Greenwood Place, Raglan House Building

Sustainability Statement

August 2013
Job Ref. 1213 Greenwood Place

Camden Tibbalds Multidisciplinary Team PCKO

tga CONSULTING ENGINEERS

a sustainable future... engineered.

GREENWOOD PLACE, RAGLAN HOUSE BUILDING

SUSTAINABILITY STATEMENT

REVISION B

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

CONTENTS

1.0 INTRODUCTION 2

1.1 PREAMBLE 2

1.4 THIS REPORT 2

2.0 DEVELOPMENT PROPOSALS 4

2.1 PROJECT DESCRIPTION 4

2.2 SUSTAINABILITY FEATURES 4

3.0 BREEAM PRE ASSESSMENT OUTCOMES 5

3.1 13-143 RAGLAN HOUSE 5

4.0 CONCLUDING REMARKS 6

APPENDIX A – 13-143 RAGLAN HOUSE BREEAM PRE ASSESSMENT 7

1.0 INTRODUCTION

1.1 PREAMBLE

A team of construction professional are developing proposals for the refurbishment of 13-143 Raglan House.

TGA consulting Engineers LLP has been engaged, as part of the Tibbalds multi-disciplinary team, to provide professional design services associated with the refurbishment of Raglan House. 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 and refurbished 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

Existing buildings which feature in this project have been assessed using BRE environmental and sustainability standard, BREEAM 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

13-143 Raglan House is a Camden Council owned building located in the Kentish Town area of London. Community facilities provided in this building will become redundant following completion of the Greenwood Place development.

Proposals have been developed to convert Raglan House into residential apartments. The refurbished building is to be designed to achieve a BREEAM 'Very Good' rating.

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 refurbished building, has been carefully considered during the early design stages.

The building and its building services proposals reflect and incorporate many of the required features and facilities that will ultimately be included in the completed building. 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

- Building envelope and building services installations
- Energy conservation, energy efficiency and energy supply
- Materials
- Water conservation
- Pollution, air quality and noise
- Wastes
- Construction site impacts

All of the above items are addressed in the BREEAM assessment tool.

3.0 BREEAM PRE ASSESSMENT OUTCOMES

3.1 13-143 RAGLAN HOUSE

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

The building achieves BREEAM 'Very Good' rating with a score of 63.18%. A minimum required score of 55% must be achieved,

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

- Improved building u values
- Individual high-efficiency, condensing gas-fired boiler units located in each dwelling
- New energy efficient building engineering services installations

Renewable energy sources have not been included at this stage.

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 report, produced by Avoca, describes the design features that have been included into the project.

BREEAM pre-assessments has been included in appendix A.

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 – 13-143 RAGLAN HOUSE BREEAM PRE ASSESSMENT

Avoca Consulting Engineers

BREEAM®

Greenwood Estate
Raglan House Refurbishment
Kentish Town, London

BREEAM Domestic Refurbishment
Pre-assessment Report

REPORT CONTROL

Document: Raglan House Refurbishment
BREEAM Refurbishment Pre-assessment Report

Project: Raglan House refurbishment

Client: TGA Consulting Engineers

Project Number: 13-143

Document Checking:

Issue	Date	Status	Prepared By	Checked By	Revision Notes
01	16/08/13	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 Domestic Refurbishment 2012 pre-assessment for the refurbishment of Raglan House, Kentish Town, London. The refurbishment will convert an existing community centre to form 5no. flats.

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

A pre-assessment meeting was held on the 17th June 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 an Energy Statement report dated 28th August 2013, the report gives details of the existing building and proposed dwellings energy performance measured using the SAP methodology; these figures have been used to substantiate credit claims within the Ene 01, Ene 02 and Ene 03 BREEAM issues.

With the commitments received to date the refurbishment of Raglan House into dwellings would achieve a BREEAM Domestic Refurbishment score of **63.18%** which would translate into a rating of '**Very Good**'.

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.

CONTENTS Page No.

Report Control		**1**
Executive Summary		**2**
Contents		**3**
1	**Introduction**	**5**
1.1	Project Team Details	5
1.2	Summary	6
1.3	Report Format	6
2	**BREEAM Domestic Refurbishment**	**7**
2.1	BREEAM Assessment Approach and Methodology	7
2.2	BREEAM Scoring and Rating	8
2.3	BREEAM Issues & Credits	9
3	**Building Details**	**10**
4	**Summary of Pre-assessment Performance**	**11**
5	**Detailed Assessment of Building Performance**	**12**
	Management	13
	Health and Wellbeing	23
	Energy	31
	Water	47
	Materials	50
	Pollution	56
	Waste	61
	Innovation	66
6	**Recommendations**	**67**

DISCLAIMER

This report is not a BREEAM certificate and does not guarantee that the BREEAM Domestic Refurbishment 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 has been commissioned by TGA Consulting Engineers to carry out a BREEAM Domestic Refurbishment pre-assessment of the proposed refurbishment of the Raglan House.

The refurbishment will involve the removal of an existing first floor conservatory, internal demolitions and the erection of new internal walls in order to form of 5no. flats within the existing shell. The architect has indicated that limited thermal improvements were proposed.

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
BREEAM Assessor	Avoca Consulting Engineers 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 Domestic Refurbishment pre-assessment scoring tool following a meeting held with the design team on 17th June 2013.

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 a BREEAM rating. Section 6 summarises additional credits which could be included in order to increase the rating achieved.

It should be noted that this is not a formal BREEAM Domestic Refurbishment 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 and the pre-assessment meeting with the design team it is anticipated that the overall rating for the refurbishment of Raglan House will be a BREEAM rating of **'Very Good'**. The percentage score achieved in the BREEAM Pre-assessment is **63.18%**. The information contained within this report is based on verbal commitments expressed by the design team; no documentary evidence has been provided or reviewed to substantiate the allocation of credits.

1.3 Report Format

Section 1: Introduction
Section 2: BREEAM Domestic Refurbishment
Section 3: Building details
Section 4: Pre-assessment summary
Section 5: Detailed Pre-assessment
Section 6: Recommendations

2 BREEAM Domestic Refurbishment

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.

The aims and objectives of BREEAM are:

- To mitigate the life cycle 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.
- To provide market recognition of buildings with a low environmental impact.
- To ensure best environmental practice is incorporated in building planning, design, construction and operation.
- To define a robust, cost-effective performance standard surpassing that required by regulations.
- To challenge the market to provide innovative, cost effective solutions that minimise the environmental impact of buildings.
- To raise the awareness amongst owners, occupants, designers and operators of the benefits of buildings with a reduced life cycle impact on the environment.
- To allow organisations to demonstrate progress towards corporate environmental objectives.

BREEAM Domestic Refurbishment is a performance based assessment method and certification scheme for domestic buildings undergoing refurbishment. The primary aim of BREEAM Domestic Refurbishment is to improve the environmental performance of existing dwellings in a robust and cost effective manner. This is achieved through integration and use of the scheme by clients and their project teams at key stages in the refurbishment process. This enables the client, through personnel qualified and licensed under the BREEAM Domestic Refurbishment Scheme and the BRE Global certification process, to measure, evaluate and reflect the performance of their refurbishment project against best practice in an independent and robust manner. This performance is quantified by a number of individual measures and associated criteria stretching across a range of environmental issues, which is ultimately expressed as a single certified BREEAM rating.

BREEAM Domestic Refurbishment covers eight categories of sustainable design which include:

- Management
- Health and Wellbeing
- Energy
- Water
- Materials
- Pollution
- Waste
- Innovation

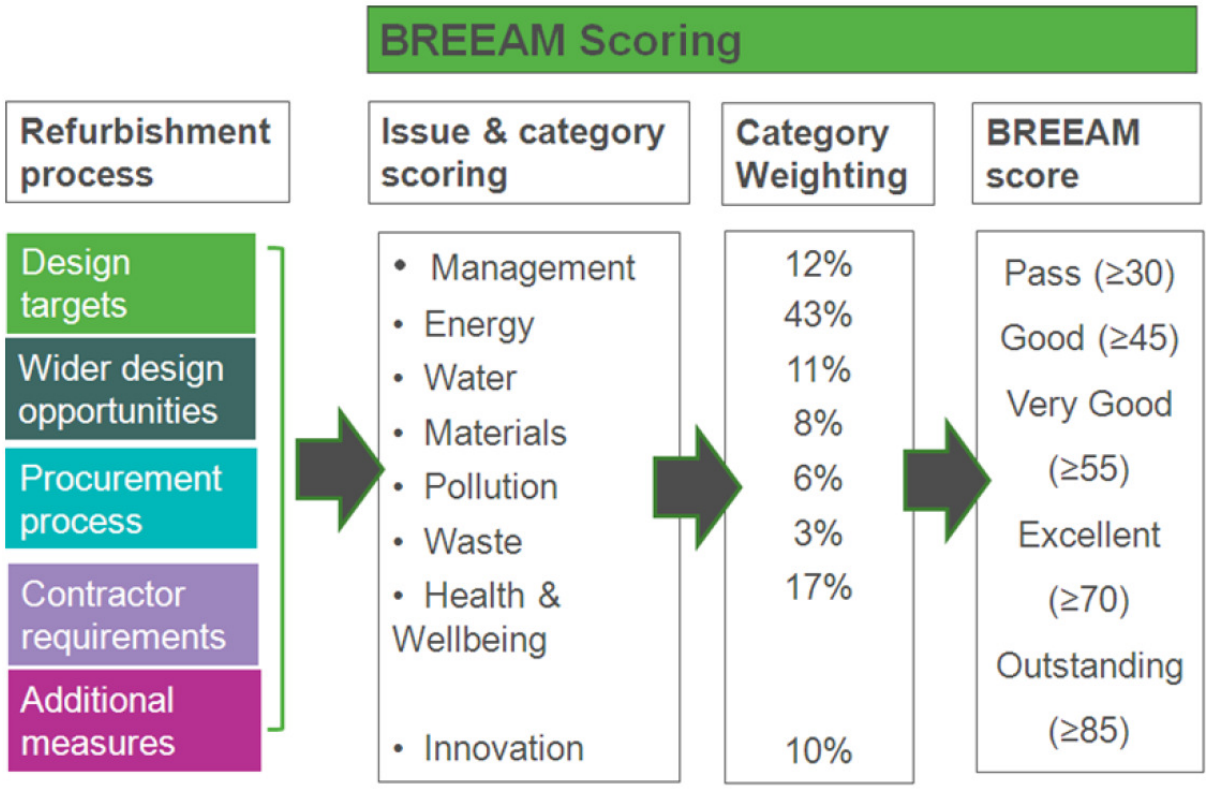
The assessment of the building results in a final report and BRE Global BREEAM certificate detailing the performance of the assessed building against the environmental issues covered by standard. The buildings performance is expressed as a BREEAM rating of PASS, GOOD, VERY GOOD, EXCELLENT or OUTSTANDING. 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 Assessment Scoring & Rating

There are a number of elements that determine the overall performance of a domestic refurbishment project assessed using BREEAM, these are as follows:

- The BREEAM rating level benchmarks.
- The minimum BREEAM standards.
- The environmental section weightings.
- The BREEAM assessment issues and credits.

The diagram below describes how a BREEAM assessment scores and rates an assessed dwelling together with the percentage points required to achieve each level.



Each BREEAM category contains a number of environmental issues, which reflect the options available when designing, procuring and constructing a building.

2.3 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 muse be achieved in order for a particular BREEAM rating level to be met. Please refer to the individual BREEAM issues within Section 5 of this report for details of the minimum standards applicable at each BREEAM rating.

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.

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	17%
Energy	43%
Water	11%
Materials	8%
Pollution	6%
Waste	3%
Innovation (additional)	10.0%

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	TBC
Building Fabric	**Walls**	Existing structure retained, no new wall insulation proposed.
	Roof	Existing pitched roof retained, insulation may be installed within the existing roof void.
	Floor	Existing floors to be retained, upper floors will be modified to ensure compliance with Building Regulations Part E noise transmission requirements.
	Windows	Existing windows may be retained if they are in a good enough condition.
Building Services	**Heating**	TBC
	Ventilation	Apartments are naturally ventilated with local mechanical extract fans serving the kitchen and wet-room areas.
	Cooling	No mechanical cooling proposed.
	Hot Water	TBC
Other	**Specify**	N/A

4 Summary of Pre-assessment Performance

Current commitments from the design team indicate that the proposed refurbishment of Raglan House achieves a pre-assessment score of **63.18%** against the BREEAM Domestic Refurbishment Environmental and Sustainability standard. This translates into a provisional BREEAM rating of **'Very Good'**.

Mandatory BREEAM Domestic Refurbishment standards met				
Good	**Pass**	**Very Good**	**Excellent**	**Outstanding**
YES	**YES**	**YES**	**NO**	**NO**

Building Performance by Section					
	Environmental weighting	**Credits available**	**Credits achieved**	**% Achieved**	**Weighted score**
Management	12%	11	8	72.72	8.73%
Health & Wellbeing	17%	12	8	66.66	11.33%
Energy	43%	29	19	65.51	28.17%
Water	11%	5	2.5	50.00	5.50%
Materials	8%	45	27	60.00	4.80%
Pollution	6%	8	3	37.50	2.25%
Waste	3%	5	4	80.00	2.40%
Innovation	10%	10	0	0	0
				Total BREEAM Score	**63.18%**

5 Detailed Pre-assessment of Building Performance

The following section details the performance of the building against each of the assessed BREEAM Domestic Refurbishment issues. For each issue the number of BREEAM credits awarded has been confirmed, this is based on the buildings compliance with the BREEAM requirements for that issue, as determined by the BREEAM 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 BREEAM issue, and serves to provide an auditable trail of evidence that confirms the buildings BREEAM performance.

The BREEAM Domestic Refurbishment issue criteria and compliance requirements that this building has been assessed against are detailed in the assessment manual for the BREEAM. A copy of the BREEAM Domestic Refurbishment assessment manual can be downloaded free of charge from www.breeam.org

Man 01 Home Users Guide		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 recognise and encourage the provision of guidance for the home owner/tenant so they can understand how to operate their home efficiently and effectively.

Credits	Criteria
3	Credits are awarded for the provision of a home users guide which includes the following contents and information: • Recommendations Report • Energy Efficiency • Water Use • Transport Facilities • Materials & Waste • Emergency Information • Local Amenities • Alternative Formats • SuperHomes Network • Links & References Full details of each of the above are contained within the BREEAM Domestic Refurbishment Technical Guide.

Design Stage Evidence Required

Written confirmation stating that a Home Users Guide will be supplied to all dwellings and that the guide will include contents as stated within the BREEAM Technical Guide.

Either a letter from the developer or a specification are acceptable as evidence.

Validation Statement

It was agreed at the pre-assessment meeting that an obligation would be placed on the main contractor to provide a Home Users Guide to each refurbished dwelling at completion of the project; Camden should confirm this requirement to the Developers.

3no. credits are to be sought.

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	0	0

Aim

To recognise and encourage refurbishment projects which are managed in an environmentally and socially considerate and accountable manner.

Credits	Criteria
1	Where the main contractor registers the site with the Considerate Constructors Scheme and achieves a score of 25-34, with no individual section scoring less than 5. **OR** The main contractor registers the site with an alternative considerate construction scheme and achieves compliance.
2	Where the main contractor registers the site with the Considerate Constructors Scheme and achieves a score of 35-39, with no individual section scoring less than 7. **OR** The main contractor registers the site with an alternative considerate construction scheme and achieves beyond compliance.
Innovation Credit	Where the main contractor registers the site with the Considerate Constructors Scheme and achieves a score of 40+, with no individual section scoring less than 7. **OR** The main contractor registers the site with an alternative considerate construction scheme and achieves exemplary level compliance.

Design Stage Evidence Required

Written confirmation that registration with the Considerate Constructor Scheme and achieve the CCS score relevant to the number of BREEAM credits sought.

OR

Register with an approved alternative considerate construction scheme.

Completion of Checklist A-3.

Validation Statement
The design team confirmed that a commitment should be placed on the Principal Contractor to participate in the Considerate Constructors or similar Scheme and achieve a beyond best practice score of between 35 and 39 points, with no individual section score less than 7 points. The Innovation Credit is not to be sought. 2no. credits have been provisionally allocated.

Man 03 Construction Site Impacts		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 refurbishment sites managed in an environmentally sound manner in terms of resource use, energy consumption and pollution.

Credits	Criteria
1	Where the Principal Contractor commits to complying with any two of the following items from BREEAM checklist A-5: 1. Monitor, report and set targets for CO2 production of energy use arising from site activities. 2. Monitor, report and set targets for water consumption arising from site activities. 3. The Main Contractor operates an environmental materials policy. 4. The Main Contractor operates an Environmental Management System. 5. 80% of site timber is reclaimed, re-used or responsibly sourced.

Design Stage Evidence Required

A completed signed and dated copy of BREEAM Appendix A: Man 03 Identifying which items will form part of the main contractor's obligations.

AND

Confirmation that site timber will be sourced from suppliers capable of providing certification to the level required for the particular tier claimed in Mat 02 Responsible Sourcing of Materials.

AND

A copy of the policy for sourcing site timber for the project.

Validation Statement

It was agreed that an obligation would be placed upon the Principal Contractor to comply with at least two of the items detailed above.

The credit for this item is therefore allocated.

Man 04 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 encourage domestic refurbishment projects 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
1	**Secure Windows and Doors** 1. Where retained external doors and accessible windows comply with the following minimum security requirements: a. External doors are of good quality with working key locks and a strong frame, where there is no sign of warping, splitting or rotting to the door or its frame. Where the door contains glazing this should be a minimum of double glazing. Putty or beading to glazed areas should be on the unexposed side of the door, in good condition, with no sign of degradation. b. Accessible Windows should have a minimum of double glazing with working key locks. Putty or beading to glazed areas should be on the unexposed side of the window, in good condition, with no sign of degradation. The window frame should be strong with no sign of warping, splitting or rot. 2. Where the following newly added features are appropriately certified as follows: a. External door sets to PAS 24:2007 or LPS 1175 Issue 7 SR1. b. Windows to BS 7950:1997 or LPS 1175 Issue 7 SR1.
2	**Secured by Design** 1. Where the principles and guidance of Secured by Design Section 2 – Physical Security are complied with. 2. A suitably qualified security consultant such as the Police Architectural Liaison Officer (ALO) or Crime prevention design advisor (CPDA) is consulted at the design stage and their recommendations are incorporated into the refurbishment specification.

Design Stage Evidence Required

Secure Windows and Doors
Confirmation that retained and new external windows and doors meet the minimum security requirements listed above.

Evidence can be provided in the form of:

1. Relevant drawings clearly showing location of the windows and external and/or entrance door sets/locks **OR**

2. A building/site inspection report and photographic evidence **OR**

3. Where the above cannot be produced a design stage commitment from the developer outlining the design specification that will be implemented in accordance with the above requirements.

Secured by Design
Detailed documentary evidence confirming:

1. That a suit-ably qualified security consultant has been contacted for advice to ensure that the requirements of Section 2 – Physical Security of Secured by Design – New Homes 2 are met.

2. A commitment to follow the advice provided by the suitably qualified security consultant.

Validation Statement

First Credit
It was agreed that windows and doors retained would meet the minimum security requirements and that new doors and windows installed will be certified PAS 24, LPS 1175 or BS 7950 as applicable.

Second Credit
Full Secured by Design Section 2 compliance may be sought, PCKO are to advise once they have met with the Police ALO.

The first credit for this issue is therefore allocated; if SBD Section 2 compliance is sought then the second credit may also be achievable.

Man 05 Protection and Enhancement 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 protect existing ecological features from substantial damage during refurbishment and enhance the ecological value of a site.

Credits	Criteria
1	**Protecting Ecological Features** 1. A site survey is carried out by a member of the project team or a Suitably Qualified Ecologist (SQE) to determine the presence of ecological features. 2. Where protected species are identified as present on site, the relevant Statutory Nature Conservation Organisation (SNCO) has been notified and protected species have been adequately protected. 3. All existing features of ecological value on the refurbishment site potentially affected by the works, are maintained and adequately protected during refurbishment works.
Innovation Credit	**Ecological Enhancement** 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 general ecological recommendations and 30% of additional recommendations.

Design Stage Evidence Required

First Credit

1. Confirmation of ecological features present prior to commencement of refurbishment works in the form of building/site inspection report and photographic evidence, drawings showing the location of the ecological features present prior to commencement of refurbishment works.
2. A copy of the notification sent to the Statutory Nature Conservation Organisation (SNCO) outlining the presence of protected species on site (where applicable).
3. Written confirmation from the developer confirming that the recommendations from the Statutory Nature Conservation Organisation (SNCO) will be implemented.
4. Written confirmation from the developer that ecological features have been adequately protected.

Innovation Credit
A copy of the ecologists report confirming the following:

1. Key and additional recommendations to protect ecological features.

2. Confirms that all UK and EU legislation in relation to protected species has been met and recommendations go beyond these requirements.

3. Confirms that the ecologist meets the requirements set out in the definition of a Suitably Qualified Ecologist.

4. Confirms that the ecologist made a site visit prior to the commencement of the refurbishment works.

AND

Confirmation from the developer confirming how the key recommendations and 30% of additional recommendations will be incorporated into the design and the planting schedule of any species to be incorporated from Suitably Qualified Ecologists.

Validation Statement

The design team will carry out a survey of the site in order to determine if there are any features of ecological value present; it is thought that no valuable features are present at Raglan House.

The exemplary level credit is not being pursued as no ecologist will be appointed.

1 credit allocated.

Man 06 Project Management		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 delivery of a functional and sustainable refurbishment, designed and built in accordance with performance expectations.

Credits	Criteria
1	**Project Roles and Responsibilities** The project manager assigns individual and shared responsibilities across the following key design and refurbishment stages: • Planning and Building control notification • Design • Refurbishment • Commissioning and handover • Occupation
1	**Handover and Aftercare** A handover meeting is arranged and at least two of the following items committed in order to determine project success: 1. A site inspection within 3 months of occupation. 2. Conduct post occupancy interviews with building occupants or a survey via phone or posted information within 3 months of occupation. 3. Longer term after care e.g. a helpline, nominated individual or other appropriate system to support building users for at least the first 12 months of occupation.
Innovation Credits	
1	**Early Design Input** Where a BREEAM Accredited Professional (AP) has been appointed to oversee key stages within the project at an early stage.
1	**Thermographic Surveying and Airtightness Testing** 1. Where Thermographic surveying and Airtightness testing have been carried out at both pre and post refurbishment stages. 2. Where an improved air tightness target has been set at design stage and testing demonstrates that this has been achieved post refurbishment.

Design Stage Evidence Required

Project Roles and Responsibilities

Written confirmation indicating when the collaboration began and the roles and responsibilities of the project team. This could be either:

- Meeting minutes
- Construction programme
- Responsibilities schedule
- Relevant section/clauses of the building specification or contract
- Project implementation plan

Handover and Aftercare

Written confirmation of a commitment/contract to provide compliant aftercare support and training or a compliant design stage commitment to provide aftercare.

Innovation Credits

Early Design Input

Written confirmation of the appointment of a BREEAM Accredited Professional (AP) or BREEAM Domestic Refurbishment Assessor including relevant section/clauses of the building specification or contract.

Thermographic Surveying and Airtightness Testing

1. A copy of the pre-refurbishment Thermographic survey.
2. Level 2 thermography certificate.
3. Pre-refurbishment air tightness results.
4. Written confirmation from the refurbishment project manager of areas to be targeted as a result of the testing.

Validation Statement

First Credit

It was decided that this credit would prove difficult to prove as the design team are only appointed up to planning stage and continuous evidence of design team collaboration through to completion is required.

Second Credit

For the second credit we do not know the handover, training and aftercare arrangements of the prospective developer and contractors so this was also omitted.

No credits can be allocated under this issue.

Hea 01 Daylighting		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 improve the quality of life in homes through the provision of good daylighting and to reduce the need for energy to light the home.

Credits	Criteria
1	**Maintaining Good Daylighting** For existing dwellings and change of use projects (e.g. conversions): 1. The refurbishment results in a neutral impact on the dwellings daylighting levels in the kitchen, living room, dining room and study. 2. Where a property is being extended: a. New spaces achieve minimum daylighting levels. b. The extension does not reduce daylighting levels in the kitchen, living room, dining room or study of neighbouring properties.
1	**Minimum Daylighting** The dwelling achieves the following daylight levels in each kitchen, living room, dining room and study: • Kitchens = 2% • Living Rooms, dining rooms and studies = 1.5% • 80% of the working plane in each new space receives direct light from the sky.

Design Stage Evidence Required

A completed signed and dated copy of Appendix A: Hea 01 , parts 1 and 2, or parts 3 and 4 as relevant.

AND

Where relevant, calculations to demonstrate:

1. Average daylight factor using the Hea01 calculator.
2. Position of the no-sky line and percentage of area of the working plane that receives direct light from the sky.

Validation Statement
First Credit PCKO confirmed that the existing glazing will either be retained or where replaced the new glazing will have a neutral impact on daylighting within the dwellings. **Second Credit** PCKO could not confirm whether the daylight factors for the relevant spaces within the refurbished building and a daylight specialist is unlikely to be appointed, therefore this credit was omitted. 1 credit allocated.

Hea 02 Sound Insulation		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 ensure the provision of acceptable sound insulation standards and so minimise the likelihood of noise complaints.

Credits	Criteria
2-4	Credits are awarded for providing sound insulation to meet or go beyond the levels set out in Approved Document Part E as follows: 2 credits = Achieving Part E compliance 3 credits = Airborne 3dB higher/Impact 3dB lower 4 credits = Airborne 5dB higher/Impact 5dB lower

Design Stage Evidence Required

Written confirmation from the developer confirming the intent to:

1. Meet the relevant sound insulation performance levels.
2. Use a Compliant Test Body to complete testing.

Validation Statement

PCKO confirmed that acoustic testing of the refurbished properties would be required by Building Control and that compliance with Part E would be sought

2 credits allocated.

Hea 03 Volatile Organic Compounds		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 a healthy internal environment through the specification of internal finishes and fittings with low emissions of volatile organic compounds (VOCs).

Credits	Criteria
1	Where all decorative paints and varnishes used in the refurbishment have met the requirement in Table – 14 of the BREEAM Technical Guide. Where at least five of the eight remaining product categories listed have met the testing requirements and emission levels for Volatile Organic Compound (VOC) emissions against the relevant standards identified in Table – 14 of the BREEAM Technical Guide. Where five or less products are specified within the refurbishment, all must meet the requirements of Table – 14 in order to achieve this credit.

Design Stage Evidence Required

A commitment from the design team that the VOC content of the relevant specified product types will comply with the standards specified within the criteria.

Validation Statement

PCKO confirmed that the dwellings will be designed so that all internal finishes comply with the BREEAM emission requirements stated in Table 14 of the BREEAM Domestic Refurbishment Technical Guide.

1no. credit has been allocated.

Hea 04 Inclusive Design		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

Adopting an inclusive design approach to optimise the accessibility of the home and its future adaptability to cope with changing needs of a household, such as old age, frailty, a short or long-term disability or a debilitating illness.

Credits	Criteria
2	An access expert or suitably qualified member of the design team (Inclusive Design Champion or NRAC Consultant/Access Auditor) has completed sections 1 and 2 of BREEAM Appendix A: Hea 04 with evidence provided of the measures implemented in the refurbishment. The access statement demonstrates reasonable provision to provide accessibility to the dwelling covering sections 1 and 2 of BREEAM Checklist A-8.

Design Stage Evidence Required

A copy of the Access Statement completed by the inclusive design champion/NRAC Auditor/Consultant to address the requirements of Sections 6—9 of Part M.

In all cases the Access Statement is signed by the developer and, when completed by an inclusive design champion or NRAC Auditor, the appointed assessor.

Validation Statement

It was agreed that the refurbished dwellings would comply with the requirements of Part M and BS 8300 and that a member of the design team would complete the access statement in accordance with the BREEAM checklists required above.

PCKO confirmed that the exemplary level criteria relating to Lifetime Homes is not being sought.

2 credits are allocated

Hea 05 Ventilation		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	1 of 2	Min. credits to achieve rating level	1	1	1	1	1

Aim

To recognise and encourage a healthy internal environment through the provision of appropriate ventilation levels to provide fresh air and avoid problems associated with the build-up of pollutants and humidity levels without excessive heat loss.

Credits	Criteria
1	**Minimum Ventilation (Mandatory)** A minimum level of background ventilation is provided (with trickle ventilators or other means of ventilation) for all habitable rooms, kitchens, utility rooms and bathrooms compliant with Section 7, Building Regulations Approved Document Part F. A minimum level of extract ventilation is provided in all wet rooms (e.g. kitchen, utility and bath-rooms), compliant with Section 5, Building Regulations Approved Document Part F. A minimum level of purge ventilation is provided in all habitable rooms and wet rooms, compliant with Section 7, Building Regulations Approved Document Part F.
2	**Advanced Ventilation** Ventilation is provided for the dwelling that meets the requirements of Section 5 of Building Regulations Part F in full.

Design Stage Evidence Required

Written confirmation from the developer confirming the level of background, extract and purge ventilation.

Validation Statement

One credit is mandatory under this issue in order to achieve any BREEAM rating.

Minimum Ventilation
The design team agreed that background, extract and purge ventilation within the dwellings would achieve compliance with Part F for existing buildings.

BREEAM also requires that any wet rooms within the refurbished building should either be supplied with an occupant controlled opening window for purge ventilation or, where this cannot be accommodated, a single room extract vent with heat recovery should be installed.

Advanced Ventilation
The dwellings will not meet the full requirements of Part F Section 5 therefore this credit is omitted.

1 credit is to be sought.

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

Aim

To reduce the risks to life, health and property resulting from fire and exposure to carbon monoxide.

Credits	Criteria
1	Compliance with the requirements of this credit is mandatory in order to achieve any BREEAM rating. Where the dwelling is supplied with mains gas or where any other form of fossil fuel is used within the building (e.g. coal), a compliant fire and carbon monoxide detector and alarm system is provided. Where the project involves electrical re-wiring the power supply for the smoke alarm and compliant carbon monoxide alarm systems are derived from the dwellings main electricity supply. The detection system(s) should comply with the following: • BS 5839-6:2004 Grade D Category LD3. • Large dwellings (up to 2 storeys) BS 5839-6:2004 Grade B Category LD 3. • Large dwellings (3 or more storeys) BS 5839-6:2004 Grade A Category LD 2. • Smoke and heat alarms positioned in accordance with Building Regulations Part B Volume 1 Section 1. • Power supply mains operated conforming to BS EN 14604:2005 complete with a battery or capacitor standby power supply. • The power supply circuit should comprise a single independent circuit at the main distribution board. • Carbon monoxide detector and alarm (where applicable) should be in accordance with BS EN 502914-1:2001 and positioned in accordance with BS EN 50292:2002. • Where smoke and carbon monoxide detectors are combined they should meet the LPS 1282 standard.

Design Stage Evidence Required

Detailed documentary evidence demonstrating that the fire detection and fire alarm system and carbon monoxide detector/s are certified to the relevant standards.

OR

Where the above evidence cannot be produced. Compliant design stage commitment outlining the design specification that will be implemented.

Validation Statement
This credit is mandatory at all BREEAM levels. TGA confirmed that compliant carbon monoxide and fire detection/alarm systems will be installed within each dwelling The mandatory credit has therefore been allocated.

Ene 01 Improvement in Energy Efficiency		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	3 of 6	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognise and encourage a reduction in CO2 emissions through improved energy efficiency of the dwelling and its services as a result of refurbishment.

Credits	Criteria
1-6	The Energy Efficiency Rating for before and after refurbishment should be obtained from either the Energy Performance Certificate using RdSAP April 2012 or from full SAP 2009. Credits are then awarded on a sliding scale for improvements to the Energy Efficiency Rating (EER) as detailed below:

Credits	Improvement in EER
0.5	≥5
1.0	≥9
1.5	≥13
2.0	≥17
2.5	≥21
3.0	≥26
3.5	≥31
4.0	≥36
4.5	≥42
5.0	≥48
5.5	≥54
6.0	≥60

Compliance Note

Material Change of Use Projects
For dwellings created as part of a material change of use project, the following conventions should be followed in order to provide a comparable pre and post refurbishment assessment of the Energy Efficiency Rating:

- For newly constructed thermal elements that replace existing elements (e.g. demolition of an existing wall and construction of a new wall), input data to calculate the pre-refurbishment EER for the element being replaced should be based upon the 'U' value of the elements prior to replacement as set out in appendix S of SAP 2009.
- For change of use projects where single dwellings are converted into multiple dwellings, or where multiple dwellings are converted into single dwellings, building dimensions for the pre and post refurbishment EER should be based on the dwellings dimensions post refurbishment.
- All other assumptions (heating, hot water, infiltration, thermal bridging etc.) should be based upon the details set out in SAP Appendix S or using actual values where available.

Design Stage Evidence Required
A copy of the design stage Energy Performance Certificate report or SAP 2009 worksheets to confirm the dwelling/s Energy Efficiency Rating pre and post refurbishment.
Validation Statement
TGA have provided an Energy Statement report dated 28th August 2013 which details the SAP performance of the Baseline and Proposed dwellings as follows: • Baseline EER = 39 • Proposed EER (Baseline + improved fabric + local boilers) = 67 The improvement in the EER is 28 therefore 3 credits can be allocated under this BREEAM issue.

Ene 02 Energy Efficiency Rating Post Refurbishment		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	2 of 4	Min. credits to achieve rating level	0.5	1.0	2.0	2.5	3.5

Aim

To encourage high levels of energy efficiency in the refurbished dwellings, thus reducing CO2 emissions, running costs and fuel poverty.

Credits	Criteria
0.5 - 4	Where the Energy Efficiency Rating (EER) post refurbishment meets the standards detailed below credits are awarded on a sliding scale:

Credits	EER post refurbishment	Minimum standards
0.5	≥50	BREEAM Pass requires an EER of 50
1	≥55	BREEAM Good requires an EER of 58
1.5	≥60	
2	≥65	BREEAM Very Good requires an EER of 65
2.5	≥70	BREEAM Excellent requires an EER of 70
3	≥75	
3.5	≥80	BREEAM Outstanding requires an EER of 81
4	≥85	

Innovation Credits

Where the EER post refurbishment meets the standards detailed below up to two extra credits can be awarded:

Credits	EER post refurbishment	Notes
1	≥85	Equivalent to an EPC band A
2	≥100	

Design Stage Evidence Required

A copy of the design stage Energy Performance Certificate report or SAP 2009 worksheets to confirm the dwellings Energy Efficiency Rating post refurbishment.

Validation Statement

TGA have provided an Energy Statement report dated 28th August 2013 which confirms that the proposed dwellings can achieve an EER of 67; an EER of 67 would allow 2 credits to be allocated and meet the mandatory requirement for Very Good.

Ene 03 Primary Energy Demand		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	5 of 7	Min. credits to achieve rating level	0	0	0	0	0

Aim

To encourage a reduction in the absolute total regulated energy demand of a dwelling as a result of refurbishment, thus saving CO2 emissions, running costs and reducing fuel poverty.

Credits	Criteria
0.5 - 7	Where the Energy Efficiency Rating (EER) post refurbishment meets the standards detailed below credits are awarded on a sliding scale:

Credits	Primary Energy Demand Post Refurbishment (kWh/m²/year)
0.5	≤400
1.0	≤370
1.5	≤340
2.0	≤320
2.5	≤300
3.0	≤280
3.5	≤260
4.0	≤240
4.5	≤220
5.0	≤200
5.5	≤180
6.0	≤160
6.5	≤140
7.0	≤120

Design Stage Evidence Required

A copy of the design stage Energy Performance Certificate report or SAP 2009 or RdSAP April 2012 (or EPC report) post refurbishment to confirm the dwellings Primary Energy Demand.

Validation Statement

TGA have provided an Energy Statement report dated 28th August 2013 which confirms that the proposed dwellings are capable of achieving a primary energy demand figure of 183.47 kWh/m²/year; this figure will allow the dwellings to achieve 5 credits.

Ene 04 Renewable Technologies		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 encourage local energy generation from renewable sources to supply a significant proportion of the dwellings energy demand and to encourage homes to reduce the total energy demand, prior to the specification of renewable technologies.

Credits	Criteria
1	Where at least 10% of the dwellings Primary Energy Demand per annum is supplied by low or zero carbon technologies. **AND** Where the dwelling has reduced energy demand prior to the specification of renewable technologies with a maximum Primary Energy Demand as follows: a. For detached, semi-detached, bungalows and end terraces: 250 kWh/m²/year. b. Mid terraces and flats: 220 kWh/m²/year.
2	Where for mid to high rise flats at least 15% of each dwellings Primary Energy Demand per annum is supplied by low or zero carbon technologies Where for dwellings other than mid to high rise flats at least 20% of each dwellings Primary Energy Demand per annum is supplied by low or zero carbon technologies **AND** Where the dwelling has reduced energy demand prior to the specification of renewable technologies with a maximum Primary Energy Demand as follows: a. For detached, semi-detached, bungalows and end terraces: 250 kWh/m²/year. b. Mid terraces and flats: 220 kWh/m²/year.

Design Stage Evidence Required
A copy of the design stage Energy Performance Certificate report or SAP 2009 or RdSAP April 2012 post refurbishment to confirm the dwellings Primary Energy Demand. **AND** Detailed documentary evidence confirming that the low or zero carbon technology specified meet the following criteria: 1. Meet all requirements as defined in Directive 2009/28/EC. 2. For technologies under 50kWe or 300 kWth these must be certified under the Micro-generation Certification Scheme (for both equipment and installers). 3. Where CHP systems are above 50 kWe they must be certified under the CHPQA standard.
Validation Statement
No LZC's are proposed therefore this credit is not sought.

Ene 05 Energy Labelled White Goods		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 provision or purchase of energy efficient white goods, thus reducing the CO2 emissions from appliance use in the dwelling.

Credits	Criteria
1	Fridges and freezers or fridge-freezers are provided to each dwelling and are recognised by the Energy Saving Trust Recommended labelling scheme, carrying the Energy Saving Trust Recommended Label. **OR** Where no white goods are provided to the dwelling(s) EU Energy Efficiency Labelling Scheme Information Leaflet is provided to each dwelling.
1	To award the second credit you must have complied with the requirements of the first credit and provide the following: 1. Washing machines and dishwashers are recognised by the Energy Saving Trust Recommended labelling scheme, carrying the Energy Saving Trust Recommended Label. 2. Washer dryers and tumble dryers have a B rating under the EU Energy Efficiency Labelling Scheme (where a washer dryer is provided, it is not necessary to also provide a washing machine). 3. Where a washer dryer or tumble dryer is not provided, the EU Energy Efficiency Labelling Scheme Information Leaflet is provided to each dwelling.

Design Stage Evidence Required

Where white goods are provided
Compliant design stage evidence outlining the appliances to be provided with their applicable ratings under the EU Energy Efficiency Labelling Scheme and/or EST recommended labelling scheme. A printed copy of the EST web-site product list is required as the EST recommended products change over time.

OR

Where no white goods are provided
A copy of the information that will be provided on the EU Energy Efficiency Labelling Scheme or EST recommended labelling scheme.

AND

Written confirmation that leaflets will be provided to all dwelling/s.

Validation Statement
The design team has confirmed that Energy Saving Trust recommended white goods would likely be provided to the dwellings together with information on the EU Energy Efficiency Labelling scheme. 2 credits are being sought.

Ene 06 Drying Space		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 provide a reduced energy means of drying clothes and so encourage reductions in energy demands.

Credits	Criteria
1	Credits are awarded when there is the provision for drying clothes externally or internally, in a secure space. 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.

Validation Statement

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

One solution would be to provide retractable drying lines above the bath in each property. If a bathroom is used as the drying space ventilation complying with the requirements of Part F must be provided.

1 credit is to be sought.

Ene 07 Lighting		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 provision of energy efficient lighting, thus reducing CO_2 emissions associated with the dwelling.

Credits	Criteria
1	**External Lighting** Where Energy Efficient Space lighting (including lighting in communal areas) and Energy Efficient Security lighting is provided. **OR** Where Energy Efficient Space lighting (including lighting in communal areas) and no Security Lighting is provided.
1	**Internal Lighting** One credit is awarded where the energy required for internal lighting is minimised through the provision of a maximum average wattage across the total floor area of the dwelling of 9 watts/m².

Design Stage Evidence Required

External Lighting
Detailed documentary evidence confirming the types of light fitting for all external lamps and the control systems applicable to each light fitting or group of fittings.

Internal Lighting
Detailed documentary evidence confirming the average watts/m² for all internal lights.

OR

Where the above cannot be provided (for both external and internal lighting) a written commitment outlining the specification which will be used is acceptable.

Validation Statement
TGA confirmed that BREEAM compliant space and security lighting will be installed at each refurbished dwelling on the scheme; TGA also confirmed that LED light fittings would be specified. 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. It was also agreed that the average wattage for internal lighting across the floor area of the refurbished dwellings would be no more than 9 watts/m². Therefore credits have been allocated.

Ene 08 Energy Display Devices		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 provision of accessible equipment to display energy consumption data to dwelling occupants, thereby encouraging them to reduce energy use.

Credits	Criteria
1	Where current electricity consumption data is displayed to occupants by a compliant energy display devices **OR** Where current primary heating fuel consumption data is displayed to occupants by a compliant Energy Display Devices.
2	Where current electricity **AND** primary heating fuel consumption data are displayed to occupants by a compliant correctly specified Energy Display Devices. **OR** Where electricity is the primary heating fuel and current electricity consumption data are displayed to occupants by a compliant Energy Display Devices.
Innovation Credit	The Energy Display Devices specified above are capable of recording consumption data.

Design Stage Evidence Required

External Lighting
Detailed documentary evidence confirming the types of light fitting for all external lamps and the control systems applicable to each light fitting or group of fittings.

Internal Lighting
Detailed documentary evidence confirming the average watts/m² for all internal lights.

OR

Where the above cannot be provided (for both external and internal lighting) a written commitment outlining the specification which will be used is acceptable.

Validation Statement
TGA confirmed that energy display devices for both electricity and primary heating fuel will be installed. TGA also confirmed that the exemplary level credit for installing meters capable of displaying historical usage data will not be installed. 2 credits are to be sought.

Ene 09 Cycle Storage		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 occupants to cycle by providing adequate and secure cycle storage facilities, thus reducing the need for short car journeys.

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.

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).

OR

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

PCKO confirmed that compliant cycle storage will be installed to meet the following criteria:

• 1 bedroom – 1 space per two dwellings
• 2-3 bedroom – 1 per dwelling
• 4 bedrooms – 2 per dwelling

Ene 10 Home Office		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 need to commute to work by ensuring residents have the necessary space and services to be able to work from home.

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

Compliance Notes

Suitable Room
Dwellings with three or more bedrooms, a suitable room is defined as a room other than the kitchen, living room, master bedroom or bathroom.

Dwellings of one or two bedrooms or studio homes a suitable room is defined as a room other than the kitchen, living room or bathroom, however may be within the master bedroom.

Sufficient Services
The following services must be provided in the suitable room intended as a home office:

- Two double power sockets.
- Telephone point.
- Window (either of the width and height are to be less than 450mm)
- Adequate ventilation.

Sufficient Space
A minimum size space should be provided (1.8m wall length) to allow a desk, chair and filing cabinet or bookshelf to be installed, with space to move around the front and side of the desk, use the chair appropriately and operate the filing cabinet safely (the 1.8m wall size requirement can, in some circumstances, be altered if drawings can prove that a desk can be fitted in any other type of arrangement, i.e. alcove or similar, fulfilling all the above criteria).

Adequate ventilation
In all cases the room must have an openable window or alternative ventilation such as a passive stack etc. Where the room relies on a window for ventilation, the minimum openable casement must be 0.5 m². A room with only an external door does not meet the minimum requirements for adequate ventilation. Alternatively where at least one credit has been achieved under issue Hea 05 - Ventilation, this is deemed to meet the requirements for adequate ventilation.

Design Stage Evidence Required
Detailed documentary evidence showing: a. Location of and sufficient space for the home office. b. Location and number of sockets. c. Location of telephone points. d. That adequate ventilation will be provided e. Window (either of the width and height of less than 450mm). **OR** Where the above cannot be produced at this stage, a compliant design stage commitment outlining the design specification that will be implemented
Validation Statement
PCKO confirmed that a compliant Home Office would be provided within each dwelling; the drawings tabled at the meeting would be altered in order to show sufficient space and furniture. 1 credit allocated

Wat 01 Internal Water Use		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	2.5 of 3	Min. credits to achieve rating level	0	0	1	2	3

Aim

To minimise the consumption of potable water in sanitary applications by encouraging the use of low water use fittings and water recycling systems.

Credits	Criteria
0.5 - 3	Where terminal fittings meet the equivalent terminal fitting consumption standards as detailed in the table below:

Credits	Calculated water consumption (litres/person/day)	Minimum Standards
0	>150	
0.5	140-150	
1	129-139	BREEAM Very Good
1.5	118-128	
2	107-117	BREEAM Excellent
2.5	96-106	
3	<95	BREEAM Outstanding

Design Stage Evidence Required

Drawings describing the location, details and type of appliances/fittings that use water in the dwelling/s, including any specific water reduction equipment.

OR

Where the above evidence cannot be produced a compliant design stage commitment to implement the specification required for the targeted credits.

Validation Statement

The design team confirmed that they would target a similar level of performance as the new build dwellings at the Highgate site which are being assessed under the Code for Sustainable Homes – 105 litres/person/day.

This level of consumption would allow 2.5 credits to be sought.

Wat 02 External Water Use		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 encourage the recycling of rainwater and reduce the amount of mains potable water used for external water uses.

Credits	Criteria
1	The credit can be awarded for either of the following: Where a compliant rainwater collection system for external/internal irrigation use has been provided to dwellings. **OR** Where dwellings have no individual or communal garden space.

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 design team have confirmed that rainwater collectors will not be specified.

0 credits are to be sought for this issue.

Wat 03 Water Meter		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 encourage the provision of equipment to measure water consumption of dwelling occupants, thereby encouraging them to reduce water use.

Credits	Criteria
1	Where an appropriate water meter for measuring usage of mains potable water has been provided to dwelling/s. The meter should provide a visible display of mains potable water consumption to occupants. The meter should be a permanent feature secured within the home in a location visible to occupants (i.e. not hidden within a cupboard) and capable of recording and displaying historic water consumption to allow water consumption to be monitored over time. The meter should be capable of displaying current consumption either instantaneously or at half hourly intervals.

Design Stage Evidence Required

Detailed documentary evidence confirming:

a. The water meter make and model.
b. The consumption data dis-played by the water meter.
c. The location of the water meter

Where the above cannot be produced at this stage, a compliant design stage commitment outlining the design.

Validation Statement

TGA confirmed that only the statutory water meter would be installed at each dwelling which would not comply with the requirements of this issue.

0 credits sought.

Mat 01 Environmental Impact of Materials		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	10 of 25	Min. credits to achieve rating level	0	0	0	0	0

Aim

To encourage the retention and enhancement of existing elements and where new materials are required the use of materials with lower environmental impacts over their lifecycle whilst optimising the thermal performance of key building elements.

Credits	Criteria
1-25	The BREEAM Domestic Refurbishment Mat1 calculator is used to determine the number of credits awarded. Credits are awarded according to the impact of new materials according to their Green Guide Rating and their impact on improving the thermal performance of the dwelling for the following elements: • Roof • External walls • Internal walls (including separating walls) • Upper and ground floors • Windows Up to a maximum of 25 credits can be awarded through achieving a combination of the credits available for each element. Retained elements, where no work is being carried out on them, are assessed against the Refurbishment Green Guide Calculator. Typically they will be counted as being very low impact by the calculator. A maximum of 5 credits are available with elements rated from A+ to E Retained elements undergoing refurbishment (e.g. the installation of solid wall insulation) are assessed against the Refurbishment Green Guide Calculator. A maximum of 5 credits are avail-able for refurbished elements depending on their Refurbishment Green Guide rating from A+ to E. New elements such as new windows, a newly constructed roof or walls are assessed against the Green Guide to Specification with a maximum of 3 credits available depending on their Green Guide rating from A+ to E. Additional credits are awarded for retained elements undergoing refurbishment as detailed in the calculation procedure (Materials) depending on the thermal improvement made as a result of refurbishment based upon the 'U' value of elements before and after refurbishment.

Design Stage Evidence Required
1. Specification providing a detailed description of each applicable element and its constituent materials. 2. Design drawings or specification detailing the location and area (m²) of each applicable element. 3. A copy of the output from the Mat1 calculator tool, including Green Guide/ Refurbishment Green Guide ratings and element numbers for each specification assessed. 4. And where relevant: a. Copies of Environmental Product Declarations. b. A link/reference to the EPD's Product Category Rules. c. Online Green Guide and or refurbishment calculator output Environmental Profile certificate(s).
Validation Statement
At the time of the pre-assessment meeting the specifications for the refurbished dwellings were yet to be finalised however, it is envisaged that a significant amount of existing structure will be retained and reused within the newly refurbished dwelling; these existing elements will be awarded a Green Guide rating of A+. However 'U' values are also unknown so a conservative target of 10 credits out of 25 has been set.

Mat 02 Responsible Sourcing of Materials		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	9 of 12	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognise and encourage the reuse of materials and the specification of responsibly sourced materials for use where required in the refurbishment process.

Credits	Criteria
1-12	Where the new materials within the following refurbished building elements are assigned a responsible sourcing tier level: • Structural Frame • Ground floor • Upper floors (including separating floors) • Roof • External walls • Internal walls (including separating walls) • Foundation/substructure (excluding sub-base materials) • Staircase • Windows, External and internal doors • Secondary fixes including skirting, panelling, fascias and balustrades • Fixed furniture • Any other significant use **Mandatory Criteria** All new timber used in the project is sourced in accordance with the UK Government's Timber Procurement Policy.

Design Stage Evidence Required

Copies of the following:

1. Design drawings and/or specification confirming: the location of elements and materials specified and the details of the materials specified for each element.
2. A copy of the purchase order from the supplier and EMS certificate number.

Where the above is not available a design stage commitment from the contractor or developer confirming that the product shall be sourced from suppliers capable of providing certification to the level required for the particular tier claimed

Mandatory Criteria
Written confirmation that all timber will come from a 'legal source' and is not on the CITES list **OR** in the case of Appendix III of the CITES list, it has not been sourced from the country seeking to protect this species as listed in Appendix III.

Validation Statement
The majority of mainstream building materials suppliers now operate under some form of environmental management system and it is thought that a reasonable score can be achieved. All timber must be responsibly sourced in accordance with the UK Government Timber Procurement policy. The Principle Contractor will be required to manage this process in order to provide sufficient evidence of this. It was agreed to target 9 out of the 12 credits available as an estimate at this stage.

Mat 03 Insulation		Minimum BREEAM Standards					
		Level	P	G	VG	E	O
No. of credits awarded:	8 of 8	Min. credits to achieve rating level	0	0	0	0	0

Aim

To recognise 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
1-4	Any new insulation specified for use within the following building elements must be assessed: • External walls • Ground floor • Roof • Building services **Embodied Impact** Where the Insulation Index for new insulation used in the buildings is ≥2 and is calculated using the BREEAM Domestic Refurbishment Mat 03 Insulation Calculator. Where Green Guide ratings, required by the BREEAM Domestic Refurbishment Mat 03 Insulation Calculator are determined using the Green Guide to specification tool.
1-4	**Responsible Sourcing** Where ≥ 80% of the new thermal insulation used in the building elements is responsibly sourced.

Design Stage Evidence Required

The following information is required to confirm compliance:

1. Text (on drawings or in a specification) describing the location and area (m2) and thickness (m) or volume (m3) of insulation specified
2. Manufacturer's technical details confirming the thick-ness and thermal conductivity of the insulating materials specified.
3. A copy of the output from the BREEAM Domestic Refurbishment Mat3 Insulation Calculator.
4. The Green Guide rating and element number for the assessed insulation specifications including Green Guide ratings and element numbers for each new insulation specification assessed.

Validation Statement
The design team has provided a commitment that a significant proportion of the insulation materials specified will be will be A or A+ rated from manufacturers who responsibly source materials used in manufacture. The Principle Contractor will be required to manage this process in order to provide sufficient evidence of this. It was agreed to target 8 out of the 8 credits available as an estimate at this stage.

Pol 01 Nitrogen Oxide Emissions		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 reduce the emission of nitrogen oxides (NOx) into the atmosphere.

Credits	Criteria
1	One credit where the dry NOx emissions of space heating and hot water systems are ≤100 mg/kWh (NOx class 4 boiler).
2	Two credits where the dry NOx emissions of space heating and hot water systems are ≤70 mg/kWh (NOx class 5 boiler).
3	Three credits where the dry NOx emissions of space heating and hot water systems are ≤40 mg/kWh.

Design Stage Evidence Required

Detailed documentary evidence describing the primary and any secondary heating systems and flue type.

Dry NOx levels and/or boiler class of the primary and any secondary heating systems.

Validation Statement

TGA confirmed that a NOx emissions figure of no more than 70mg/kWh for space and water heating would be achieved - TGA will advise in due course whether an extra credit for a NOx figure of no more than 40mg/kWh can be sought.

2 credits have been allocated.

Pol 02 Surface Water Run-off		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 encourage domestic refurbishments to have a neutral impact upon site run-off and recognise refurbishments that adopt opportunity measures to reduce and delay the discharge of rainfall to the public sewers and watercourses. This will protect the watercourses and reduce the risk of localised flooding, pollution and other environmental damage.

Credits	Criteria
1	**Neutral Impact on Surface Water** Where any new hard standing areas are permeable, this must include all new pavements, drive-ways and where applicable public rights of way, car parks and non-adoptable roads (e.g. community scale refurbishment projects). Where the building is being extended onto any previously permeable surfaces, or an impermeable surface that drains onto a permeable surface (e.g. paving slabs set on concrete that drained onto soft landscaped areas) the additional run-off for rainfall depths up to 5 mm caused by the area of the extension must be managed on site using appropriate Sustainable Drainage Systems (SuDS) such as Soakaways. Any calculations necessary to demonstrate that criterion 2 will be achieved should be carried out by an Appropriately Qualified Professional (AQP).
1	**Reducing Run-off from Site: Basic** Where all run-off from the roof for rainfall depths up to 5 mm, have been managed on site using source control methods (e.g. through infiltration, soakaways etc.). This should include runoff from all existing and new parts of the roof.
1	**Reducing Run-off from Site: Advanced** An appropriately qualified professional should be used to design an appropriate drainage strategy for the site. Where run-off as a result of the refurbishment is managed on site using source control achieving the following requirements: The peak rate of run-off as a result of the refurbishment for the 1 in 100 year event has been reduced by 75% from the existing site. The total volume of run-off discharged into the watercourses and sewers as a result of the refurbishment, for a 1 in 100 year event of 6 hour duration has been reduced by 75%.

Design Stage Evidence Required
Copy of all relevant calculations and information necessary to meet the requirements. AND Drawings showing the impermeable areas pre and post refurbishment. Where the evidence above cannot be produced a compliant design stage commitment outlining the design specification that will be implemented. Written confirmation of the appointment of an appropriately qualified professional to carry out the calculations and provide design criteria for all relevant elements.
Validation Statement
First Credit It was agreed that development would have a neutral impact on surface water as the area of hard landscape will not be increased; this will meet the criteria of the first credit. **Second and Third Credits** The criteria for the second and third credits are to be passed onto the civil engineer to see whether they are likely to be achieved. 1 credit allocated.

Pol 03 Flooding		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	2	2

Aim

To reward dwellings located in low flood risk areas and where dwellings are located in medium to high flood risk zones, to recognise where they are refurbished in accordance with a flood resilience/resistance strategy.

Credits	Criteria
2	**Option 1 – Low flood Risk** Where a Flood Risk Assessment (FRA) has been carried out and the assessed dwellings are defined as having a low annual probability of flooding. **Option 2 – Medium/High Flood Risk** Where a Flood Risk Assessment (FRA) has been carried out and the assessed dwellings are defined as having a medium or high annual probability of flooding. Two credits are awarded where as a result of the dwellings floor level or measures to keep water away the dwelling is defined as achieving avoidance from flooding by following BREEAM Technical Checklist A-10; Decision Strategy Flow Chart. Where avoidance is not possible, two credits are achieved where a full flood resilience/resistance strategy is implemented for the dwellings in accordance with recommendations made by a Suitably Qualified Building Professional.

Design Stage Evidence Required

Options 1 and 2
A copy of a flood risk assessment confirming Flood zone or annual probability of flooding in the site location.

AND

Where appropriate, correspondence from the appropriate statutory body confirming Reduced annual probability of flooding due to existing flood defences.

Option 2 Only
Detailed Documentary Evidence demonstrating how BREEAM Checklist A10: decision strategy flow chart has been used to assess the site.

Flood Resilience Strategy Document completed by a Suitably Qualified Building Professional.

Detailed documentary evidence confirming how the recommendations will be implemented.

Validation Statement
The flood risk at the sites is unknown so it was agreed that the civil engineer would be contacted for advice before any credit commitments are made for this issue. 0 credits allocated.

Was 01 Household Waste		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 the provision of dedicated storage facilities for a dwellings recyclable or compostable waste streams, so that waste is diverted from landfill or incineration.

Credits	Criteria
1	**Recycling Facilities** One credit can be awarded where the dwelling complies with one of the scenarios detailed in the table below:

Scenario	Internal Recycling Storage Requirements
A compliant collection scheme is in place.	1. Three internal recycling containers provided where recycling is not sorted post collection. 2. One internal recycling container provided where recycling is sorted post collection. 3. Minimum thirty litre total capacity, no single container less than seven litre capacity. 4. Located in a dedicated position.
No compliant collection scheme is in place and no adequate external storage is provided.	1. Three internal recycling containers provided. 2. Minimum sixty litre total capacity. 3. Located in a dedicated position.
No compliant collection scheme is in place and adequate external storage is provided.	1. Three internal recycling containers provided. 2. Minimum thirty litre total capacity, no single container smaller than seven litre capacity. 3. Located in a dedicated position.

1	**Composting Facilities** One credit is available for providing home composting facilities as follows: Dwellings with significant external private space - all of the following are met: 1. Where a composting service or facility is provided for green/garden waste. 2. Where a composting service or facility is provided for kitchen waste. 3. Where an interior container is provided for kitchen composting waste of at least seven litres. Dwellings without significant external private space - all of following are met: 1. Where a composting service or facility is provided for kitchen waste. 2. Where an interior container is provided for kitchen composting waste of at least seven litres.

Design Stage Evidence Required

First Credit
Detailed documentary evidence highlighting:

a. The type and sizes of internal storage bins
b. The location of internal and external storage bins and distance to kitchen
c. The types and sizes of external storage bins

AND

Where there is a local authority collection scheme or private recycling scheme a letter, leaflet, website or other published information from the Local Authority or private recycling scheme operator describing:

a. The types of waste collected.
b. The frequency of collection.
c. Type of collection sorting.

Second Credit
Detailed documentary evidence highlighting:

a. The location and size of external composter.
b. Distance of external storage and/or composter from external door.
c. Location of the sufficiently sized internal space.

AND

Where there is a local authority collection scheme or private recycling scheme: A letter, leaflet, website or other published information from the Local Authority or private scheme describing details of the scheme location.

Validation Statement
First Credit PCKO confirmed that Raglan House will be designed to comply with the first credit requirements of this issue as they will be designed to include sufficient internal recycling containers and external storage (where required). **Second Credits** PCKO confirmed that there would be insufficient space to store compost facilities so this credit is not sought. 1 credit allocated.

Was 02 Refurbishment Site Waste Management		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 promote resource efficiency via the effective management and reduction of waste related to the refurbishment process.

Credits	Criteria
1	An SWMP is formulated containing the following: • A target benchmark for resource efficiency i.e. m^3 of waste per £100,000 of project value or tonnes of waste per £100,000 of project value (in line with the credit available). • Procedures and commitments for minimising non-hazardous construction waste in line with the benchmark and best practice. • Specify waste minimisation actions relating to at least 3 key waste groups and recording decisions taken. • Procedures for minimising hazardous waste. • Procedures for sorting, reusing and recycling construction and demolition waste (if generated) (according to the waste streams generated by the scope of the works) either on site or through a licensed external con-tractor. • Procedures for measuring the amount of construction and demolition waste (if generated) diverted from land-fill. • Licence details for the waste carrier, and permit details for the site the waste is taken to, if waste is removed off-site. • The name or job title of the individual responsible for implementing the above.
1	The above criteria are achieved and the following additional criteria are completed: • A resource efficiency benchmark of 26.52m^3 **OR** 16.9 tonnes per £100,000 of project value is not exceeded. • Where Non-hazardous construction waste generated by the dwellings refurbishment meets or exceeds the resource efficiency benchmark. • Where the amount of waste generated against £100,000 of project value is recorded in the SWMP. • Where a pre-refurbishment audit of the existing building is completed. • Where the demolition is included as part of the refurbishment programme, then the audit should also cover demolition materials.

1	Where the criteria of the first two credits are achieved plus: • Where non-hazardous demolition waste generated by the dwellings refurbishment meets or exceeds the refurbishment & demolition waste diversion benchmarks.
Innovation Credit	Where the first three credits have been achieved the Innovation credits can be awarded as follows: • Where non-hazardous construction waste generated by the dwellings refurbishment meets or exceeds the exemplary level resource efficiency benchmarks. • Where Non-hazardous demolition waste generated by the dwellings refurbishment meets or exceeds the exemplary level diversion benchmarks.

Design Stage Evidence Required

A copy of the compliant Site Waste Management Plan/Checklist A-9 containing the appropriate benchmarks, commitments and procedures.

AND

Where appropriate, a copy of the pre-refurbishment audit.

OR

Compliant design stage commitment that requires the principal con-tractor to produce a SWMP/complete BREEAM Checklist A-9 in line with the criteria and to outline in detail the criteria with respect to resource efficiency and target(s) and procedures to be included in the SWMP.

Validation Statement

It was agreed that an obligation would be placed upon the Principal Contractor to prepare and complete a SWMP in order to achieve 3 credits.

The exemplary level credit will not be sought at this time.

3 credits have been allocated.

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

Aim

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

Credits	**Criteria**
2	Ene 02 Energy Efficiency Rating
1	Ene 08 Display Energy Devices
1	Wat 1 Internal Water Use
1	Was 2 Refurbishment Site Waste Management
1	Pol 2 Surface Water Run-off
1	Man 2 Responsible Construction Practices
1	Man 5 Protection and Enhancement of Ecological Value
2	Man 6 Project Management
1	Hea 4 Inclusive Design

Approved Innovation Credits

No approved innovations are to be sought for this development.

Validation Statement

No innovation credits are to be sought.

6 Recommendations

On the basis of this BREEAM Domestic Refurbishment pre-assessment of the refurbishment of Raglan House and the information currently available, it is anticipated that the BREEAM rating which could be achieved when the final assessment is undertaken is '**Very Good**' with a score of **63.18%**.

Further opportunities to increase the BREEAM score are 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 BREEAM Technical Manual.

Credit Title	Recommendations	% Weighted Score Available
Energy		
Man 04 – Security	**1 Credit** Liaise with a suitably qualified security consultant and ensure that the design complies with the principles and guidance of Secured by Design Section 2.	1.09
Health & Wellbeing		
Hea 02 – Sound Insulation	**Up to 2 additional credits** Increase the sound insulation beyond Building Regulations Part E requirements as follows: • 1 credit – 3dB better • 2 credit – 5dB better	2.83
Hea 05 – Ventilation	**1 Credit** Ensure that internal ventilation fully complies with the requirements of Building Regulations Part F Section 5.	1.42

Energy		
Ene 01 – Improvement in Energy Efficiency Rating	**Up to 3 additional credits** Increase the EER of each dwelling by up to ≥60 points. See Ene 01 criteria in Section 5 above for full details of how credits are awarded.	4.44
Ene 02 – Energy Efficiency Rating Post Refurbishment	**Up to 2 additional credits** The design team would need to ensure that an Energy Efficiency Rating of 70-85 is achieved. Full SAP calculations for the refurbished dwellings should be completed in order to see if this is feasible.	2.96
Ene 03 – Primary Energy Demand	**Up to 2 additional credits** Decrease each dwellings primary energy demand between ≤180 kWh/m²/yr - ≤120 kWh/m²/yr. See Ene 03 criteria in Section 5 above for full details of how credits are awarded.	2.96
Ene 04 – Renewable Technologies	**Up to 2 additional credits** Incorporate LZC's into each dwelling to reduce primary energy demand by up to 15% and limit total primary energy demand for the dwelling to no more than 220 kWh/m²/yr. See Ene 04 criteria in Section 5 above for full details of how credits are awarded.	2.96
Ene 09 – Cycle Storage	**1 Credit** Increase cycle storage to cater for the following: • 1 Bedroom - 1 cycle per dwelling • 2-3 bedrooms - 2 cycles per dwelling • 4 bedrooms - 4 per dwelling	1.49

Water		
Wat 01 – Internal Water Use	**0.5 Credit** Decrease potable water consumption within the dwelling to no more than 95 litres/person/day.	1.1
Wat 02 – External Water Use	**1 Credit** Specify compliant rainwater collectors for irrigation use to cater for each dwelling.	2.2
Wat 03 – Water Meter	**1 Credit** Install and an appropriately specified and visible water meter within each dwelling.	2.2
Materials		
Mat 01 - Environmental Impact of Materials	**Up to 15 additional credits**	2.66
Mat 02 - Responsible Sourcing of Materials	**Up to 3 additional credits**	0.54
Pollution		
Pol 01 - NOx Emissions	**1 Credit** Limit NOx emissions related to generation of space heating and hot water to no more than 40mg/kWh.	0.75
Pol 02 – Surface Water Run-off	**1 Credit** Ensure that the first 5mm of run-off is appropriately treated. **1 Credit** Available where an appropriately qualified engineer confirms that the peak rate and volume of run-off from the 1:100 year storm can be reduced by 75% as a result of development.	0.75 0.75

Pol 03 – Flooding	**Up to 2 additional credits** Provide a flood risk assessment confirming the risk of flooding from all sources at the development site.	1.5
Maximum additional BREEAM points available based on the above		32.60%