary aggregates obtained from a non-construction post-consumer or post-industrial by-product source.

INNOVATION CREDIT REQUIREMENTS
The following outlines the exemplary level criteria to achieve an innovation credit for this BREEAM issue.

Where the total amount of recycled and/or secondary aggregate specified is greater than 35% (by weight or volume) of the total high-grade aggregate specified for the project.

To contribute to the total amount, the percentage of high-grade aggregate specified per application (where present) that is recycled and/or secondary aggregate, must meet the exemplary minimum levels (by weight or volume) as defined in the table above.

Design Stage Evidence Required
Relevant section/clauses of the building specification or contract. Project team calculations. Documentation confirming the source of recycled/secondary aggregates and that the required amount can be provided.
Validation Statement
This credit was discussed and it was agreed that it would be difficult to achieve, as a result no credits can be allocated.

Wst 03 Operational Waste		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 1	Min. credits to achieve rating level	0	0	0	1	1

Aim

To recognize and encourage the provision of dedicated storage facilities for a buildings operational-related waste streams, so that this waste is diverted from landfill or incineration.

Credits	Criteria
1	There is dedicated space(s) to cater for the segregation and storage of operational recyclable waste volumes generated by the assessed building/unit, its occupant(s) and activities. The dedicated space(s) must be: 1. Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams. 2. Accessible to building occupants / facilities operators for the deposit of materials and collections by waste management contractors. 3. Of a capacity appropriate to the building type, size, number of units (if relevant) and predicted volumes of waste that will arise from daily/weekly operational activities and occupancy rates (at least 2m² per 1000m² of net floor area). Where the consistent generation in volume of the appropriate operational waste streams is likely to exist, e.g. large amounts of packaging or compostable waste generated by the building's use and operation, the following facilities are provided as part of its waste management strategy: a. Static waste compactor(s) or baler(s); situated in a service area or dedicated waste management space. b. Vessel(s) for composting suitable organic waste resulting from the building's daily operation and use **OR** adequate space(s) for storing segregated food waste and compostable organic material prior to collection and delivery to an alternative composting facility. c. Where organic waste is to be stored or composted on site, a water outlet is provided adjacent to or within the facility for cleaning and hygiene purposes.

Design Stage Evidence Required

Design drawings and/or relevant section/clauses of the building specification or contract confirming provision and scope of dedicated facilities.

Project team meeting minutes / letter confirming likely building waste streams and indicative Volumes.

Validation Statement
The design team have confirmed that BREEAM compliant recycling storage facilities will be installed on site in addition to storage for general waste. Avoca advised that if the operation of the centres would lead to the consistent generation of large volumes of waste i.e. packaging or food waste then compactor/baler or compost facility is also required. 1no. credit has been provisionally awarded.

LE 01 Site Selection		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 2	Min. credits to achieve rating level	0	0	0	0	0

Aim

To encourage the use of previously developed and/or contaminated land and avoid land which has not been previously disturbed.

Credits	Criteria
1-2	**PREVIOUSLY DEVELOPED LAND – 1 CREDIT** At least 75% of the proposed development's footprint is on an area of land which has previously been developed for use by industrial, commercial or domestic purposes in the last 50 years. **CONTAMINATED LAND – 1 CREDIT** The site is deemed to be significantly contaminated as confirmed by a contaminated land specialist's site investigation, risk assessment and appraisal, which has identified: a. The degree of contamination. b. The contaminant sources/types. c. The options for remediating sources of pollution which present an unacceptable risk to the site. The client or principal contractor confirms that remediation of the site will be carried out in accordance with the remediation strategy and its implementation plan.

Design Stage Evidence Required

PREVIOUSLY DEVELOPED LAND
Design drawings (including existing site plan), report or site photographs confirming:

1. Type and duration of previous land use.
2. Area (m²) of previous land use.
3. Proposed site plan showing location and footprint (m²) of proposed development and temporary works.

CONTAMINATED LAND
A copy of the specialist's land contamination report.

Design drawings (including existing site plan) showing contaminated areas and areas to be remediated in relation to any proposed development.

A letter from the principal contractor or remediation contractor confirming:

1. The remediation strategy for the site.
2. Summary details of the implementation plan.

If a contractor has not yet been appointed, a letter from the client or their representative confirming that the appointed contractor will undertake necessary remediation works to mitigate the risks identified in the specialist report.

Validation Statement
PREVIOUSLY DEVELOPED LAND The proposed development site is on the site of the existing Greenwood Centre which will be demolished to make way for the new building, it is envisioned that the final footprint of the building will be inside the boundary of the previously developed site and will comply with the requirements of this issue. **CONTAMINATED LAND** At the time of the pre-assessment meeting the design team were awaiting the findings of the site investigation so the credit associated with land contamination were not sought. 1 credit has been allocated.

LE 02 Ecological value of site and protection of ecological features.		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 1	Min. credits to achieve rating level	0	0	0	0	0

Aim

To encourage development on land that already has limited value to wildlife and to protect existing ecological features from substantial damage during site preparation and completion of construction works

Credits	Criteria
1	Land within the construction zone is defined as 'land of low ecological value' using either: 1. The BREEAM checklist for defining land of low ecological value. **OR** 2. A Suitably Qualified Ecologist who has identified the land as being of 'low ecological value' within an ecological assessment report, based on a site survey. All existing features of ecological value surrounding the construction zone and site boundary area are adequately protected from damage during clearance, site preparation and construction activities as listed below: a. Trees of over 100 mm trunk diameter, and/or of significant ecological value, are protected by barriers. Barriers must prohibit construction works in the area between itself and the tree trunk. Minimum distance between tree trunk and barriers must be either the distance of branch spread or half tree height, whichever is the greater. b. Trees are protected from direct impact and from severance or asphyxiation of the roots. c. Hedges and natural areas requiring protection must either have barriers erected and be protected, or, when remote from site works or storage areas, be protected with a prohibition of construction activity in their vicinity. d. Watercourses and wetland areas are to be protected by cut-off ditches and site drainage to prevent run-off to natural watercourses (as this may cause pollution, silting or erosion). In all cases, the principal contractor is required to construct ecological protection prior to any preliminary site construction or preparation works (e.g. clearing of the site or erection of temporary site facilities).

Design Stage Evidence Required

A completed copy of Table 11-1 signed and dated by the client or a design team member.

AND EITHER

Plans, site photographs and specifications confirming presence, or otherwise, of ecological features and the protection measures specified.

OR

Ecologist's report highlighting information required in accordance with the Appendix F 'Relating Ecology Reports to BREEAM'.

Where relevant for multi residential buildings:

Evidence in line with the Design stage evidence requirements of the CSH Issues Eco 1 and Eco 3 **OR** A copy of the Design Stage CSH certificate and report.

Validation Statement

An ecology report has been completed by Chris Blandford Associates which confirms that the existing site is of negligible ecological value and there are no significant individual features of value within the site.

The design team should note that the ecologist will be required to complete the relevant sections of BREEAM Appendix F at the time of formal assessment in order to relate ecology report to specific BREEAM credits.

1 credit has been allocated.

LE 03 Mitigating ecological impact		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	2 of 2	Min. credits to achieve rating level	0	0	1	1	1

Aim

To minimise the impact of a building development on existing site ecology.

Credits	Criteria
1-2	**1 Credit** The change in ecological value of the site is less than zero but equal to or greater than minus nine i.e. a minimal change, using the methods outlined in either (a) or (b) below: a. Determine the following information and input this data in to the BREEAM LE 03/LE 04 calculator: i. The broad habitat type(s) that define the landscape of the assessed site in its existing pre-developed state and proposed state. ii. Area (m²) of the existing and proposed broad habitat types. **OR** b. Where a suitably qualified ecologist (SQE) has been appointed and based on their site survey they confirm the following and either the assessor or ecologist inputs this data in to the BREEAM LE 03/LE 04 calculator: i. The broad habitat types that define the landscape of the assessed site in its existing pre-developed state and proposed state. ii. Area (m²) of the existing and proposed broad habitat plot types. iii. Average total taxon (plant species) richness within each habitat type. **2 Credits** Where the change in ecological value of the site is equal to or greater than zero i.e. no negative change, using the methods outlined in either (a) or (b) above

Design Stage Evidence Required

Design drawings including proposed and existing (predevelopment) site plan/survey.

AND EITHER

A completed copy of the BREEAM LE 03/LE 04 calculator

OR

A copy of the ecologist's report highlighting information required in Appendix F **OR** a copy of Appendix F completed by the ecologist **AND** written confirmation from the client/design team detailing how the ecologist's recommendations will be implemented.

Where relevant for multi-residential buildings;

Evidence in line with the Design stage evidence requirements of the CSH Issues Eco 4.

OR

A copy of the Design Stage CSH certificate and CSH compliance report confirming the change in ecological value for the site.

Validation Statement

The design team have confirmed at the pre-assessment meeting that a suitably qualified ecologist has been appointed to give advice on the scheme and it was agree that the scheme would target a neutral change in ecological value; this should be achievable as the majority of the existing site comprises buildings or hard landscaping.

The design team should note that the ecologist will be required to complete the relevant sections of BREEAM Appendix F at the time of formal assessment in order to relate ecology report to specific BREEAM credits.

2 credits have been allocated.

LE 04 Enhancing site ecology		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 3	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognise and encourage actions taken to maintain and enhance the ecological value of the site as a result of development.

Credits	Criteria
1-3	**1 Credit** A suitably qualified ecologist (SQE) has been appointed to report on enhancing and protecting the ecology of the site and: a. The SQE provides an Ecology Report with appropriate recommendations for protection and enhancement of the site's ecology. b. The report is based on a site visit/survey by the SQE. The general recommendations of the Ecology Report for enhancement and protection of site ecology have been, or will be, implemented. **2 Credits** The above criteria are achieved. The recommendations of the Ecology Report for enhancement and protection of site ecology have been implemented, and the suitably qualified ecologist confirms that this will result in an increase in ecological value of the site up to (but not including) 6 plant species. The increase in plant species has been calculated using the BREEAM LE03/LE04 calculator, using actual plant species numbers. **3 Credits** The requirements of the first credit are achieved. The recommendations of the Ecology Report for enhancement and protection of site ecology have been implemented, and the suitably qualified ecologist confirms that this will result in an increase in ecological value of the site of 6 plant species or greater. The increase in plant species has been calculated using the BREEAM LE 03/LE 04 calculator, using actual plant species numbers.

Design Stage Evidence Required

Ecologist's report highlighting information required in Appendix F or a copy of Appendix F completed by the ecologist.

Design drawings including proposed and existing (pre-development) site plan/survey.

Written confirmation from the client/design team confirming how the ecologist's

recommendations will be implemented.

Where relevant for multi residential buildings:

Evidence in line with the Design stage evidence requirements of the CSH Issues Eco 4.

OR

A copy of the Design Stage CSH certificate and CSH compliance report confirming the change in ecological value for the site.

Validation Statement

The design team have confirmed that a suitably qualified ecologist has been appointed on to offer advice on enhancing and protecting the site ecology and it was agreed to incorporate their general recommendations for protection and enhancement within the landscaping scheme.

At present no landscape plan has been completed and as such the ecologist has not completed species calcs therefore species values for the site cannot be confirmed, it was therefore agreed to target the first credit and assess the second and third credits at a later date.

The design team should note that the ecologist will be required to complete the relevant sections of BREEAM Appendix F at the time of formal assessment in order to relate ecology report to specific BREEAM credits.

1 credit allocated.

LE 05 Long term impact on biodiversity		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	2 of 2	Min. credits to achieve rating level	0	0	0	0	0

Aim

To minimise the long term impact of the development on the site and the surrounding area's biodiversity.

Credits	Criteria
1-3	There is a commitment to achieve the mandatory criteria and appropriate number of additional criteria (listed below) as follows:

Building type	No. of credits	No. of additional criteria
All building types except prisons	**1**	2
	2	4
Prison buildings	**1**	2
	2	3
	3	4

Where the Suitably Qualified Ecologist (SQE) confirms that some of the additional criteria listed below are not applicable to the assessed development, the credits can be awarded as follows:

		Applicable additional criteria				
		All	**4**	**3**	**2**	**1**
Building type	**Credits**	**Number of additional criteria to achieve**				
All building types except prisons	**1**	2	2	2	2	1
	2	4	4	3		
Prison buildings	**1**	2	2	1	2	1
	2	3	3	2		
	3	4	3	3		

MANDATORY CRITERIA

A suitably qualified ecologist (SQE) has been appointed prior to commencement of activities on site.

The suitably qualified ecologist confirms that all relevant UK and EU legislation relating to protection and enhancement of ecology has been complied with during the design and construction process.

A landscape and habitat management plan, appropriate to the site, is produced covering at least the first five years after project completion. This is to be handed over to the building occupants and includes:

a. Management of any protected features on site.
b. Management of any new, existing or enhanced habitats.
c. A reference to the current or future site level or local Biodiversity Action Plan.

	ADDITIONAL CRITERIA The principal contractor nominates a 'Biodiversity Champion' with the authority to influence site activities and ensure that detrimental impacts on site biodiversity are minimized in line with the recommendations of a suitably Qualified ecologist. The principal contractor trains the site workforce on how to protect site ecology during the project. Specific training must be carried out for the entire site workforce to ensure they are aware of how to avoid damaging site ecology during operations on site. Training should be based on the findings and recommendations for protection of ecological features highlighted within A report prepared by a suitably qualified ecologist. The principal contractor records actions taken to protect biodiversity and monitor their effectiveness throughout key stages of the construction process. The requirement commits the principal contractor to make such records available where publicly requested. Where a new ecologically valuable habitat, appropriate to the local area, is created. This includes habitat that supports nationally, regionally or locally important biodiversity, and/or which is nationally, regionally or locally important itself; including any habitat listed in the UK Biodiversity Action Plan (UK BAP), Local Biodiversity Action Plan (LBAP), those protected within statutory sites (e.g. SSSIs), or those within non-statutory sites identified in local plans. Where flora and/or fauna habitats exist on site, the contractor programmes site works to minimise disturbance to wildlife. For example, site preparation, ground works, and landscaping have been, or will be, scheduled at an appropriate time of year to minimise disturbance to wildlife. Timing of works may have a significant impact on, for example, breeding birds, flowering plants, seed germination, amphibians etc. Actions such as phased clearance of vegetation may help to mitigate ecological impacts. This additional requirement will be achieved where a clear plan has been produced detailing how activities will be timed to avoid any impact on site biodiversity in line with the recommendations of a suitably qualified ecologist.

Design Stage Evidence Required
MANDATORY CRITERIA Ecologist's report highlighting information required in Appendix F or a copy of Appendix F completed by the ecologist. **AND EITHER** A copy of the site's landscape and habitat management plan. **OR** Relevant section/clauses of the building specification or contract confirming its development and scope. **OR** A letter from the client confirming a commitment to produce the management plan and its' scope. **ADDITIONAL CRITERIA** Relevant section/clauses of the building specification or contract or an appointment letter from the Contractor. Training schedule or letter of confirmation from the principal contractor committing to provide relevant training. **OR** A copy of the specification clause requiring the training of the site's workforce by the principal contractor. A letter from the principal contractor confirming monitoring and reporting criteria for the development. **OR** A copy of the specification clause requiring the principal contractor to undertake monitoring and reporting. A copy of the proposed site plan highlighting the new ecologically valuable habitat. A SQE's report or letter confirming that the habitat supports the relevant biodiversity action plan(s). The SQE's report or letter confirming actions required with respect to programming site works to minimise disturbance. The principal contractor's programme of works. **OR** Relevant section/clauses of the building specification or contract confirming that the programme of site works will minimise disturbance to wildlife in accordance with the SQE's recommendations.

Documentary evidence from the design team or wildlife group confirming:

1. Scope of the partnership.
2. Details and remit of the wildlife group.
3. A description of the process for on-going support that the group commit to give to the partnership.
4. Details of meetings and actions to date.

Validation Statement

The design team have confirmed that a suitably qualified ecologist will be appointed on this scheme to offer advice on the long term impact on biodiversity.

An obligation will need to be placed upon the principle contractor to comply with the mandatory criteria and a minimum of 4no. additional criteria in order to achieve these credits.

2 credits have been allocated.

Pol 01 Impact of refrigerants		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 3	Min. credits to achieve rating level	0	0	0	0	0

Aim

To reduce the level of greenhouse gas emissions arising from the leakage of refrigerants from building systems.

Credits	Criteria
1-3	**Three Credits** Where the building does not require the use of refrigerants within its installed plant/systems. **OR** alternatively, where the building does require the use of refrigerants, the three credits can be awarded as follows: **Two Credits** Where the systems using refrigerants have Direct Effect Life Cycle CO_2 equivalent emissions (DELC CO_2e) of =100 kg CO_2e/kW cooling capacity. To calculate the DELC CO_2e the following information is sourced from the design team and entered into the BREEAM Pol 01 calculator: a. Global Warming Potential (GWP) of the specified system refrigerant(s). b. Total refrigerant charge (kg). c. Cooling capacity of the system(s) (kW). d. Sectoral release factors: i. Annual refrigerant leakage rate (% of refrigerant charge). ii. Annual purge release factor (% of refrigerant charge). iii. Annual service release factor (% of refrigerant charge). iv. Probability factor for catastrophic system failure (%). v. Recovery efficiency (% of refrigerant charge). **OR** Where air-conditioning or refrigeration systems are installed the refrigerants used have a Global Warming Potential (GWP) =10 **One Credit** Where the systems using refrigerants have Direct Effect Life Cycle CO_2 equivalent emissions of (DELC CO_2e) of =1000kg CO_2e/kW cooling capacity/kW cooling capacity. **One Credit** Where systems using refrigerants are contained in a moderately air tight enclosure (or a mechanically ventilated plant room), and an automated permanent refrigerant leak detection system is installed covering high-risk parts of the plant **OR** where a refrigerant leakage/charge loss detection system is specified, which is not based on the principle of detecting or measuring the concentration of refrigerant in air.

	The automatic shutdown and pump down of refrigerant occurs on the detection of refrigerant leakage/charge loss. Automatic pump-down to either a separate storage tank or into the heat exchanger is acceptable, but only where automatic isolation valves are fitted to contain the refrigerant once fully pumped down. The alarm threshold that triggers automatic pump down upon detection of refrigerant in the plant room/enclosure is set to a maximum of 2000ppm (0.2%), but lower levels can be set. Use a robust and tested automated permanent refrigerant leak detection system, normally defined as that included on the Enhanced Capital Allowance (ECA) Energy Technology Product List (or an equivalent list).

Design Stage Evidence Required

NO-REFRIGERANT – 3 CREDITS
Documentary evidence confirming the absence of refrigerant in the development.

REMAINING CREDITS
A copy of the specification clause or letter from the M&E engineer /system manufacturer confirming relevant refrigeration type and system information.

A completed copy of the BREEAM Pol 01 Calculator.

Validation Statement

The exact details of refrigerant systems within the building was not finalised at the time of the pre-assessment meeting and it was agreed not to target any of these credits.

Pol 02 NOx emissions		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	3 of 3	Min. credits to achieve rating level	0	0	0	0	0

Aim

To encourage the supply of heat and/or cooling from a system that minimises NOx emissions, and therefore reduces pollution of the local environment.

Credits	Criteria
1-3	The following is required to demonstrate compliance: Where the plant installed to meet the building's delivered heating and cooling demand has, under normal operating conditions, a dry NOx emission level (measured at 0% excess O2) as follows:

Other Building Type	
100 mg/kWh (space heating)	**1 Credit**
70 mg/kWh (space heating)	**2 Credit**
40 mg/kWh (space heating)	**3 Credits**

Design Stage Evidence Required

Relevant section/clauses of the building specification or contract.

Manufacturer's product details.

Calculations from the project team.

Validation Statement

The design team have confirmed that the plant installed to provide both heating will provide a Dry NOx level of no more than 40mg/kWh for space heating

At the time of writing there has been no system specification submitted to assess against the Pol 02 criteria above however TGA were to source details and forward for assessment.

3 credits have been allocated.

Pol 03 Surface water run off		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	4 of 5	Min. credits to achieve rating level	0	0	0	0	0

Aim

To avoid, reduce and delay the discharge of rainfall to public sewers and watercourses, therefore minimising the risk of localised flooding on and off site, watercourse pollution and other environmental damage.

Credits	Criteria
1-5	**FLOOD RISK** **2 Credits** Where the assessed development is situated in a flood zone that is defined by the relevant planning, policy and technical guidance documents, as having a low annual probability of flooding. A site specific Flood Risk Assessment (FRA) confirms that there is a low risk of flooding from all sources. **1 Credit** Where the assessed development is situated in a flood zone that is defined by the relevant planning, policy and technical guidance documents, as having a medium or high annual probability of flooding and is not within the Functional Floodplain. **AND** A site specific Flood Risk Assessment (FRA) confirms 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** The ground level of the building and access to both the building and the site, are designed (or zoned) so they are at least 600mm above the design flood level of the flood zone in which the assessed development is located. **SURFACE WATER RUN-OFF** **Pre-requisite** An appropriate consultant is appointed to carry out, demonstrate and/or confirm the following criteria: **1 Credit** Where drainage measures are specified to ensure that the peak rate of run-off from the site to the watercourses (natural or municipal) is no greater for the developed site than it was for the pre-development site. This should comply at the 1 year and 100 year return period events. Calculations include an allowance for climate change; this should be made in accordance with current best practice planning guidance.

	1 Credit Where flooding of property will not occur in the event of local drainage system failure (caused either by extreme rainfall or a lack of maintenance). **AND EITHER** The post development run-off volume, over the development lifetime, is no greater than it would have been prior to the assessed site's development. Any additional predicted volume of run-off for the 100 year 6 hour event must be prevented from leaving the site by using infiltration or other SuDS techniques. **OR** (only where the above 'additional predicted volume' criterion cannot be achieved). Justification from the Appropriate Consultant indicating why the above criteria cannot be achieved i.e. where infiltration or other SuDS techniques are not technically viable options. The post development peak rate of run-off is reduced to a limiting discharge. The limiting discharge is defined as the following and the option with the highest flow rate must be achieved; a. The pre development 1-year peak flow rate **OR** b. The mean annual flow rate Qbar **OR** c. 2l/s/ha Note that for the 1-year peak flow rate the 1 year return period event criterion applies (as described in the peak run off criteria above). For either option above calculations must include an allowance for climate change; this should be made in accordance with current best practice planning guidance. **MINIMISING WATER COURSE POLLUTION** **1 Credit** The Appropriate Consultant confirms that there is no discharge from the developed site for rainfall up to 5mm. Specification of Sustainable Drainage Systems (SUDs) or source control systems such as permeable surfaces or infiltration trenches where run-off drains are in areas with a relatively low risk source of watercourse pollution. Specification of oil/petrol separators (or equivalent system) in surface water drainage systems, where there is a high risk of contamination or spillage of substances such as petrol and oil. All water pollution prevention systems have been designed and detailed in accordance with the recommendations of Pollution Prevention Guideline 3 and where applicable the SUDS manual. A comprehensive and up-to-date drainage plan of the site will be made

	available for the building/site occupiers. Where the building has chemical/liquid gas storage areas, shut-off valves are fitted to the site drainage system to prevent the escape of chemicals to natural watercourses (in the event of a spillage or bunding failure). Where present, all external storage and delivery areas designed and detailed in accordance with the recommendations of the Environment Agency's publication Pollution Prevention Pays Guidance and, if relevant to the building type, PPG25 Hospitals and Healthcare establishments.

Design Stage Evidence Required

FLOOD RISK

1. Flood risk assessment.
2. Design drawings.
3. Where appropriate, correspondence from the appropriate statutory body confirming reduced annual probability of flooding due to existing flood defences.
4. Where relevant for multi-residential buildings evidence in line with the Design or Post Construction Stage requirements of the CSH Issue Sur 2 or certificate demonstrating compliance.

SURFACE WATER RUN-OFF

1. Statement from the appropriate consultant confirming that they are qualified in line with the BREEAM definition.
2. Consultant's report containing all information necessary to demonstrate compliance including:
    a. Type and storage volume (l) of the drainage measures.
    b. Total area of hard surfaces (m²).
    c. Peak/Volume flow rates (l/s) pre and post development for the return period events.
    d. Additional allowance for climate change designed in to the system.
    e. Impact on the building of flooding from local drainage system failure.

MINIMISING WATERCOURSE POLLUTION

1. The consultant's report detailing the design specifications, calculations and drawings to support the 5mm rainfall discharge criteria.
2. Design drawings and/or relevant section/clauses of the building specification or contract indicating:
    a. High and low risk areas of the site.
    b. Specification of SUDS, source control systems, oil/petrol separators and shut-off valves as appropriate.

3. A letter or other formal correspondence from the project team:
    a. Confirming water pollution prevention systems are designed in accordance with PPG3 and the SUDS manual (where appropriate).
    b. Outlining indicative examples of compliance with PPG3 and the SUDS manual.
    c. Confirming a copy of the drainage plan will be produced and handed over to the building occupier.
    d. Confirming design of all external storage and delivery areas is in compliance with relevant Pollution Prevention Guidance.
    e. Outlining indicative examples of compliance with the PPG.

Validation Statement
Campbell Reith Associates confirmed via email dated 03/05/13 that the following credits could be allocated: • Flood Risk – 2 credits • Surface Water Run-Off – 2 credits • Minimising Water Course Pollution – 0 credits Therefore a total of 4 credits have been allocated on the basis of the above.

Pol 04 Reduction of night time light pollution		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 1	Min. credits to achieve rating level	0	0	0	0	0

Aim

To ensure that external lighting is concentrated in the appropriate areas and that upward lighting is minimised, reducing unnecessary light pollution, energy consumption and nuisance to neighbouring properties

Credits	Criteria
1	The external lighting strategy has been designed in compliance with Table 1 (and its accompanying notes) of the ILE Guidance notes for the reduction Of obtrusive light, 2005. All external lighting (except for safety and security lighting) can be automatically switched off between 2300hrs and 0700hrs. This can be achieved by providing a timer for all external lighting set to the appropriate hours. If safety or security lighting is provided and will be used between 2300hrs and 0700hrs, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 1 of the ILE's Guidance notes, for example by using an automatic switch to reduce the lighting levels at 2300 or earlier. Illuminated advertisements, where specified, must be designed in compliance with ILE Technical Report 5 – The Brightness of Illuminated Advertisements.

Design Stage Evidence Required

Design drawings.

Relevant section/clauses of the building specification or contract or external lighting design data/calculations.

In the case of the external lighting design, the M&E engineer or lighting designer must provide indicative examples of where and how the strategy complies with the assessment criteria.

Validation Statement

TGA confirmed at the pre-assessment meeting that all of the installed external lighting and controls will comply with the above Pol 04 reduction of night time light pollution criterion.

1 credit has been allocated.

Pol 05 Noise attenuation		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 1	Min. credits to achieve rating level	0	0	0	0	0

Aim

To reduce the likelihood of noise from the new development affecting nearby noise-sensitive Buildings.

Credits	Criteria
1	The credit can be awarded by default where there are or will be no noise-sensitive areas or buildings within 800m radius of the assessed development. Where there are or will be noise-sensitive areas or buildings within 800m radius of the assessed development a noise impact assessment in compliance with BS 7445:1991 has been carried out and the following noise levels measured/determined: a. Existing background noise levels at the nearest or most exposed noise-sensitive development to the proposed development or at a location where background conditions can be argued to be similar. b. The rating noise level resulting from the new noise-source. The noise impact assessment must be carried out by a suitably qualified acoustic consultant holding a recognised acoustic qualification and membership of an appropriate professional body. The noise level from the proposed site/building, as measured in the locality of the nearest or most exposed noise-sensitive development, is a difference no greater than +5dB during the day (0700hrs to 2300hrs) and +3dB at night (2300hrs to 0700hrs) compared to the background noise level. Where the noise source(s) from the proposed site/building is greater than the levels described in the above paragraph, measures have been installed to attenuate the noise at its source to a level where it will comply with the above criterion.

Design Stage Evidence Required

Design drawings highlighting:

a. All existing and proposed noise-sensitive buildings local to, and within, the site boundary.
b. Proposed sources of noise from the new development.
c. Distance (m) from these buildings to the assessed development.

The acoustician's report, acoustician's qualifications and professional status.

OR

Relevant section/clauses of the building specification or contract requiring a noise assessment by a suitably qualified acoustician in compliance with BS 7445:1991.

OR

A letter from the client or design team confirming that they will appoint an acoustician to carry out a noise assessment in compliance with BS 7445:1991.

Acoustician's report with recommendations for noise attenuation measures. **AND EITHER**

A marked-up design plan highlighting the specification of the acoustician's attenuation measures.

OR

A formal letter from the client or design team confirming where relevant, that attenuation measures recommended by an appointed suitably qualified acoustician will be installed.

Validation Statement

The design team confirmed that a suitably qualified acoustician will be appointed to conduct a background noise survey of the site, should the noise level be exceeded by more than 5dB during the day and 3dB at night attenuation will be needed.

1 credit has been allocated.

Inn 01 Innovation		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 10	Min. credits to achieve rating level	0	0	0	0	0

Aim

To support innovation within the construction industry through the recognition of sustainability related benefits which are not rewarded by standard BREEAM issues.

Credits	Criteria
1-10	**EXEMPLARY LEVEL OF PERFORMANCE IN EXISTING BREEAM ISSUES** One Innovation credit can be awarded where the building demonstrates exemplary performance by meeting defined innovation credit criteria in one or more of following BREEAM assessment issues: • Man 01 Sustainable procurement. • Man 02 Responsible construction practices. • Hea 01 Visual comfort. • Ene 01 Reduction of CO_2 emissions. • Ene 04 Low or zero carbon technologies. • Wat 01 Water consumption. • Mat 01 Life cycle impacts. • Mat 03 Responsible sourcing of materials. • Wst 01 Construction site waste management. • Wst 02 Recycled Aggregates. **APPROVED INNOVATIONS** One innovation credit can be awarded for each innovation application approved by BRE Global, where the building complies with the criteria defined within an Approved Innovation application form.

Design Stage Evidence Required

For Exemplary Level Performance:
As defined within each existing BREEAM issue listed above.

For Approved Innovations:
A copy of the Approved Innovation application or confirmation of the Approved Innovation reference number.

AND

Relevant documentary evidence demonstrating specification of the approved innovation.

Validation Statement

The client has confirmed on an email dated 25/04/13 that they will ask the FM provider to carry out data monitoring for three years post occupation; no other innovation credits are sought at this time.

1 Innovation credit has been allocated.

6 Recommendations

On the basis of the pre-assessment information detailed in Section 5 and the information currently available, it is anticipated that the BREEAM rating likely to be achieved when the final assessment is undertaken is **'EXCELLENT'** with a score of **75.15%.**

Further opportunities to increase the BREEAM score are however still available; the following is a summary of standard credits that have not been allocated within Section 5 of this report but which may be achievable pending further information from the project team. Innovation credits are not listed as none have been sought at this time.

It should be noted that some of the credits listed below are pending confirmation from design team members may be added to the score once the final design has been agreed.

The full requirements for each credit are fully detailed in the individual BREEAM credit criteria above.

Credit Title	Recommendations	% Weighted Score Available
Management		
Man 01 Sustainable Procurement	**1 CREDIT** Confirm whether a BREEAM AP was appointed to monitor the design process and report during RIBA stage B-E.	0.545%
Man 03 Construction Site Impacts	**1 CREDIT** Available where the Principal Contractor commits to monitor transport of construction waste and materials to/from site.	0.545%
Man 05 Life Cycle Cost and Service Life Planning	**UP TO 3 ADDITIONAL CREDITS** Where the project team carries out compliant Life Cycle Cost analysis. Please note that this process must start at RIBA stage C/D or equivalent.	1.64%

Health and Wellbeing		
Hea 01 Visual Comfort	**1 CREDIT** Appoint a daylight specialist to confirm the average daylight factors throughout the building.	1.07%
Hea 05 Acoustic Performance	**UP TO 2 ADDITIONAL CREDITS** These credits may be available where the client has appointed an acoustician to advise the design team from the briefing stages of the project and undertake pre-completion testing. **Please note that where this has taken place at a later stage credits may not be achievable.**	2.14%
Hea 06 Safety and Security	**1 CREDIT** This credit may be achievable, the architect has been liaising with the Secured by Design officer and will confirm in due course.	1.07%
Transport		
Tra 03 Cyclist Facilities	**1 CREDIT** Incorporate sufficient number of compliant cyclist facilities within the building.	0.72%
Water		
Wat 01 Water Consumption	**UP TO AN ADDITIONAL 3 CREDITS** Specify internal water use fittings which have a reduced flow rate/capacity, or install grey water recycling facilities which are used to offset potable water use. Demonstrate a min. 55% improvement on the notional baseline Wat 01 BREEAM usage rate.	2%

Materials		
Mat 03 Responsible Sourcing	**1 CREDIT** One extra credit would be achievable where there is a commitment for the Principal Contractor to achieve at least 54% of the available points under this issue; this means that a significant majority of major building materials are responsibly sourced.	0.96%
Waste		
Wst 01 Construction Waste Management	**UP TO 2 ADDITIONAL CREDITS** The Principal Contractor commits to achieve increased resource efficiency benchmarks for non-hazardous construction waste as follows: • 7.5m³ or 6.5 tonnes – 1 credit • 3.4m³ or 3.2 tonnes – 2 credits	 1.25% 2.5%
Wst 02 Recycled Aggregate	**1 CREDIT** Where 25% of all high grade aggregate used on site is recycled or secondary aggregate.	1.25%
Land Use and Ecology		
LE 01 Site Selection	**1 CREDIT** Where the site investigation confirms the presence of significant contamination on site which will require remediation prior to development.	1%
LE 04 Enhancing Site Ecology	**UP TO AN ADDITIONAL 2 CREDITS** Implement the recommendations of the ecology report and ensure that the plant species value of the site is increased by up to 6 plant species or greater, additional credits can be claimed as follows: • Increase of up to 6 species – 1 credit • Increase of 6 species or greater – 2 credits	 1% 2%

Pollution		
Pol 01 Impact of Refrigerants	**3 CREDITS** Avoid the use of refrigerant systems within the building. **OR** **2 CREDITS** Specify refrigerant systems which achieve a Direct Effect Life Cycle CO_2 equivalent of 100mg/CO_{2e}/Kw cooling capacity (or 100mg/CO_{2e}/Kw cooling capacity for 1 credit) **OR** the cooling systems installed use refrigerants with a Global Warming Potential of 10 or less. **AND** **1 CREDIT** Refrigerant systems are installed within a moderately air tight enclosure (or mechanically ventilated plant room) and are complete with a refrigerant leak detection system with emergency pump down.	2.31% 1.54% 0.77%
Maximum additional BREEAM points available based on the above		19.75%

APPENDIX B – HIGHGATE ROAD RESIDENTIAL BUILDING CFSH PRE ASSESSMENT

Greenwood Estate
Proposed Highgate Road Apartments
Kentish Town, London

Code for Sustainable Homes
Pre-assessment Report

REPORT CONTROL

Document: Highgate Road Apartments
Code for Sustainable Homes Pre-assessment Report

Project: Highgate Road residential apartment units

Client: TGA Consulting Engineers

Project Number: 13-104

Document Checking:

Issue	Date	Status	Prepared By	Checked By	Issue Notes
01	15/08/13	Draft	L.Mason	J.Houghton	Issued to TGA
02	28/08/13	Full Issue	L.Mason	J.Houghton	Revised to incorporate project team comments – issued for planning

EXECUTIVE SUMMARY

Avoca Consulting Engineers has been commissioned by TGA Consulting Engineers to carry out a Code for Sustainable Homes (CfSH) pre-assessment of 42no. new apartments on the site of the existing Highgate Centre, Kentish Town, London. The aspiration of the project team is to achieve a **'Level 4'** rating and in order to provide this the scheme must achieve CfSH assessment score of **68%** including several mandatory criteria.

This report details the potential performance of the proposed dwellings, as measured against the BRE Environmental and Sustainability Standard - Code for Sustainable Homes.

A pre-assessment meeting was held on the 4th April 2013 between PCKO Architects, TGA Consulting Engineers and Avoca Consulting Engineers in order to review the scheme drawings and gain commitments from the design team regarding compliance with the individual Code for Sustainable Homes issues.

In addition to the above discussions, TGA Consulting Engineers have provided a summary of the design stage SAP calculations for two typical dwelling types within the building. These have been run against several servicing strategy options with TGA deciding that a mixture of Combined Heat and Power, Photovoltaic arrays and Solar Thermal arrays offer the best solution to meet a 25% reduction in CO_2 emissions over Building Regulations 2010 Part L1a requirements. This SAP output summary has been used to substantiate the number of credits claimed within Code issue Ene 1.

With the commitments received to date each of the residential apartments is capable of achieving a Code for Sustainable Homes score of **69.06%** which would translate into a rating of **'Level 4'**.

It should be noted that the majority of the credit allocations detailed in this report are based on verbal commitments expressed by the design team with only limited documentary evidence provided to substantiate the pursuit of credits, as such it should be used for guidance purposes only.

Section 6 of this report contains the details of additional credits which are available should the design team wish to increase the score further.

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DISCLAIMER

This report is not a Code for Sustainable Homes certificate and does not guarantee that the Code for Sustainable Homes rating sought will be achieved until a Final Report has been issued and verified by the BRE. Its purpose is to provide written guidance on how best to approach the rating and state the information required to gain it.

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ALTERATIONS

The BRE hold the right to update or alter the scheme at any time, Avoca Consulting Engineers Ltd, as their agents will implement these changes, as required, to any assessment being undertaken.

1 Introduction

Avoca Consulting Engineers Ltd has been commissioned by TGA Consulting Engineers Ltd to carry out a Code for Sustainable Homes November 2010 pre-assessment of the proposed redevelopment of the Highgate Centre site, the development will comprise the demolition of an existing building on the site and construction of a new 7 storey apartment building containing 42no. new apartments. Retail space will be included on the ground floor of the proposed building; however, this is excluded from the CfSH assessment.

This pre-assessment report is the first stage in the CfSH assessment process and it should be followed by both Design and Post Construction Stage assessments in order to confirm the rating achieved.

1.1 Project Team Details

Name / Position	**Company / Address**
Developer	London Borough of Camden Housing and Adult Social Care Department 2nd Floor Bidborough House 38-50 Bidborough Street London WC1H 9DB
Architect	PCKO Architects 45-51 Lowlands Road Harrow on the Hill HA1 3AW
M & E Consultant	TGA Consulting Engineers Ltd Building 3 Gateway 1000 Stevenage Herts SG1 2FP
CfSH Assessor	Avoca Ltd 1st Floor Swale House Mandale Business Park Belmont Industrial Estate Durham DH1 1TH

1.2 Summary

This report has been prepared based on a Code for Sustainable Homes pre-assessment of the redevelopment of the Highgate Centre site into residential apartments.

Section 5 summarises the commitments made by the design team regarding compliance with each individual CfSH issue and provides guidance to help the project team in achieving a **'Level 4'** rating.

It should be noted that this is not a formal CfSH assessment and will not be issued to BRE for certification purposes. A formal assessment should be undertaken when the design stage of the project is complete (RIBA Stage D/E).
On the basis of this pre-assessment it is anticipated that the overall rating for the proposed Highgate Centre site will be a **'Level 4'** Code for Sustainable Homes rating. The percentage score indicated using the standard CfSH pre-assessment scoring tool is **69.06%**.

1.3 Report Format

Section 1: Introduction to assessment
Section 2: Introduction to Code for Sustainable Homes
Section 3: Building details
Section 4: Assessment summary
Section 5: Pre-assessment
Section 6: Recommendations

2 Code for Sustainable Homes

2.1 CfSH Assessment Approach and Methodology

The Code for Sustainable Homes (the Code) is an environmental Assessment method for rating and certifying the performance of new homes. It is a national standard used in the design and construction of new homes, with a view to encouraging continuous improvement in sustainable home building. The Code is based on EcoHomes. It was launched in December 2006 with the publication of *Code for Sustainable Homes: A step-change in sustainable home building practice* (Communities and Local Government, 2006). The Code became operational in April 2007 in England, and having a Code rating for new build homes mandatory, from the 1st May 2008. This mandatory requirement came into effect for all developments where a Local Authority received the building notice, initial notice or full plans application after the 1st May 2008. Developments where a Local Authority had received these stages on, or before 30th April 2008 are exempt.

Where Building Regulations apply, compliance is necessary at all times.

The implementation of the Code is managed by BRE Global under contract to the Department for Communities and Local Government, under arrangements based on the EcoHomes operating systems. BRE Global is the main license holder. Under the terms of its agreement with Communities and Local Government, BRE Global issues licenses to both assessors and other Code service providers. BRE Global provides training, licensing and registration of Code assessors to standards ISO 14001 and ISO 9001, within a UKAS registered 'competent persons scheme'.

Code service providers are licensed organizations offering all or part of the range of Code services, including assessor training; registration and monitoring; quality assurance of assessments; certification; investigation and resolution of complaints; and maintenance of records (BRE Global, 2007). At the time of publishing, Stroma Ltd and Robust Details Ltd are the only other organizations licensed to prove all Code services.

The Code for Sustainable Homes covers nine categories of sustainable design which includes:

- Energy and CO_2 Emissions
- Water
- Materials
- Surface Water run-off
- Waste
- Pollution
- Health and Wellbeing
- Ecology

Each category includes a number of environmental issues. Each issue is a source of impact on the environment which can be assessed against a performance target and awarded one or more credits. Performance targets are more demanding than the minimum standard needed to satisfy Building Regulations or other legislation. They represent good or best practice, are technically feasible, and can be delivered by the building industry. Homes have already been built to Code Level 6 'True Zero Carbon' by the industry.

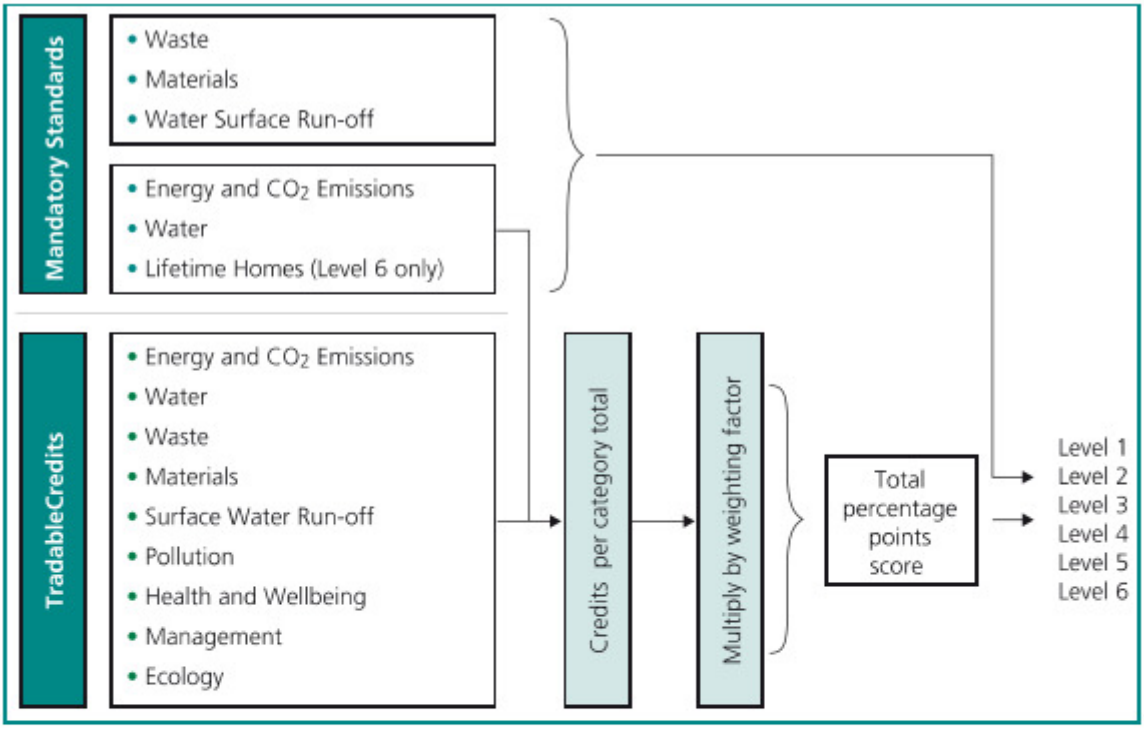
The Code differs from BREEAM and Ecohomes by:

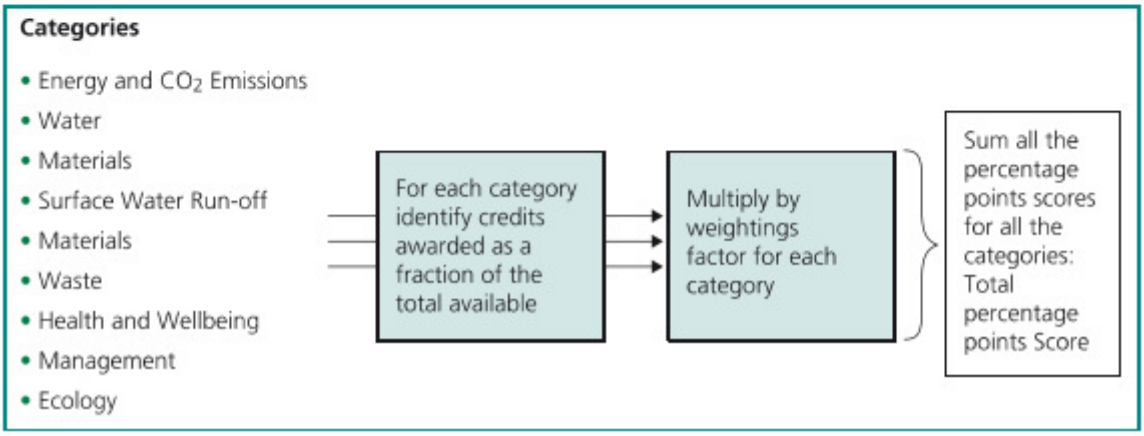
- Rating dwellings on a scale from Level 1 to 6, where level 6 is the highest.
- Assessing individual dwellings instead of groups of dwellings.
- Establishing minimum mandatory standards for CO_2 emission rates, indoor water use, materials, waste and surface water run-off, for achieving the lowest level of the Code.
- Demanding higher minimum mandatory standards for CO_2 emission rates and indoor water use, for Levels 2 to 6 of the Code.
- Requiring compliance with Lifetime Homes criteria to achieve Level 6 of the Code.
- Assessing dwellings at both design stage (DS) and post construction (PCS) stage.
- Awarding final Code certificates after the post construction assessment has been carried out.

In addition to the mandatory standards, each design category scores a number of percentage points. The total number of percentage points establishes the Level of Rating for the dwelling. The certificate illustrates the rating achieved with a row of stars. A star is awarded for each level achieved. Where an assessment has taken place by where no rating is achieved, the certificate states that zero stars have been awarded.

2.2 Code for Sustainable Homes Assessment Scoring & Rating

The diagram and text below describes how the Code for Sustainable Homes Assessment scores and rates an assessed dwelling.





The Code for Sustainable Homes categories contain a number of environmental issues, which reflect the options available when designing, procuring and constructing a building.

The following percentage points score is required for each of the code levels:

- Level 1 = 36%
- Level 2 = 48%
- Level 3 = 57%
- Level 4 = 68%
- Level 5 = 84%
- Level 6 = 90%

2.3 Code for Sustainable Homes Issues and Credits

Tradable Code for Sustainable Homes issues
Each environmental issue has a set number of 'credits' available and these credits can be awarded where the building demonstrates that it complies with the requirements of that issued.

Minimum Code for Sustainable Homes standards
A number of issues within a category have set minimum standards, i.e. a minimum number of credits that must be achieved in order for a particular Code for Sustainable Homes rating level to be met. Please refer to the individual CfSH issues within Section 5 of this report for details of the minimum standards applicable at each CfSH rating.

Environmental weightings, final score and Code for Sustainable Homes Rating
Once each Code for Sustainable Homes issue has been assessed the category percentage scores are determined (based on the number of credits achieved over those available within a category), and an environmental weighting applied (as shown below). The weighted category scores are then totalled to give an overall score and any additional scores for innovation is added to give the final CfSH score, which is used to determine the CfSH rating. The environmental weightings are as follows:

Issue Category	Issue Weighting
Energy	36.4%
Water	9.0%
Materials	7.2%
Surface Water Run-off	2.2%
Waste	6.4%
Pollution	2.8%
Health and Wellbeing	14.0%
Management	10.0%
Ecology	12.0%

The weighting factors have been derived from consensus based research with various groups such as government, material suppliers and lobbyists. This research was carried out by the BRE to establish the relative importance of each environmental issue.

3 Building Details

General	**Building**	Apartments with some limited communal areas.
	Site	Existing, redeveloped
	Floor Area	3228m²
Building Fabric	**Walls**	Brick with lightweight metal infill to concrete frame internally.
	Roof	Inverted warm flat roof with roof gardens.
	Floors	Concrete frame, screed.
	Windows	Timber aluminium composite.
Building Services	**Heating**	CHP and supplementary gas fired boilers.
	Ventilation	Mechanical ventilation with heat recovery.
	Cooling	Split DX air conditioning systems (ground floor only).
	Hot Water	Community heating system
Other	**Specify**	Solar PV and solar thermal systems.

4 Summary of Pre-assessment Performance

Current commitments from the design team indicate that the proposed residential apartments at the Highgate site achieve a pre-assessment score of **69.06%** against the Code for Sustainable Homes standard. This would translate into a CfSH rating of '**Level 4**'.

Section 6 of this report details measures which could be implemented by the design team in order to increase the score further should this be required.

Mandatory Code for Sustainable Homes standards met					
Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**	**Level 6**
YES	**YES**	**YES**	**YES**	**NO**	**NO**

Building Performance by Section					
	Environmental weighting	**Credits available**	**Credits achieved**	**% of credits achieved**	**Weighted score**
Energy	36.40%	31	19	61.29	22.30%
Water	9.00%	6	4	66.66	6.00%
Materials	7.20%	24	15	62.50	4.50%
Surface Water Run-off	2.20%	4	0	0.00	0%
Waste	6.40%	8	6	75.00	4.80%
Pollution	2.80%	4	4	100.00	2.80%
Health & Wellbeing	14.00%	12	8	66.00	9.33%
Management	10.00%	9	9	100.00	10.00%
Ecology	12.00%	9	7	77.00	9.33%
			Total Code for Sustainable Homes Score		**69.06%**

5 Detailed Assessment of Building Performance

The following section details the performance of the building against each of the assessed Code for Sustainable Homes issues. For each issue the number of Code for Sustainable Homes credits awarded has been confirmed, this is based on the buildings compliance with the CfSH requirements for that issue, as determined by the CfSH Assessor. The findings of the Assessor are based on the dwelling type information (evidence) they have collated or design team/developer verbal/written commitments. This information is referenced for each assessed CfSH issue, and serves to provide an auditable trail of evidence that confirms the buildings CfSH performance.

The CfSH issue criteria and compliance requirements that this building has been assessed against are detailed in the assessment manual for the CfSH. A copy of the CfSH assessment manual can be downloaded free of charge from www.gov.uk

Ene 1 Dwelling Emission Rate		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	3 of 10	Min. credits to achieve rating level	0	0	0	3	9	10

Aim

To limit CO_2 emissions arising from the operation of a dwelling and its services in line with current policy on the future direction of regulations.

Credits	Criteria
1-10	Credits are awarded based on the percentage improvement in the Dwelling Emission Rate (*DER*), (estimated carbon dioxide emissions in kg per m² per annum arising from energy use for heating, hot water and lighting for the actual dwelling), over the Target Emission Rate (*TER), (*the maximum emission rate permitted by Building Regulations), for the dwelling where DER and TER are as defined in AD L1A 2010 Edition of the building Regulations. Credits are awarded in accordance with the table below. Please note: there are additional mandatory minimum requirements to demonstrate a Code Level 6 (zero carbon) dwelling.

Design Stage Evidence Required

Detailed documentary evidence confirming the TER, DER and percentage improvement of DER over TER based on design stage SAP outputs.

OR

A copy of the calculations as detailed in the assessment methodology based on design stage SAP outputs.

AND

Confirmation of Fabric Energy Efficiency performance where SAP section 16 allowances have been included in the calculation. (Code Level 6 dwellings 'zero carbon').

Validation Statement

At the pre-assessment meeting a number of servicing strategies were discussed, these included individual boilers, whole house vent with heat recovery and either PV or solar thermal arrays serving each flat; the option of connecting the apartments to the CHP system at the Greenwood Centre was also being investigated.

'U' values are to be improved beyond the Camden sustainability standard, which are typically 30% below Building Regulations requirements.

On 14th August 2013 TGA provided a summary of the SAP calculations which have been run based on the based on 1no. typical ground floor flat and 1no. upper floor flat.

A number of options have been looked at but the only iteration which provides the mandatory 25% reduction in CO_2 emissions required is a combination of CHP, Solar Photovoltaic and Solar Thermal arrays, CO_2 emission rates are as follows:

- Ground floor – TER = 19.59 $kgCO_2/m^2$ / DER = 14.27 $kgCO_2/m^2$ (27% reduction)
- Upper floor – TER = 18.29 $kgCO_2/m^2$ / 12.05 $kgCO_2/m^2$ (34% reduction)

The above figures allow the allocation of 3 credits for this issue.

Ene 2 Fabric Energy Efficiency		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	7 of 9	Min. credits to achieve rating level	0	0	0	0	7	7

Aim

To improve fabric energy efficiency performance thus future-proofing reductions in CO_2 for the life of the dwelling.

Credits	Criteria
3-9	Credits are awarded based on the dwellings Fabric Energy Efficiency rating, in kWh/m²/yr, depending upon unit configuration (detached, semi-detached, mid-terrace or apartment blocks). FEE is defined as the energy demand for space heating and cooling expressed in kilowatt-hours of energy demand per square meter per year.

Design Stage Evidence Required

Detailed documentary evidence confirming the fabric energy efficiency based on Design Stage SAP outputs.

OR

Where applicable a copy of calculations as detailed in the Code Technical Guide assessment methodology based on Design Stage SAP outputs.

Validation Statement

SAP calculations had not been produced at the time of the meeting and the architect confirmed that 'U' values, air permeability rates and thermal bridging values had yet to be set.

It was agreed that the fabric standards would be increased in order to meet the Code level 5 mandatory requirements (an FEE rating of 39kWh/m2/year).

7 out of 9 credits would be scored.

Ene 3 Energy Display Devices		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	**0 of 2**	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote the specification of equipment to display energy consumption data, thus empowering dwelling occupants to reduce energy use.

Credits	Criteria
1	Where current electricity **OR** primary heating fuel consumption data are displayed to occupants by a correctly specified energy display device.
2	Where current electricity **AND** primary heating fuel consumption data are displayed to occupants by a correctly specified energy display device. **Default Cases** Where electricity is the primary heating fuel and current electricity consumption data are displayed to occupants by a correctly specified energy display device.

Compliance Note

A correctly specified energy display device comprises of a self-charging sensor(s) fixed to the incoming supplies to measure and transmit data to a visual display unit within the dwelling. The visual display unit should display the following information:

- Local time.
- Current mains energy consumption (kilowatts and kilowatt hours).
- Current emissions (g/kg CO_2).
- Current tariff.
- Current cost.
- Display accurate balance information (amount in credit or debit).
- Visual presentation of data to allow consumers to easily identify high and low level usage.
- Historical consumption data so that consumers can compare their current and previous usage in a meaningful way. This should include cumulative consumption data in any of the following forms day/week/month/billing period.

Design Stage Evidence Required
Detailed documentary evidence confirming that the correctly specified energy display device is dedicated to the dwelling. **AND** The consumption data displayed by the correctly specified energy display device. **Please Note** Where detailed documentary evidence cannot be produced at this stage a specification can be allowed as evidence of intent to meet the specific requirements. **OR** A letter of instruction to a contractor/supplier or a formal letter from the developer giving the specific undertaking can be allowed.
Validation Statement
Credits not sought.

Ene 4 Drying Space		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	1 of 1	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote a reduced energy means of drying clothes.

Credits	Criteria
1	Credits are awarded when there is the provision for drying clothes externally or internally, in a secure space, in accordance with the Code technical requirements. For 1-2 bedroom dwellings, the drying equipment must be capable of holding 4m+ of drying line. For 3+ bedroom dwellings, the drying equipment must be capable of holding 6m+ of drying line.

Design Stage Evidence Required

For internal drying spaces, detailed documentary evidence confirming; the location of drying facilities, details/location of ventilation provided, the length of drying line and details for the lock provided (for communal drying space only).

For external drying spaces, detailed documentary evidence confirming; the location of fixings/footings or posts, the length of drying line, details of the lock provided (for communal drying space only).

Please Note
Where detailed documentary evidence cannot be produced at this stage, a specification can be allowed as evidence of intent to meet all specific requirements.

OR

A letter of instruction to a contractor/supplier or a formal letter from the developer giving the specific undertaking can be allowed.

Validation Statement

The design team has confirmed that suitable drying facilities will be provided for all dwellings within the scheme.

It was felt that the most appropriate solution would be to provide retractable drying lines above the bath in each property.

If a bathroom is used as the drying space then extract ventilation should be provided and achieve a minimum extract rate of 30l/s and be controlled in accordance with Building Regulations Approved Document F; please note the ventilation rate required by the Code is higher than the requirement for a typical bathroom given in AD F.

1no. credit is to be sought.

Ene 5 Energy Labelled White Goods		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	2 of 2	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote the provision or purchase of energy efficient white goods, thus reducing the CO_2 emissions from appliance use in the dwelling.

Credits	Criteria
1	Where the following appliances are provided and have an **A+** rating under the EU Energy Efficiency Labelling Scheme: Fridge and Freezers or Fridge-freezers
1	Where the following appliances are provided and have an **A** rating under the EU Energy Efficiency Labelling Scheme: Washing machines and dish washers. **AND EITHER** Tumble dryers or washer dryers have a **B** rating (where a washer dryer is provided, it is not necessary to also provide a washing machine). **OR** EU Energy Efficiency Labelling Scheme information is provided to each dwelling in place of a tumble dryer or washer dryer.
1	Where no white goods are provided but EU Energy Efficiency Labelling Scheme information is provided to each dwelling. Note: To obtain this credit, any white goods available to purchase from the developer must be compliant with the above criteria.

Design Stage Evidence Required

If any white goods are to be provided, detailed documentary evidence confirming the appliances to be provided with their applicable ratings under the EU Energy Efficiency Labelling scheme.

Where washer dryers or tumble dryers will not be provided and the second credit is sought, provide detailed documentary evidence including: a copy of the EU Energy Efficiency Labelling scheme information **AND** confirmation that the information will be provided to all dwelling.

If no white goods are provided, detailed documentary evidence as follows: A copy of the information that will be provided on EU Energy Efficiency Labelling scheme **AND** Confirmation that the information will be provided to all dwellings **AND** Confirmation that all

appliances available for purchase with the dwelling are compliant with the assessment criteria.

Please Note
Where details cannot be produced at this stage, a formal letter from the developer giving the specific undertaking will suffice.

Validation Statement

The design team has confirmed that white goods will be available from the developer as well as information on the EU Energy Efficiency Labelling Scheme.

Please note that where credits are being awarded for supplying energy labelling information and white goods are available to purchase from the developer then these must conform to the requirements above.

2no. credits sought.

Ene 6 External Lighting		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	2 of 2	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote the provision of energy efficient external lighting, thus reducing CO_2 emissions associated with the dwelling.

Credits	Criteria
1	**Space Lighting** Where all external space lighting, including lighting in common areas, is provided by dedicated energy efficient fittings with appropriate control systems.
1	**Security Lighting** Where all security lighting is designed for energy efficiency and is adequately controlled such that: All burglar and security lights have: • A max wattage of 150 W AND • PIR Sensors AND • Daylight cut-off sensors All other security lighting: • Is provided by dedicated energy efficient fittings. AND • Is fitted with daylight cut-off sensors OR a time switch.
1	**Default Cases** If no security lighting is installed, the security lighting credit can be awarded by default, provided that all of the specification requirements relating to space lighting have been met. Dual lamp luminaires with both space and security lamps can be awarded both credits provided that they meet the above criteria for energy efficiency.

Design Stage Evidence Required
Relevant drawings clearly showing the location of all external light fittings **AND** detailed documentary evidence confirming the types of light fitting and efficacy, in lumens per circuit watt, for all lamps. Details of the control systems applicable to each light fitting or group of fittings. **Please Note** Where detailed information is not available at this stage then a letter of instruction to a contractor/supplier or formal letter from the developer giving the specific undertaking, will be required.
Validation Statement
TGA confirmed that code compliant space and security lighting will be installed and the majority of space lighting will be LED fittings. It was also noted during the pre-assessment meeting that all external steps, pathways, main external entrances and all communal internal spaces are included within the assessment of this issue. 2no. credits sought.

Ene 7 Low and Zero Carbon Technologies		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	2 of 2	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To limit CO_2 emissions and running costs arising from the operation of a dwelling, its services and appliances by encouraging the specification of low and zero carbon energy sources to supply a significant proportion of energy demand.

Credits	Criteria
1	Where energy is supplied by low or zero carbon technologies and there is a 10% reduction in CO_2 emissions as a result.
1	There is a 15% reduction in CO_2 emissions as a result.

Design Stage Evidence Required

A copy of the calculations as detailed in the assessment methodology based on design stage SAP outputs.

AND

Detailed documentary evidence confirming that the specified low or zero carbon technologies meet any additional requirements defined in Directive 2009/28/EC as applicable.

And are:

Certified under the Microgeneration Certification Scheme OR certified under the CHPQA standard (both the product and the installer must be certified).

Validation Statement

The LZC strategy for this development is to be confirmed however it was agreed that a compliant LZC technology would be installed in order to target full credits for this issue.

This Code issue requires that the SAP calculation produced for and Building Regulations ADL1a compliance is extended to include unregulated energy used within the dwelling i.e. appliances and cooking; credits are then awarded as follows:

- 1 credit for a net CO_2 reduction of 10%.
- 2 credits for a net CO_2 reduction of 15%.

2no credits have been provisionally allocated on the basis that all dwellings will perform accordingly; however SAP calculations for each dwelling type are required in order to confirm this.

Ene 8 Cycle Storage		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	1 of 2	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote the wider use of bicycles as transport by providing adequate and secure cycle storage facilities, thus reducing the need for short car journeys and the associated CO_2 emissions.

Credits	Criteria
1	Where individual or communal cycle storage is provided, that is adequately sized, secure and convenient, for the following number of cycles: Studios or 1 bedroom dwellings – storage for 1 cycle every two dwellings. 2 and 3 bedroom dwellings – storage for 1 cycle per dwelling. 4 bedrooms and above – storage for 2 cycles per dwelling.
2	Studios or 1 bedroom dwellings – storage for 1 cycle per dwelling. 2 and 3 bedroom dwellings – storage for 2 cycles per dwelling. 4 bedrooms and above – storage for 4 cycles per dwelling. **Note: The requirements for secure cycle storage are met where compliance with clause 35 of Secured by Design (SBD) New Homes 2010 is achieved.**

Design Stage Evidence Required

Detailed documentary evidence showing:

- The number for bedrooms and the corresponding number of cycle storage spaces per dwelling.
- Location, type and size of storage.
- Convenient access to cycle storage.
- Any security measures.
- Details of the proprietary system (if applicable).
- How the requirements of Clause 35 SBD will be met (if applicable).

Where detailed information is not available at this stage then a letter of instruction to a contractor/supplier or formal letter from the developer to the assessor, giving the specific undertaking, will suffice.

Validation Statement

At the time of the pre-assessment final details of the cycle storage were to be confirmed, PCKO stated that provision for cycle storage will follow the general guidance of the London Housing Design Guide and that sufficient cycle storage to gain 1no. credit will be installed.

Ene 9 Home Office		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	1 of 1	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote working from home by providing occupants with the necessary space and services thus reducing the need to commute.

Credits	Criteria
1	Where sufficient space and services have been provided which allow occupants to set up a home office in a suitable room.

Design Stage Evidence Required

Detailed documentary evidence showing the following in the proximity of the desk space:

- Location of and sufficient space for the home office.
- Furniture layout.
- Location and number of sockets (two double sockets required).
- Location of telephone points.
- That adequate ventilation will be provided (0.5m² opening window casement).
- That an average daylight factor of 1.5% is achieved.
- Confirmation that there is cable connection or that broadband is available at the site or two telephone points are provided.

Where detailed information is not available at design stage then a letter of instruction to a contractor/supplier or formal letter from the developer to the assessor, giving the specific undertakings above, will suffice.

Validation Statement

The design team confirmed that a compliant Home Office would be provided within each dwelling.

1no. credit is to be sought.

Wat 1 – Indoor Water Use		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	3 of 5	Min. credits to achieve rating level	1	1	3	3	5	5

Aim

To reduce the consumption of potable water in the home from all sources, including borehole well water, through the use of water efficient fittings, appliances and water recycling systems.

Credits	Criteria
1	Water consumption (litres/person/day) ≤ 120 l/p/d
2	≤ 110 l/p/d
3	≤ 105 l/p/d
4	≤ 90 l/p/d
5	≤ 80 l/p/d

Design Stage Evidence Required

Completed water efficiency calculator for new dwellings, internal potable water use for each dwelling which has a different specification.

AND

Detailed documentary evidence showing:

- Location, details and type off appliances/fittings that use water in the dwelling, including and specific water reduction equipment with the capacity/flow rate or equipment.
- Location, size and details of any rainwater and greywater collection system provided for use in the dwelling.

Where detailed documentary evidence is not available at this stage;

Completed water efficiency calculator for new dwellings, internal potable water use for each dwelling which has a different specification.

AND

A letter of instruction to a contractor/supplier or a formal letter from the developer giving a specific undertaking, providing sufficient information to allow the water calculations to be completed.

Validation Statement
The design team has confirmed that a maximum internal water use figure of 105 litres/person/day will be achieved through the specification of low-flow fittings and efficient water use appliances; this complies with the mandatory requirement for Code Level 4. The design team have also provided confirmation that no grey/rainwater recycling systems will be installed to help off-set the internal potable water use. 3no. credits are to be sought.

Wat 2 – External Water Use		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	**1 of 1**	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote the recycling of rainwater and reduce the amount of mains potable water used for external water use.

Credits	Criteria
1	Where a correctly specified and sufficiently sized system to collect rainwater for external/internal use has been provided to a dwelling with a garden, patio or communal garden space. (examples of such systems include rainwater butts and central rainwater collection systems).
1	**Default Cases** If no individual or communal garden spaces are specified, or if only balconies are provided, the credit can be awarded by default.

Design Stage Evidence Required

Detailed documentary evidence stating the type, size and location of any rainwater collection systems.

Where detailed information is not available at this stage then a letter of instruction to a contractor/supplier or formal letter from the developer to the assessor, giving the specific undertaking, will suffice.

Validation Statement

The ground floor dwellings will have access to a communal garden and some high level flats have access to a terrace, each of these will have rainwater butts sized to meet the following criteria:

- 1 litre/m² of land allocated to the dwelling with a minimum of 200 litres per communal garden. If the communal garden is allocated to more than six dwellings, a maximum of 30 litres per dwelling can be applied.

Some upper floor apartments will only have access to an external balcony which will comply by default.

1no. credit is to be sought as all dwellings should comply.

Mat 1 – Environmental Impact of Materials		**Minimum Code for Sustainable Homes Standards**						
		Level	**1**	**2**	**3**	**4**	**5**	**6**
No. of credits awarded:	**10 of 15**	Min. credits to achieve rating level	0	0	0	0	0	0

Aim
To specify materials with lower environmental impacts over their life-cycle.

Credits	**Criteria**
-	**Mandatory Requirement** Where at least three of the following five key elements of the building envelope achieve a rating of A+ to D in the 2008 version of the Green Guide: • Roof • External Walls • Internal Walls (including separating walls) • Upper and ground floors (including separating floors) • Windows
1 - 15	Where the Code Mat 1 Calculator Tool is used to assess the number of credits awarded for the five key elements described above.

Design Stage Evidence Required
Complete Code Mat 1 Calculator Tool, showing building elements at the design stage with the relevant Green Guide element numbers. **AND** References stating the design or specification documentation used to complete the tool.

Validation Statement
The design team have confirmed that all key building elements are likely to achieve an A+ to D rating referenced against the Green Guide to Specification. At the time of the pre-assessment, no detailed building specification had been submitted for assessment against the Mat 1 requirements. An estimated score 10no. credits have been provisionally allocated. **To achieve any code level the materials specification must achieve a Green Guide rating of between A+ and D for at least three of the five elements of the building envelope.**

Mat 2 – Responsible Sourcing of Materials – Basic Building Elements		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	3 of 6	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To specify materials with lower environmental impacts over their life-cycle.

Credits	Criteria
1-6	Where 80% of the assessed materials in the following building elements are responsibly sourced: • Frame • Ground Floor • Upper Floors (including separating floors) • Roof • External walls • Internal walls (including separating walls) • Foundation/substructure (excluding sub-base materials) • Staircases Additionally, 100% of any timber in these elements must be legally sourced.

Design Stage Evidence Required

Complete Code Mat 2 Calculator Tool, showing building elements at the design stage.

AND

Detailed documentary evidence stating the materials specified in each element.

Documentation stating specific materials to be re-used. (where applicable)

Documentation stating specific recycled materials. (where applicable)

AND

A letter of intent to use suppliers who can provide and EMS Certificate (or equivalent) for the recycling process.

Where certified materials are to be used, the following evidence will be required:

A letter of intent from the developer or other detailed documentary evidence confirming the product shall be sourced from suppliers capable of providing the relevant certification to the particular tier claimed.

OR

A copy of the relevant certificates as appropriate.

Validation Statement
The design team has provided a commitment that a significant proportion of the materials used within the basic building elements will be responsibly sourced. The Principle Contractor will be required to manage this process in order to provide sufficient evidence of this. 3no. credits have been provisionally allocated as an estimate (this is based on the average performance of previous projects).

Mat 3 – Responsible Sourcing of Materials – Finishing Elements		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	2 of 3	Min. credits to achieve rating level	0	0	0	0	0	0

Aim
To promote the specification of responsibly sourced materials for the finishing elements.

Credits	Criteria
1- 3	Where 80% of the assessed materials in the following finishing elements are responsibly sourced: • Staircase • Windows • External & Internal doors • Skirting • Panelling • Furniture • Fascia's • Any other significant use Additionally, 100% of any timber in these elements must be legally sourced.

Design Stage Evidence Required

Complete Code Mat 3 Calculator Tool, showing building elements at the design stage.

AND

Detailed documentary evidence stating the materials specified in each element.

Documentation stating specific materials to be re-used. (where applicable)

Documentation stating specific recycled materials. (where applicable)

AND

A letter of intent to use suppliers who can provide and EMS Certificate (or equivalent) for the recycling process

Where certified materials are to be used, the following evidence will be required:

A letter of intent from the developer or other detailed documentary evidence confirming the product shall be sourced from suppliers capable of providing the relevant certification to the particular tier claimed.

OR

A copy of the relevant certificates as appropriate.

Validation Statement
The design team confirmed that a significant proportion of the materials used in finishing elements will be responsibly sourced. This process will be managed by the Main Contractor. All timber or timber products FSC/PEFC/CSA certified (internal doors, skirting, panelling, kitchen units, fitted furniture, bath panels, fascia's, frames, boarding, or other significant use.) All other products ISO14001/EMAS/BES6001 certified for the key & supply chain processes 3no. credits have been provisionally allocated (this is based on the average performance of previous projects).

Sur 1 – Management of Surface Water Run-off from Developments		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	0 of 2	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To design surface water drainage for housing developments which avoid, reduce and delay the discharge of rainfall run-off to watercourses and public sewers using SUDS techniques. This will protect receiving waters from pollution and minimise the risk of flooding and other environmental damage in watercourses.

Credits	Criteria
-	**Mandatory Requirements** Ensuring that the peak rate of run-off from the developed site is no more than that of the existing site's rate of run-off. Ensure that the post development volume of run-off, allowing for climate change over the development lifetime, is no greater than it would have been prior to the development.
1	**Water Quality Criteria** Ensure that there is no discharge from the developed site for rainfall depths up to 5mm.
1	Ensure that the run-off from all hard surfaces shall receive an appropriate level of treatment in accordance with the SuDS Manual to minimise the risk of flooding.
-	**Default Cases:** The mandatory criteria can be deemed to be met by default if the site discharges rainwater directly to a tidal estuary or the sea.

Design Stage Evidence Required

MANDATORY ELEMENTS
Statement from the appropriately qualified professional (drainage consultant) confirming that they are qualified in line with the code definition.

AND

The appropriately qualified professional's report containing all information necessary to demonstrate compliance with the peak rate of run-off and volume of run-off requirements.

AND

A Flood Risk Assessment confirming the risk of flooding from all sources of flooding (this may be contained in the appropriately qualified professionals report).

AND

Drawings showing the pre-development drainage for the site (natural or constructed).

AND

Drawings showing the proposed drainage solution, system failure flood flow routes, potential flood ponding levels and ground floor levels.

AND

Confirmation from the appropriately qualified professional that local drainage system failure would not cause an increase in the risk of flooding within dwellings either on or off site.

WHERE CREDITS ARE SOUGHT
The appropriately qualified professional's report detailing the design specifications, calculations and drawings to support the awarding of the credits.

Validation Statement

The design team have committed to meeting the mandatory requirements of this issue.

The Sur 1 mandatory requirements summary template is to be completed by a suitably qualified consultant to demonstrate compliance with the mandatory requirements of this credit.

There has been no confirmation that either of the tradable credits (detailed above) can be awarded therefore no credits are sought at this time.

To achieve any code level rating the minimum mandatory requirements for dealing with surface water run-off must be achieved.

Sur 2 – Flood Risk		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	**0 of 2**	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote housing developments in low flood risk areas, or to take measures to reduce the impact of flooding on houses built in areas with a medium of high risk of flooding.

Credits	Criteria
2	**Either** Two credits are available for developments situated in Zone 1 – low annual probability of flooding and where the site-specific flood risk assessment (FRA) indicates that there is a low risk of flooding from all sources.
1	**OR** One credit is available for developments situated in Zone 2 and 3a – medium and high annual probability of flooding, where the finished ground level of all habitable parts of dwellings and access routes to the ground level and the site, are placed at least 600mm above the design flood level of the flood zone. The FRA accompanying the planning application must demonstrate to the satisfaction of the local planning authority and statutory body, that the development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed.

Design Stage Evidence Required

For developments situated in Zone 1

A FRA (prepared according to good practice guidance as outlined in PPS25 Development and Flood Risk) which shows that there is a low risk of flooding from all sources.

For medium (Zone 2) or high (Zone 3a) flood risk areas

A FRA (prepared according to good practice guidance as outlined in PPS25 Development and Flood Risk) which shows that there is medium or high risk of flooding.

AND

Site plans indicating the design flood level, the range of ground levels of the dwellings, car parking areas and site access (lowest to highest), showing that the criteria (finished floor levels of all habitable rooms and access routes being at least 600mm above the design flood level) are met, along with any notes explaining the function of any areas lying below the design flood level.

AND

Confirmation from the local planning authority that the development complies with PPS25 and is appropriately flood resilient and resistant, and has managed any residual risk safely.

Where the site is under the protection of flood defences and the flood risk category of the site is reduced:

Written confirmation from the Environment Agency of the reduction in flood risk category is required.

Validation Statement

At the time of the pre-assessment there had been no confirmation of the sites risk of flooding.

A compliant flood risk assessment must be carried out by a suitably qualified consultant in order to confirm that the site is not at risk from flooding from rivers, seas, local drainage, canals etc.

No credits currently sought.

Was 1 – Storage of Non-recyclable Waste and Recyclable Household Waste		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	4 of 4	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To provide adequate internal and external storage space for non-recyclable waste and recyclable household waste.

Credits	Criteria
-	**MANDATORY REQUIREMENTS** **Storage of household waste** An adequate external space should be allocated for waste storage and sized to accommodate containers according to the largest of the following two volumes: • The minimum volume recommended by British Standard 5906, based on a maximum collection frequency of once per week. This volume is 100 litres for a single bedroom dwelling, with a further 70 litres for each additional bedroom. • The total volume of the external waste containers provided by the Local Authority. Storage space must provide inclusive access and usability (Checklist IDP). Containers must not be stacked.
2	**Storage of recyclable household waste** Dedicated internal storage for recyclable household waste can be credited where there is no (or insufficient) dedicated external storage capacity for recyclable material, no Local Authority Collection Scheme and where the following criteria are met: At least three internal storage bins: • All located in an adequate internal space. • With a minimum total capacity of 60 litres.
	Storage of recyclable household waste A combination of internal storage capacity provided in an adequate internal space, with either: • A Local Authority Collection scheme, or • No Local Authority Collection scheme but adequate external storage capacity.

4	**Local Authority Collection Scheme** In addition to a Local Authority Collection Scheme (with a collection frequency of at least fortnightly), at least one of the following requirements must be met: • Recyclable household waste is sorted **after** collection and a single bin of at least 30 litres is provided in an adequate internal space. • Materials are sorted **before** collection and at least three separate bins are provided with a total capacity of 30 litres. Each bin must have a capacity of at least 7 litres and be located in an adequate internal space. • An automated waste collection system which collects at least three different types of recyclable waste. **No Local Authority Collection Scheme but adequate external storage capacity.** For houses and flats there must be at least three identifiably different internal storage bins for recyclable waste located in an adequate internal space: • With a minimum total capacity of 30 litres. • With a minimum individual capacity of at least 7 litres. **AND** **For houses**, an adequate external space must be provided for storing at least three external bins for recyclable waste: • With a minimum total capacity of 180 litres. • With a minimum individual capacity of 40 litres. **For flats**, a private recycling scheme operator must be appointed to maintain bins and collect recyclable waste regularly. Recycling containers must: • Be located in an adequate external space. • Be sized according to the frequency of collection, based on guidance from the recycling scheme operator. • Store at least three types of recyclable waste identifiably different bins.

Design Stage Evidence Required

MANDATORY ELEMENT:
Provide table – Cat 5.1 – Supplementary Information Sheet for Was 1 and a copy of Checklist IDP.

Where 2 credits are sought:

Detailed documentary evidence stating:
- The location of internal storage
- The number, types and size of internal storage

Where 4 credits are sought:

Detailed documentary evidence stating:
- The location of internal and external storage
- The number, types and size of internal and external storage

AND

A letter, leaflet, website or other published information from the Local Authority/waste scheme provider describing:
- The types of waste collected
- The frequency of collection
- If there will be pre or post collection sorting

Validation Statement

PCKO confirmed that all mandatory storage requirements for recyclable and non-recyclable waste will be satisfied.

PCKO also stated that the local council's collection scheme was being revised and it was not known whether recycling would be sorted pre or post collection, however, internal containers will be provided to suit the relevant Code criteria once this has been confirmed.

4no. credits have been provisionally allocated on the basis of the above.

It was also noted that the routes from the nearest external door to the external storage areas or refuse chutes (in high rise buildings) show be of a minimum distance and accessible.

To achieve any code level rating the minimum storage requirements for dealing with internal waste must be achieved.

Was 2 – Construction Site Waste Management		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	2 of 3	Min. credits to achieve rating level	0	0	0	0	0	0

Aim
To promote resource efficiency via the effective and appropriate management of construction site waste.

Credits	Criteria
1	**Minimising Construction Waste** Where there is a compliant Site Waste Management Plan (SWMP) that contains: • Target benchmarks for resource efficiency, i.e. m^3 of waste per $100m^2$ or tonnes of waste per $100m^2$ set in accordance with best practice. • Procedures and commitments to minimise non-hazardous construction waste at design stage. Specify waste minimization actions relating to at least 3 waste groups and support them by appropriate monitoring of waste. • Procedures for minimising hazardous waste. • Monitoring, measuring and reporting of hazardous and non-hazardous site waste production according to the defined waste groups (according to the waste streams generated by the scope of the works).
	Diverting Waste from Landfill Where there is a compliant Site Waste Management Plan (SWMP) including procedures and commitments to sort and divert waste from landfill, through either: • Re-use on site (in situ or for new applications) • Re-use on other sites • Salvage/reclaim for re-use • Return to the supplier via a 'take-back' scheme • Recovery and recycling using an approved waste management contractor • Compost According to the defined waste groups (In line with the waste streams generated by the scope of the works). **AND** One of the following has been achieved:

2	Where at least 50% by weight or by volume of non-hazardous construction waste generated by the project has been diverted from landfill. **OR**
3	Where at least 85% by weight or by volume of non-hazardous construction waste generated by the project has been diverted from landfill

Design Stage Evidence Required

A copy of the compliant SWMP containing the appropriate benchmarks, commitments and procedures for waste minimisation and diversion from landfill in line with the criteria and with Checklists Was 2a, Was 2b and Was 2c.

OR

Confirmation from the developer that the SWMP includes/will include benchmarks, procedures and commitments for minimising and diverting waste from landfill in line with the criteria and with Checklists Was 2a, Was 2b and Was 2c.

Validation Statement

There is a commitment from the Design Team to ensure that the main contractor will provide a compliant Site Waste Management Plan which includes procedures and commitments to sort and divert waste from landfill, and at least 50% by weight or by volume of non-hazardous construction waste generated by the project has been diverted from landfill. In-line with checklists Was 2b and 2c.

Therefore 2no. credits are to be sought for this issue.

Was 3 – Composting		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	**0 of 1**	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote the provision of composting facilities to reduce the amount of household waste sent to landfill.

Credits	Criteria
1	Individual composting facilities. **OR** A local communal or community composting service, which the Local Authority runs or where there is a management plan in place. **OR** A Local Authority green/kitchen waste collection system (this can include automated waste collection systems). All facilities must also: • Be in a dedicated position • Provide inclusive access and usability (Checklist IDP) • Have a supporting information leaflet provided to each dwelling

Design Stage Evidence Required

Detailed documentary evidence stating:

- The location and size of the internal and external storage
- That an information leaflet will be supplied
- Distance of storage from dwelling

AND

Completed Checklist IDP

For communal/community composting schemes detailed documentary evidence stating:

- Distance of storage from dwelling
- Management arrangements
- Location and size of storage
- Details of the scheme including opening times, access restrictions etc
- Confirmation that an information leaflet will be supplied

AND

Complete Checklist IDP

Where applicable, detailed documentary evidence stating:

Details of the Local Authority kitchen/garden waste collection scheme.

Details of the automated waste collection scheme.

Where detailed documentary evidence is not available at this stage:

A letter of instruction to a contractor/supplier, a formal letter from the developer giving the specific undertaking or the manufacturer's information, for all the above required details.

Validation Statement

The design team has confirmed that the composting credit is not sought.

As a result no credits will be awarded.

Pol 1 – Global Warming Potential (GWP) of Insulants		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	1 of 1	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote the reduction of emissions of gases with high GWP associated with the manufacture, installation, use and disposal of foamed thermal and acoustic insulating materials.

Credits	Criteria
1	Credits are awarded where all insulating materials in the elements of the dwelling, listed below, only use substances that have a GWP < 5 (in manufacture AND installation): • Roofs: including loft access • Walls: internal and external including lintels and all acoustic insulation • Floors: including ground and upper floors • Hot water cylinder: pipe insulation and other thermal stores • Cold water storage tanks: where provided • External doors

Design Stage Evidence Required

Completed Checklist Pol 1 showing the proposed insulation materials (or none) for each element, and whether they are foamed using blowing agents or are un-foamed (from table Cat 6.1).

Validation Statement

There is a commitment from the design team that all insulants used in the proposed development will have a GWP of <5, in-line with the requirements of Pol 1.

At the time of writing no documentation indicating the specification of the insulation has been provided, which can be assessed against the requirements of Pol 1.

1no. credit has been provisionally allocated.

Pol 2 – NOx Emissions		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	**3 of 3**	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote the reduction of emissions of gases with high GWP associated with the manufacture, installation, use and disposal of foamed thermal and acoustic insulating materials.

Credits	Criteria
1	Credits are awarded where all insulating materials in the elements of the dwelling, listed below, only use substances that have a GWP < 5 (in manufacture AND installation): • Roofs: including loft access • Walls: internal and external including lintels and all acoustic insulation • Floors: including ground and upper floors • Hot water cylinder: pipe insulation and other thermal stores • Cold water storage tanks: where provided • External doors

Design Stage Evidence Required

Detailed documentary evidence describing:

- The primary and secondary heating systems and flue type
- Dry NOx levels and/or boiler class of the primary and secondary heating systems

Where NOx averaging is required due to multiple heating systems within the dwelling:

Copy of calculations as detailed in the methodology based on design stage SAP outputs.

Where detailed documentary evidence is not available at this stage:

A letter of instruction to a contractor/supplier or a formal letter from the developer to the Code assessor giving the specific undertaking.

Validation Statement

The design team have confirmed that all space heating and hot water will be provided by a system with a Dry NOx emission level of less than 40 mg/kWh, in-line with the Pol 2 requirements.

Details of the heating system(s) should be supplied for assessment.

3no. credits have been provisionally allocated.

Hea 1 - Daylighting		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	0 of 3	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote good daylighting and thereby improving quality of life and reduce the need for energy to light the home.

Credits	Criteria
1	Kitchen must achieve a minimum average daylight factor of at least 2%.
1	All living rooms, dining rooms and studies (including any room designated as a home office under Ene 9 – Home Office) must achieve a minimum average daylight factor of at least 1.5%.
1	80% of the working plane in each kitchen, living room, dining room and study (including any room designated as a home office under Ene 9 – Home Office) must receive direct light from the sky.

Design Stage Evidence Required

Copy of the calculations as detailed in the methodology to demonstrate:

- Average daylight factor using the formula described in the definitions section (method described in Littlefair (1998) as set out in BS 8206-2) or computer simulation or scale model measurements.
- Position of the no-sky line and percentage of area of the working plane that receives direct light from the sky.

Confirmation from the developer that the calculations accurately reflect the dwelling as designed.

Validation Statement

PCKO have confirmed that the dwellings should achieve very good daylight levels, however average daylight factors are unknown at this time and PCKO have subsequently requested that no credits be allocated under this issue at this time.

It should be noted that any room claiming the credit under Ene 9 Home Office must achieve a daylight factor of 1.5%.

A daylighting specialist is to be appointed and further credits may be achievable pending their input.

No credits allocated on the basis of the above.

Hea 2 – Sound Insulation		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	3 of 4	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote the provision of improved sound insulation to reduce the likelihood of noise complaints from neighbours.

Credits	Criteria
1 3 4	Where: • Airborne sound insulation values are at least 3dB higher • Impact sound insulation values are at least 3dB lower **OR** • Airborne sound insulation values are at least 5dB higher • Impact sound insulation values are at least 5dB lower **OR** • Airborne sound insulation values are at least 8dB higher • Impact sound insulation values are at least 8dB lower Than the performance standards set out in the Building Regulations approved for England and Wales, Approved Document E (2003 Edition with amendments 2004). This can be demonstrated through **EITHER** A programme of pre-completion testing based on the normal programme of testing described in Approved Document E, for every group or sub-group of houses or flats, demonstrating that the above standard or standards are achieved. **OR** Use of constructions for all relevant building elements that have been assessed and approved as Robust Details by Robust Detailed Limited (RDL) and found to achieve the performance standards stated above. All relevant dwellings must be registered with RDL.
4 3	**Default Cases** Detached dwellings. Attached dwellings where separating walls or floors occur only between non-habitable rooms.

Design Stage Evidence Required
Where pre-completion testing will be carried out: A letter from the developer confirming the intent to: • Meet the relevant sound insulation performance levels. • Use a compliant test body to complete the testing. **OR** Where Robust Details will be used: • Confirmation that the Robust Details chosen will achieve the required performance standards for sound insulation (as applicable). • Confirm that the relevant plots are registered with RDL (the purchase statement).
Validation Statement
During the pre-assessment meeting it was agreed that all party walls and floors will achieve a 5dB improvement over Building Regulations minimum standards for airborne and impact sound insulation levels. This can be demonstrated by registering the site with Robust Details **OR** pre-completion acoustic testing using a UKAS accredited acoustician. 3no. credits have been provisionally allocated.

Hea 3 – Private Space		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	**1 of 1**	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To improve quality of life by promoting the provision of an inclusive outdoor space which is at least partially private.

Credits	Criteria
1	Where outdoor space (private or semi-private) has been provided that is: • Of a minimum size that allows all occupants to use the space. • Provided with inclusive access and usability (Checklist IDP). • Accessible only to the occupants of designated dwellings.

Design Stage Evidence Required

Detailed documentary evidence confirming:

- The number of bedrooms served by the outdoor space.
- That the outdoor space meets the minimum size requirements.

AND

Completed Checklist IDP.

Where a shared outdoor space in provided, detailed documentary evidence demonstrating:

- The private space is accessible only to occupants of designated dwellings.

Where detailed documentary evidence is not available at this stage:

A letter of instruction to a contractor/supplier or a formal letter from the developer to the assessor giving a specific undertaking.

Validation Statement

Dwellings on the ground floor will have access to a shared communal outdoor space which will only be accessible to residents.

Flats on the upper floors will each have their own external balcony/terrace in compliance with the London Housing Guide standards.

1no. credit has been provisionally allocated on the basis of the above.

Hea 4 – Lifetime Homes		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	**4 of 4**	Min. credits to achieve rating level	0	0	0	0	0	4

Aim

To promote the construction of homes that are accessible and easily adaptable to meet the changing needs of current and future occupants.

Credits	Criteria
4	Where all of the principles of Lifetime Homes, applicable to the dwelling being assessed, have been complied with.
	OR
3	Where an exemption from Lifetime Homes criteria 1 and/or 3 is applied to selected pathways, subject to a steeply sloping plot gradient, but all other principles of Lifetime Homes, applicable to the dwelling being assessed, have been complied with.

Design Stage Evidence Required

Confirmation from the developer that all 16 of the Lifetime Homes design criteria are met.

OR

Where an exemption from Lifetime Homes criteria 2 and/or 3 is sought:

- Confirmation from the developer that all other design criteria are met.

AND

Detailed documentary evidence demonstrating access routes subject to steeply sloping gradients at pre development and completion.

Validation Statement

PCKO confirmed that the proposed development will comply with all of the relevant requirements of Lifetime Homes.

At the time of writing the Lifetime Homes checklist has not been submitted for assessment against the Hea 4 requirements. The Architect is to complete this prior to fully assessing the criteria.

4no. credits have been provisionally allocated.

Man 1 – Home User Guide		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	3 of 3	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote the provision of guidance enabling occupants to understand and operate their home efficiently and make the best use of local facilities.

Credits	Criteria
2	Provision of a Home User Guide, compiled in accordance with Checklist Man 1, Part 1, together with confirmation that the guide is available in alternative formats.
1	Where the guide includes additional information relating to the site and its surroundings and is compiled in accordance with Checklist Man 1, Part 2.

Design Stage Evidence Required

Where a home user guide will be supplied covering operational issues only:

Confirmation in the form of a letter from the developer or in the specification that the guide will be:

- Supplied to all dwellings within the development
- Be developed to the required standards (as a minimum, including a list of contents showing that the guide will cover all of the issues required in Checklist Man 1 Part 1)

Where a home user guide covering operational issues and issues relating to the site and surroundings will be supplied:

As above and including information covered in Checklist Man 1 Part 2.

Validation Statement

The design team have confirmed that all residents will be provided with a Home User Guide, upon completion of the scheme, compiled using checklist Man 1 part 1 (operational issues) and checklist Man 1 part 2 (site and surroundings) which will also be also be available in alternative accessible formats on request.

The Principal Contractor will be responsible for coordinating the production of this.

3no. credits have been provisionally allocated.

Man 2 – Considerate Constructors Scheme		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	2 of 2	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote the environmentally and socially considerate, and accountable management of construction sites.

Credits	Criteria
1	Where there is a commitment to meet best practice under a nationally or locally recognised certification scheme such as the Considerate Constructors Scheme.
2	Where there is a commitment to go significantly beyond best practice under a nationally or locally recognised certification scheme such as the Considerate Constructors Scheme.

Design Stage Evidence Required

Specification clause or other confirmation of commitment from the contractor or developer to comply with the Considerate Constructors Scheme and achieve formal certification under the scheme with either a pass score or a score of 32 points and above.

AND

Confirmation that registration with the Considerate Constructors Scheme has taken place no later than the commencement of the construction phase.

Validation Statement

The design team have confirmed that a commitment will be placed on the appointed Principal Contractor to participate in the Considerate Constructors or similar Scheme and achieve a beyond best practice score of between 35 and 50 points, with no individual section score less than 7 points.

2no. credits have been provisionally allocated.

Man 3 – Construction Site Impacts		**Minimum Code for Sustainable Homes Standards**						
		Level	**1**	**2**	**3**	**4**	**5**	**6**
No. of credits awarded:	**2 of 2**	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote construction sites managed in a manner that mitigates environmental impacts.

Credits	**Criteria**
1	Where there are procedures that cover two or more of the following items: • Monitor, report and set targets for CO_2 production or energy use arising from site activities. • Monitor and report CO_2 or energy use arising from commercial transport to and from the site. • Monitor, report and set targets for water consumption from site activities. • Adopt best practice policies in respect of air (dust) pollution arising from site activities. • Adopt best practice policies in respect of water (ground and surface) pollution occurring on the site. • 80% of site timber is reclaimed, re-used or responsibly sourced. **OR**
2	Where there are procedures that cover four or more of the items listed above.

Design Stage Evidence Required

Completed copy of Checklist Man 3 (signed and dated) detailing the procedures that will be employed to minimise construction site impacts.

Validation Statement

The design team have confirmed that an obligation will be placed on the appointed Principal Contractor to put in place procedures to cover four or more of the listed Construction Site impacts requirements (listed above).

2no. credits have been provisionally allocated.

Man 4 – Security		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	2 of 2	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote the design of developments where people feel safe and secure – where crime and disorder, or the fear of crime, does not undermine quality of life or community cohesion.

Credits	Criteria
2	An Architectural Liaison Officer (ALO) or Crime Prevention Design Advisor (CPDA) from the local police force is consulted at the design stage and their recommendations are incorporated into the design of the dwelling. **AND** Section 2 – Physical Security from 'Secured by Design – New Homes' is complied with (Secured by Design certification is not required).

Design Stage Evidence Required

Detailed documentary evidence showing:

- That and ALO/CPDA has been consulted with to ensure that the requirements of Section 2 – Physical Security from 'Secured by Design – New Homes' are met.
- A commitment to follow the advice provided by the ALO/CPDA.

Validation Statement

PCKO confirmed that Section 2 compliance with Secured by Design will be sought.

2no. credits allocated.

Eco 1 – Ecological Value of Site		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	**1 of 1**	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote development on land that already has a limited value to wildlife, and discourage the development of ecologically valuable sites.

Credits	Criteria
1	Where the development site is confirmed as land of inherently low ecological value. **Either** By meeting the criteria for low ecological value (using Checklist Eco 1 – Land of Low Ecological Value) **OR** By being confirmed by a suitably qualified ecologist **OR** Where an independent ecological report of the site, prepared by a suitably qualified ecologist, confirms that the construction zone is of low or insignificant ecological value. **AND** Any land of ecological value outside the construction zone, but within the development site will remain undisturbed by the construction works.

Design Stage Evidence Required

Where using Checklist Eco 1, provision of:

- Site visit report from the design team/ assessor confirming details adequate to meet Checklist Eco 1 based on plans of the site and surrounding area prior to the commencement of construction works/site clearance.

Where a suitably qualified ecologist is appointed:

A copy of a report or letter from the ecologist highlighting the information required as set out in the 'Code for Sustainable Homes Ecology Report Template'.

AND

Detailed documentary evidence identifying the construction zone and how any areas of ecological value outside the construction zone will remain undisturbed in accordance with the ecologist's recommendations.

Validation Statement
The ecology report completed by Chris Blandford Associates confirms that the site is of low ecological value. The design team should note that at the time of formal assessment the ecologist will be required to complete a copy of CfSH Checklist Eco 1. 1no. credit has been allocated.

Eco 2 – Ecological Enhancement		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	1 of 1	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To enhance the ecological value of a site.

Credits	Criteria
1	Where a suitably qualified ecologist has been appointed to recommend appropriate ecological features that will positively enhance the ecology of the site. **AND** Where the developer adopts all key recommendations and 30% of additional recommendations.

Design Stage Evidence Required

A copy of the ecologists report highlighting the information required as set out in the 'Code for Sustainable Homes Ecology Report Template'.

AND

Detailed documentary evidence stating:

- How the key recommendations and 30% of the additional recommendations will be incorporated into the design.
- The planting schedule of any species to be incorporated from suitably qualified ecologists recommendations.

Validation Statement

The design team has confirmed that a Suitably Qualified Ecologist will be appointed to recommend appropriate ecological features that will positively enhance the ecology of the site, in line with the CfSH Ecology Report Template, and these measures (Key and Additional) will be implemented in the scheme design.

1no. credit has been allocated.

Eco 3 – Protection of Ecological Features		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	0 of 1	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote the protection of existing ecological features from substantial damage during the clearing of the site and the completion of construction works.

Credits	Criteria
1	Where all existing features of ecological value on the development site potentially affected by the works are maintained and adequately protected during site clearance, preparation and construction works.
	Default Cases The credit can be awarded by default where the site has been classified as having low ecological value in accordance with section 1 of Checklist Eco 1, Ecological features of the site, AND no features of ecological value have been identified. If a suitably qualified ecologist has confirmed a feature can be removed because of its insignificant ecological value or where an arboriculturalist has confirmed a feature can be removed, owing to poor health/condition, the credit can be achieved provided all other features are adequately protected in accordance with the ecologist's recommendations.

Design Stage Evidence Required

Detailed documentary evidence confirming ecological features present and how they will be protected.

Where compliance with the criteria is demonstrated by the relevant documents submitted to the Planning Authority which gained planning approval, these can be used as evidence.

Where ecological features are being removed for health and safety and/or conservation reasons:

Written evidence from an appropriate statutory body/arboriculturalist confirming the requirement to remove any features.

Where ecological features are being removed and are of low ecological value:

A copy of the ecologist report highlighting the information required as set out in the Code for Sustainable Homes Ecology Report Template.

Validation Statement
The ecology report completed by Chris Blandford Associates confirms that the site is of low ecological value and no individual features of ecological value have been identified. The design team should note that at the time of formal assessment the ecologist will be required to complete a copy of CfSH Checklist Eco 1 in order to confirm credits. 1no. credit has been allocated.

Eco 4 – Change in Ecological Value of Site		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	2 of 4	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To minimise reductions and promote and improvement in ecological value.

Credits	Criteria
1 2 3 4	The ecological value before and after development is measured, and the overall change in species per hectare is: • Minor negative change: between -9 and less than or equal to -3 • Neutral: greater than -3 and less than or equal to +3 • Minor enhancement: greater than 3 and less than or equal to 9 • Major enhancement: greater than +9

Design Stage Evidence Required

Copy of the calculations completed by the assessor and supported by the following detailed documentary evidence:

- Proposed site layout
- The pre-development site survey, clearly indicating natural and built features on both the site and the land surrounding the site before the proposed development
- Landscape and plot categories (in accordance with the Assessment Methodology) with a list of site areas provided for both before and after the development

Where the advice of and ecologist is sought, the following detailed documentary evidence must be provided:

Code for Sustainable Homes Ecology Report Template completed by the ecologist.

AND

Written confirmation from the developer confirming how the ecologist's recommendations will be implemented including a planting schedule.

Validation Statement

PCKO confirmed that the change in species value post development is likely to be neutral therefore 2no. credits have been allocated.

Eco 5 – Building Footprint		Minimum Code for Sustainable Homes Standards						
		Level	1	2	3	4	5	6
No. of credits awarded:	2 of 2	Min. credits to achieve rating level	0	0	0	0	0	0

Aim

To promote the most efficient use of a buildings footprint by ensuring that land and material use is optimised across the development.

Credits	Criteria
1	For houses, where the net internal floor area : net internal ground floor area ratio is greater than or equal to 2.5 : 1. **OR** For blocks of flats, where the net internal floor area : net internal ground floor area ratio is greater than or equal to 3 : 1. **OR** For a combination of houses and flats, the ratio of total net internal floor area : total net internal ground floor area of all houses and flats (i.e. the site wide footprint to floor area ratio) is greater than the area weighted average of the two target ratios.
2	For houses, where the net internal floor area : net internal ground floor area ratio is greater than or equal to 3 : 1. **OR** For blocks of flats, where the net internal floor area : net internal ground floor area ratio is greater than or equal to 4 : 1. **OR** For a combination of houses and flats, the ratio of total net internal floor area : total net internal ground floor area of all houses and flats (i.e. the site wide footprint to floor area ratio) is greater than the area weighted average of the two target ratios.

Design Stage Evidence Required

Calculation of the building footprint ratio, stating the Net Internal Floor Area (NIFA) and the Net Internal Ground Floor Area (NIGFA).

Validation Statement

On the basis of the layouts tabled at the pre-assessment meeting the building footprint to upper floor ratio will be greater than 4:1 therefore 2 credits should be achievable.

6 Recommendations

On the basis of the pre-assessment information detailed in Section 5 and the information currently available, it is anticipated that the Code for Sustainable Homes rating likely to be achieved when a final assessment is undertaken would be **'Level 4'** with a score of **69.06%**.

Further opportunities to increase the Code for Sustainable Homes score are available; the following is a summary of credits that may be achievable and have not been allocated in Section 5 of this report.

It should also be noted that the final specification of the building envelope is yet to be fully confirmed and these decisions may facilitate additional credits to become available in the Ene 1, Mat 1, Mat 2 and Hea 2 sections.

The full requirements for each credit are fully detailed in the Code for Sustainable Homes Technical Manual.

Credit Title	Recommendations	% Weighted Score Available
Energy		
Ene 1 Dwelling Emission Rate	**Up to 7 additional credits** Extra credits are available in increments of 0.1 for achieving greater than a 40% improvement of DER over TER, these credits will be confirmed once SAP calcs for each dwelling type have been completed.	8.19
Ene 2 Fabric Energy Efficiency	**Up to 2 additional credits** Consider increasing the fabric energy efficiency of the apartments to $\leq$32 kWh/m²/year.	2.34
Ene 3 Energy Display Devices	**1 Credit** Consider installing an energy display device on either the primary heating fuel OR electricity to each dwelling. **OR** **2 Credits** Consider installing an energy display device on both the primary heating fuel AND electricity to each dwelling	1.17 2.34

Ene 8 Cycle Storage	**1 Credit** Increase the amount of cycle storage in order to cater for the following: • Studios or 1 bed – 1 cycle per dwelling. • 2 and 3 bed – 2 cycles per dwelling. • 4 bed and above – 4 cycles per dwelling.	1.17
Water		
Wat 1 – Water Consumption	**Up to 2 additional credits** Decrease the consumption of potable water per dwelling. Extra credits are available at the following levels: • 1 credit @ 90 litres/person/day. • 2 credits @ 80 litres/person/day. **Please note that to award these credits it is probable that rainwater or grey water recycling would be necessary in addition to low water use sanitaryware.**	1.50 3.00
Materials		
Mat 1 – Environmental Impact of Materials	**Up to 5 additional credits** At the time of the pre-assessment meeting it was agreed to make a conservative estimate of the credits achievable for this issue. The designers should look carefully at the specification of all major building elements in conjunction with the Green Guide to Specification document and once the design is finalised the award of extra credits for this item can be confirmed.	1.50
Mat 2 – Responsible Sourcing of Materials (Major Building Elements)	**Up to 3 additional credits** The manufacturers of materials for the major building elements are unknown at this point however once these are specified it may be possible to confirm additional credits. To gain maximum credits for this item	0.90

	manufacturers of specified materials should operate an Environmental management system which covers both them and their supply chain - BES 6001, FSC AND PEFC are examples of the accreditations with the highest weighting.	
Mat 3 - Responsible Sourcing of Materials (Finishing Elements)	**1 Credit** As Mat 2 above.	0.3
Surface Water Run-off		
Sur 1 – Management of surface Water Run-off from Developments	**1 Credit** Where the drainage designer confirms that there will be no run-off for the first 5mm of rainfall. **1 Credit** Where the drainage designer confirms that run-off from hard surfaces will receive an appropriate level of treatment in accordance with the SUDS manual.	0.55 0.55
Sur 2 – Flood Risk	**Up to 2 additional credits** Where a flood risk assessment is carried by a suitably qualified consultant in order to confirm the risk of flooding at the site.	1.10
Waste		
Was 2 – Construction Site Waste Management	**1 Credit** Increase the requirement for diversion of waste from landfill to 85%.	0.80
Was 3 – Composting	**1 Credit** Consider providing communal external composting facilities, which can be used by the residents of the new apartments. As well as the external containers, internal compostable waste storage will also be required in each apartment.	0.80

Health & Wellbeing		
Hea 1 – Daylighting	**1 Credit** Ensure that all living rooms, dining rooms and studies achieve a daylight factor of 1.5%. **1 Credit** Ensure that all kitchens achieve a daylight factor of 2%. **1 Credit** Ensure that at least 80% of the working plane in all living rooms, dining rooms, kitchens and study receives direct light from the sky.	1.16 1.16 1.16
Hea 2 – Sound Insulation	**1 Credit** Increase sound insulation between dwellings by 8dB over the requirements of Part E for both airborne and impact sound.	1.16
Ecology		
Eco 4 – Change in Ecological Value of Site	**Up to 2 additional credits** The proposed landscape design should be forwarded to the appointed ecologist to enable the species value of the existing and proposed site layouts to be confirmed. 1no. credit is available where there is an increase in plant species of between 3 and 9 species and 2no. credits for an increase over 9.	2.66
Maximum additional CfSH points available based on the above		30.84Type equation here.%